MANAGEMENT TOWARD GOVERNMENT POLICY IN RESPONSIBILITY TO DISASTER IN THAILAND: CASE STUDIES OF FLOODS BETWEEN 1942-2012

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ABSTRACT

The objectives of the study are 1) to study disaster management in Thailand, focusing on floods, by the government, public, and private sectors at 4 levels: international, national, provincial, and local level; 2) to analyze factors affecting the efficiency and effectiveness of the formation and implementation of public policies related to risk reduction and management of disasters caused by floods; and 3) to develop management guidelines for government policy in response to disasters in Thailand and appropriate approach in response to future disasters. The researcher used qualitative research methods to collect data by interviewing 18 informants and organizing two group conversations with 32 participants. The tools used were a semi-structured interview, a set of questions for group conversations, and a recording form for data collection from documents.

The results of the research are as follows: 1) before 2011, a specific disaster management agency had not yet been established. In 2011, the government clearly formulated a disaster policy according to the Disaster Prevention and Mitigation Act, B.E. 2550, which clearly specified the roles and duties. After 2011, an organization was established that was in charge of preventing and mitigating disasters from water and floods; 2) the factors which affected the efficiency and the effectiveness of the policy formation and the management according to the government policy could be divided into technical factors, human performance factors, and systemic and organizational performance factors; and 3) the management pattern in the future should encourage a relationship that results from mutual values and trustful cooperation. Also, there should be immediate action taken when severe floods take place. The person who has the power to decide and give orders according to the Disaster Prevention and Mitigation Act, B.E. 2550 is the prime minister, and the operating agency is the Department of Disaster Prevention and Mitigation.

KEY WORDS: MANAGEMENT TOWARD GOVERNMENT POLICY / RESPONSIBILITY TO DISASTER / FLOODS

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การจัดการตามนโยบายรัฐเพื่อตอบสนองภัยพิบัติในประเทศไทย: กรณีศึกษา อุทกภัย ระหว่าง พ.ศ. 2485-2555
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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษา 1) สภาพการจัดการตามนโยบายรัฐเพื่อตอบสนองภัยพิบัติในประเทศไทย กรณีศึกษา อุทกภัยของหน่วยงานภาครัฐ ประชาชน และเอกชนใน 4 ระดับ ได้แก่ ระดับนานาชาติ ระดับชาติ ระดับจังหวัดและระดับท้องถิ่น 2) วิเคราะห์ปัจจัยที่มีผลต่อประสิทธิภาพและประสิทธิผลในการก่อรูปนโยบายและการจัดการตามนโยบายรัฐเพื่อตอบสนองภัยพิบัติในประเทศไทย กรณีศึกษา อุทกภัยของหน่วยงานภาครัฐ ประชาชน และเอกชน และ 3) พัฒนาการจัดการตามนโยบายรัฐเพื่อตอบสนองภัยพิบัติในประเทศไทย กรณีศึกษา อุทกภัย และรูปแบบการจัดการที่ควรจะเป็นภายใต้การตอบสนองภัยพิบัติโดยทั่วไป ผู้วิจัยใช้วิธีการวิจัยเชิงคุณภาพ ในการเก็บรวบรวมข้อมูล โดยทำการสัมภาษณ์ผู้ให้ข้อมูลจำนวน 18 คน และจัดสนทนากลุ่ม 2 ครั้ง มีผู้เข้าร่วมสนทนากลุ่มรวมทั้งสิ้น 32 คน เครื่องมือที่ใช้ ประกอบด้วย แบบสัมภาษณ์กึ่งมีโครงสร้าง แนวคำถามการสนทนากลุ่ม และแบบบันทึกข้อมูลจากเอกสาร

ผลการวิจัยสรุปได้ว่า 1) สภาพการจัดการ พิจารณาตามนโยบายรัฐบาล โดยใช้เกณฑ์ช่วงเวลา พบว่า นโยบายรัฐบาลช่วงก่อน พ.ศ. 2554 ยังไม่มีการจัดตั้งหน่วยงานดูแลภัยพิบัติที่เกิดขึ้นเฉพาะ นโยบายรัฐบาลช่วง พ.ศ. 2554 มีการกำหนดนโยบายอย่างชัดเจนในเรื่องของภัยพิบัติ เป็นไปตามพระราชบัญญัติป้องกันและบรรเทาสาธารณภัย พ.ศ. 2550 ที่ระบุบทบาทและหน้าที่อย่างชัดเจน นโยบายรัฐบาลช่วงหลัง พ.ศ. 2554 มีการจัดตั้งองค์กรเพื่อทำหน้าที่ปฏิบัติและรับผิดชอบด้านการป้องกันและบรรเทาสาธารณภัยจากน้ำและอุทกภัย 2) ปัจจัยที่มีผลต่อประสิทธิภาพประสิทธิผลในการก่อรูปนโยบายและการจัดการตามนโยบายรัฐ จำแนกเป็น ปัจจัยเชิงเทคนิค ปัจจัยผลการปฏิบัติงานของมนุษย์ และปัจจัยระบบและผลการปฏิบัติงานขององค์การ และ 3) รูปแบบการจัดการในอนาคตควรมีรูปแบบของการส่งเสริมความสัมพันธ์กันที่เกิดขึ้นจากการมีค่านิยมร่วมและทำงานด้วยกันอย่างไว้วางใจ และควรมีการดำเนินการตามพระราชบัญญัติป้องกันและบรรเทาสาธารณภัย พ.ศ. 2550 ทันทีที่เกิดอุทกภัยร้ายแรง โดยผู้มีอำนาจตัดสินใจและสั่งการตามพระราชบัญญัติป้องกันและบรรเทาสาธารณภัย พ.ศ. 2550 คือ นายกรัฐมนตรี หน่วยงานที่ทำหน้าที่นำนโยบายรัฐบาลไปปฏิบัติ คือ กรมป้องกันและบรรเทาสาธารณภัย

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CHAPTER I
INTRODUCTION

1.1 Background and Justification

1.1.1 Situation of Disaster

A great number of disasters have occurred in the past decade, causing damage to people's lives and properties. It also affects the environment, economics and society. In developing countries, disasters are big obstacles for them to reach development goals. Moreover, if the disaster management is poor, the government of that country may be in an unstable situation (Office of the National Economic and Social Development Board, 2011: 1). Disasters tend to be more severe due to climate change and global warming, settlement, growing population and migration from the countryside to cities (Coppola, 2011: 18).

The word, "Disaster" is the combination of two words, "dis" and "astro" which means "away from the starts". "Disasters are measured in terms of lives lost, injuries sustained, property damaged or lost, and environmental degradation. These consequences are manifested through both direct and indirect means, and can be tangible or intangible" (Coppola, 2011: 30). Disasters are not always limited to a single hazard. Sometimes two or more completely independent disasters occur at the same time; for instance, an earthquake strike during a flood. It is more common that one disaster triggers a secondary hazard (Coppola, 2011: 30). Centre for Research on the Epidemiology of Disaster (CRED) recorded 414 natural disasters and the fact that "these killed 16,847 persons, affected more than 211 million others and caused over 74.9US$ billion in economic damages" (Lindell, Perry and Prater, 2007: 11).

Disaster trends indicate that the overall number of people affected by disasters in rising, less deadly and more costly. Poor countries are disproportionately affected by disaster consequences. The number of disasters is increasing each year (Coppola, 2011: 18-27).

There are various forms of disaster i.e. natural disaster such as tornadoes and manmade disaster such as violence in the work place. The appropriate preparedness for the disaster is necessary in order to reduce the risk and damage (Schneider and Larry, 1952: 1). Among all types of disaster, flood is the most frequent one (40-60%) in this decade, while hurricane and earthquake consist of 15-30%, drought 3-10% and volcano eruption 1-3%. All types of disaster, except drought, occur mostly in Asia (approximately 40%), with 30% in North America, 15% in Latin America and Caribbean, 10% in Europe, 4% in Africa and 1% in Oceania (Albala-Bertrand, 1993: 44).

1.1.2 Situation of Disaster in Thailand

The most severe disaster which raised awareness among Thai people was the Tsunami in 2004, which struck 407 villages in 6 Southern provinces of Thailand (Phang Nga, Krabi, Phuket, Ranong, Trang and Satun, killing 5,309 people (1,240 foreigners, 2,341 unidentified, 3,370 missing (Office of the National Economic and Social Development Board, 2011: 54). Countries that were the most highly damaged by Tsunami 2004 included Indonesia, Sri Lanka, India and Thailand respectively. In case of Thailand, the severity of the damage was partly due to lack of information and lack of effective Tsunami warning system.

According to the record, Thailand has experienced various forms of disaster, most of which were flood.

Tumthong (2004: 8-10) stated in his work about the floods along Chao Phraya River as follows:

Flood in 1942 caused a lot of damage to the areas along Chao Phraya River. The water level at King Rama I Bridge Water Level Sensing Station was 2.25 meter, which was the highest level of the station, and the water level at Nakhon Sawan Water Level Sensing Station 2 was 1.50 meter higher than that of the year 1995. In 1942, the areas along Chao Phraya River were still covered with forests. There were no dams or specific plans to prevent flood. In 1978, there was heavy rain in the areas along the upper part of Chao Phraya River. The areas along three out of four branches of Chao Phraya River (Nan, Yom and Ping) were flooded including Pasak River. There were heavy flood flows at Nakhon Sawan Water Level Sensing Station 2,

Chainat Station 13 and Angthong Station, with maximum flow rates of 3,500 cubic meter/second, 3,800 cubic meter/second and 2,900 cubic meter/second respectively. Heavy rain in the areas along Chainat-Pasak Canal and Lop Buri River caused severe flood that lasted several months. Some other provinces, from Chainat to Phra Nakhon Si Ayutthaya, were also flooded but not seriously. However, Bangkok was not affected.

In 1980, heavy rain caused floods in some areas. The flow rates of Chao Phraya River in Nakhon Sawan and Chainat were 4,400 cubic meter/second and 3,800 cubic meter/second respectively. There were also severe floods in some provinces along Chao Phraya River, from Chainat to to Phra Nakhon Si Ayutthaya. The flood damaged houses and agricultural areas in Nakhon Sawan, Chainat, Sing Buri, Angthong and to Phra Nakhon Si Ayutthaya.

In 1983, Bangkok was seriously flooded due to heavy rain in the areas along the upper part of Chao Phraya River from September to November. Water flow rate at Chainat Station was 3,400 cubic meter/second in October and November. Water from Sakae Krang River flowed to Chao Phraya River at the rate of 2,300 cubic meter/second. Besides, there was a heavy rain (434 millimeter) in the areas along the lower part of Chao Phraya River in August, causing floods in many parts of Bangkok. The total amount of rain from September to November was 405 millimeter, causing floods in most areas of Bangkok. The water level at King Rama I Bridge Station was 2.04 meter. The floods in 1983 made people aware of the damage caused by them. As a result, plans and projects to prevent floods along the areas on Western and Eastern parts of Chao Phraya River were initiated.

In 1995, there was another severe flood covering the areas of 20,000 square meters from the upper part of Chao Phraya River (especially along Yom and Nan River) to lower areas of Central part. In this year, Bangkok was not as highly affected by the flood as the areas around it. The flood in 1995 was caused by heavy rain and storms from July to September. In the areas along Nan and Pasak River, there was a heavy rain of 450 and 345 millimeter respectively. The water flow rates at Nakhon Sawan Station, Chainat Station and Angthong Station were 4,800 4,500 and 2,700 cubic meter/second respectively. There were floods in some provinces along

Chao Phraya River, from Chainat to to Phra Nakhon Si Ayutthaya. The flood covered most areas in Central part of Thailand.

In 1996, there was another flood caused by heavy rain and the overflow of the river water. Compared with other floods, this one was not so serious. The water flow rate at Nakhon Sawan Station was 3,000 cubic meter/second. Due to heavy rain in Western part of Tha Chin River, the water in Krasiau Dam was released, causing floods in many areas of Suphan Buri.

The flood in 2003 affected 44 provinces, 160 districts, 488 sub-districts and 1,692 villages. 668,362 people from 198,500 households were affected. Nineteen people died. It also caused a lot of damage to the construction. For example, 1,243 roads, 105 bridges, 3 irrigation canals and 84 reservoirs and 3,515 houses were partly damaged, while 558,952 of agricultural areas, 1,162 fish ponds, 6,691 cattle and 8 drain pipes were totally damaged. The total cost of the damage was 137,631,592 baht (Thailand Integrated Water Resource Management, 2003).

In 2004, there were 12 floods affecting 56 provinces, 361 districts, 27 district branches, 1,675 sub-districts and 8,339 villages. 1,795,701 people were affected.

In 2006, the storm called, “Changsarn” caused heavy rain during August 1 – November 24, 2006, resulting in the flood which damaged 5,607,502 agricultural areas in 47 provinces, and 476,687 farmers were affected (Department of Agricultural Extension, 2006: 1 cited in Jirawat, 2007: 1).

In 2011, a tropical storm called, “Nok Ten” caused one of the most severe floods in Thailand. From July 25 to September 2, the flood damaged 8 provinces (Sukhothai, Phichit, Phitsanulok, Nakhonsawan, Phra Nakhon Si Ayutthaya, Angthong, Chainat and Ubon Ratchathani), 42 districts, 299 sub-districts and 1,832 villages. 362,338 people from 118,963 households were affected (Pollution Control Department, 2011: 1). The flood continued to damage more areas. As of September 19, there were 26 provinces that had been affected by the flood. These provinces were Sukhothai, Phichit, Phitsanulok, Nakhonsawan, Uthai Thani, Chainat, Sing Buri, Angthong, Phra Nakhon Si Ayutthaya, Lopburi, Saraburi, Suphanburi, Nakhon Pathom, Pathum Thani, Nonthaburi, Ubon Ratchathani, Yasothon, Loei, Khon Kaen,

Maha Sarakham, Si Sa Ket, Chachoengsao, Nakhon Nayok, Tak, Sa Kaeo and Prachin Buri (Center for Emergency Management, 2011: 1).

The above mentioned disasters were in accordance with the study by Dr. Gary Shook on the topic, "A Disaster Risk Assessment for Thailand Using a Technique of Decision Analysis", which ranked disaster risks in Thailand as shown in the table below:

Table 1.1 Ranks of Disaster Risks in Thailand

No.	Disaster	Risk Level	Point
1	Flood	High	2.39
2	Catastrophes	High	2.37
3	Explosives	High	2.34
4	Windstorm	Medium	2.31
5	Drought	Medium	2.24
6	Fire	Medium	2.20
7	Landslide	Medium	2.15
8	Earthquake	Medium	1.97
9	Turmoil	Medium	1.92
10	Refugees	Medium	1.87
11	Pests	Medium	1.77
12	Epidemic diseases	Medium	1.63

Source: Department of Disaster Prevention and Mitigation, 2009: 4.

In the past, disaster management in Thailand prioritized rehabilitation rather than prevention. Disaster management was inefficient. An expert of the United Nations stated that the problems of disaster management in Thailand were: poor organizational management and authorization. Moreover, there were no laws, policies and plans directly related to disaster reduction and management, and there was no cooperation among relevant organizations. This resulted in an unclear, chaotic way of work which caused a lot of budget (Tingsanchali, et al., 2003: 5-6). The study of Piotrowski (2010: 110) stated that formal disaster planning, particularly in local

governmental jurisdiction, either fails to implemented at the time of crisis or proves to be irrelevant to the needs of specific disasters. Such drawbacks to planning can also be applied to multi-national response to crises, wherein multi-jurisdictional factors contribute to poor coordination, conflicts in communication, and a breakdown in command-and-control functions. The result is Government in "inaction" (Piotrowski, 2010: 109).

A case study of Thailand's tsunami disaster management Moe and Pathranarakul (2006: 403) reveals that there specific problems encountered in each of the phases of project life cycle such as

1. lack of master plan for disaster management in Thailand;
2. lack of activities for proactive approach including prediction and warning for disaster occurrences;
3. no specific responsible units;
4. slow decision making in national level for emergency relief activities;
5. unclear line of command from top to provincial level authorities;
6. logistic problems for distributing goods for emergency relief;
7. lack of effective collaboration among institutions in different levels;
8. lack of encouragement for participation of local and international NGOs;
9. lack of education and knowledge for tsunami in potential disaster effected communities; and
10. lack of information management or database system.

This is in accordance with the study of Tingsanchali, et al. (2003: 2) which summarized the disaster management in Thailand as follows:

1. Disaster management in Thailand before the government reform in 2002 was quite complicated as it involved 34 laws and 20 departments under 9 ministries. The disaster management team consisted of people from various government offices under the supervision of the Civil Emergency Relief Administration Division under the Department of Provincial Administration with cooperation of the

governor of each province. The disaster management team worked together only when disaster occurred. (Tingsanchali, et al., 2003: 2-3)

2. The information on water forecast was managed by Thai Meteorology Department, Royal Irrigation Department and Bangkok Metropolitan Administration. Each department has its own system of information management. No specific set of data on natural disaster was collected. It is included in other sets of data, making it difficult or impossible to be compared or used by other departments/offices. Moreover, some data are not in accordance with one (Tingsanchali, et al., 2003: 2)

3. Population growth and urbanization can increase disaster risk. As the population grows, more space is needed. More people live in risk areas. Industrious and economic areas expand, causing physical changes to the lands such as more impermeable areas. (Tingsanchali, et al., 2003: 1-6)

4. According to the study of Wungaeo, et al., 2007, the limitations of disaster management were based on the complicated administration lines, resulting in slow response to the disaster. The "top down" administration line causes inefficiency in disaster management. In addition, the Department of Risk Prevention and Mitigation was just established in 2002. There were limitations such as insufficient manpower to implement the policies for the benefits of local communities. (Wungaeo, et al., 2007: 167-168). This study was quite similar to the case of Hurricane Katrina in New Orleans as 52% of people thought the government was not prepared for disasters at all levels while 62% thought the response to the disaster was too slow. According the Times, the city of New Orleans had plans for disaster management and risk reduction. However, Ray Nagin, Mayor of the city, was reluctant to evacuate people because if there was no serious disaster but the Mayor announced the evacuation, the City had to compensate for benefit loss of all businesses in the areas that had to be closed. (Time, 2005: 20-22 cited in Wungaeo, et al., 2007: 73). In the other hand the private sector's response to Hurricane Katrina was swift and effective when compared to the government's response. Companies like Wal-Mart, Home Depot, and State Frame Insurance made preparations for the impending disaster weeks before Katrina hit, and were willing and able to bring resources to bear on the disaster area days before government agencies could manage to do so. Government's recognition and response to Katrina was confused, chaotic, and much slower (Sobel

and Leeson, 2006: 56). FEMA was placed under the umbrella of the Department of Homeland Security, adding new political decision makers to the mix. At each level of the bureaucratic process is a key political decision maker who can stall the process, since his sing-off is required before any proposed action cab be considered at the next level of political decision making, where yet another key political decision maker is asked to consider the same proposal. The result of layered bureaucracy inherent to centralized decision making is slow and delayed action (Sobel and Leeson, 2006: 57).

5. In the chaos of extreme events, people tend to have less systematic decision making processes. Informed decision require basic understanding and adaptive capacity to adapt to different situations and unexpected consequences. (Kamolvej, 2006: 42) If information is delivered too late, it may fail to prevent damages or losses, while if too early, it may be neglected. During disasters the need for information changes continuously. There are various phases in disaster management that demand specific information (Janssen, Lee, Bharosa and Cresswell, 2010: 2). Disaster management is underpinned by reciprocity mutual trust and willingness to share information among organization (Janssen, Lee, Bharosa and Cresswell, 2010: 4).

In order to solve the problem on disaster risk reduction and management, Department of Disaster Prevention and Mitigation was established under the umbrella of the Ministry of Interior in accordance with the government reform in 2002, and the Department of Water Resources is in charge of policies and master plans of water resource management. However, when work has to be done with cooperation of other departments in other ministries, the process can be more complicated and time consuming. (Tingsanchali, et al., 2003: 8, 11) Emergency situations are dynamic and the sequential effects are uncertain. The devastation can expand to a large scale of the area which affects more of the population. Sometimes difficult to define where the authority and responsibility lie in the multi-agency work so that this integration will need the official collaboration of both national and local response units (Kamolvej, 2006: 38). Management of interagency emergency operations not only to prepare them to work together, but also to balance command-control and decentralization. (Kamolvej, 2006: 39) These types of interactions should occur not only at the top of the organizations making decision jointly, but also at lower level. Crisis management is centered around humans, including first responders and decision-makers. Equally

important are persons outside these responding organization, such as civilians, who might help or observe something that is crucial. In fact, civilians are often the actual "first responders" as a result of being caught up in or near the location of a disaster (Janssen, Lee, Bharosa and Cresswell, 2010: 4).

From the above mentioned situations, we can conclude that there is a need for emerging policies and schemes of disaster management such as creating network and partnership at the local, provincial, national and international levels. What kinds of organizations or agencies should be included in disaster management? What are the roles and authority of these organizations or agencies? What are the efficiencies and effectiveness? What are the factors affecting the efficiencies and effectiveness? Can we explain disaster management, using critical theory of public policy? Why or Why not?

1.2 Objectives of the Study

1.2.1 To study disaster management in Thailand, focusing on flood, by the government sector, people sectors and private sectors at 4 levels: international, national, provincial and local level.

1.2.2 To analyze factors affecting the efficiency and effectiveness of the formation and implementation of public policies related to risk reduction and management of disaster caused by flood by the government sector, people sectors and private sectors.

1.2.3 To develop a management toward government policy in responsibility to disaster in Thailand: case study on flood and previous management, current situation and appropriate approach in response to future disaster.

1.3 Questions of the Study

1.3.1 How disaster caused by flood is managed in Thailand and how is the system of disaster prevention and mitigation developed and implemented? What is the role of the government in disaster management at the international, national, provincial and local level? Which department or sectors are in charge and what kinds of activities have been done?

1.3.2 What are the problems and obstacles in the implementation of public policies on the prevention and mitigation of disaster caused by flood from 1942 to 2012? What are the causes of these problems? What are the factors affecting the efficiency and effectiveness of disaster prevention and mitigation at the international, national, provincial and local level?

1.3.3 In which way should the disaster prevention and mitigation policies be developed and implemented in order to manage disaster in Thailand? Why should it be in that way?

1.4 Scope of the Study

1.4.1 Content of the study: The purposes of this study include: to identify the issues on disaster prevention and mitigation focusing on flood management, by studying public policy implementation based on Network Approach; to analyze and synthesize the disaster management that has been done previously in response to the floods in 1942 -2012 as Thailand has experienced a lot of disaster caused by floods during this period of time, resulting in damage to the environment, economics and society.

1.4.2 Time frame of the study: This study is scheduled for 32 months, which can be divided according to the activities as follows: Literature Review and Development of the instrument (8 months), data collection (12 months), data processing (8 months), writing (3 months) and revision (1 month).

1.5 Definitions

Policy Process means the formation, implementation and evaluation of public policies. The first stage is the identification of the problems and needs of such policies and how they are managed. In this study, the researcher focuses on the practices and activities that have been done to manage the disaster caused by flood during 1942-2012, the authorized governmental and private bodies at the international, national, provincial and local level. The second stage of policy process is the

implementation of the policies. This study focuses on the cooperation of the organizations in charge (government, private and people) at the international, national, provincial and local level. The last stage of policy process is the evaluation, which focuses on the efficiency and effectiveness of the formulated policies.

Efficiency means how effectively the available resources are used for the activities of disaster management as an integral approach with cooperation of the organizations in charge from the government sector, people sectors and private sectors, for quick action and effective disaster management.

Effectiveness means the outcome resulted from the cooperation of the organizations in charge from the government sector, people sectors and private sectors so that the disaster is managed in the same direction, with common goals and mutual agreement.

Response to the disaster means the steps and process of policy implementation in order to reduce or get rid of damage from the disaster that has happened or will happen. The study also focuses on the cooperation and interaction of the organizations in charge (government, people and private) at the international, national, provincial and local level.

Crisis means an unexpected situation that causes undesirable outcomes to the organizations such as natural disaster, financial crisis, political turmoil, too rigid rules and regulations. Some organizations are affected by external crisis i.e. natural disaster (flood, hurricane, and earthquake), terrorism, accidents and market share loss. These external crises result in damage at local and governmental level.

Disaster means a dangerous situation that happens so suddenly, causing damage and loss of lives and property, affecting the environment, economics and society. In this context, disaster is divided into 2 types: natural disaster and manmade disaster. However, this study focuses on flood, which is a natural disaster. Literature review of this study is based on the Disaster Prevention and Mitigation Act B.E. 2550

(2007), which covers all forms of disaster as, in Thailand, there is no specific law for each form of disaster.

Flood means a situation when the overflow of water submerges land which is normally dry, either by heavy rain or the overflow of water from water bodies such as rivers or canals. This study focuses on the flood in Thailand during 1942-2012 as the first recorded flood was the one in 1942. Before that, there had been no official record or evidence of floods in Thailand. The flood in 1942, which lasted for 3 months, was one of the most severe floods in Thai history. The flood in 2011 also caused a lot of damage. In order to prevent and manage damage caused by the floods that have happen or may happen in the future, a model project was launched in August 2011 at Bang Rakam District in Phitsanulok, which marks the ending point of this study.

Disaster Management means the process of disaster prevention and mitigation which is done systematically and continuously, starting from an observation and analysis of the situation, dissemination of information and utilization of the available resources in order to reduce or get rid of damages that may occur from the disaster, including the rehabilitation and restoration after the disaster.

Disaster Management Process means the process consisting of 4 components: damage reduction, preparedness, response to disaster and rehabilitation.

Damage reduction means the process to reduce or get rid of all possible damages that may be caused by the disaster.

Preparedness means training and educating those who may be affected by the disaster as well as the rescuers. This includes the preparation of tools and equipments necessary for the evacuation in case of emergency.

Response to Disaster means action or activities to reduce or to get rid of damages that have occurred or will occur in order to prevent economic loss and to be prepared for changes.

Rehabilitation is a necessary process for those who are affected by the disaster in order to support them to get out of their life crisis as soon as possible. The rehabilitation process starts right after the response to the disaster.

Government Policies include the Constitution, laws, regulations and acts related to the response to disaster, cabinet resolutions in Thailand.

1.6 Expected Outcome

1.6.1 Acquire information on the disaster by the government sector, people sectors and private sectors at the international, national, provincial and local level.

1.6.2 Identify factors that affect the efficiency and effectiveness of the policy formation and implementation in order to response to the disaster in Thailand by the government sector, people sectors and private sectors.

1.6.3 Have guidelines which are in accordance with public policies to response to the disaster caused by flood, as part of the general plan to response to the disaster in Thailand.

1.7 Conceptual Framework

The conceptual framework of the study is applied from the concept of Policy Process by Dunn (1994: 17). The process consists of different stages. The first stage is the formation of policies which starts from identifying problems and developing new policies to illustrate the policy content and to identify stakeholders. The severity of problem was analyzed, using related documents such as the government announcements and other official documents related to disaster management. The second stage is policy implementation. In this context, the concept on relationship of the nation, state and local authority by Wright (1988: 17) is applied to explain relationship of government sector, people sectors and private sectors. In addition, the network approach by Sabatier (1988: 131-132) is applied in order to study the cooperation of the authorized bodies/organizations; to find appropriate

methods in disaster management and to explain the development of policies in response to the disaster caused by flood. The policies on disaster management were analyzed, using available data such as the identified problems in policy implementation and disaster management. The deficiency of each model was studied and analyzed in order to develop a new model on disaster management by the government in response to the disaster caused by flood as explained by the following framework:

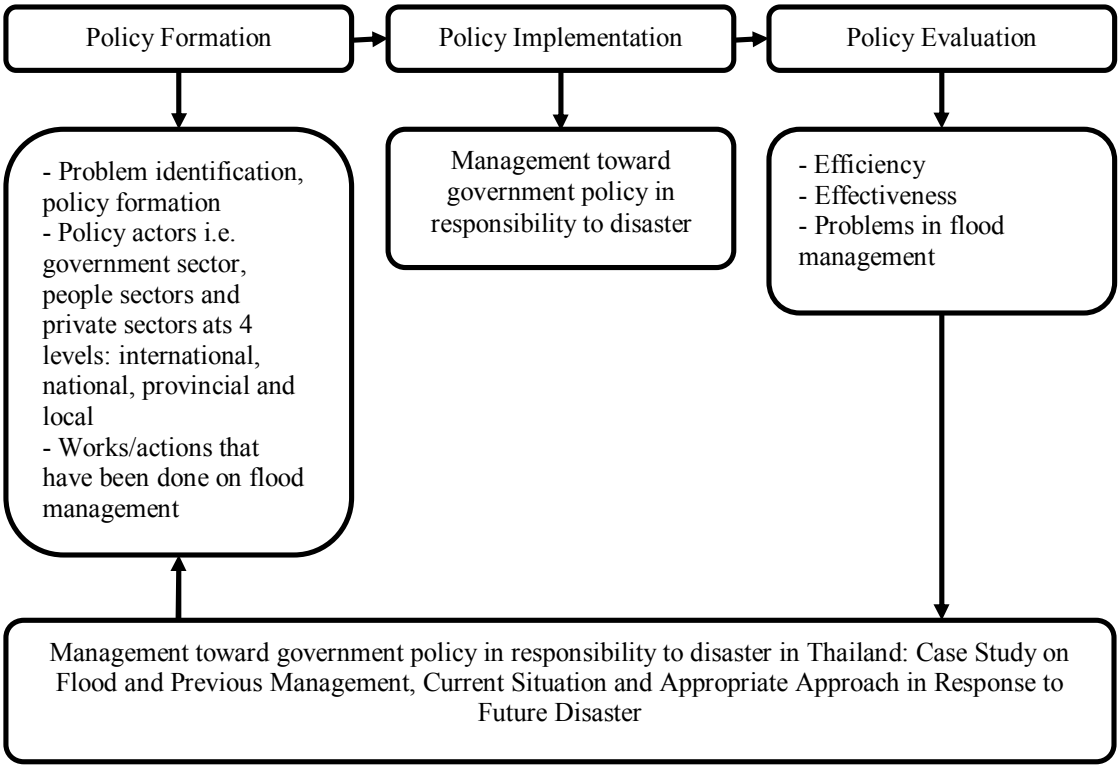

Figure 1.1 Conceptual Framework

CHAPTER II
LITERATURE REVIEW

The researcher has in this research explored documents, books, textbooks and related researches as details follows:

1. Concept and Meaning of Disaster
2. Concepts and Theories of Administration and Relationship of Government Bodies
3. Concept of Social Network
4. Public Policy Theory
5. Situations of Floods in Thailand
6. Related Policies and Laws
7. Related Researches

2.1 Concept and Meaning of Disaster

2.1.1 Meaning of Disaster

The term disaster is derived from the Latin roots dis- and astro, meaning "away from stars" (Coppola, 2011: 29). Disaster is reserved for events that produce more losses than a community can handle (Lindell, Perry and Prater, 2007: 3).

Blacks Law Dictionary (Schneid and Larry, 1952: 1); The Malaysian National Security Council (MNSC) Directive 20 (Shaluf and Ahmadun, 2006: 286); Coppola (2011: 29) defines disaster as a calamitous event, an event to be blamed on an unfortunate configuration, especially one occurring suddenly and causing great loss of life, damage property, or hardship and hamper local social and economic activities, as a flood, airplane crash, or business failure.

To summarize, disaster as a calamitous event, especially one occurring suddenly and causing great loss of life, damage property.

2.1.2 Type of Disaster

Type of disaster has been classified into natural disasters and man-made disasters.

Natural disaster are catastrophic events resulting from natural causes such as floods, earthquakes, landslides, mudslides, hurricanes etc over which man has no control. Man –made disaster can be sudden or long term (Shaluf and Ahmadun, 2006: 286-287). Whereas Lindell, Perry and Prater (2007: 3-5) classify three types such as 1) Natural disasters such as, floods, volcanic eruptions, and wild-land fires; 2) Technological disasters are somewhat different from the pattern among natural disasters such as nuclear power plants and liquefied natural facilities, posing risks for both employee and those who live nearby; and 3) Terrorist disasters are recently recognized additions to the types of threats we must confront.

The Department of Disaster Prevention and Mitigation (2009: 3-4) classified the types of disasters using the idea of the classical concept. The causes of disasters have two categories: 1) natural disasters such as floods, storms, landslides, droughts, earthquakes, forest fires, etc.; and 2) man-made disasters such as forest fires, hazards from traffic and transportation, hazards from chemicals and hazardous materials. A contemporary concept has classified the types, causes and intention into three categories. The first category is natural disasters such as floods, storms, earthquakes, landslides, droughts and forest fires. The second category is technological disasters caused by man-made events such as fire, traffic and transportation hazards, and threat of work, etc. Finally, complex disasters caused by man-made events that intend political or social aims (with emphasis on racial, religious or ideological motivation), such as terrorism, insurgency variations and cross-country migration.

To summarize, type of disaster has been classified into natural disasters and man-made disasters.

2.1.3 Meaning and Concept of Crisis

A crisis is an unexpected and undesired event that affects an organization, such as a natural disaster, financial crisis, political disorder or strict regulations. Crisis management has the objective to protect an organization from the effects of threats in critical condition (Sikich, 1996 cited in Pathranarakul, 2003: 9). Many organizations

suffer from crises that are not of their own making. This includes those resulting from natural disaster such as hurricanes, floods and earthquakes; act of terrorism; industrial sabotage; accidental damage; and market forces (Moore and Lakha, 2006: 85-86). Booth (1993, cited in Pathranarakul, 2003: 11) classifies the crisis on the base of Selbst by considering the events and separate change of situations on 3 levels. The levels indicate the kind of crisis affecting the organization. Each crisis affects different organizations. The changes have 3 levels:

Table 2.1 Type of crisis

Situation /situation change	Response of Leaders	Attitude of public and individuals
Declination from extraneous, degradation, less from internal, locate the threat affecting devastation of the organization (situation is not indicated output, recognized as Creeping Crisis)	Bureaucratic response and regulation This approach is adhered to the original regulation. No re-organization or lack of serious regarded crisis.	Acceptance of crisis by relevant individuals Effort to present issues into agenda by affected people Other groups have movement
Threats by a period or a loss of some or all organizations	Reactive response and push for negotiations Important to realize specific problems Lack of interest The final result is a routinised crisis	To collide of conflict and become politics in organization People and all groups participate in operation
Threat occurs rapidly, creating losses or threats to the total organization	Response by protection Increasing knowledgeable and acceptant people	Movements of groups and people to protect organization from crisis

Source: Booth, 1993 cited in Pathranarakul, 2010: 11.

2.1.4 Characteristics of Crisis

It being very difficult to decide on a generally accepted definition of crisis, it may be better to look at the characteristics of such an event. Whilst every crisis is different there are often shared characteristics, namely;

2.1.4.1 there is an element of surprise;

2.1.4.2 there is a perceived or real loss of control, particularly during the early stages;

2.1.4.3 there are no immediate obvious solutions;

2.1.4.4 there is a shortage of time;

2.1.4.5 the events outplace the response by the organization, at least during the early stages;

2.1.4.6 there is an escalating flow of events that become more intensive;

2.1.4.7 there is insufficient information when it is most needed; occasionally there may be too much information;

2.1.4.8 important interests are at state such as a threat to resource or people;

2.1.4.9 there is a lack of resources, at least during the early stages;

2.1.4.10 there is intense scrutiny from the outside;

2.1.4.11 the key player develop a siege mentality;

2.1.4.12 there is panic;

2.1.4.13 the regular decision-making processes are disrupted;

2.1.4.14 there is an urgent need for rapid decision making, particularly in the short-term; and

2.1.4.15 affected managers focus on short-term planning/ decisions/actions (Moore and Lakha, 2006: 87-88).

2.1.5 Type of Incidents and Levels of Crises

2.1.5.1 Type of Incidents

In a 1997 survey undertaken by The Corporate Response Group, a number of companies identified the following as incidents or events that could lead to crises;

1) workplace violence (55%)
2) kidnap (53%)
3) terrorist action (51%)

4) fraud (35%)

5) product tampering/recall (34%)

6. ethics (30%)

7) succession of Chief Executive Officer (28%) and

8) racism-sexism litigation (26%) and takeovers (20%) (Moore and Lakha, 2006: 89-90)

The types of crises are extremely varied and will differ depending on the level at which it occurs and the type of organization affected. For instance, at regional level, it could include:

2.1.5.2 At Regional:

1) political instability;

2). religious and racial conflict between countries; and

3) the collapse of world financial markets.

2.1.5.3 At State Level It Could Include:

1) a threat to territorial integrity;

2) political instability within the State itself;

3. political instability or destabilizing factors in neighbouring states;

4) religious and racial conflict between group within a State;

5) excessive national debt;

6) external economic sanctions;

7) currency devaluation;

8) acts of terrorism;

9) serious outbreak of civil disorder;

10) organised crime;

11) large influx of refugees; and

12) large-scale corruption.

To summarize, a crisis is an unexpected and undesired event that affects an organization such as natural disaster, financial crisis, political disorder or strict regulations. Many organizations are affected by crisis even if the organization isn't

responsible, such as hurricane, flood and earthquake, rebellion, sabotage in an industrial factory; way accident waste and way marketing power might have effects at the local and federal level.

2.1.6 Disaster in Other Countries

2.1.6.1 India

1) Land features

With its vast territory, large population and unique geo-climatic conditions, the Indian subcontinent has always been exposed to natural catastrophes. The Indian subcontinent is among the world' s most disaster-prone areas, 54 % of land vulnerable to earthquakes, 8 % of land vulnerable to cyclones, 5 % of land vulnerable to floods and more than 1 million houses damaged annually, plus human, social, other losses (Atmanand, 2003: 286). The largest earthquake magnitude in India has been 8.7 which had its origin in the Shillong Plateau in 1897 This and the 1950, magnitude 8.6 in Sadiya region have been so intense that the rivers changed their courses, ground elevations got changed permanently and stones were thrown upward. In the last century, India had five earthquakes concluded that table 2.2 (Atmanand, 2003: 291).

Table 2.2 Five earthquakes in India

Areas	Year	Magnitude
Shillong Plateau	1897	8.0
Kangra	1950	8.0
Bihar-Nepal	1934	8.3
Andaman	1941	8.1
Assam	1950	8.6

Source: Atmanand, 2003: 291.

2) Strategy and approach to disaster management

The government recognized the need for a shift a post-disaster reactive approach to pre-disaster pro-active approach, preparedness, mitigation and prevention. This shift is strategy is feasible because of advancements in science and technology, effective implementation has shown decline in casualties, advancements in forecasting technologies and warning system, government policy to strengthen hazard mapping, R&D and standardization and enlargement and reinforcement of disaster prevention systems, equipment and facilities.

The objectives of India's national policy for natural disaster reduction is to reduce loss of lives, property damage and economic disruption (Atmanand, 2003: 293-294). Similarly the goals of disaster prevention in India's national policy for natural disaster reduction are (Atmanand, 2003: 294): 1) creating public awareness about safety from disasters; 2) amending/enacting legislation of safety from hazards; 3) planning development areas with safety from hazards; 4) protection of habitations from adverse hazard impacts; 5) constructing new buildings safe from hazards; and 6) retrofitting existing building for improving hazard resistance.

There are various amendments in the legislation that may be necessary: 1) amendments to town/country planning acts and master plan area development rules; 2) land use zoning in hazard-prone areas and establishing techno-legal regimes; 3 incorporation of safety requirements in building bye-laws of local bodies/panchanyats-applicable to new buildings and extension of old building, empowering local bodies to exercise controls; and 4) legislation to upgrade hazard resistance of critical buildings for use and safety of large number of people-schools, hospitals, cinemas, congregation halls, water tanks, towers, telephone exchanges, fire stations, headquarters of police and administration (Atmanand, 2003: 293-294).

3) The various stakeholders in the process of disaster mitigation are: 1) policy makers; 2) decision makers; 3) administration; 4) professional (architects and engineers); 5) profession institutions; 6) R&D institutions; 7) financial institutions; 8) insurance sectors; 9) community; 10) NGOs; and 11) common man.

The subsequent discussion will be on the role of insurance in disaster management, preparedness and mitigation.

2.1.6.2 Malaysia

1) Land features

Malaysia has experienced 39 disasters during the period of 1968-2004. The natural disasters were 49 % of total disasters. Most of disasters were resulted form the heavy rain. Malaysia has experienced 18 man-made disasters. (Shaluf and Ahmadun, 2006: 286) The types and frequency of the disasters have been summarized in Table 2.3

Table 2.3 Disasters type in Malaysia (1968-2004)

Type of disaster	Frequency	Fatalities	Injuries
Natural disaster	19	1,460	821
Man-made disaster	18	282	1,892
Subsequent disaster	2	-	-
Total	**39**	**1,742**	**2,713**

Source: Shaluf and Ahmadun, 2006: 288.

Kuala Lumpur is the capital of Malaysia, located on a river basin and surrounded by the Indian and Pacific Oceans. Due to its hot and humid climate with rain, the city cannot absorb water. Natural flood detention occurs often because they can not drain water quickly enough. Major flooding in the past occured 2 times, in 1926 and 1971, but after expansion of the city in 1985 there has been flooding almost every year. Damage estimates are worth almost 1 percent of GDP.

2) Strategy and approach to disaster management

In 2000, the Malaysian government implemented the Smart Tunnel Project, divided into three classes according to tier 1 and tier 2, namely the traffic of cars and taxis during rush hour. Tier 3 is a floor drain in cases where there is little flooding. If the water level rises and drains, tunnel tier 1 and tier 2 will be closed for traffic Any change to the drainage tunnel should be done immediately (Tiwtanorm, 2012: 36).

2.1.6.3 Zambia

1) Land features

The year 1977 witnessed the Kanyama disaster, in which scores of residents of this squatter settlement, situated in the capital city of Lusaka, lost their homes and property due to severe rains and flooding which occurred during that year. The victims of the floods were temporarily sheltered at the Agricultural Show Grounds on the Great East Road. In this disaster about 5000 people were left homeless (Mulwanda, 1991: 43). Disasters cannot always be prevented, but their effects can almost always be mitigated. The science of disaster management involves systematic observation and analysis of measures relating to disaster prevention, mitigation, preparedness, emergency response, rehabilitation and reconstruction.

2) Strategy and approach to disaster management

In practice, disaster management seeks to: save lives and diminish damage to property threatened by disasters; improve the effectiveness of emergency operation; and to facilitate the rapid reestablishment and improvement of social, economic and environmental systems after a disaster (UNDRO News, 1987: 20 cited Mulwanda, 1991: 46). Risk reduction measures should be considered an integral part of development plans. There are certain crucial requirements and mechanisms for effective implementation of the disaster management programmes.

- Public awareness and education is essential and it can be achieved through the use of education institutions, starting from the primary school level right through to the highest educational levels.

- After a disaster strikes, a long-term programme is likely to be necessary to prevent the recurrence of similar disasters in the future. Training programmes, therefore, should be placed on high priority, in order gradually to build the capacity of the people to help themselves at all levels, especially during the period immediately following a disaster.

- Research and developments is an important component of disaster management, and governments therefore must support adequate research and development programmes.

legal framework is essential for disaster management, because its establishes safety standards (Mulwanda, 1991: 46-47). Figure 2.1 gives an idealised

model of national disaster mitigation network for Zambia, which includes the government's policy of decentalising decision-making to the grass root level. The structure of such a network and the attendant functions would be as follows.

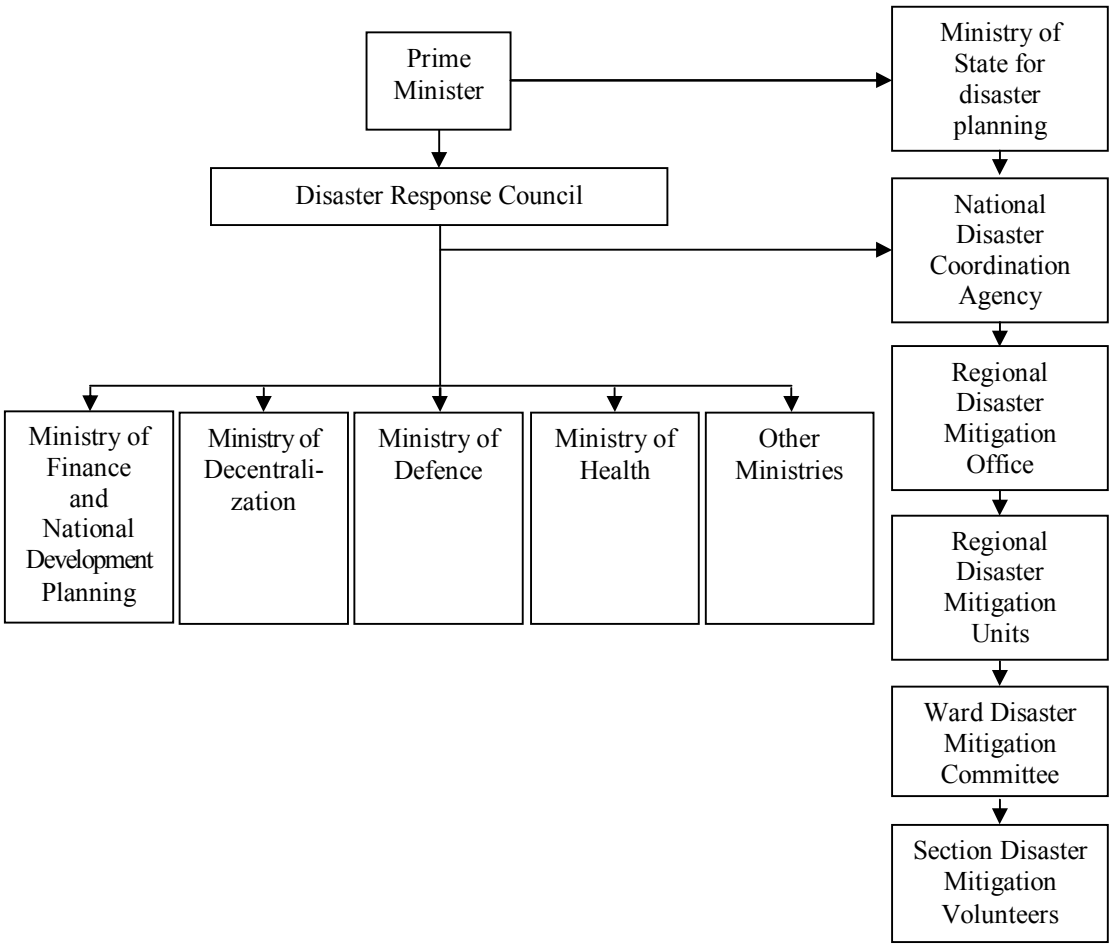

Figure 2.1 Model of an institutionalized national disaster mitigation network
Source: Mulwanda, 1991: 48.

2.1.6.4 Bangladesh

1) Land features

Bangladesh remains one of the most disaster-prone countries of the world as it has been from time immemorial owing to its geographical location, land characteristics, multiplicity of rivers, the monsoon climate and coastal morphology. It is exposed to a wide variety of natural disasters, such as tropical cyclones and storm surges, floods, tornadoes, river/coastal erosion, earthquake, droughts, torrential rains epidemics and arsenic contamination (Sabur, 2012: 44).

Sabur (2012: 37) In the process, disaster is defined as an event, natural or man-made, sudden or progressive, that seriously disrupts the functioning of a society, causing human, material, or environmental losses of such as severity that the affected community has to respond by taking exceptional measures.

2) Strategy and approach to disaster management

The disaster management vision of the Government of Bangladesh is to reduce the risk of people, especially the poor and the disadvantaged, from the effects of natural, environmental and human induced hazards, to a manageable humanitarian level, and to have in place an efficient emergency response system capable of handling large-scale disasters. Among the disadvantaged, women and children are of prime concern. Over the years, gender mainstreaming in disaster management has emerged as significant point. One of the predominant ideals, in this regard, is to promote gender equality and the empowerment of the women within the disaster management framework. Disaster management involves the management of both risks and consequences of disaster that would include prevention, emergency response and post-disaster recovery (Sabur, 2012: 38).

2.1.6.5 The Netherlands

1) Land features

Most areas of the Netherlands are plains with about a quarter of the country below sea level. The Netherlands has sustained land area by pumping water out of the lakes. To be useful, the Netherlands has built dams, sewers and numerous pumping stations. To prevent approximately half of the country from experiencing heavy flooding, they have the largest engineering building for water management in the world (Apiprachyasakul, 2011: 268).

2) Strategy and approach to disaster management

Their approach to control flooding areas is to select protected areas, where populations are dense. The dam is made using natural dunes and levees. Dam water storage and doors prevent the flood waves from the sea. An embankment is constructed to prevent flooding of major rivers. Wright and Hamilton are the line, while the drainage canals and pumping stations are more complex to maintain the water level in the lower residential and agricultural areas. The Water Control Board is

an organization that reports directly to the government to maintain a flood protection system. In each region, a total of 26 nationwide stations play a role in managing the flood protection corridor water levels, water quality and waste water treatment in each region of the country. Currently, disaster prevention will be developed in a large building to reduce the impact of sea and flooding in the future (Apiprachyasakul, 2011: 270).

2.1.6.6 Thailand

1) Land features

Geographically, Thailand is divided into 6 parts. Northern part consists of high mountains and plateaus. Northeastern part covers 170,000 square kilometers (one-third of the whole country). Most areas of central part are lowlands with rich soil. Most areas of eastern part are connected to the sea, with mountains and small hills. Most areas of the western part are ranges and plains along the valleys. Both sides of the Southern part are next to the sea, with the Gulf of Thailand in the East and Andaman Sea in the West (Chaiprajong, 2005: 16-17).

2) Strategy and approach to disaster management

From the past to the present, there is no master plan for the management of water resources. No primary agency is responsible directly. For example, economic and social development in the last 5 years (2006-2011) has shown that the country's water management policy does not make specific policy, but rather under economic policies, land, natural resources and the environment. Policy implementation is not as successful as it should be and water issues cannot be solved entirely. Meanwhile, research studies from the past to the present have not resolved the issue of water management in an efficient way. Because most research has focused on the quantitative management of water resources (such as the allocation of water to various aspects of human exploitation), water resources have not been fully integrated in operation from all sectors of society. As a result, water resources (surface water, ground water, and sea) in most parts of the country are in decline or are likely to decline. If this problem is not dealt with in a systematic correction, it may affect the consumers of the country in the near future. (Aquatic Ecology and Mathematical Modeling Center, Sea Water Section, 2012: 2) A disaster situation happens in

Thailand and creates loss of life and property of citizens. 7 years ago (B.E. 2545 - 2551) there was found to be promising increase in flooding for Thailand, which is experiencing the problem regularly (National Committee of Disaster Prevention and Mitigation, 2009: 2) despite the efforts of all agencies in fixing the problem. However, management continues to focus on specific problems. By the lack of care in the community about the impact upstream and downstream (Supharatid, n.d: 4), management of current disasters has defined management framework.

Disaster management in Thailand before the government reform in 2002 was quite complicated as it involved many departments. After the government reform in 2002. It is assigned to the Department of Disaster Prevention and Mitigation as the primary agency responsible for developing a comprehensive structure, and from there down to the field level. For the three laws directly related to disaster management (Civil Defence Act B.E. 2522, National Civil Defence Plan B.E. 2548 and Disaster Prevention and Mitigation Act B.E. 2550), they emphasize on disaster management by following regular steps and involve three level such as national, provincial and local level (Duangsrisai, 2012: 1-7). This result was congruent with the study of Sriratanaban (2005: 259); Office of Disaster Prevention and Mitigation (2012: 13-18); Janjirawuttikul (2012: 1); Prochart (2013: 75), According to the conclusion of factors such as communication system, politics and administration, knowledge and discipline of people, information management and transportation problem, it has been discovered in terms of communication that an efficient communication requires a ready sender and a clear message. Also, there should be the organization of data which will be communicated at each period during disaster to support decisions (Kuljitjuerwong, 2013: 111-112).

The public clearly needs policy for both types of disasters, including a policy and operational framework for coordinated action based on Disaster Prevention and Mitigation Act B.E. 2550.

The Prime Minister is the Chairman of National Disaster Prevention and Mitigation in the case of an extremely serious public disaster with command over the commander of the directorate, all State agencies and local governments to take action of, prevent and mitigate such disasters.

The National Committee of Disaster Prevention and Mitigation operates with the Prime Minister or Deputy Prime Minister as Chairman. As policymakers in preparing a plan, the National Disaster Prevention and Mitigation Committee, Integrated Development of Disaster Prevention and Mitigation and local Department of Disaster Prevention and Mitigation work together with all relevant sectors and local government representatives to prepare a national plan for prevention and mitigation. The Department of Disaster Prevention and Mitigation acts as Director and Secretary of the National Committee of Disaster Prevention and Mitigation.

National Disaster Committee by the Prime Minister or Vice Prime Minister is the Chairman of the otter raise, who is responsible for the accident and raising safety concerns. The Department of Disaster Prevention and Mitigation Life-saving Suit is Director and Secretary to command and take any action on prevention and mitigation in the country as well as over provincial / local levels according to the law (National Committee of Disaster Prevention and Mitigation, 2009: 21-22).

Disaster Prevention and Mitigation Act B.E. 2550 was enacted to provide disaster management and relief in the present. It took effect from 6 November 2007 by Civil Defense Act B.E. 2522 and the Fire Defense Act B.E. 2542 in order to comply with the Reorganization of Ministries, Ministerial Bureaus and Departments, B.E. 2545. Ministerial Regulations for the Reorganization of Ministry B.E. 2545, determined the authority of the Department of Disaster Prevention and Mitigation to conduct public protection and disaster relief reconstruction, which are summarized as follows: 1) Scope of Disaster Prevention and Mitigation, covering all disasters. We have to define the definition of disaster and security threat explicitly (Section 4); 2) Determining a policy of prevention and mitigation plan implemented by the National Committee of the National Disaster Prevention and Mitigation, which have a total of 23 people, with the Prime Minister or Vice Prime Minister as Chairman of the Board (Section 6 and Section 7); 3) Department of Disaster Prevention and Mitigation shall be the central government unit to operate any related activities on national disaster prevention and mitigation (Article 11); 4) A plan for disaster prevention and mitigation is determined on a three -level plan that is the plan of the National Disaster Prevention and Mitigation. Thailand Disaster Prevention and

Mitigation Plan and Planning Disaster Prevention and Mitigation, Bangkok (Article 11, Section 12, Section 16, Section 17, Section 33 and Section 34); 5) The person who is responsible for the prevention and mitigation is also responsible for relating them to the unity, clearing all forms that are national, provincial and local levels.

A brief overview is shown. Each country has different disaster management in the preparation of guidelines for prevention, response and recovery. However, similarities in disaster management focus on the institutional response to disasters.

Collins (2009: 35) mentions that the problem was not a lack of goodwill, but rather a lack of good coordination. Furthermore, where systems of the state government have been weak, the tendency has been to sustainability of the actions. With the increase in their influence, the definition of an NGO has become far from clear. Conclude that table 2.4

Table 2.4 Broad typology of institutions identified with disaster and development strategies

Type of organisation	Description	Institutional rationale	Role in disaster and development work
Emergency service	State sector primary responders	Deal with immediate aftermath of an incident.	A part of civil contingencies and disaster preparedness plans.
Civil society	People who are informally grouped with each other through location or their means of primary subsistence.	People independently cooperating with each other towards a common goal.	Mobilises prevention and response activities as part of ordinary life.
Civil societal organisation (CSO)	Community based function, locally more representative.	Represent coordinated bottom-up strategies that include local knowledge.	Community based disaster management (CBDM) using community response group, risk and resilience committees or similar.

Table 2.4 Broad typology of institutions identified with disaster and development strategies (cont.)

Type of organisation	Description	Institutional rationale	Role in disaster and development work
Non-governmental organisation (NGO)	Has legal institutional status and usually agreements with official donors and/or recipient government. May be national or international, with an ideological, humanitarian or religious mission or purpose.	Development or disaster reduction through projects and advocacy. Independence from the government of the country within which it was formed.	Implementing donor and government disaster and development programmes and / or emergency relief.
NGO (development)	NGO that is oriented towards human development issues.	Addresses basic and extended human needs.	Recreates livelihood security, support infrastructural development.
NGO (environment)	NGO that is oriented towards environment and conservation issues.	Addresses sustainability of the natural resource base. May be ecological conservationist or economic approaches.	Promotes intrinsic value of nature and secure natural environments. Environmental economics and natural resource management as part of disaster risk reduction and sustainable development.
Non-governmental humanitarian agency (NGHA)	Implements humanitarian assistance. Includes International Committee of the Red Cross, International Federation of Red Crescent Societies and MSF	Saves life in emergency situations. Rationale may vary depending on the mission statement of each organisation	Assesses emergency and requirements and delivers to target populations during crisis. This may also be done in collaboration with or parallel to the other NGO groups.

Table 2.4 Broad typology of institutions identified with disaster and development strategies (cont.)

Type of organisation	Description	Institutional rationale	Role in disaster and development work
Inter-governmental organization (IGO)	Organisation where two or more governments represented (i.e. all of the UN agencies)	Represents international state level dialogue and policy on issues of global concerns.	Synthesises global disaster and development policy. Provides a support base to international disaster and development related strategies.
Private sector	Privately owned enterprises.	Business and enterprise for profit.	Implements strategies that improve business continuity. Ethical investment for disaster risk reduction. Makes donations to disaster and development work. Engaged in design, manufacturing or supply to the disaster and development sector.

Source: Collins, 2009: 36-37

International cooperation in the Hyogo Framework happened in 2005 with the purpose of disaster prevention and disaster reduction broadly shared around the world, including the consideration of reducing the damage from disasters. A sustainable development approach defines the five main topics as follows:

1. Ensure that disaster risk reduction is a national and local agenda with systematic organization and implementation.
2. Indicate access and surveillance, the risk of disaster, including increasing the efficiency of warnings.
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
4. Reduce major risk factors.

5. Continuous strengthening of disaster preparedness to perform effectively at all levels (Department of Disaster Prevention and Mitigation, 2007: 153).

Key strategies from HFA focused on: integrating "disaster risk considerations into sustainable development policies, planning, and programming at all levels", especially emphasizing "disaster prevention, mitigation, preparedness and vulnerability reduction"; developing and strengthening "institutions, mechanisms and capacities at all levels, in particular at the community level, that can systematically contribute to building resilience to hazards"; and systematically incorporating "risk reduction approaches into the design and implementation of emergency preparedness, response and recovery programmes in the reconstruction of affected communities" (UN/ISDR, 2005 cited in Brower and Magno, 2011: 38). A disaster is a continuously unfolding situation, marked by changes in urgency, scope, impact, the types of appropriate responders, and the responders' needs for information and communication. These dynamics add to the complexity and uncertainly of information sharing and coordination, while the ability to communicate and share information effectively becomes more crucial (Janssen, Lee, Bharosa and Cresswell, 2010: 1). An extensive literature review and careful reflection unearthed two dimensions framing and naming categories of disaster administration, a concern for process and a concern for tools. The categorization of theory in disaster research in this article is grouped along these two dimensions, in four categories. The first category is the literature on decision making and decision theory, which is also the largest of the categories. The second category focuses on leadership and management and is labeled administrative theories. The third category encompasses social theories, including writing that bemoans the state of the literature as a whole and calls for more/better theorizing, and more/better development of the theories and practices to address social aspects of resource economic theories, could loosely be described as a cluster of resource economics theory and it was also the smallest of the groups, given that its approaches tend to be limited to projections of financial impacts, risk management, and shifts in insurance (Sementelli, 2007: 498-499). Conclude that table 2.5

Table 2.5 Categories of disaster administration theory

High	**Decision Theory** Rational approaches Policies Standard Operating Procedures Basic Heuristics/Satisficing Geographic Information System	**Administrative Theories** Leadership Management Ethics/Administrative Responsibility
Concern of Tools	**Economic Theories** Resource allocation Economic Impacts Systems	**Social Theory** Social Construction Critical Postmodern Gendered approaches
Low		Marginalization
	Low **Concern of Process** High	

Source: Sementelli, 2007: 499.

Table 2.5 illustrates a two dimensional framework to begin organizing the theories related to crisis and disaster administration. Decision theories as described in this research refer to approaches to disaster and crisis that most often rely on a series of stage, steps, heuristics, or procedures to understand, describe, or cope with the crisis or disaster. Administrative theories, in contrast, tend also to emphasize processes as well as tools, rather than focusing on certain utilitarian outcomes exclusively. Economic theories in the context represent interesting abstractions, though experiments, and other approaches to disaster and crisis that often lack the utilitarian outcomes of decision theories, making them useful primarily as a mode of description rather than a mode of action. Finally, social theories tend to be almost entirely process oriented, focusing on the means and methods of action rather than classical outcomes (Sementelli, 2007: 499).

An impressive amount of attention is currently being given to the future of emergency management. Without doubt, a new theoretical perspective and policy guide are required (McEntire, Fuller, Johnson and Weber, 2002: 267). Public administration theory should formulate ideals and goals for natural disaster administration. These ideals would include the protection of life, property, and liberty.

Goals may include the restoration of services, law and order. Without ideals and goals, it is difficult to monitor expected outcomes (Herzog, 2007: 587-588).

Herzog (2007: 590) lists a set of theoretical ideals that are appropriate for planning/mitigation and for management/response. These ideals are associated with various characteristics and may be unattainable. In general, planning can follow postmodern ideals and management is often forced to revert back to tradition ideals from the established bedrock of public administration theory Table 2.6

Table 2.6 Natural disaster planning versus management ideals

Characteristic	Planning	Management
Hierarchy	Structuration	Bureaucracy
Approach	Bottom-up	Top-down
Practitioner	Reflective	Reflective
Operational	Heuristics	Rule, Procedure
Decision Impetus	Theories	Models
Governance	Democratic	Autocratic
Patterns	Discursive	Recursive

Source: Herzog, 2007: 590.

Moreover McEntire, Fuller, Johnson and Weber (2002: 268-273) explain about disaster paradigm so that First, Comprehensive emergency management concept possessed inherent drawbacks. By focusing too much on hazards, comprehensive emergency management failed to recognize the many social, political, economic, cultural, and other variables leading to disaster. Second, the disaster-resistant community model has been defined as a "means to assist communities in minimizing their vulnerability to natural hazards by maximizing the applications of the principle and techniques of mitigation to their development and/or redevelopment decision-making process". Third, the disaster-resilient community is commonly related to social factors (economic, psychological, and cultural) pertaining to recovery. Fourth, sustainable development and sustainable hazards mitigation may not show relevance to all of the actors involved in emergency management. Finally, invulnerable development and comprehensive

vulnerability management is related to all type of triggering agents. Depending on the location and construction of building and the availability and effectiveness of warning and evacuation systems, a society may be vulnerable to natural agents such as earthquake, flooding, volcanoes, tornadoes, hurricanes, and the like. Show that Table 2.7

Table 2.7 Comparison of disaster paradigm

	Comprehensive emergency management	**Disaster-resistant community**	**Disaster-resilient community**	**Sustainable development and sustainable hazards mitigation**	**Invulnerable development comprehensive vulnerability management**
Hazard/ Triggering agents	Natural, technological, civil, biological	Natural	Natural	Natural (especially flooding) and technological to a lesser extent	Natural, technological, civil, biological
Phases/ functional areas	Mainly preparedness and response	Mitigation	Recovery and mitigation to lesser extent	Mitigation and recovery	Mitigation, preparedness, response, and recovery
Actors	Mainly the public sector (particularly emergency managers and first responders)	Mainly the public sector (particularly urban planners and engineers)	Mainly individuals and groups involved in recovery from the public, private, and nonprofit sectors	Urban planners, engineers, insurance agencies, nongovernment organizations, environmentalist, and citizens	Most, if not all, organizations from the public, private, and nonprofit sectors, as well as citizens in general
Variable	Mainly physical	Mainly physical	Social and physical to a lesser extent	Physical and social to a lesser extent (depending on scholar and due to the excessive focus on hazards)	Physical and social

Table 2.7 Comparison of disaster paradigm (cont.)

	Comprehensive emergency management	Disaster-resistant community	Disaster-resilient community	Sustainable development and sustainable hazards mitigation	Invulnerable development comprehensive vulnerability management
Discipline	Mainly sociology and public administration	Mainly geography and engineering	Mainly psychology, sociology, and economics, geography and engineering to a lesser extent	Geography, engineering and environmental science, anthropology, economics, and sociology to a lesser extent	The vast majority of fields from hard and soft sciences as well as epidemiologists and others in the medical field

Source: McEntire, Fuller, Johnson and Weber, 2002: 281.

In addition, Patterson, et al. (2010: 127) study the role of community in disaster response: conceptual models which focus on role that community plays in the continuum of disaster preparedness, response and recovery, and we explore where community fits in conceptual frameworks concerning disaster decision-making. Concepts like social resilience are related to theories of "social capital" which stress the importance of social networks, reciprocity, and interpersonal trust according to the study of Newport, et al. (2003: 33) suggest that disaster preparedness will not be effective without the participation of the vulnerable communities. Participation of the community in resource identification, capabilities, coping mechanisms and existing facilities towards vulnerability assessment will be more effective in the planning of a sensible and practical system, which will be more suitable for the needs of the community.

Osti (2004: 6) explains about participation, a form of cooperation between agencies and the community, has been widely recognized as an efficient tool for analyzing and addressing social problems in a sustainable manner. The community is adversely affected by disaster and cannot contribute cash and/ or times; very few community members are the victims and their participation is not enough for the

accomplishment of potential measures; targeted beneficiaries are poorest of the poor and cannot become involved unless they have alternatives to support their daily life. Community management is a form of community participation where community takes a decisive role and has responsibility, authority and control over events (Osti, 2004: 7-8). According to the study of Said, et al., (2011: 278) indicate that community ownership to the tsunami disaster and the local communities are prepared to improve their capacity and capability. The initiative undertaken by the study to raise awareness and preparedness to tsunami disaster by adopting the community-based approach is found to be effective. This is evident from the participation, co-operation, team work that were demonstrated by all the stakeholders in all the activities organized. They were been able to produce their own tsunami emergency response plan that was successfully tested during the emergency exercise.

According to the study of Said, et al., (2011: 89-92) explain the results of the study show that in order to achieve a successful disaster management, there is a need for the participation of the community in various disaster management cycle, although the type of this contribution may differ according to the characteristics of each specific country. Experiences from this study and other similar research show the benefits of the active participation and involvement of the community. The study revealed that policy makers and experts who deal with disasters should agree on the following issues; 1) communities are able to identify the existing problem and to prioritize them; 2) in most participatory activities, people show more flexibility and use their capabilities to solve their problems; 3) people who live in disaster prone countries should be prepared for an active participation in the disaster management; 4) planning for disaster management should be undertaken through a participatory approach and possible get started with activities on increasing the awareness, public education and risk analysis; 5) planning to achieve disaster management should include all short-term activities as well as long term in which a realistic assessment of resources, capacities, capabilities and characteristic of the active stakeholders in flied has been undertaken; 6) conducting community-based disaster management as a part of national policy is possible and its existence without considering the governing rules of a country seem impossible; 7) introducing tools for planning, organizing, coordinating, policy making and control for reaching sustainable development based

on the work quality standards is very difficult; and 8) appropriate of resources and capacities must to community-based disaster management.

In case of disasters, the people at the community level have more to lose because they are the ones directly hit by either major or minor disasters and they are the first who can become vulnerable to the impact of disasters on their community. This concept gave rise to the idea of community-based disaster management where communities are put at the forefront. Through the CBDM, the people's capacity to respond to emergencies increase by providing them with more access and control over resource and basic social services. Through these community-based activities, people should be able to participate along side government officials and experts as the direct stakeholders of these activities. While people should own the problems, consequences and challenges of any mitigation and /or preparedness initiatives, it is necessary to take people's involvement further, into policy and strategy. Since the way of implementation of community-based approach differs in various countries due to the culture, socio-economic, political, and health related issues, it is not possible to design a uniform application to stabilize this approach. In other words, it should consider the specific characterizations of the region and area where the interference is taking place. In this regard, this has designed an appropriate model for Iran based on the requirement, characteristics and priorities of the country in encountering and management of natural disaster (Jahangiri, et al, 2011: 83-84). The level of community participation are illustrated in table 2.8

Table 2.8 The hybrid studies on community-based disaster management regarding disaster management: a comparative study in selected countries

Country	Used models	Level of intervention	Phases of intervention	Emphasis on disaster cycle	Guide organization	Planning	Type of community participation in			
							Policy making	Organizing	Coordination	Control
Australia	Paton and Johnson model, strengthening self-drive movements United Nations, UNCRD, humanitarian action organizations, strengthening self-drive movements Hybrid model, UNDP and the hierarchical model, UNCRD and consultative councils.	Local and neighborhood	All phases	All phases	Governmental	Active and learner	Passive	Active	Active and learner	Active
India	-	Local and neighborhood	Pre-disaster phase	Prevention	Governmental	Cooperative and consultative	Cooperative and consultative	Passive and consultative	Active and learner	Passive
Japan	-	National Local, neighborhood and national	All phases	All phases	Governmental	Cooperative	Passive and consultative	Cooperative and consultative	Active and learner	Passive
Philippines	ICDPP	-	All phases	All phases	Non-governmental	Active and learner	Active and learner	Active and learner	Active and learner	Active and learner

Table 2.8 The hybrid studies on community-based disaster management regarding disaster management: a comparative study in selected countries (cont.)

Country	Used models	Level of intervention	Phases of intervention	Emphasis on disaster cycle	Guide organization	Planning	Type of community participation in			
							Policy making	Organizing	Coordination	Control
Solomon Islands	ICDPP, UNCRD	Local	Pre-disaster phase	Prevention	Non-governmental	Active and learner	Learned, active, associate	Active and learner	Active and learner	Active and learner
Turkey	Hierarchical, UNDP, self-drive and UNCRD	Local and neighborhood	Post-disaster phase	Recovery	Governmental	Passive	Passive	Passive	Passive	Passive
USA	Hierarchical	Local and neighborhood	All phases	All phases	Governmental	Cooperative and consultative	Passive	Active and learner	Passive	Passive

Source: Jahangiri, et al., 2011: 86.

2.1.7 Disaster Impacts

Department for International Development (DFID) (2006 cited in Collins, 2009: 18-19) The summary of key issues to consider provides a good orientation to thinking about the circumstances within which disaster reduction might contribute to achieving Millennium Development Goals (MDGs) in table 2.9

Table 2.9 Examples of disaster impacts on effects to meet the Millennium Development Goals (MDGs)

MDG	Direct impacts	Indirect impacts
1. Eradicate extreme poverty and hunger	- Damage to housing, service infrastructure saving productive assets and human losses reduces livelihood sustainability.	- Negative macroeconomic impacts, including sever short-term fiscal impacts on growth, development and poverty reduction. - Forced sale of productive assets by vulnerable households pushes many into long-term poverty and increases inequality.
2. Achieve universal primary education	- Damage to education infrastructure. - Population displacement interrupts schooling.	- Increased need for child labour for household work, especially for girls. - Reduced household assets make schooling less affordable-girls probably affected most.
3. Promote gender equality and empower women	- As men migrate to seek alternative work, women/girls bear an increased burden of care. - Women often bear the brunt of distress coping strategies, e.g. by reducing food intake.	- Emergency programmes may reinforce power structures which marginalize women. - Domestic and sexual violence may rise in the wake of disaster.
4. Reduce child mortality	- Children are often most at risk, e.g. of drowning in floods. - Damage to health and water and sanitation infrastructure. - Injury and illness from disaster weakens children's immune system.	- Increased numbers of orphaned, abandoned and homeless children. - Household asset depletion makes clean water, food and medicine less affordable.

Table 2.9 Examples of disaster impacts on effects to meet the Millennium Development Goals (MDGs) (cont.)

MDG	Direct impacts	Indirect impacts
5. Improve maternal health	- Pregnant women are often at high risk of death/injury in disaster. - Damage to health infrastructure. - Injury and illness from disaster can weaken women's health.	- Increased responsibilities and workloads create stress for surviving mother. - Household asset depletion makes clean water, food and medicine less affordable.
6. Combat HIV and AIDS, malaria and other diseases	- Poor health and nutrition following disaster weakens immunity. - Damage to health infrastructure. - Increased respiratory diseases associated with damp, dust and air pollution linked to disaster.	- Increased risk from communicable and vector borne diseases, e.g. malaria and diarrheal diseases following floods. - Impoverishment and displacement following disaster can increase exposure to disease, including HIV and AIDS, and disrupt health care.
7. Ensure environmental sustainability	- Damage to key environmental resources and exacerbation of soil erosion of deforestation. - Damage to water management and other urban infrastructure. - Slum dwellers/people in temporary settlements often heavily affected.	- Disaster induced migration to urban areas and damage to urban infrastructure increase the number of slum dwellers without access to basic service and exacerbate poverty.
8. Develop a global partnership for development	- Impacts on programmes for small island developing states from tropical storms, tsunamis, etc. - Impacts on commitment to good governance, development and poverty reduction nationally and internationally.	-
All MDGs	-	Reallocation of resource-including official development assistance (ODA)-from development to relief and recovery.

Source: Department for International Development (DFID), 2006 cited in Collins, 2009: 18-19.

Indirect effects by systemic disarticulations show that

1. Disarticulation of household conditions, Homelessness, evacuation, migrations, Shortage of communal services and facilities, Decline of social and economic, Entitlement;

2. Disarticulation of the states of health and nutrition of the population, Physiological and psychological stress, Decline of hygiene and sanitation standards, Environmental contamination: epidemic, disease, Malnutrition, starvation, famine;

3. Disarticulation of economic circuit, Intra-effects (i.e. between producers: input-output effects), Inter-effects (i.e. between producers and consumers: income effects), Outer effects (i.e. withdrawals and injections: policy and expectation effects);

4. Disarticulation of public activities, Institutional stress (i.e. overburden and discontinuities), Alteration of systemic opportunities (i.e. space opening and closing) (Albala-Bertrand, 1993: 20).

Conclude that disaster management of other countries is regarded context of area and constructional strategy in mitigation and prevention which summarized table 2.10

Table 2.10 Conceptual framework for disaster management of other countries

Countries	Conceptual framework for disaster management
1. India	- Creating public awareness. - Constructing new building safe for hazard.
2. Malaysia	- Creating clever tunnel.
3. Zambia	- Creating public awareness and training. - Establishing safety standard.
4. Bangladesh	- Promote gender equality and empower women.
5. Netherland	- Creating a dam. - Organizing the role and to specify the organization for prevention of the flood.
6. Thailand	- Management was under the Disaster Prevention and Mitigation Act B.E. 2550.

Source: Synthesized by the Researcher

2.1.8 Process of Disaster Management

Meaning and Process of Disaster Management; the occurrence of disasters, both natural and man-made, needs to have a process to manage or solve problems efficiently. The events are sometimes violent and unexpected when they occur. While these events have caused damage to life and property of the population, if the damage is worth the money, it impacts the effectiveness of disaster management process, which is important to reduce the losses from disasters. The word disaster management refers to the continuous process that is observed from the observation, analysis, release of information, and use of various resources to protect the public from severe impact of any possible future disasters. Preparation for and response to emergency situations includes rehabilitation and reconstruction after a disaster, which generally consists of disaster management in the following areas: (Carter, 1991: 29 – 30)

1. Prevention. An evaluation of the event and the loss of protection, disaster or event that occurs, as well as the devastating impact on communities such as the building of drainage to prevent flooding or grading the risk of a disaster season.

2. Mitigation. Disaster relief practices to reduce the impact of disasters on the nation and the community, such as defining symbols when a disaster occurs.

3. Preparedness. An evaluation by the central government, communities and individuals to respond urgently and effectively to catastrophic events. This assessment includes planning and research for storage to keep sources, goods, and consumer goods and training to personnel or the public.

4. Response. Respond to disasters immediately and in order when a disaster occurs. It aims to save lives and protect people from the damaging effects caused by the disaster.

5. Rehabilitation. It is a process at the community and national level to help the community to return to normalcy. This restoration includes creation and restoration that may take a year or more.

6. Development. To speed up the process of creating development and interaction in society about dealing with disasters and disaster management. Disaster management cycle is shown in Figure 2.2 below.

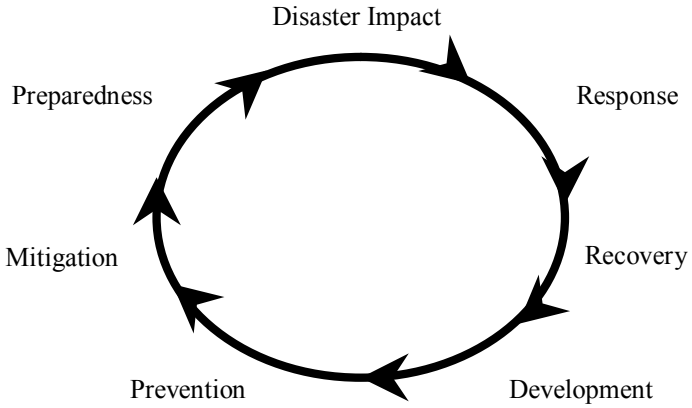

Figure 2.2 Cycle of disaster management

Source: Carter, 1991.

Office of the Public Sector Development Commission (2007) is determinant in the crisis management manual, Generally, it is divided by the cycle of disaster management into four steps: 1) to prevent and reduce the impact; 2) to prepare for disasters; 3) management of emergencies; and 4) recovery and reconstruction or post-disaster management according to disaster management cycle is summarized by National Committee of Disaster Prevention and Mitigation (2009: 31) as figure 2.3

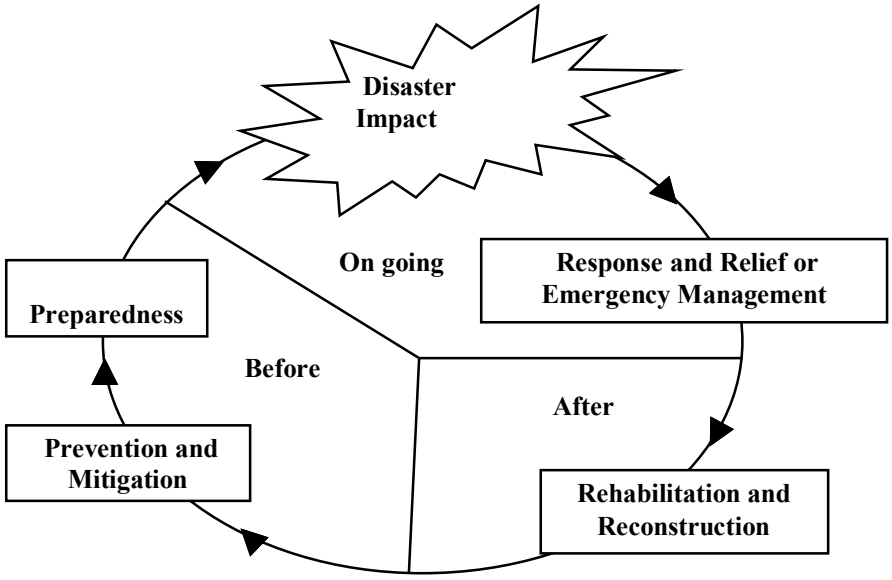

Figure 2.3 Disaster management cycle

Source: National Committee on the Disaster Prevention and Mitigation, 2009: 31

Figure 2.3 according to comprehensive disaster management is based upon four distinct components; mitigation, preparedness, response, and recovery. Although a range of terminology is often used in describing them, effective disaster management utilizes each component in the following manner: 1) Mitigation. Involves reducing or eliminating the likelihood or the consequences of a hazard, or both. Mitigation seeks to "treat" the hazard such that it impacts society to a lesser degree; 2) Preparedness. Involves equipping people who may be impacted by disaster or who may be able to help those impacted with the tools to increase their financial and other losses; 3) Response. Involves taking action to reduce or eliminate the impact of disaster that have occurred or are currently occurring, in order to prevent further suffering, financial loss, or a combination of both; and 4) Recovery. Involves returning victims' lives back to a normal state following the impact of disaster consequences (Coppola, 2011: 9-10).

However, in research of Moe and Pathranarakul (2006: 339-400) explain about disaster management such as

1. Prediction. In this phase, mitigation and preparedness activities are concluded in the prediction phases. This includes structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards and non-structural measures taken in advance to ensure effective response to the impact of hazard, including the issuance of timely and effective early warnings and temporary evacuation of people and property from threatened locations.

2. Warning. This phase refers to the provision of timely and effective information, through identified institutions, that allow individuals exposed to a hazard to take action to avoid or reduce their risk and prepare effective response.

3. Emergency relief. This provision of assistance or intervention during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can be of immediate, short- term, or protracted duration.

4. Rehabilitation. This phase includes decisions and action taken after a disaster with a view to restoring or improving the pre-disaster living

conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk.

5. Reconstruction. This phase includes the essential activities conducted are mitigation, preparedness activities in prediction phase; response activities in warning and emergency relief phase; and recovery activities in rehabilitation and reconstruction phase.

Conclude that disaster management has four components including mitigation, preparedness, response and recovery.

Coppola (2011: 12) describes the response and recovery alone, however, are not effective means of managing disaster if they are performed in the absence of a comprehensive regimen of preparedness and mitigation activities (see Table 2.11) Risk identification and assessment is normally conducted by the key actors of in national, provincial, district, sub-district, and village levels. The principle key stakeholder of the disaster management is the governmental unit, namely Department of Mitigation and Preparedness Center (DMPC). The assessment of impact levels is critical because it can be used for rehabilitation and reconstruction. The main purpose are to identify damage level of disasters effected areas and locations in terms of social, economic, and environmental assessment, to prioritize effected communities for rehabilitation and reconstruction, and to design and plan for implementation of reconstruction process. Levels of impacts can be classified into high, medium, and low (Moe and Pathranarakul, 2006:404).

Managing disasters with the integrated approach can receive valuable gains. The proactive approach allows mitigations, preparedness, and warning for disaster before they take place. Natural hazards are normally classified by their onset time. Some are slow-onset and provide lead-time for mitigative action. Slow-onset hazards include droughts, floods and volcanic eruption. Other events, such as flash floods, tsunamis and cyclones, provide little or no lead-time for increases the potential for saving lives, livestock, property, and livelihoods of population at risk (Moe and Pathranarakul, 2006: 408, 409). Thus, the impact assessment is crucial for successful implementation of disaster related public project management (Moe and Pathranarakul, 2006: 402, 404). An important focal shift among the world's international disaster management organization, agencies, and interest groups from

disaster response to disaster prevention is evidence of widespread recognition and acceptance of this (Coppola, 2011: 12).

Table 2.11 Response and recovery-based management versus prevention and risk reduction-based management

Response and Recovery-based Efforts	Prevention and Risk Reduction-based Efforts
Primary focus on disaster events	Focus on vulnerability and risk issues
Single, event-based scenarios	Dynamic, multiple risk issues and development scenarios
Basic responsibility to respond to an event	Fundamental need to assess, monitor, and update exposure to changing conditions
Often fixed, location-specific conditions	Extended, changing, shared or regional, local variations
Responsibility in single authority or agency	Involves multiple authorities, interest, actors
Command and control, directed operations	Situation-specific functions, free and open association and participation
Established hierarchical relationships	Shifting, fluid, and tangential relationships
Often focused on hardware and equipment	Dependent on related practices, abilities, and knowledge base
Depend on specialized expertise	Focus on aligning specialized expertise with public views and priorities
Urgent, immediate, and short time frames in outlook, planning, attention, and returns	Moderate and long time frames in outlook, planning, values, and returns
Rapidly changing, dynamic information usage, which is often conflicting or sensitive in nature	Accumulated, historical, layer, updated, or comparative use of information

Table 2.11 Response and recovery-based management versus prevention and risk reduction-based management (cont.)

Response and Recovery-based Efforts	Prevention and Risk Reduction-based Efforts
Primary, authorized, or singular information sources, need for definitive	Open or public information, multiple, diverse, or changing sources, differing perspectives and points of view
Facts in-out or vertical flows of information	Dispersed, lateral flows of information
Relates to matter of public security, safety	Matters of public interest, investment, and safety

Source: Adapted from Jeggle, 2001 cited in Coppola, 2011: 13.

Management after disasters according to the Department of Disaster Prevention and Mitigation summarizes the main factors in disaster management as follows:

1. Community networks and volunteers to manage the risk of disasters.
2. Risk management plan from annual disaster of community.
3. Process of enhancing capabilities, training and exercises to manage the risk of disasters.
4. Should be careful and announce information about the situation.
5. Rules and agreement on cooperation in the community, which should be consistent with and not contrary to law.
6. Monitoring and evaluation process.

2.2 Concepts and Theories of Administration and Relationship of Government Bodies

Public administration and public policies in an area that are set up by a government body at one level are regarded as national government mechanism. In this case, it is easy to identify the authorities in charge or main actors who are responsible for the success or failure of the policy. However, the current situation is different as the policy process is more complicated in terms of the variety of main actors, their roles and relationship. The policies are part of "policy network" where the government's role changes from administrator to coordinator of the policy network (Luangpraphat, 2010:62).

The management of water and other resources is carried out in accordance with policies set at various levels of government (Viessman and Welty, 1985: 51). Basic to the resolution of many water problems is clarification of the roles of federal, state, and local governments in addressing them (Viessman and Welty, 1985: 53).

These institutional elements are sometimes hard to change because they may involve political sensitivities and may also be tied to local traditions. Institutional issues of importance include:

1. The nonuniform, incomplete, and sometimes conflicting coverage of state and federal water law.
2. The failure of laws, agencies, and water user to recognize the interrelations of surface waters and groundwater.
3. The separation by states and administrative processes of water equality and water quantity.
4. The failure to recognize that water is not a free commodity. Users often pay far less than the cost of providing the water they use.
5. The focus on projects as opposed to comprehensive plans for achieving water resource goals.
6. The lack of effective national, state, and regional mechanisms for setting priorities for water resources investments.
7. The lack of mechanisms for ensuring implementation of plans. The diffusion of legislative jurisdictions at all levels of government.

8. The inability of federal, state, and local agencies to coordinate their programs.

9. The proliferation of regulations, many of which constrain rather than promote the effective use of the nation's water.

10. The nonuniformity in requirements for evaluating water resources projects (Viessman and Welty, 1985: 52-53).

The legal and national-state emphases of the term federalism suggest a third reason for shifting to IGR (Wright, 1988: 17). Federalism implies a hierarchical set of power or authority relationship. The Separate-Authority Model of IGR, sharp, distinct boundaries separate the national government and state governments (Wright, 1988: 23). The Inclusive-Authority Model is represented in figure 2.5 by concentric circles diminishing in size from national to state to local. The Overlapping-Authority Model are limited, dispersed power, interdependence, limited areas of autonomy, bargaining-exchange relationships, cooperation and competition (Wright, 1988: 29). In figure 2.4-2.6

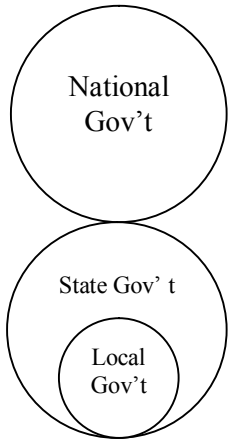

Figure 2.4 The separate-authority model

Source: Wright, 1988: 20.

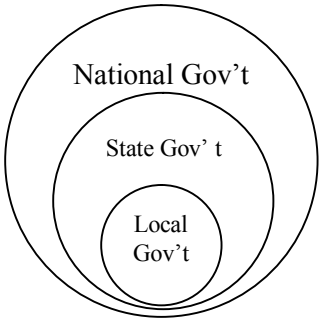

Figure 2.5 The inclusive-authority model

Source: Wright, 1988: 20.

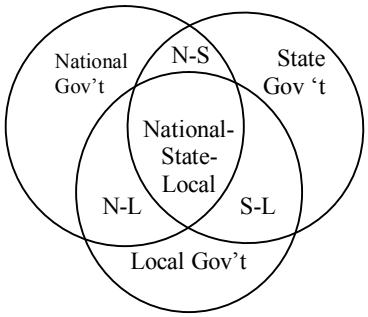

Figure 2.6 The overlapping-authority model

Source: Wright, 1988: 20.

This integration will need the official collaboration of both national and local response units. Emergency situations are dynamic and the sequential effects are uncertain. The devastation can expand to a larger scale of the area which affects more of the population. It is sometimes difficult to define where the authority and responsibility lie in the multi-agency work (Kamolvej, 2006: 38). An intergovernmental network approach seeks to find an appropriate level of authority through the management of interagency emergency operations not only to prepare them to work together, but also to balance command-control and decentralization. Ironically, the idea of decentralization and empowerment of local authorities is the underlying value of giving the local governments the authority to control their emergency operation (Kamolvej, 2006: 39).

In addition to effective intergovernmental coordination and efficient information and communication management, the study also reviews community networks. Local residents are frontline emergency response personnel, if they are well-trained because they are closer to the incident and have more experience in the area. Their informed response to states of emergency can mitigate damage and reduce levels of severity, buying time for emergency personnel with more advanced equipment to arrive and operate. Community representatives and volunteers are also trusted by local residents. Evacuation and emergency regulations can be directed effectively by the assistance of these groups (Kamolvej, 2006: 41-42).

According to Price (2009: 14) study about Disaster Management and Community capacity in Rural Alberta revealed that every response begins at the local level and it is important for communities and municipalities to have adequate capacity to respond to disaster. During an event, municipalities do not function in isolation, while providing assistance and services to their residents, rural municipalities rely on each other, can call on the province for support, who can then call upon the federal government if their capacities are exceeded. The hierarchical response system allows for the adaptation of the level of response based on the event that is occurring.

The framework describes nine principles that considered the heart of the framework.

1. Responsibility for emergency management is shared by the federal, provincial and local governments but also business, organizations and individuals who have the responsibility for being prepared for disaster.

2. The comprehensive approach is inclusive and involves partners from all parts of society in a risk-based, all hazard, and proactive perspective with balance in regards to the prevention and mitigation, preparedness, response and recovery functions.

3. Effective Partnership between individuals, communities, municipalities, and federal, provincial, territorial government, First Nations, emergency first responders, the private sector (both business and industry) according to Brinkerhoff (2002: 325-326) explain the mutuality enables partners to contribute to the partnership with fewer constraints (approvals, scrutiny, regulation, and other forms of interference) and greater legitimacy. Especially when the partnership is intended to

resolve conflict, mutuality can help to ensure acceptance of the partnership's policy and procedures and ease their implementation when each actor has agreed to them and feels a sense of ownership.

4. Coherency of Action which is described as the need for collaboration, coordination and integration to facilitate the most effective use of emergency management resource and execution of activities.

5. At risk-based approach focuses on vulnerability assessments and the determination of the optimal balance and integration of the function that address these vulnerability.

6. All vulnerabilities must consideration for defining natural disasters and man-made disasters.

7. Resilience is expressed as "the capacity of a system, community or society to adapt to disturbances resulting from hazards by persevering, recuperating or changing to reach and maintain an acceptable level of functioning".

8. Clear Communications are critical before, during, and after an event and the principle states that government should aim to be as transparent as possible about the work that each does in relation to disaster and emergency management.

9. Continuous Improvement is the concluding principle and focuses on utilizing the lesson that are learned from past events and the information that is generated from evidence-based and qualitative studies in order to improve programming (Price, 2009: 15-16).

2.3 Concept of Social Network

Social network is a link of direct and indirect relationship of social units. It is a natural phenomenon in human society. When a network is set up, people in the network have some forms of relationship, starting from close-knit units (families, relatives) to broader units (colleagues, neighbors, people around us). Each type of relationship creates different activities with different levels of participation (Whitney and Lindell, 2000 cited in Phromlert, 2005: 34).

Social network means human relationship in society at the individual level, individual and groups, groups and groups, groups and networks. Social network can explain human behaviors and relationship such as activities, communication, cooperation and dependency, exchange, sharing, etc. within various kinds of structures and forms of networks. Human social network covers all units, from societal level to individual level. Various kinds of relationship occur in the social network: relationship between individuals and the network; influence of network on the individuals, etc. Social network is a process of shared activities, interaction and close relationship of the units as members (Apakaro, 2004: 6). Wasserman and Faust (1994: 6) defined the most distinguishing feature is that social network analysis focuses on relationships among social entities and on the patterns and implications of these relationships. Instead of analyzing individual behaviors, attitudes, and beliefs, social network analysis focuses its attention on social entities or actors interaction with one another and on how these interactions constitute a framework or structure that can be studied and analyzed in its own right (Dempwolf and Lyles, 2012: 6).

Networks may be modeled using dots or "nodes" to represent actors in the network, and lines between the dots to represent the relationships or "ties" between actors. SNA is both a theoretical perspective on how the interactions of individual autonomous actors form the social structures of community and a set of analytical tools to analyze those interactions and social structures as networks of nodes (actors) and ties (relationships) (Dempwolf and Lyles, 2012: 4). Newman (2003 cited in Dempwolf and Lyles, 2012: 5) identifies four "loose categories" of network analysis, including: 1) social network, such as form of contact or interaction between individual; 2) Information networks such as links in the World Wide Web and academic citation networks; 3) Technological networks, such as water, transportation, and energy systems; and 4) Biological networks, such as food webs with predators, prey, and decomposer. Planners routinely face six types of problems where SNA may prove especially useful. These include problems that involve: 1) coordination, cooperation, or trust; 2) the sources and uses of power and influences; 3) multiple levels of organization; 4) informal organization; 5) flows of information and/or transaction costs; and 6) problems involving the dynamics of community (network)

development (modified from Heaney and McClurg, 2009 cited in Dempwolf and Lyles, 2012: 9).

Network management is to bring together all the agencies that benefit common policies. The exchange of specific information and for the same purpose (Goodsell, 2006: 628), disaster management should be multi-agency and each level is a clear relationship. Although the flood management in the past would have problems with coordination but the flood management managed to control a multi-agency partnership will demonstrate a partnership of government, private sector, non-profit organization, charitable organizations and people for a common goal. The structure is an informal and temporary activities (Simo and Bies, 2007: 125). The trust is essential to reduce the performance gap (Simo and Bies, 2007: 125). If the work of the local authority and the government has failed and the structure of the partnership will be formal or informal, it depends on the level and size of the trust (Simo and Bies, 2007: 137). Therefore, the development of a sustainable flood management should be changed the culture (values, attitudes and behaviors) for readiness to face emergency situations (McEntire, Fuller, Johnson and Weber, 2002: 270).

All social structure can change depending on the forms of groups and relationship. Resource exchange is based on the specific exchange. Social structure consists of public sectors, private sectors and civil society (Charoenwongsak, 2001: 144 cited in Phromlert, 2005: 25).

Government is a machine that is driven by society to proceed systematically. The government sector has evolved over many years, allowing the creation of powerful relations. Integration is difficult to implement because the management is a top-down form. By the policy of the authority to cause problems in the coordination of social networking with other sectors are private and the public sectors. The plan and process of decentralization to local government organizations, Act B.E. 2542 and Civil Defense Act B.E. 2522, came about due to government mismanagement. By focusing on more participation in the process than vertical relationships, it is top-down.

The coordination of social networks from past to present is still managed by government as key machinery (Phromlert, 2005: 28).

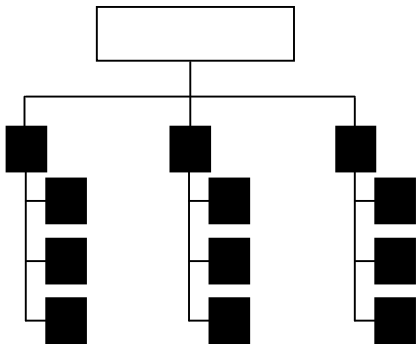

Figure 2.7 Structure of government

Source: Suntivong, 1990: 257, 313 cited in Phromlert, 2005: 27.

Private sectors are important to social development. These have evolved from humanitarian assistance. The private sectors have been working various angles, supporting self-reliance by pushing for resolution of social problems, creating consciousness of collective groups and publishing the process involved. The operation is an ongoing social movement. A key aspect of the private sector is to coordinate and share their learning with other networks (Apakaro, 2004: 80-81). The strengths of the private sector are committed to offering a choice of social development, supporting the people to self-reliance and taking part in the solutions. However, the limitations of the private sector are limited budgets for activities. The lack of awareness of certain interest groups and their activities as a tool for work does not fit the context of social Thailand.

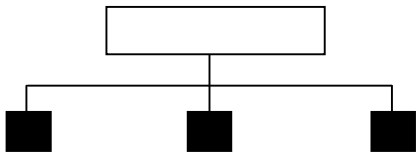

Figure 2.8 Structure of private sectors

Source: Suntivong, 1990: 313 cited in Phromlert, 2005: 29.

A working model as horizontal more than the public sector has a concept of community and civil society, playing a role in resolving social problems and creating a sustainable environment. The role in the interface with various groups, co-operation in planning the survey group in the activity in sponsoring, promoting, training, demonstrations, public relations and their role as co- operational support, such as a joint public relations campaign. The training is conducted together with the government and so on.

The people sector, as a structure, is a combination of people in the area by using cultural community. The procedure works as cooperation with other participants. The integration of people in this sector happens from learning and relaying experience together by a natural process. There is the relation between people, in order that, the group combination of public sector might born from the support from the government sector or others sectors to want the social strength, there is the latency in oneself development and the community.

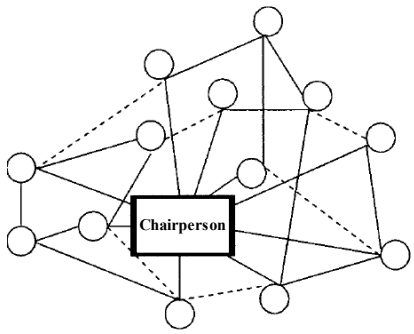

Figure 2.9 Public structure

Source: Suntivong, 1990: 239 cited in Phromlert, 2005: 30.

People structures are similar in horizontal structure, with directional integration contributing to learning. This happens so profoundly with no rules to regulate them and their dependence.

The work of the people sector can be divided into 2 large degrees. The first level is to strengthen the community in transforming learning and self-management. The second level is creating the opportunity and capacity of the network and expanding it to other networks. Integration is to enhance self-reliance through learning inherited wisdom and the adaptation of the community, including participation in local

development with emphasis on interoperability to achieve alignment in the higher levels. However, restrictions on the activities of the people sector are budget constraints, a lack of learning skills, a lack of adaptation, a lack of self-management systems, a lack of leaders with the knowledge and capabilities, a lack of network management systems that are causing ongoing activities (Phromlert, 2005: 31).

Network theory is a part of the theory of functional structure. Although it is different because social network theory is not focused on the development of the structure occurred, the structures focused on horizontal structure are related to other actions of cultural norms of social learning processes and collected group together. The patterns of change in structure have evolved over time. A connection exists between the relationship of the actors, which is different in direction and is linearly related. Special characteristics of social networks are the relationships related from the micro to macro level. The smallest level is composed of the individual, growing to family, group, district, province, country until the biggest is the global level. It is a social network, which is characteristic of a modern society with an extensive study of information technology revolution (Phromlert, 2005: 35).

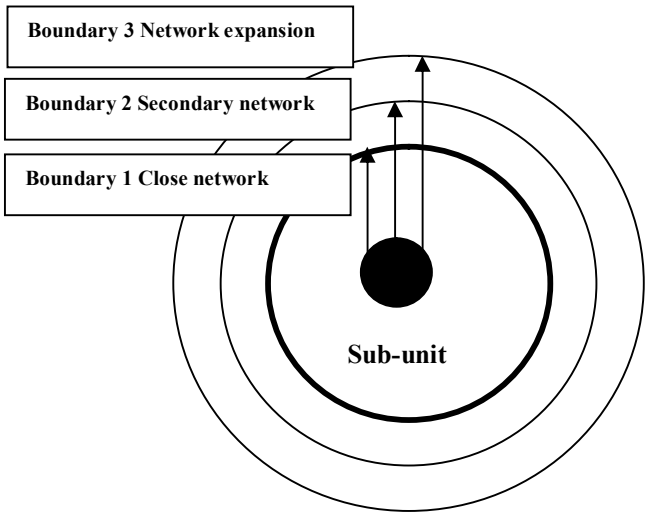

Figure 2.10 Concept of social network

Source: Phromlert, 2005: 35.

2.3.1 Elements of the Network (Tumornsunthorn, Empradit and Sangkhawan, 1998: 23)

1. Scale refers to a number of social groups in a society where individuals are related. There may be less or more depending on several factors, such as age or geographic remoteness and so on.

2. Character of the relationship means a mutual membership in a social group whose commitment and the quality of that relationship is substantial.

3. Period means the period of contact individuals begin and continue a relationship with each other. A consecutive period shows a steady relationship. If a person has a strong affinity and is known for a long time, it will affect social support, causing people to help each other more.

4. The frequency of contact means frequency to conversation. Frequency of contact will demonstrate the stability of the group.

5. Methods used in contact. There are many ways to communicate, such as letters, telephones, talking etc. The best method to communicate is talking because it makes the conversation more understandable than other methods.

2.3.2 Evaluating Network Effectiveness

Although cooperative, interoganizational networks have become a common mechanism for delivery of public services, evaluating their effectiveness Consistent with a multiple stakeholder perspective, evaluation of network effectiveness is extremely complex and has generally been neglected. Our model focuses on evaluation on networks at three broad levels of analysis; community, network, and organizational/ participants levels (Provan and Milward, 2001: 414).

An important issue in the delivery of publicly funded health and human services at the local-community level is the integration and coordination of organizational providers into service-delivery networks. The development and utilization of these networks has been focus of organizational and public policy scholars since at least the 1960s. Recently, the focus has boarded from a concern with individual relationships among organization to an examination of the multiple interactions that comprise full networks, including discussion of how public policy is implemented through

networks of cooperating service providers (Provan and Milward, 2001: 414). As table 2.12 shows

Table 2.12 Summary of network evaluation relationships

Levels of network analysis	Key stakeholder groups	Effectiveness criteria
Community	Principals and Clients - Client advocacy groups - Funders - Politicians - Regulators - General public	Cost to community - Building social capital - Public perceptions that problem is being solved - Changes in the incidence of the problem - Aggregate indicators of client well-being
Network	Principals and agents -Primary funders and regulators - Network administrative organization - Member organizations	- Network membership growth - Range of services provided - Absence of service duplication - Relationship strength (multiplexity) - Creation and maintenance of network administrative organization (NAO) - Integration/coordination of services - Cost of network maintenance - Member commitment to network goals
Organization/ participant	Agents and clients - Member agency board and management - Agency staff - Individual clients	- Agency survival - Enhanced legitimacy - Resource acquisition - Cost of services - Service access - Client outcomes - Minimum conflict for multiprogram agencies multiple networks

Source: Provan and Milward, 2001: 416.

2.3.3 Concept of Network Policies

Network policies are a group of people from both public and private sectors to create beneficial policies, similar to binding affinity group members. Mutual aid is dependent on benefits. Some policies may be isolated from other networks, such as a communications policy not interfering with a water policy.

Network policies can be used to design new governance structures different from the vertical bureaucracy and horizontal structure of business systems. It is a horizontal structure is organized in cooperation with the government and private sectors to negotiate and resolve problems. The government sector is simultaneously faced with three systems, which are the bureaucracy systems, market systems and network systems. The final systems have autonomy against government control.

1. The policy network shows the pattern of interaction of the actors. In a subsystem, the policies are varied. Categories are mainly focused on the role that concept of pluralism, diversity and competition of the actors. This cooperation concept focuses on cooperation between the actors at the center, which are not many.

2. A tool for social network analysis analyzed complex plans of interactions among policy actors. This may be used as quantitative research to study the structure and indicators, such as the level of centralization, coherence and concentration. The part of interpreting depends on research interest groups (Vinijnaiyapak, 2011: 128).

Sirorot (1996: 7) discussed the types of network policies. There are eight kinds, which have government and societal roles related in the following forms:

1. Bureaucratic Network as a pattern is all actors coming from the government.

2. Issue Network, as a pattern, has both governmental and social sectors with interaction together. The social sector has a dominant role.

3. Participatory Statist Network as a pattern is a governmental sector, which has a role, but is dominated by the social sector.

4. Pluralist Network as a pattern is a governmental sector that has a high role. The role of the social sector will change continually.

5. Clientelistic Network as a pattern is a patronage system. The governmental sector has a dominant role.

6. Cultured Network is a model where both government and society have a role, but the role of the State is dominated by the social sector with the social sector playing roles in the governmental sector.

7. Triadic Network as a pattern has three sectors composed of one governmental sector and two social sectors. It is dominated by the governmental sector.

8. Corporatist Network as a pattern has both government and civil society together in a network but not for profit, in order to share knowledge. Patterns in the social sector will play a greater role than the governmental sector and control the situation.

Sirorot (1999: 263) concluded the key aspects of network policies as follows:

1. Required dependence between members of the network. The members have limited resources. Therefore, they rely on the resources of other members in the network so that they can accomplish the intended goal. Dependence is not fixed, but is adapted to the situation and changed by the members' relationships.

2. Process of network policies is intended to participate as various actors. A 'one-man show' or single agency will not act alone to determine the strategy and operation of other actors. Each character will have their objectives, goals and interests. We could not find a single purpose or goal to be noticeable from the outset, because the policy is the result of the actors involved. Interaction does not mean that all the characters are equally competent in the interaction process itself. Power will depend on the actors who have a network resource that is valuable and needed in that moment.

3. Institution, because network policy consists of a pattern of relations interdependent between the actors, this will affect the way the relationship is on going. As such, it often occurs as a pattern. It is durable and not easy to break. It has been established as a rule of conduct that made such interactions more meaningful and valuable. Help to continue this pattern is possible that it is an institution.

Rhodes and Marsh (1992: 1-26) collected the concept and study policy network about a city in the United Kingdom (UK) by considering the policy community and policy network for explaining policy procedure in the UK. In order that the policy network is relational, the micro level between roles of the benefiting group and the government is policy specification. In the macro level, it is decentralized within the society (The Distribution of power within Contemporary Society) with separate policy community and policy network, following the idea of Rhodes and Marsh. As shown in Table 2.13.

Table 2.13 Policy community and policy network

Type of Network	Characteristics of Network
Policy community/regional community	Safety, limited number of members, vertical relationships, limit of bargaining in horizontal lines
Network of Expertise	Safety, limited number of members, vertical relationships, limit of bargaining in horizontal lines in order to respond to professional interests
Governmental Network	Limited number of members, vertical relationships, extent cooperative network and horizontal relationships
Producer Network	Uncertain number of members, limit vertical relationships in order to respond to the interests of producer
Problem network issue	Uncertainty, many members, limit of vertical relationships

Source: Rhodes and Marsh, 1992: 14.

As well, present policy community and policy networks still follow the idea of the Wilks and Wright Model.

Table 2.14 Policy community and policy network following the ideal of the Wilks and Wright model

Policy Issue	Level of policy	Actor
Policy area	Industry, education, communication, public health	International policy
Policy	chemistry, communication, etc.	Policy community
Important Issue of Policy	chemistry base, medicine, agriculture chemistry, soap, sanitary ware	Policy network
Policy heading	Health and safety regulations using medicine	-

Source: Rhodes and Marsh, 1992: 19.

The rhetoric was that public private partnership had the potential to merge the strengths of the public and private sectors into an alliance whereby the relationship itself adds value. Specifically, the private sector would bring along innovation, financial capacity, leading-edge technology, efficiency, and entrepreneurialism, and this would be employed within the public sector's framework of social responsibility, environmental awareness, and local knowledge (Hodge, 2004: 38; Hodge and Greve, 2007: 545; Scharle, 2002: 228 cited in Macdonald, 2012: 584). Effectively, the relationship creates added value by bringing together the competencies of both sectors, achieving outcomes that neither sector could do in isolation (Macdonald, 2012: 584). See Table 2.15-2.17

Table 2.15 Relationship-outcome typologies and characteristics

Outcome Typology	Characteristic of Outcome Typologies			
	Skelcher and Sullivan, 2008:757	**Cigler, 1999:88**	**Thompson and Sander, 1998: 74-77**	**Keast and Mande, 2009:2**
Competition			Short-term focus, may have conflicting objectives with coercive environment	
Networking		Members join and disconnect easily; resource sharing on ideas, news, and reports		
Cooperation	Shared information, mutual support	Cooperation on one or more activities, few resources	Project-specific common objectives with improved relations and multiple points of contact	Loose connections with low trust, tactical information sharing independent goals power remains with organizations
Coordination	Common tasks, compatible goals	Stable, more formal structure with some loss of autonomy; higher resource commitments		Work-based trust with structured communication flows; project-base information sharing semi-interdependent goals

Table 2.15 Relationship-outcome typologies and characteristics (cont.)

Outcome Typology	Characteristic of Outcome Typologies			
	Skelcher and Sullivan, 2008:757	**Cigler, 1999:88**	**Thompson and Sander, 1998: 74-77**	**Keast and Mande, 2009:2**
Collaboration	Integrated strategies, collective purpose	Significant resource commitment; may be written agreement on structure and processes	Long-term focus, improved processes, shared authority and measures tied to team incentives	Dense interdependent connections with high trust; frequency communication a tactical information sharing; long-term time frame (three years); high risk/high reward
Coadunation	Unified structure, combined cultures			
Coalescing			One common performance measurement system, integrated cultures, implicit trust, shared risk	

Source: Macdonald, 2012: 583.

Table 2.16 Collaboration continuum

Outcome	Characteristics
Control	Short-term focus. Parties may have conflicting objectives and coercive environment.
Cooperation	Project-specific common objectives with improved relationship and multiple points of contact. Shared information (low level) and mutual support, parties join and disconnect easily. Parties cooperate on one or more activities, but few resources are committed.

Table 2.16 Collaboration continuum (cont.)

Outcome	Characteristics
Coordination	Interworking structure is stable because of more formal structure with some loss of autonomy. Higher resource commitments, but still not on long-term basis. Common tasks and compatible goals have been developed.
Collaboration	Collective purpose and long-term focus (3+ years) with significant resource commitment. Integrated strategies, improved processes, shared authority, and measures tied to team incentives. May be written agreement on structure and processes.
Coalescing	One common performance-measurement system, integrated culture implicit trust, and shared risk. Unified structure and combined cultures.

Source: Macdonald, 2012: 586.

As a result, a framework with only four outcomes was established, and the outcome names were generically described as: Dissociated benefits- representing the control outcome, low mutual benefits, medium mutual benefits, and high mutual benefits.

The Interaction Approach Model developed from the interacting variables, involves four element:

1. The interaction process-the exchange of products and services, information, finance, and social interaction.
2. The interacting parties-the characteristics of parties, covering the individuals, technology, and the size, structure, strategies, and experience of the organization themselves.
3. The atmosphere- the impact of episodes between the parties, the nature of the relationship, and the length of time the relationship has existed.
4. The environment- the wider context, including the market structure, the dynamics of the relationship, the international impact on the buyer or seller, and market channels. (Hakanson, 1982: 15-23 cited in Macdonald, 2012: 588) The constructs for the initial framework are shown in Table 2.17

Table 2.17 Constructs for initial framework

Construct Group	Construct
Interaction process	Quality of product/service Information sharing Financial, value/potential for profit Communication and shared language
Parties	Business focus and objectives Interpersonal relationships Governance Leadership Incentives and alignment across party boundary Quality, skills of people
Atmosphere	Type of relationship Integration of cultures, ease of doing business Measurement and evaluation systems for projects and relationship Trust, reliability, and integrity Degree of discussion
Environment	Business/political/social environment Status that comes with the relationship

Source: Macdonald, 2012: 589.

Table 2.15-2.17 can conclude that a public-private partnership is a distinct and radical form of governance that can achieve otherwise unachievable results (Macdonald, 2012: 579).

It can be concluded that the partnership between government and the private sector in a partnership that interact together to solve the same problem with the exchange of information and resources. Therefore, the cooperation was made by the recognition and awareness of the problem, which led to trust, according to the concept of Sabatier, trust will cause the direction of working together.

2.4 Public Policy Theory

2.4.1 Policy Analysis

Policy analysis is the activity of creating knowledge of and in the policy making process. In creating knowledge of policy-making processes policy analysts investigate the causes, consequences, and performance of public policies and programs (Dunn, 1994: 1-2).

The methodology of policy analysis provides information that is useful in answering five kinds of questions. What is the nature of problem? What present and past policies have been established to address the problem, and what are their outcome? How valuable are these outcomes in solving the problem? What policy alternatives are available the problem, and what are their likely future outcomes? What alternatives should be acted on to solve the problem? The process of policy analysis is a series of intellectual activities carried out within a process comprised of activities that are essentially political. These political activities can be described usefully as the policy-making process and visualized as a series of interdependent phases arrayed through time: agenda setting, policy formulation, policy adaptation, policy implementation, policy assessment (Dunn, 1994: 12-14). The methodology of policy analysis draws from and integrates elements of multiple disciplines (Triangulation) (Dunn, 1994: 2). In figure 2.11

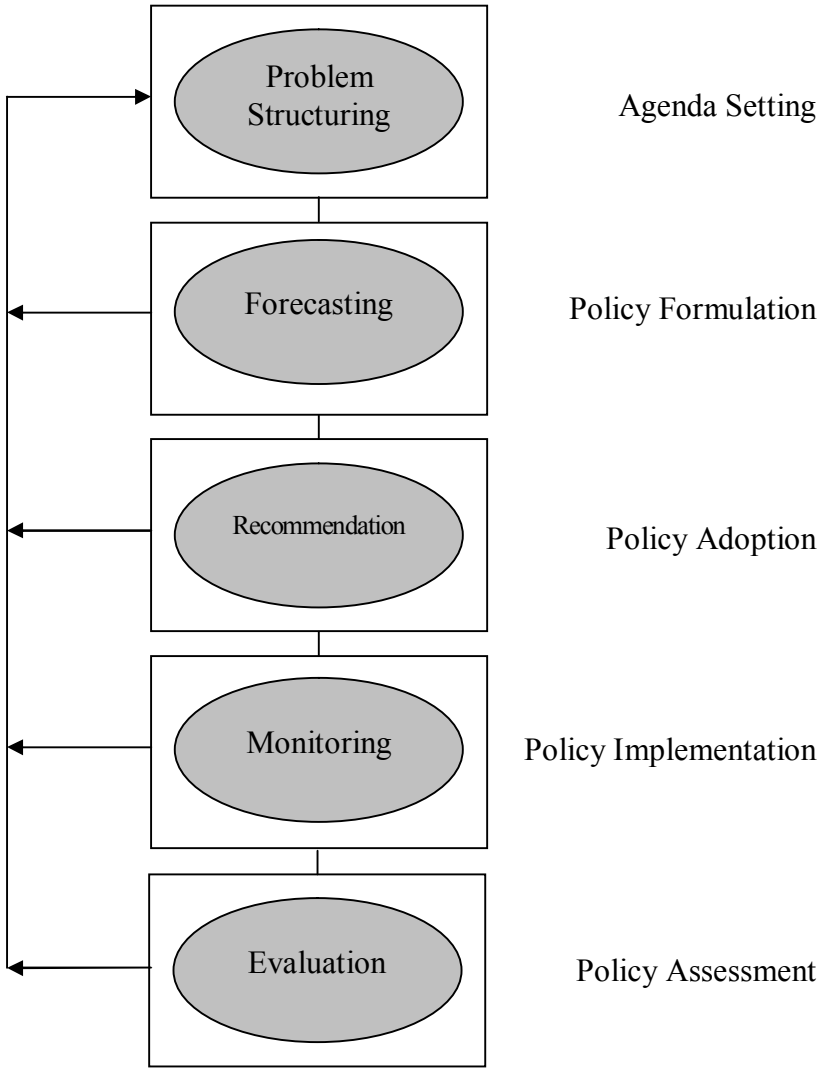

Figure 2.11 Appropriateness of policy-analytic procedures to different phases of policy-making

Source: Dunn, 1994: 17.

Hill (1993: 5-8) explains the type of policy analysis. Most of the distinction between policy analysis are clear objectives and beneficiaries to distinguish the different research methods. Policy advocacy is to provide feedback, information, policy monitoring and evaluating to provide outcome, impact and effectiveness the specific policy in order to find a set of actions to be the best policy.

The analysis of policy trend is to study about inputs and process to create policy change environmental driving forces. The purpose of each target policy analysis

is to characterize the policy. Analysis and demonstrate social policy as social systems theory, assumptions about policy and policy makers about the content matches the activities and objectives. The formation of the issue is through the implementation of the alternatives. Negotiation environmental education is against the public policy process, which has resulted in better understanding the causes and outcomes and the decision to improve knowledge about society, which is based on the relationship between social power, political process and public policy for understanding the incorporation significance and the development of the theory of social sciences (Dye, 2005: 5-6). Policy analysts are but one among many different types of actors in a policy system. A policy system, or the overall institutional pattern within which policies are made, involves interrelationships among three elements: public policies, policy stakeholders, and policy environments (Figure 2.12) (Dunn, 1994: 70-71).

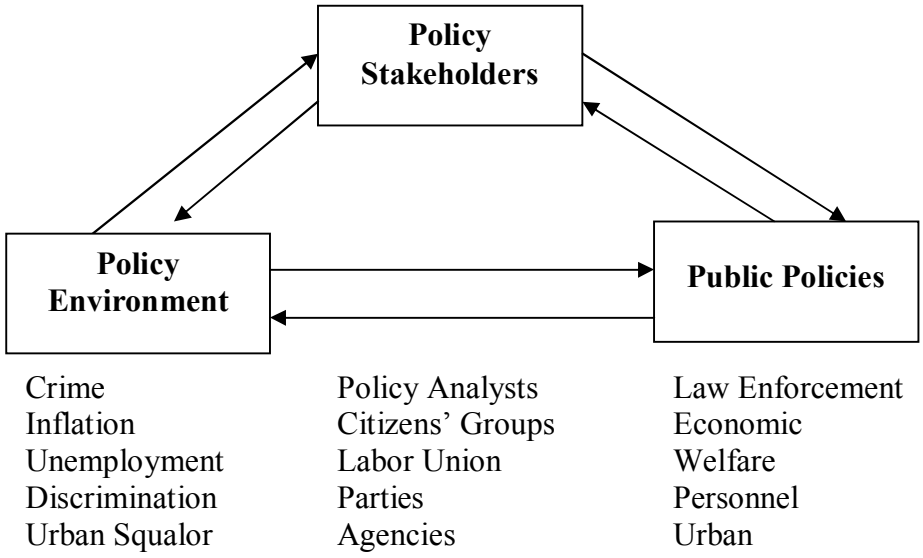

Figure 2.12 Three elements of a policy system

Source: Dunn, 1994: 71.

Forms of Policy Analysis provide a basis for distinguishing three major forms of policy analysis.

1. Prospective Policy Analysis, which involves the production and transformation of information before policy action are initiated and implemented,

tend to characterize the operating styles of economist, systems analysts, and operation researchers.

2. Retrospective Policy Analysis conforms in major respects to the description of policy research offered earlier. Retrospective analysis, which is confined to the production and transformation of information after policy action has been taken, typifies the operating styles of the three major groups of analysts.

- Disciplinary-oriented analysts. This group, comprised largely of political scientists and sociologists, seeks primarily to develop and test discipline-based theories and describe the causes and consequences of policies.

- Problem-oriented analysts. This group, also composed largely of political scientists and sociologists, likewise seeks to describe the causes and consequences of policies.

- Application-oriented analysts. The third group of analysts includes sociologists and some political scientists but also persons from professions such as social work and public administration and such fields as evaluation research.

3. Integrated policy analysis is a more comprehensive form of analysis which combines the operating styles of practitioners concerned with the production and transformation of information both before and after policy action has been taken (Dunn, 1994: 75-79).

The process of policy analysis: Dunn recommended that there are 11 steps of policy analysis.

1. Analyze the structure of problems: To decide whether the problem is an emerging issue. If it really is, then find out whether it is a personal or public issue. In case of public issue, the nature of such issue will be analyzed and categorized as an issue in the administration or policy. According to Dunn (1994: 146), the policy problems can be divided into 3 types: 1) well-structured; 2) moderately-structured; and 3) ill-structured as shown in Table 2.18.

Table 2.18 Differences in the structure of three classes of policy problems

Element	Structure of Problem		
	well-structured	**moderately-structured**	**ill-structured**
Decision maker (s)	one or few	one or few	many
Alternative	limited	limited	unlimited
Utilities (values)	consensus	consensus	conflict
Outcome	certain or risk	uncertain	unknown
Probabilities	calculable	incalculable	incalculable

Source: Dunn, 1994: 146.

2. Set up goals and objectives: After a problem is identified as a policy problem, goals and objectives will be set up in order to solve or to respond to the problem. The goals and objectives should be realistic, reachable and practical.

3. Find choices: All possible choices will be identified in order to solve the policy problems.

4. Analyze the choices: All choices will be analyzed and compared.

5. Select the choice: After analyzing all possible choices by comparing pros and cons of each choice, the best and most feasible one will be selected as solution of the problem.

6. Implement: The selected choice will be implemented in order to solve the problem.

7. Monitor: There must be a close monitor during the implementation of the selected problem solving method so that the obstacles or problems in the implementation (if any) can be solved in a timely manner.

8. Identify the outcome: After the policy implementation, the outcome will be analyzed in order to find the output and effect of such policy.

9. Evaluate the outcome: The outcome of the policy will be evaluated.

10. Evaluate the policy implementation: After step 8 and 9, the implementation of such policy shall be evaluated.

11. Find practical solution: This is the last stage where best choice is brought into practice (Nimpanich, 2009: 65-66).

2.4.2 Efficiency and Effectiveness of the Policies

In term of the efficiency and effectiveness of the policies, the factors to be considered are as follows: The efficiency is based on the amount of the output while the effectiveness is based on the success in reaching the goals of the organization (Nimpanich, 2009: 297).

Worrathepputtipong (1990: 4) indicated the meaning of the effectiveness of the policy that the scope of reducing costs, especially the cost in terms of money which can be determined from the total cost, or the ratio between benefits and costs. The effectiveness of the policy refers to the scope of the beneficiaries of the policy that meet the setting goal, including other beneficiaries that does not expect as well.

Nimpanich (2009: 297) indicated the evaluation of the efficiency and effectiveness of the policies, the following criteria are used:

First, the criteria on the efficiency are used more often than those of the effectiveness.

Second, efficiency is mostly used to evaluate the performance such as the evaluation of policy implementation. Sometimes there is a misunderstanding that high efficiency means high productivity as the difference between efficiency and effectiveness is not clear.

Third, to avoid ambiguity, efficiency can be defined as “to get maximal result with minimal resources.”

Fourth, if the term efficiency is used for productivity, the evaluation must be done in a long term. The cost and benefits shall be evaluated in a long term basis whereas the effectiveness can be evaluated by direct interview with stakeholders whether the plan/project reach its goal and objectives.

Fifth, in order to evaluate policy implementation, both efficiency and effectiveness are included. Effectiveness not only means the ability to reach the goal and objectives, but also the satisfaction of the service recipients (or consumers).

Efficiency means the ability to get productivity with the available resources. There are 2 types of efficiency:

First type of efficiency means the ability to get highest productivity with lowest resource. In other words, the available resources are used as effectively as possible.

Second type of efficiency means the ability to reduce the cost of one unit of production (Nimpanich, 2009: 299-300).

Judging from the information mentioned above, the operational definition of efficiency and effectiveness in this study means:

Efficiency means the use of the available resources in response to disaster in a timely manner, with cooperation within and among organizations of public and private sectors as well as the communities.

Effectiveness means productivity of the cooperation within and among organizations of public and private sectors as well as the communities in response to the disaster.

2.4.3 The Relationship between Policy and Implementation

From the problems of the policies and the practices of the government in case of disasters in the past shown that there was a lack of flexibility and unable to work as a system in order to solve the said issues. The management across the agencies will need the cooperation of all parties, which apparently shown that the joint management had to require all parties to take part in the planned direction and co-practice by all parties have mutual trust and faith (Wungaeo, et al., 2006: 28). Sabatier (1988: 131-132) describes that the framework has at least three basic: first, that understanding the process of policy change-and the role of policy-oriented learning therein-requires a time perspective of a decade or more. Second, that the most useful way to think about policy change over such a timespan is through a focus on "policy subsystem" i.e. the interaction of actors from different institutions interested in a policy area. Third, that public policies (or programs) can be conceptualized in the same manner as belief system, i.e. as sets of value priorities and causal assumptions about how to realize them. (Figure 2.13)

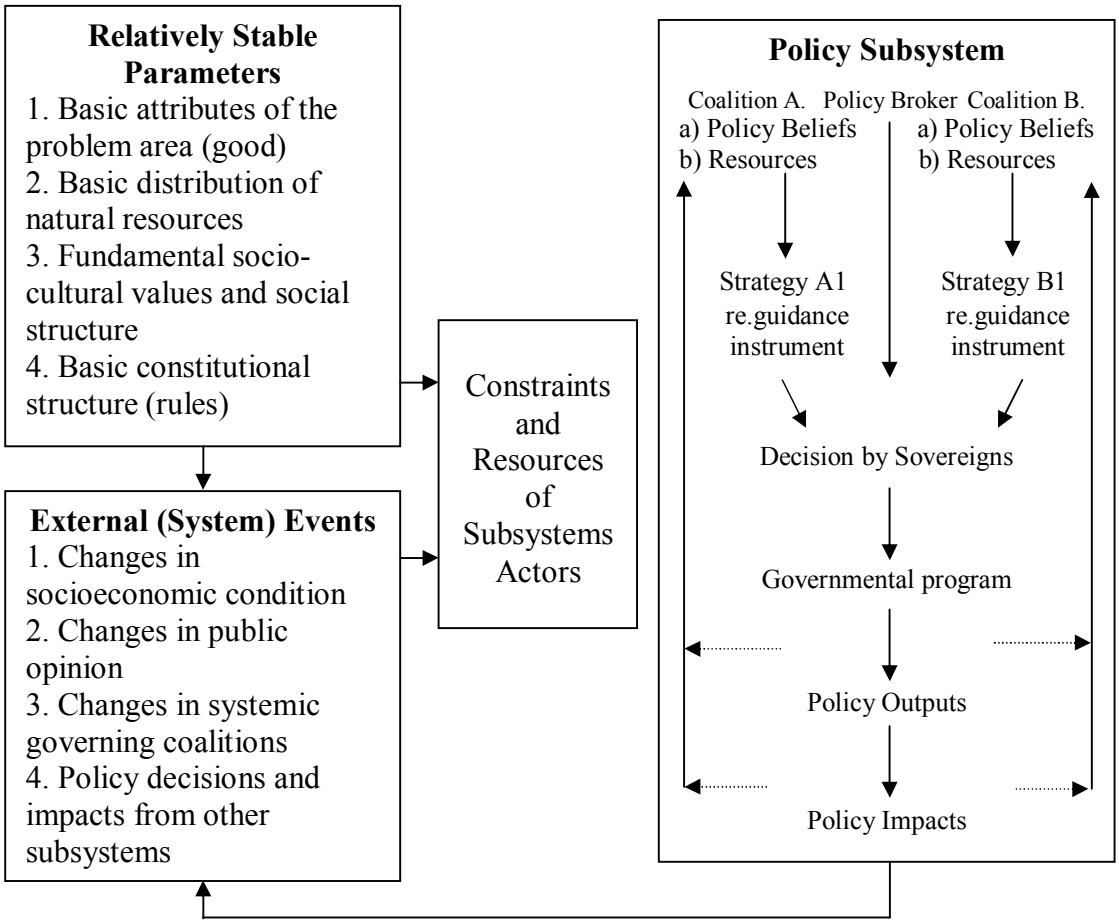

Figure 2.13 General model of policy change focusing on competing advocacy coalitions within policy subsystems

Source: Sabatier, 1988: 132.

A common form of policy changes focus on cooperation within the subsystem Sabatier policies that are utilized in the development of a model for the future management of the proposed research by pointing out that the management of cross-agency cooperation between governments. The private sector and people sector to look a partnership need to change the set values to work together, since the problem formulation and solution of the participation of all parties, and causes the check and balance each other. However, in the process of change and uncertainty of the situation needs to study the impact and creates a limitation of the worker and the resource for working that there are two kinds of factors are relatively stable. While there was another dynamic at all times. Factors or both variables are variables that occur outside

(exogenous variable), which both variables are characterized Top-down analysis is a factor to consider for policy makers. For example, Air pollution control policy Variables that affect the application of policies might include.

The quality of air exists naturally. Political or policy is generally constant over time. While the change in economic conditions or the nature of the cooperation of the agencies under the bureaucracy that is the nature of the variables that are moving in the other hand. Variable within a subsystem that has a Bottom-up, ie in practice, it may require cooperation from multiple practitioners, such as political practitioners, representatives of various interest groups and academic. When the organization changes, the practitioners will need to make a strategy for implementing in order to achieve objectives. The disputes will be settled by a third party called a "policy broker" who provided the opposition rally and choose the option that causes the increase of the policies in place at the practitioner level. Produce this policy will result in a negative impact on the problem. As well as other adverse consequences (Chantarasorn, 2005: 92-93).

External factors affecting policy change within subsystems

The following set of very stable factors may be either within, or external to, the policy subsystem compose of

1. Basic attributes of the problem area (good)
2. Basic distribution of natural resources
3. Fundamental socio-cultural values and social structure
4. Basic constitutional structure (rules) (Sabatier, 1988: 135-136)

Dynamic (system) events

1. Changes in socioeconomic condition
2. Changes in systemic governing coalitions
3. Policy decisions and impacts from other subsystems (Sabatier, 1988: 136-137).

The complexity of modern society, the expansion of government functions, and the technical nature of most policy problems create enormous pressures for specialization. It is exceedingly difficult, except perhaps in small communities, to be

knowledgeable about more that one or two policy sectors (Sabatier, 1988: 137). The distinction between 'advocacy' and 'broker' is, however, a continuum. Many brokers will have some policy bent, while advocates may show some serious concern with system maintenance. The concept of an "advocacy coalition" assumes that it is shared beliefs which provide the principal 'glue' of politics. Moreover, as shall be discussed shortly, it is assumed that people's 'core' beliefs are quite resistant to change. This leads to one of the critical hypotheses of the entire framework (Sabatier, 1988: 141). While belief system will determine the direction in which an advocacy coalition (or any other political actor) will seek to move governmental programs, its ability to do so will be critically dependent upon its resources (Sabatier, 1988: 143). Following figure 2.14 and table 2.19

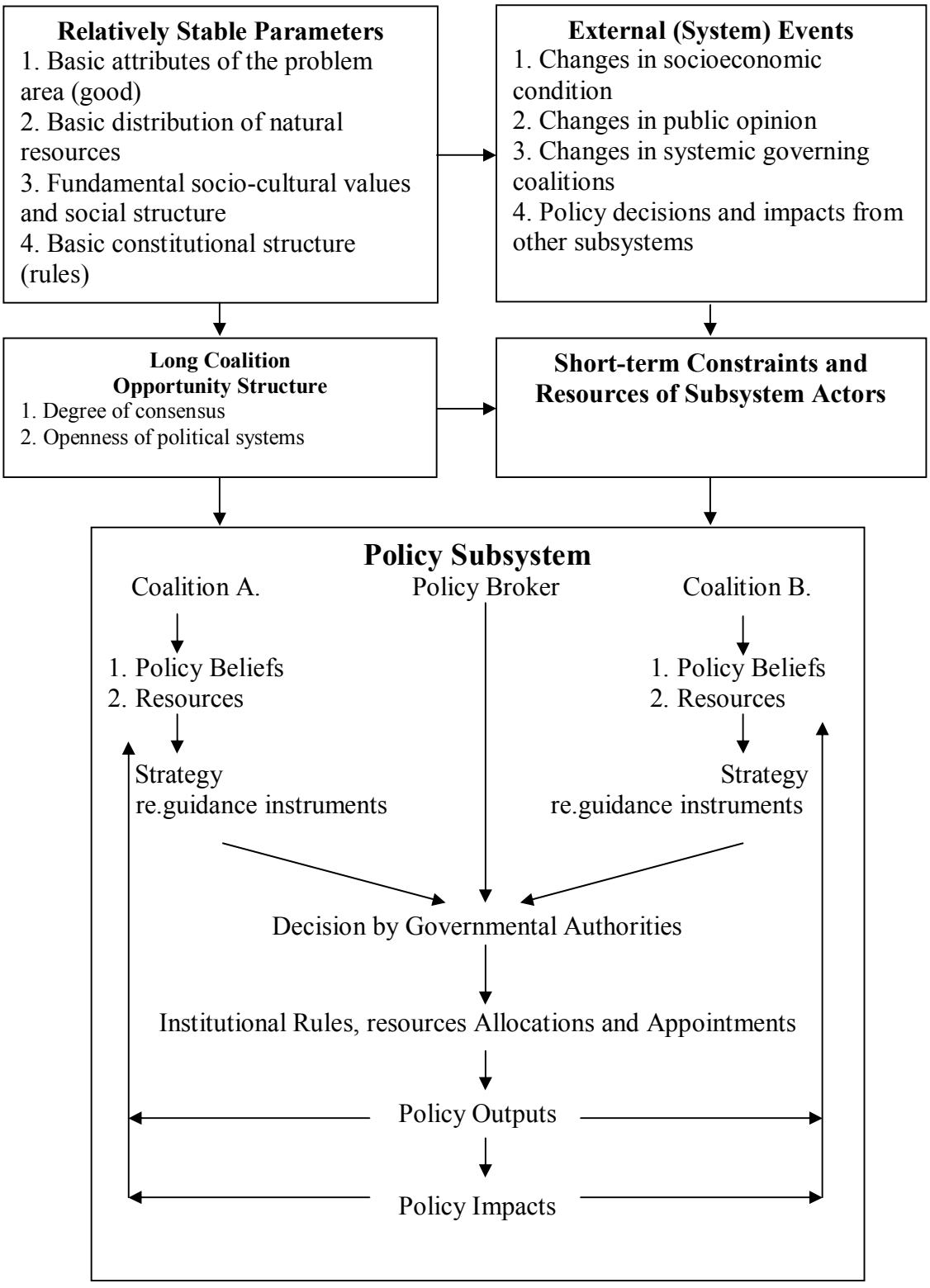

Figure 2.14 Diagram of advocacy coalition framework modified hierarchically from Sabatier

Source: Robichau and Lynn, 2009: 33.

Table 2.19 Structure of belief systems of policy elite

	Deep (Normative) core	Near (policy) core	Secondary aspects
Defining characteristics	Fundamental normative and ontological axioms.	Fundamental policy positions concerning the basic strategies for achieving normative axioms of deep core.	Instrumental decisions and information searches necessary to implement policy core.
Scope	Part of basic personal philosophy. Applies to all policy areas.	Applies to policy areas of interest (and perhaps a few more)	Specific to policy/subsystem of interest.
Susceptibility to change	Very difficult; akin to a religious conversion.	Difficult, but can occur if experience reveals serious anomalies.	Moderately easy; this is the topic of most administrative and even legislative policy-making.
Illustrative components	1) The nature of man -inherently evil vs. socially redeemable. - Part of nature vs. dominion over nature. -Narrow egoists vs. contract-tarians. 2) Relative priority of various ultimate values: freedom, security, power, knowledge, health, love, beauty, etc. 3) Basic criteria of distributive justice: Whose welfare counts? Relative weights of self primary groups, all people, future generations, non-human being, etc.	1) Proper scope of governmental cs. Market activity. 2) Proper distribution of authority among various units (e.g. levels) of government. 3) Identification of social groups whose welfare is most critical. 4) Orientation on substantive policy conflicts, e.g. environmental protection vs. economic development. 5) Magnitude of perceived threat to those values.	1) Most decisions concerning administrative rules, budgetary allocations, disposition, and even statutory revision. 2) Information concerning program performance, the seriousness of the problems, etc.

Table 2.19 Structure of belief systems of policy elite (cont.)

	Deep (Normative) core	Near (policy) core	Secondary aspects
Illustrative components (cont.)		6) Basic choices concerning policy instruments, e.g. coercion vs. inducement vs. persuasion. 7) Desirability of participation by various segment of society: -Public vs. elite participation. -Experts vs. elected officials. 8) Ability of society to solve problems in this policy area: - Zero-sum competition vs. potential for mutual accommodation. -Technological optimism vs. pessimism.	

Source: Sabatier, 1988: 145.

Hill (2005: 73) summarizes about this characteristic of model which is: 1) trust in subsystem of policy as a unity of analysis; 2) basic model of individual, possible of complex structural goal and ability in limited data process; 3) focusing on policy learning; 4) collaborative concept of sum of members at multiple levels of governments; 5) concept that is also system belief and set of policy goal; and 6) collaboration that action of government and other institutions for change behavior and problem situation of collective belief.

In summary, the researcher used the following conceptual frameworks:

1. Dunn's concept concerning policy process for the explanation of policy formation by considering the definition of problem, the formation of policy and the policy actors which reflect policy topics and stakeholders as well as the problem's level of severity by analyzing documents from the government regarding the management of floods, announcements and other related orders.

2. Wright's concept concerning the relationship between nations, states and localities for the explanation of policy actors, relationship and information and resource exchange between agencies, i.e., government agencies, private agencies and people.

3. Macdonald's concept concerning social network and Sabatier's main values to connect to mutual perception and coordinative activities between policy actors and to support collaborative approaches.

2.5 Situations of Floods in Thailand

Geographically, Thailand is divided into 6 parts:

Northern part consists of high mountains and plateaus. Some important mountains include Dan Lao Mountain, Luang Prabang Mountain, Thongchai Mountain, Petchaboon Mountain, Khun Tal Mountain, Phee Pan Nam Mountain. This part is the origin of many rivers such as Ping River, Wang River, Yom River, Nan River. These 4 rivers meet at Pak Nam Pho, Nakhon Sawan Province, and it is the origin of Chao Phraya River, which is the most important river of the country.

Northeastern part covers 170,000 square kilometers (one-third of the whole country). On the western border of this part, there are two ranges of mountains: Petchaboon Mountain and Dong Paya Yen Mountain. The area where these two mountains are connected is the origin of many hills (or Phoo in Northeastern dialect) such as Phoo Kradueng, Phoo Luang, Phoo Kiaw, Phoo Rua. On the southern border, there are ranges of San Kampang and Panom Dongrak Mountain which is the origin of many rivers such as Moon River, Chee River, Lam Takong River, Lam Dome Noi River, Lam Dome Yai River. The central area of Northeastern part is like

an island, with some plateaus. The soil in this part is sandy and cannot hold water. This causes drought in dry season.

Central part: Most areas in this part are lowlands with rich soil. Thus, there are many rice fields and agricultural areas. It is considered as main source of agricultural products. This part also has the highest density of population.

Eastern part: Most areas of the eastern part are connected to the sea, with mountains and small hills. There is a small river running from Banthad and Janthaburi Ranges to the Gulf of Thailand.

Western part: Most areas of the western part are ranges and plains along the valleys. The mountains in this area are not so high compared with other parts. Tanao Sri and Thongchai Ranges are main mountains. Western has a large plain along Mae Klong River which runs to the Gulf of Thailand in Samut Songkram Province.

Southern part: Both sides of the Southern part are next to the sea, with the Gulf of Thailand in the East and Andaman Sea in the West. There are mountain ranges (Tanao Sri, Nakhon Sri Thammarat, San Kala Kiri and Phuket Ranges) that go all the way to the border of Thailand and Malaysia. These ranges divide the southern part of Thailand into two parts: eastern and western parts. There are some small rivers such as Pranburi River, Krabi River, Lang Suan River, Trang River and Ko-lok River (Chaiprajong, 2005: 16-17).

2.5.1 Definition of Flood Disaster

Flood disaster means all kinds of disaster arising from floods caused by the higher level of the sea, ocean or rivers. The strong tide of the floods can cause a lot of damages and loss of lives. Every year, there are floods in different parts of the world i.e. India, Pakistan and the Philippines (Setsuban, 1998: 89). Floods are caused by cyclone, monsoon, thunderstorm, higher sea level, earthquake and volcano eruption.

Flood means the unusually high level of water on the land. In case of heavy rain, sometimes the water cannot flow to the river or canals fast enough. Hence the excessive water remains on the land, causing flood in that area. In some cases, the floods are caused by humans. Some water ways such as canals or rivers are blocked intentionally or unintentionally by people, causing damages to the environment

including lives and property of others (National Committee on the Disaster Prevention and Mitigation, 2009: 112)

In this context, flood means the unusually high level of water on the land caused by heavy rain, giving excessive water to the rivers or canals. Then the water level is getting higher and the water flows back to the land.

2.5.2 Types of Floods

Lamlert (2003: 8-9) divided floods based on their causes as follows:

1. Sudden flood: caused by long heavy rain on the mountains or high lands. Then heavy water flows to the lower land. The water flow is so strong that it cannot be released to the nearby canals or rivers in a short period of time. This kind of flood can cause a lot of damages to lives and property.
2. Flood from the river banks: When the water level in the rivers or canals is higher than the banks, the water flows to the areas along the coast.
3. Flood caused by heavy rain: When there is a long heavy rain, the water cannot flow the rivers or canals quickly enough, causing flood on that area.
4. Flood caused by tides: When the tide is high, sea water flows to the rivers, causing floods along the coastal areas.
5. Flood caused by sea storms: A tropical cyclone can causes huge waves, leading to a sudden flood and damages to the communities along the coast.
6. Flood caused by underwater waves: Earthquake or volcano eruption can cause huge waves under the sea which can cause a lot of damages when they hit the banks.

The National Committee on Disaster Prevention and Mitigation (2009: 112) divided floods based on the conditions as follows:

1. Flood from excessive water/overflow to the banks: This kind of flood is mostly caused by poor drainage system management. When there is heavy rain for several days, the excessive water causes floods in that area. However, this kind of flood is not sudden. It takes some days, and it usually affects the communities in lowlands near the end of the rivers.

2. Sudden flood: This kind of flood is caused by heavy rain on the steep highland that cannot hold water, causing sudden floods to the lower areas. Other causes include broken dams or reservoirs. Sudden flood usually occurs at the valleys between two steep mountains. Even though there is no rain in that area, it can be attacked by the sudden flood caused by heavy rain on the mountain. Since the water flows very fast, it is almost impossible to prevent or to evacuate.

2.5.3 Stages of Floods

There are 3 stages of floods as follows:

1. Stage of Crisis: This is the first stage when excessive water or heavy water flow strikes that area. At this stage, it is unpredictable how serious the floods can be. Thus, it is necessary to watch the situation closely.
2. Stage of Stability: The water level becomes stable. However, if there are other factors such as heavy rain, it may return to stage 1.
3. Stage of Recovery: At this stage, the water level gets lower. It is also called "after crisis stage" as it has gone through the crisis.

Lamlert (2003: 10) explained relationship of the level of floods and chances of having floods by studying previous records of the Return Period (an estimated time that an event, such as an earthquake or flood, will reoccur). Flood can be categorized by its severity as follows:

1. Not Severe: There is a little excessive water, causing water level to be a little higher than usual.
2. A Little Severe: The water is higher than regular level. The excessive water is approximately 1.25 to 1.5 times of regular water. The Return Period is 2-5 years.
3. Medium Severe: The water is higher than regular level. The excessive water is approximately 1.5 to 2 times of regular water. The Return Period is 5-25 years.
4. Highly Severe: The water is higher than regular level. The excessive water is more than to 2 times of regular water. The Return Period is more than 25 years.

For the level of flood risk correlated with activity. The loss of life and property of the people living in areas susceptible to flooding is set to 4 levels.

1. The level of flood risk defined as the flooding that does not cause loss of life and property.

2. Flood less risk defined as the flooding that caused a nuisance, inconvenience to commuters and less loss of property.

3. The moderate flood risk set to flood the loss of property and buildings more. However, no loss of life.

4. Severe flooding risk set to flood the loss of property and buildings more than a moderate risk of flooding and loss of life.

The previous floods that occurred in Thailand can be summarized as follows figure 2.15 (Apipratyasakul, 2011: 19-20):

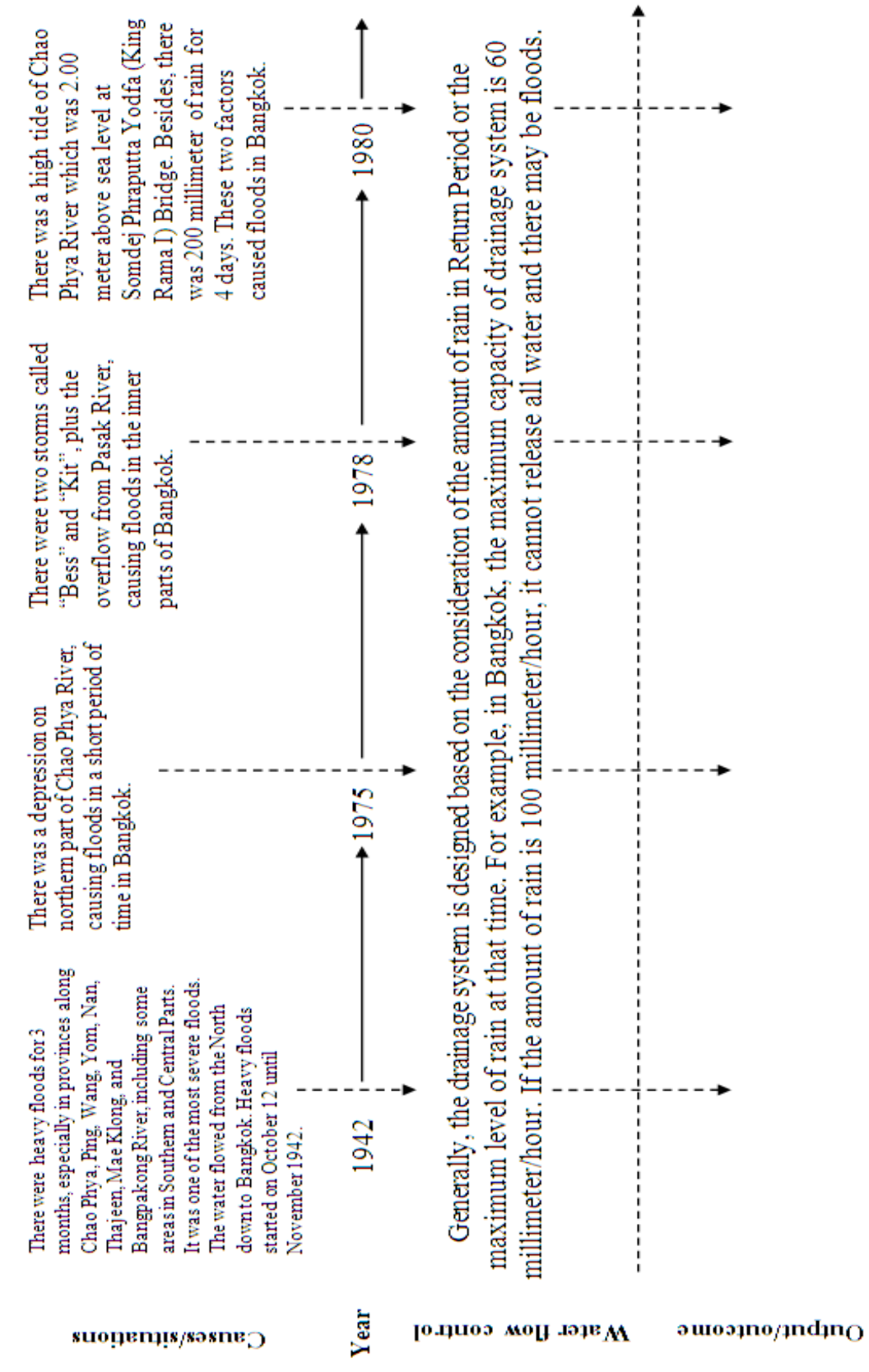

Figure 2.15 Summary of flood situations in Thailand

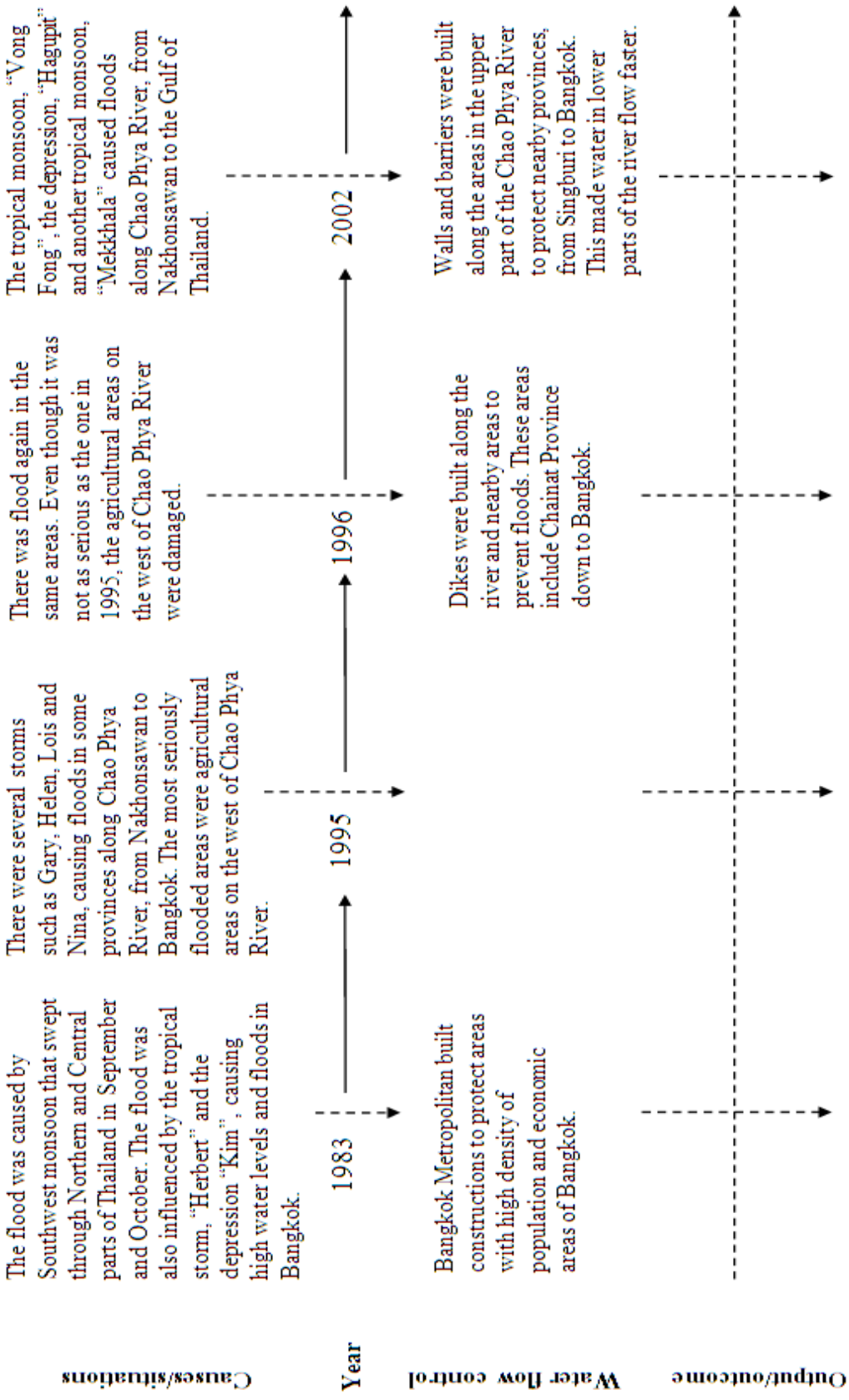

Figure 2.15 Summary of flood situations in Thailand (cont.)

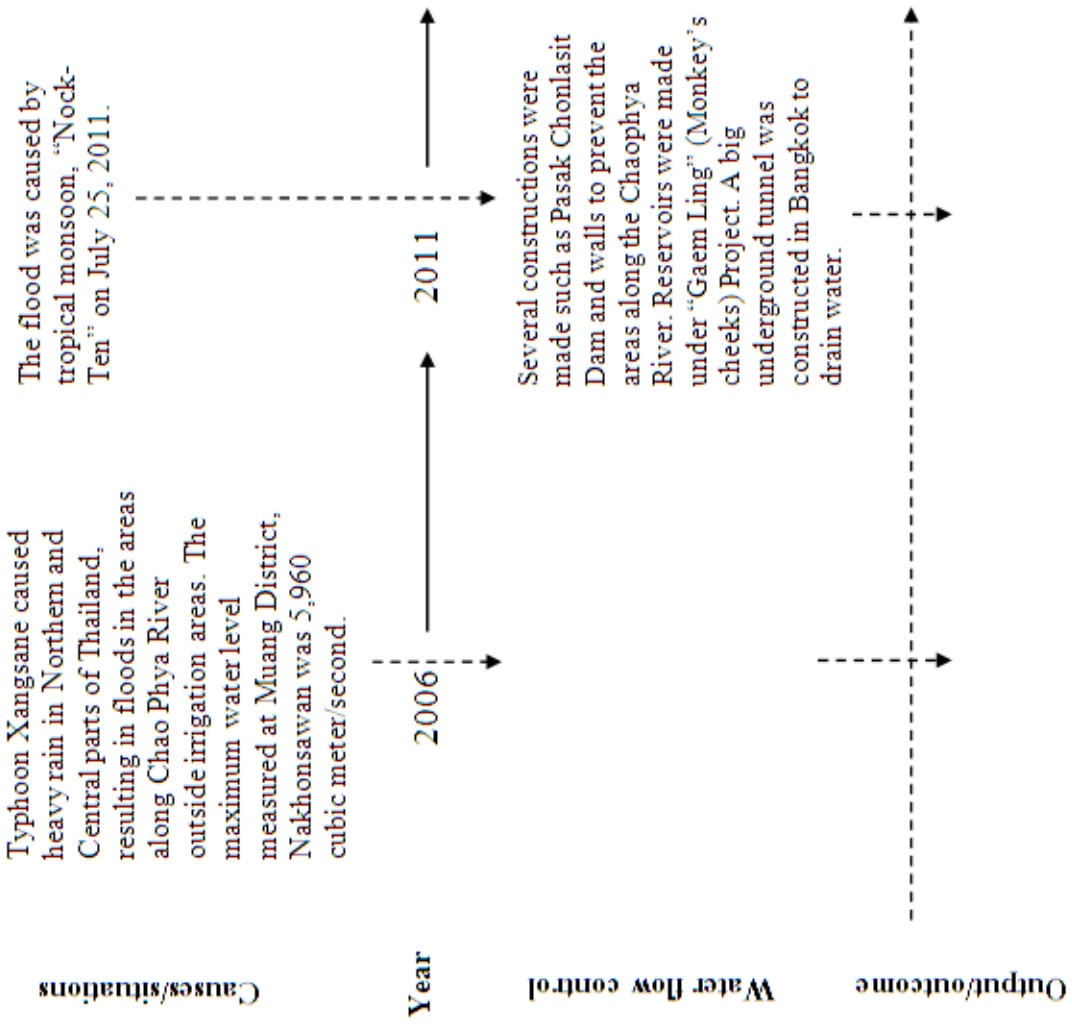

Figure 2.15 Summary of flood situations in Thailand (cont.)

2.5.4 Process of Flood Management

Thammasang (2010: 15-17) explained the process of flood management as follows:

The Stage before Flood

1. Check, analyze, revise and update data concerning the areas at risk and make it available at the national and local level. Data revision at the local level should be made with cooperation of the organizations, communities and stakeholders so that the revised data are accurate, precise and sufficient to prevent and prepare for the floods in the areas.

2. Provide information to the communities and prepare places for evacuation. This information can be derived from the communities at risk and from relevant organizations.

3. Have action plans to prevent and manage floods. The plans should be in accordance with the National and Provincial Plan on Disaster Prevention and Mitigation as well as the Master Plan on Disaster Prevention and Support to Those Affected by Floods and Mudslides (5-year Plan). The implementation of these plans should be in accordance with the environment and context of the communities, with cooperation of all stakeholders from the government and private sectors and the community.

4. Local and provincial administrative offices and Local Center of Disaster Prevention and Mitigation are assigned to survey, monitor and prepare data, prepare/provide equipments, materials, communication devices and telecommunication network (both main network and spare network), tools and vehicles to be prepared for the disaster.

5. Provincial and Local administrative offices prepare rescue teams for disaster prevention and mitigation. In emergency, each person has clear duty/mission. These rescue teams include Surveillance and Rapid Response Team: SRRT, Emergency Response Team: ERT, One Tambon One Search and Rescues: OTOS. Name list and contact information of team members must be available all the time.

6. Make local action plans for disaster prevention and mitigation in the areas at risk which are in accordance with the provincial plans. There

should be Evacuation drills so that people in the affected areas can be rescued and evacuated to safe zones.

7. Provide warning system and other preparations for disaster prevention and mitigation as follows:

7.1 Provide information and warning: The organizations in charge i.e. Thai Meteorological Department, Department of Mineral Resources, Hydrology Department and National Disaster Warning Center should closely follow and regularly report the weather, rain, sea level, river level, dams, reservoirs and give information including warning to the public based on the estimation of the disaster, geographical and other characteristics of the affected areas.

7.2 Equip warning system: The warning system and rain gauge should be equipped in all areas at risk. Local people should form a team that work as volunteers of the disaster prevention and mitigation. These volunteers are assigned specific duties such as giving disaster warning to the community, recording all information of the areas at risk, etc.

7.3 Inform the public or the community about the disaster: The provincial administration, district, sub-district and local administration offices should have plans of how to give information and how to communicate with the public in case of disaster. The information needed to be provided to the public include:

7.3.1 Provide knowledge and proper understanding on the disaster and its damages, including the observation and guidelines about how to be prepared and to protect themselves.

7.3.2 The government offices in charge have to inform the public, especially those in the areas at risk, about the disaster prevention and reduction.

7.3.3 Promote measures, guidelines and projects of disaster preparedness and disaster risk reduction in the areas near the rivers or sea.

8. Train staff and volunteers so that they have knowledge and skills in disaster prevention and reduction and are always prepared to support when the disaster occurs.

9. The government offices in charge, with cooperation from private sectors, must have regular drills for staff, volunteers and people in the areas at risk. The budget for the drills can be derived from the local administrative offices or other organizations when necessary.

10. Set up centers to prevent and reduce disaster from floods at the provincial, district and local levels to be coordinating centers for disaster prevention and reduction.

11. Local administrative offices should set up budget to be preserved for emergency and disaster reduction. The budget set up and allocation will be in accordance with the regulations of the provincial, municipal and district offices concerning budget set up and allocation for people in the community B.E. 2543.

Steps of Work during Disaster

1. When the disaster occurs, the government offices in charge announce the affected areas as the disaster areas and follow the action plans and specific plans on disaster mitigation of the province, district or local administrative office. According to the Regulations of the Ministry of Finance B.E. 2546, when the disaster occurs in a province, the governor has authority to announce the affected areas in the province as the disaster areas and to rescue people in those areas. In case the disaster occurs in Bangkok, the Director General of the Department of Disaster Prevention and Mitigation has authority to announce the affected areas as disaster areas. This is in accordance with regulations of the Ministry of Interior. The Department of Disaster Prevention and Mitigation, with consent of the Ministry of Finance.

The Provincial Office of Disaster Prevention and Mitigation and the District Center of Disaster Prevention and Mitigation are main offices under the Department of Disaster Prevention and Mitigation which are in charge of disaster mitigation with cooperation of all relevant offices and organizations so that there is a unity of work even in such a big disaster. When the disaster occurs in a province, the Governor of that province has authority as the Director of the Provincial Office of Disaster Prevention and Mitigation, to support people affected by the disaster and to provide rehabilitation to the affected communities.

In case the disaster covers areas of more than one districts or provinces, the initial information from mass media such as radios and TVs usually reaches the Department of Disaster Prevention and Mitigation before the official reports. The District Center of Disaster Prevention and Mitigation has a duty to check the information and report it to those with higher authority so that they can give orders to the officials of the centers of disaster prevention and mitigation at the 3 levels (provincial, district, local level) to rescue and support people who are affected by the disaster and to announce the emergency situation according to the regulations of the Department of Disaster Prevention and Mitigation concerning the guidelines and conditions of the announcement of the disaster in case of an emergency for small disaster (announced on January 30, 2004 and April 26, 2005).

2. The center of disaster preparedness and reduction was changed to be the Emergency Operation Center at the national, provincial, district and local levels with the mission of flood prevention and mitigation as well as to support those who are affected by floods and to rehabilitate public places, to work as a coordinating center to support work of the authorities in the affected areas. When there is a disaster, most people expect support from the government. Therefore, the government bodies in charge of this matter need to take action, with cooperation of other relevant offices, to rescue and support them. The rescue includes the provision of machines, equipments and vehicles to rescue people no matter if they are dead or alive. Other kinds of support include restoration, rehabilitation, compensation and financial support.

The government, especially the Department of Disaster Prevention and Mitigation needs to fully utilize whatever resources available for them i.e. administrative structure, manpower, equipments, machines. Whenever there is a disaster, no matter small or big, the Department of Disaster Prevention and Mitigation and the Provincial Office of Disaster Prevention and Mitigation need to take quick action in disaster management, restoration and rehabilitation using all available resources. The Emergency Operation Center shall be set up at the province, district and local offices according to Article 16 of the Disaster Prevention and Mitigation Act B.E. 2550. The budget shall also be allocated in accordance with Rule of the Ministry of Finance on the Advance Payment for Financial Assistance to Persons Sustaining

Damages from Disaster B.E. 2546 and the Revisions as well as Announcement of the Areas Affected by the Disaster in accordance with Rule of the Ministry of Finance No. 16 and 18.

Steps after Disaster (Restoration and Rehabilitation)

Once the disaster becomes not destructive anymore, the following steps shall be done:

1. Provide medical care to those who have been injured. If the injuries are too serious, the patients need to be sent to a bigger hospital.

2. The person in charge of each administrative area (at the provincial, district and local level) shall make a list of damages to life and properties in the area, and issue official documents for those who are qualified to get support from the government.

3. After the disaster, the provincial administrative body needs to inform the local highway authority about the damaged roads so that they can be repaired or reconstructed as soon as possible. If the roads are seriously damaged, the local administrative authority can ask for support from the Armed Forces Development Command in the area or nearby and from the Regional Center of Disaster Prevention and Mitigation. These authorities shall support the affected areas in various ways such as restoration of public facilities and utility systems including clean up the areas.

4. Cooperate with charity organizations such as Rajaprajanugroh Foundation, Princess Pa Foundation, Thai Red Cross and other charity organizations and volunteers in the area to support those who are affected by the disaster based on the emergencies and needs.

5. Ask for support from the police and civil defense volunteers to protect people who are affected by the disaster and their properties.

6. Provide support to people who are affected by the disaster in accordance with Rule of the Ministry of Finance on the Advance Payment for Financial Assistance to Persons Sustaining Damages from Disaster B.E. 2546 and the Revisions on Guidelines on Providing Support to People Affected by the Disaster B.E. 2551. The support given to those affected by the disaster include the following areas: 1) support directly given to those affected by the disaster; 2) social welfare and

rehabilitation; 3) medical care and public health services; 4) crops; 5) fishery; 6) livestock; 7) agriculture; 8) disaster prevention and mitigation; and 9) disaster operation to support people affected by the disaster.

Jitjaras and Ketsingnoi (2012: 39-43) suggested the following strategies on water management:

1. Dam and water management plan: Make action plans on the management of main dams on Chao Phraya River such as Bhumibol, Sirikit, Pasak Chonlasittha, Kwai Noi with cooperation of relevant authorities for various kinds of support such as information about water level, water quantity and water release from the dams.

2. Organizational restructuring plan: There shall be a national committee on the policies of water and flood management. An emergency plan should be made in order to prepare and respond to the floods to reduce the damages and to shorten time of rehabilitation. The authority in charge needs to regularly check the water conditions and to assess the floods before and during flood season so that the water in big and medium sized reservoirs can be controlled especially in flood season.

3. Restoration and maintenance plan: Repair and maintain good conditions of dikes and water gates. Build up more water gates in the areas where water flows to the sea. To maintain good conditions of these structures, the areas at risk are divided into different zones based on the following criteria:

3.1 City and land usage planning: This will control the density of population so that there are spaces to store water, to slow down the flows and to be floodways. The Plan shall also control the constructions to make sure the water flows are not blocked by buildings, streets, factories, villages and houses to make sure that the water can flow to the sea as quickly as possible. Moreover, there should be canals parallel to the streets that are in the flooded areas.

3.2 Building control: Buildings in flooded areas should be reconstructed to be able to stand the floods and to avoid or reduce damages caused by floods.

3.3 Control the constructions of buildings that may block water flows, and support non-life insurance.

4. Database and warning system development plan: Database should be developed and improved. Concerning the warning system, there should be a River Network Model for accurate weather forecast and warning system in order to prevent disaster caused by solar storms such as earthquake and floods. If there is an accurate warning system, the information about the disaster can reach the public promptly through mass media and other channels such as radios, televisions, websites and mobile phones.

5. Emergency plan for each area: Each province should have its own water management structure as the provinces in Thailand have different geographic characteristics. Moreover, each province must have its own plan to respond to the emergency promptly before getting support from central government.

6. Floodway plan and restoration plan: Floodways can be used for avoiding floods in the communities that are located in the areas at risk. Using floodways is one of the strategies of water management. In order to build floodways, there should be cooperation of experts on city planning and hydrological mapping, as well as civil and irrigation engineering. These experts shall work together to find the best practice of water management. Some other ways to prevent floods include: clean drainage pipes, canals, quaternary canals and open floodways; equip water pump in flooded areas; control the operation of the water gates, ridges and pump stations; build temporary ridges; set up mobile rapid response units which are 24 hours available.

7. To study the causes of floods i.e. forest depletion, water misuse (water stock, deviation of floodways).

Maiklad (2012) gave suggestions about flood management as follows:

1. Prevent floods by constructions: Structural constructions should be built, with minimum expenses, to prevent floods in the areas at risk. Such constructions should be in accordance with the geographical characteristics and other conditions of the communities/areas and shall not affect the environment (or affect the environment as little as possible). In an area/community, one or more constructions can be built as follows:

1.1 Construction of dikes: Dikes can be built to prevent floods. They are usually built not so fare from the banks of the rivers to

prevent tides from attacking nearby communities. They should be higher than the highest flood level in the record.

1.2 Constructions of floodways: New canals can be built and connected with other canals to release excess water from those canals and let it flow to nearby rivers, canals or sea.

1.3 Improve waterways so that the water can flow more rapidly to avoid floods in rainy season or flood season. If the waterway has a sharp curve, another waterway should be built to let the water flow in a straight line. This new waterway shall let water flow more rapidly. As a result, less water shall flow through the original waterway and it will naturally become small or dry.

1.4 Build irrigation dams to restore water in flood season and release it in dry season for irrigation crops and other purposes. However, nowadays there are few areas that can be used for dam constructions.

1.5 Release water from lower basins: Some lower basins or areas are at risk of floods as the water runs from higher areas to the lower parts and stay there. The water in these areas needs to be released to bigger waterways or to the sea through drainage canals. This can be done by digging new canals or clearing the existing canals so that the water can flow quickly.

1.6 Protect forests so that they can hold water. In this way, it can slow down water speed that runs from the mountain to lower areas.

2. Prevent floods by not having constructions: Human beings should learn to live with nature by adjusting themselves to nature so that they can be safe. No need to be against nature. For example, we can learn how to adjust ourselves to live in accordance with the conditions of the natural floods. In order to do that, several strategies are recommended as follows:

2.1 Draw a map of the areas that are usually flooded with lots of details such as geographical characteristics of the areas at risk, severity of damages measured with accurate instruments. Such information shall be used for water management.

2.2 Based on the map mentioned in 2.1, the geographical characteristics of the areas at risk shall be analyzed how to utilize the areas by having proper city plans and risk management plans.

2.3 After the analysis, if it is found that no constructions can prevent such areas from floods (such as some parts of Tung Kula Rong Hai, some areas along the banks of Yom River in Sukhothai, Phitsanulok and Pijit, some areas along Chao Phraya River and Pasak River in Petchaboon, Moon and Chi River, etc.), people in these areas should learn how to adjust themselves to the floods. There are several suggestions as follows:

2.3.1 Utilize the water: People living in the flooded areas can make use of the water by storing it in the ponds so that they can have water in dry season. Moreover, they can raise fish or grow crops that can survive floods.

2.3.2 Avoid building houses in waterways. If cannot avoid, make sure the houses are higher than flood levels.

2.3.3 In the agricultural areas that are flooded every year, the farmers need to adjust time to grow rice or other crops according to the flood season. For example, for farmers whose fields are in the irrigation areas, they can start growing rice after the flood. This will allow them to grow rice twice a year (in ten months) and the floods shall not damage their rice fields at all.

2.3.4 Build dikes which are higher than flood level. Water can be kept between dikes to be used in dry season. By this way, farmers can grow fish and some crops in the water between the dikes and can grow rice or fruits on the dikes. Besides, water between the dikes can be used for their rice or fruits in dry season.

2.4 For the villages or communities located on the foot of the mountains or hills that are at risk of flash floods, they should be moved to a nearby chateau or higher areas to avoid damages to their lives and properties. This strategy is called an “Escape from the Disaster”. The main concept is to accept the nature, not against it.

2.5 Set up an efficient weather forecast and warning system and develop technology for accurate weather forecast.

Ayuphong (2012) gave recommendations on how to prevent damages from floods. His recommendations included both constructional and non-constructional strategies. According his study, there are two main factors to avoid or reduce damages from floods. First, to accept floods as part of nature. Second, to respond to it in an

appropriate way, with cooperation of government and private sectors in flood management as summarized in Table 2.20.

Table 2.20 Strong points and weak points of each strategy

Strategy	Strong Points	Weak Points
Constructional Strategy 1. To build dams and dikes	- can prevent floods in certain areas - not so costly - can be designed in accordance with severity of floods - can develop and make use of the land on the dam and can also make use of the water in the basin	- need to pay compensation to people who live in the area of construction - Water way is deviated, which makes water level become higher. - costly maintenance - If water level becomes higher than the dam or dike, there will be floods that can cause lots of damages. - It may be unsafe for people living near the dam. - It affects environment.
2. To improve water ways/drainage canals outside the community	- Increase the capacity of main water ways. - Can prevent floods in certain areas. - Doesn't take up much space. - Damages that may arise from the construction can be managed more easily than the case of big constructions.	- It is costly to prepare the areas of construction. - In the long run, the banks of the canals may be damaged by water. - If the main structure of the construction needs impairment, it can be costly. - It may cause problems to the nearby areas.
3. To build check dams and water storage	- We can use natural water storages to keep water. - Water flow can be less strong. -In dry season, farmers can use the stored water. - It is cheap and easy to build.	- When there is a flood, these areas may be seriously damaged. - The use of the land for habitats in the community needs to be controlled. - When there are more residues, the capacity of water storage becomes lower.

Table 2.20 Strong points and weak points of each strategy (cont.)

Strategy	Strong Points	Weak Points
4. To build reservoirs	- Water flow can be decreased. - can prevent floods in certain areas	- need to pay compensation to people who live in the area of construction, using public fund - The construction is costly. - In order to build reservoirs, some habitat areas may be taken from the owners. - It may be unsafe for people living along the areas of waterways. - It may cause problems to the environment such as polluted water and residues.
Non-Constructional Strategy 1. Land management/city plan/construction control/community expansion control	- Can reduce damages including loss of lives and properties - Manage the land in accordance with the floods - Can make sure that the buildings that will be constructed in the community shall not cause or worsen the floods. - Can protect environment	- The land in the areas under control cannot be developed. - need to pay compensation to the land owners - People living in the areas under control may feel that they are restricted.
2. To expropriate land and demolish buildings in the areas of waterways	- Without buildings that block waterway, the water can flow more easily. Thus, the water level will be lower. - There will be no buildings at risk of damages from floods. - Can save money that needs to be spent for rehabilitation after floods as the number of affected people decrease.	- People living in the areas may not want to give up their land or properties. - In case of large areas, the cost of expropriation may be too high. - To make people move from the construction areas, it needs consensus and mutual agreement.

Table 2.20 Strong points and weak points of each strategy (cont.)

Strategy	Strong Points	Weak Points
3. To use certain areas as water storage	- Can avoid problem about residues collapsed banks - Can make water flow less strong by keeping rainwater	- Does not work well in case of big floods - The use of the land in such areas needs to be thoroughly analyzed.
4. To store and control water quantity in the area	- Can keep water in the areas we need - Can slow down water flow - Low construction cost	- Limit the opportunity to expand the community or to develop the land in the controlled areas - Can be used in the areas that have small sized water storage only - In case of land expropriation, have to pay compensation to the land owners
5. Forecast and warning of floods	- Can reduce damages and loss of lives - People are aware of and prepared for disaster. - The forecast and warning of floods are fast and easy. - This strategy can be used with any other strategy.	- It takes time to raise public awareness and to get response from the public. - The system can be used well in small sized communities only. - If the forecast or warning system is not accurate enough, people may not pay attention. - This strategy needs to be used together with other strategies for more efficiency.
6. To educate and to inform the public	- Can raise public awareness. As a result, people are more prepared for the floods. - Get more cooperation from the public in preparedness and response to the floods	- Give more workload to the authorities - May not work well if there is resistance from the public or community

Table 2.20 Strong points and weak points of each strategy (cont.)

Strategy	Strong Points	Weak Points
7. To prevent damages to buildings and other constructions	- Can reduce works after floods such as cleaning up - Very helpful in the areas where there are businesses and factories	- Can be used in some particular building structures only - Can cause lots of damages if the floods are too severe - Business or factory owners have to pay
8. To evacuate people from the areas at risk	- Can reduce loss of lives - Easy to operate	- An efficient warning system is needed. - Need good plans on the evacuation routes and centers - People need to be aware of the risks and be well prepared for the evacuation.
9. Set up plans to handle the floods	- Can reduce risks and damages such as injuries, damages to land and properties - Rescue and support those who are affected by floods - As people are safe from floods, the government can save money that needs to be spent for rehabilitation. - It offers alternatives to people living in flooded areas.	- An efficient warning system is needed. - Need to set up action plans and trainings for relevant persons - High operation costs - Private insurance companies are not willing to take this kind of cases - In case of public insurance, it needs to get money from public funds. - The support and operation has to be done continuously.
10. To set up mitigation plans	- Can decrease financial burden to those who are affected by the floods - Can reduce problems arising from floods	- Need to get money from public funds - Long term support may be needed.

Table 2.20 Strong points and weak points of each strategy (cont.)

Strategy	Strong Points	Weak Points
11. To provide flood insurance	- Can support people who are affected by floods - Can save the money that the government needs to pay for those who are affected by floods - Can be an alternative for those who live in flooded areas	- Private insurance companies are not willing to take this kind of cases - In case of public insurance, it needs to get money from public funds. - The support and operation has to be done continuously.
12. To adjust to the floods	- Can reduce damages that may be caused by floods - Land owners pay for all expenses arising from the adjustment by themselves.	- This strategy can be used in the non-flooded areas only. - This strategy does not work in case of big floods.

Source: Ayuphong, 2012.

In conclusion, to handle with the floods, there are 2 main categories of the strategies: structural and non-structural strategies. In order to choose appropriate strategies, we need to consider the context and geographical characteristics of the areas.

2.6 Related Policies and Laws

2.6.1 Constitution of the Kingdom of Thailand B.E. 2550 (1997)

The content on disaster is stated in the following sections of the Constitution of the Kingdom of Thailand B.E. 2550:

Section 281: Subject to section 1, the State shall give autonomy to local government organisations in accordance with the principle of self-government based upon the will of the people in the locality and promote the role of a local government organisation as a principal provider of public services and encourage it to participate in the decision-making for solving problems in the locality. Any

locality which meets the conditions of self government shall have the right to be formed as a local government organisation, as provided by law.

Section 67: The right of a person to give to the State and communities participation in the conservation, preservation and exploitation of natural resources and biological diversities and in the protection, promotion and preservation of the quality of the environment for regular and continued livelihood in the environment which is not hazardous to his or her health and sanitary condition, welfare or quality of life, shall be protected as appropriate.

Any project or activity which may seriously affect the community with respect to the quality of the environment, natural resources and health shall not be permitted, unless, prior to the operation hereof, its impacts on the quality of the environment and on public health have been studied and assessed and a public hearing process has been conducted for consulting the public as well as interested persons and there have been obtained opinions of an independent organization, consisting of representatives from private organizations in the field of the environment and health and from higher education institutions providing studies in the field of the environment, natural resources or health.

The right of a community to bring a lawsuit against a Government agency, a state agency, a state enterprise, a local government organization or other state authority which is a juristic person for the performance of duties under this provision shall be protected.

Section 73: Every person shall have a duty to serve in armed forces, render assistance in the prevention and alleviation of public hazards, pay taxes and duties, render assistance to the official service, receive education and training, safeguard, protect and pass on national arts, culture and local knowledge and conserve natural resources and the environment, as provided by law.

The implementation of a project or an activity may cause serious impacts upon the community, both in environmental quality, natural resources and health, which will be prohibited except to study and assess the impact upon the environment and public health in such a community. It provides a mechanism to gather the opinions of the public and stakeholders beforehand, which provides for an independent organisation consisting of representatives of private organisations and those in higher

education. The representatives involve environmental or natural resource management, or health, who provide opinions prior to the implementation of the rights of communities to sue the government, government sector, state enterprises and local government, or other legal entities; so that to perform its duties under this provision shall be protected.

Therefore, the local government is one of the execution units and should be prepared, as the director of the 'Division of Prevention and Mitigation', in that area, for any situation faced by the organisation responsible for the Prevention and Mitigation of local government. In this case, it is in the form of organisations, including the Division of Prevention and Mitigation Tambon Administration Organization, or as a division of the Prevention and Mitigation Division; otherwise referred to as the 'Prevention and Mitigation Division Director' and the 'Provincial Administration'. Each organisation will have an executive director, and a permanent secretary of the local government as an assistant. Cooperation between local authorities and divisions of 'Prevention and Mitigation' departments must focus upon the participation of a civil society, or a local community (Kamolvej, 2011).

2.6.2 The National Economic and Social Development Plan

During the 8th National Economic and Social Development Plan, the priority of disaster management shifted from rescue to prevention and mitigation. Main purpose of disaster management was to prevent disaster and to reduce damages arising from the disaster that may affect the economics and quality of life of people in the country. Main purpose was to prevent disaster caused by technology and road accidents. In the 8th National Economic and Social Development Plan, priorities were given to the prevention and mitigation of the following disaster: natural disaster (floods, windstorm, drought, earthquake), industrial disaster (disaster or accidents from industries such as explosion, fire, chemical leak), transportation disaster (transport of chemical and dangerous substances, traffic accidents, oil leak into the sea). Based on the 8th National Economic and Social Development Plan, disaster management followed the following steps: 1) effectively work with current structures and mechanisms. Make changes only when necessary and make sure the changes are for better management and will not cause confusion in management; 2) encourage

more participation from private sectors and civil society. Raise public awareness on disaster preparedness and educate communities at all levels; and 3) create data system on disaster management and support education on techniques (Tingsanchali, et al., 2003: 5-8, 5-9). The 9th National Economic and Social Development Plan focused on participation of local communities. Main objective of this Plan was to raise public awareness on environmental preservation, to increase participation of people in disaster administration and management, to have database on disaster management at local levels for efficient monitoring and follow up. The objectives of this Plan are in accordance with those of the 10th and 11th National Economic and Social Development Plan.

Phakdeetham (2011: 31-33) concluded that the participation of people in law and the 'National Economic and Social Development Plan No. 10' guidelines, was developed to maintain an ecological balance of resources and to raise awareness. The resource base is the common property of society. Everyone has the benefit to participate in shared responsibilities in doing so. The cognitive capacity to build awareness is an important tool for decision-making; in order to maintain a balance between conservation and exploitation concerning the short-term and long-term benefits, and between the stakeholder groups. It is also necessary to create a social network which is a partnership between the public sector, private sector, local communities, NGOs and academics, in order to achieve the power to drive it. Moreover, such a relationship is a relationship which includes the exchange of knowledge and resources between the government, private non-profit organisations, and other agencies; thus, increasing the performance of the community under the same purpose (Varda, 2011: 897) as shown in Table 2.21.

Table 2.21 Summary of the National Economic and Social Development Plan

National Economic And Social Development Plan	Contents	Details
1st National Economic and Social Development Plan (B.E. 2504-2509) (1961-1966)	In the first three years (B.E. 2504-2506) of the 1st National Economic and Social Development Plan, the policy and objectives of financial and economic and social development plan was clearly defined. However, the next three years (B.E. 2507-2509), only initial plans were made. Projects and budget for social and economic development were roughly determined. At that time, there was lack of accurate information and data. Therefore, the project implementation was incomplete. It was difficult to identify the budget allocated to each project. Even though there were some weak points of this plan, it was a good beginning of social and economic development in Thailand. These weak points were lesson learned for the improvement of the 2nd Plan.	Not mentioned in National Economic and Social Development Plan
2nd National Economic and Social Development Plan (B.E. 2510-2514) (1967-1971)	At the early state of the 2nd Plan, Thai economic rapidly expanded due to higher agricultural and industrial production. Foreign investment and the expenses of USA in Thailand were also higher. However, at the end of the Plan, Thai economic expansion was slower and there was economic constraint for the first time in more than 10 years. There were 3 main reasons of economic fluctuation: 1) The global market needs changed, resulting in lower export of Thai agricultural products especially rice and rubber. 2) The expenses of the US military in Thailand had changed. 3) Foreign investment was lower compared with the previous years.	Not mentioned in National Economic and Social Development Plan

Table 2.21 Summary of the National Economic and Social Development Plan (cont.)

National Economic And Social Development Plan	Contents	Details
3rd National Economic and Social Development Plan (B.E. 2515-2519) (1972-1976)	The 3th National Economic and Social Development Plan began in the difficult period of time as Thailand experienced economic, social and political problems caused by internal and external factors. External factors included the changes in world economic structure, social concepts and political situations. These problems resulted in lower demand of agricultural products of Thailand such as rice and rubber. In addition, the prices of these products were getting lower at the global market. There were also problems due to the changes of financial policies of big countries resulting in instability of their currencies such as US dollars, Japanese yen and mark Germany. In term of social problems, there was a big change among the youth in Thailand regarding their social and political beliefs, resulting in generation gap. At that time, there was a lot of social and economic changes in Thailand and at the global level. There were also political crisis in the world from time to time especially in our neighboring countries. Due to these situations, most policies of this Plan emphasized on how to solve the problems that the country was facing and how to pave a way for the next Plan.	Not mentioned in National Economic and Social Development Plan

Table 2.21 Summary of the National Economic and Social Development Plan (cont.)

National Economic And Social Development Plan	Contents	Details
4th National Economic and Social Development Plan (B.E. 2520-2524) (1977-1981)	The 4th Plan was aimed to keep economic stability of the country and to control the cost of living which may cause inflation. At the same time, the country had to control foreign exchange reserves to make it stable enough to support the economic and investment in order to reduce economic and social gap among people in the country. There should be more income generation among people. Social and economic status of farmers and laborer should be raised. Everybody should have better quality of life. Economic development and social welfare and services should be expanded to the majority of people especially those in rural areas. There was an emphasis on the improvement of the population quality and the employment promotion. Birth rate would be decreased. Quality of life would be improved in a long term. People in urban and rural areas must have jobs according to their capacity. There was a preparation for labor force of younger generation which would come into the labor market. There was natural resource management such as land management, environmental protection, water resource management, etc. The country resources, including manpower, were used for security reason. One of many ways to promote national security was to promote economic and social development in all parts of the country especially in the vulnerable or politically sensitive areas.	Not mentioned in National Economic and Social Development Plan

Table 2.21 Summary of the National Economic and Social Development Plan (cont.)

National Economic And Social Development Plan	Contents	Details
5th National Economic and Social Development Plan (B.E. 2525-2529) (1982-1986)	In order to solve social and economic problems, a new way of development must be determined. The economic system should be improved in accordance with the world situations and the future. Rural development should be promoted. The new trend of economic development should be in accordance with the national security. In other words, the country development should emphasize on "the economic development which promotes unity of the country."	Not mentioned in National Economic and Social Development Plan
6th National Economic and Social Development Plan (B.E. 2535-2539) (1992-1996)	Main objective of the 6th National Economic and Social Development Plan was to solve social and economic problems that had been unsolved before this plan. People should have higher income and better quality of life. The economic should be more developed than that of the 5th Plan. According to this plan, economic development included financial and economic stability of the country. Employment and income distribution should be promoted. Environment and national resources should be protected. Justice should be promoted in society and quality of life should be developed in both urban and rural areas.	Have plans on the promotion of happy society which included security in life and property, social security such as disaster management. The aim was to reduce death rate and injury rate caused by accidents in transportation (land, marine), accidents at home or at public places for disaster prevention and continuous follow up. Promote cooperation among public and private sectors in disaster prevention. (Tingsanchali, et al., 2003: 5-6, 5-7)

Table 2.21 Summary of the National Economic and Social Development Plan (cont.)

National Economic And Social Development Plan	Contents	Details
7th National Economic and Social Development Plan (B.E. 2535-2539) (1992-1996)	The 7th National Economic and Social Development Plan were balanced planning for every development such as keeping the growth of economic in the suitable rate and stabilize to distribute moral through people in the country as human development resource quality, environment thorough preserve natural resource not declined as in objectives of the next 5 years future plan to International country. Most of populations were having a good income and distribute to countryside with good moral, culture to international moreover the private sectors has joined in a part of development then adjusted a part of government sectors would be necessary coordinated development with the private sectors.	To do the important to widely admin and including of regenerate of prevention and preparing plan from nature and accident. Adjusting for suitable in present situation and revive together with development after it happen. (Tingsanchali, et al., 2003: 5-8)
8th National Economic and Social Development Plan (B.E. 2540-2544) (1997-2001)	The 8th National Economic and Social Development Plan were pointed to the next century and in B.E. 2540-2544 with dominated in procedure changing a part of development or the branches of economic and social in holistic, as in relationship of integration system would be sustainable effectiveness more than the last of 8th development plan strategy point were view of the main objectives of economics and social and short term measurement in the same role of officers so that the strategy relation and way of the scope in structure, planning and measurement to continue the activation result including the most useful for people or apart of people's decision joining and supported by government.	Tingsanchali, et al., (2003: 5-5) said that the way of safety in public of the 8th Development Plan, every public accident was many times confusing in emergency situation helping on duty in every level of staffs to government cause not have direct officer to response made that Prime Minister to response and on duty to manage in public safety and trends to separate part of safety but extravagant of resource

Table 2.21 Summary of the National Economic and Social Development Plan (cont.)

National Economic And Social Development Plan	Contents	Details
8th National Economic and Social Development Plan (B.E. 2540-2544) (1997-2001) (cont.)		and un effectiveness work the 8th Development Plan changed the way of public safety to relieve and prevented by the main objective to prevent and reduce the influence ways of nature and quality of life and economic and damage of technological accident and prevention of human being including the purpose of major public danger of the 8th National Development plan was natural disaster (flood, windstorm, drought and earthquake), industrial disaster (industrial accident as explosion, fire, chemical leak) transportation disaster (transport of chemical and dangerous substances, traffic accidents, oil leak into the sea). The ways of disaster management in the 8th National Economic and Social Development Plan as follow: 1) Effective work with current structures were by clearly changing role reduction of confusion management;

Table 2.21 Summary of the National Economic and Social Development Plan (cont.)

National Economic And Social Development Plan	Contents	Details
8th National Economic and Social Development Plan (B.E. 2540-2544) (1997-2001) (cont.)		2) Encourage of participation of private sectors and people joined in public awareness and educated the disaster preparation. 3) Creation the prevent disaster data system and supported in technical subjects. (Tingsanchali, et al., 2003: 5-8, 5-9)
9th National Economic and Social Development Plan (B.E. 2545-2549) (2002-2006)	The 9th National Economic and Social Development Plan was based on the " The Sufficiency Economy" Philosophy to lead the way of development and administer the country together with development procedure of "people are the center of development" purposed to balance developing of people, social, economy and environment to sufficiency and sustainable to Thai people. The result of the 9th Development Plan was successful widely expanded economic at the rate 5.7 % per year to stable economic, reduction of poor people while the better quality of life due to the impact of health promotion to secure more than before and cover the most people in country and reducing drugs problem but un stabled Thai economic and vary from outside factors and still had quality of education problem, poor and overlap the income, life safety and property and transparency of government administrative would be continued efficiency development.	No. (4) The administrative strategic of natural and environment (4.1) The additional administrative effected the natural and environment to revive and conserve and develop the basic economic by adjust of integrated management in joining local people to change Thais' behavior to know and conscious in preservation national environment and increasing of law control to follow and capable investigation.

Table 2.21 Summary of the National Economic and Social Development Plan (cont.)

National Economic And Social Development Plan	Contents	Details
10th National Economic and Social Development Plan (B.E. 2550-2554) (2007-2011)	More changing of complex globalization would necessary have definition of development to enhance the strong structures of the country to competition in current globalization to make more standard and powerful to compare the group of people in the social throughout the countryside and local administration to revive and conserve of natural and environment to be sustained and based of living in Thai society all improvement of good governance every level of administrative of development to secure and sustain with honor and prestige to International community.	No. 5.4 The development strategy based on variety of biological and basic security resource of environment. No. (1) Keep up the base of balancing resource of ecosystem to balance the conservative and knowledge useful for development to survive and revive natural resource and managed by the local rule of limit. To keep and care of natural resources such as soil, water, wide wood, sea resource and the coast, the mineral resource including stop using the important resources cause of higher damaged then created the mechanism to solve by careful methods in other development systems of disaster prevention.
11th National Economic and Social Development Plan (B.E. 2555-2559) (2012-2016)	During the 11th National Economic and Social Development Plan period, the country's development will emphasize building resilience at the family, community, society and national levels under the sustainable development concept as outlined in the Philosophy of Sufficiency Economy.	5.6 Strategy for Managing Natural Resources and Environment toward Sustainability: 5.6.1 Restore, conserve and create security for the

Table 2.21 Summary of the National Economic and Social Development Plan (cont.)

National Economic And Social Development Plan	Contents	Details
11th National Economic and Social Development Plan (B.E. 2555-2559) (2012-2016) (cont.)	This Plan features specific development factors based on human, social, physical, financial, natural resource, environmental and cultural assets. The goal is to utilize these assets to create a society of quality by building the intellectual basis for generating resilience in citizens and the society, to achieve a green economy where knowledge and Thai identity will be used to restructure the economy based on innovation, to connect effectively with the regional and global economies, to foster sustainability in the agricultural sector and prosperity in the food and energy sectors, to sustainably manage natural resources and the environment, to reinforce good governance and harmony in all sectors and at every level. The accomplishment of these objectives will lay the foundations for balance and sustainable development and lead to a just and happy society.	natural resource base and the environment. Restore forest and conservation areas. Develop databases and geographical information systems. Reform the overall system of land ownership and distribution to be more equitable. Accelerate restoration of soil quality to increase agricultural productivity and food security. Establish a management system for marine and coastal resources. Stimulate integrated water management to support sustainable food and energy security and alleviate floods and droughts. Improve resources to increase the supply in potential water storage areas. Promote efficient, cost-effective, and environmentally sound water use. Formulate a systematic water resource infrastructure master plan for domestic consumption. Encourage conservation

Table 2.21 Summary of the National Economic and Social Development Plan (cont.)

National Economic And Social Development Plan	Contents	Details
11th National Economic and Social Development Plan (B.E. 2555-2559) (2012-2016) (cont.)		and share the benefits of biodiversity equitably. 5.6.2 Shift the development paradigm and steer the country toward an environmentally sustainable, low-carbon economy and society. Restructure production sectors toward an environmentally sound low-carbon economy. Increase energy efficiency in the transport sector to reduce greenhouse gas emissions. Develop environmentally friendly cities with emphasis on integrated urban planning having cultural, social and ecological aspects. Modify consumption behavior to facilitate the transition to a low carbon and environmentally stable society. 5.6.3 Enhancement of adaptive capacity to handle climate change. Develop knowledge about the impact of climate change and adaptation to it. Develop management tools to deal with climate change.

Table 2.21 Summary of the National Economic and Social Development Plan (cont.)

National Economic And Social Development Plan	Contents	Details
11th National Economic and Social Development Plan (B.E. 2555-2559) (2012-2016) (cont.)		5.6.4 Respond to natural disasters. Map risk areas at the national, regional and provincial levels. Upgrade the efficiency of disaster management. Develop databases and a telecommunication system. Establish disaster relief planning for the entire population. Ensure that the private sector, public enterprises, schools and local authorities are well-prepared and have plans to respond to disasters.

2.6.3 Government Policy

From 1980 to 1991, the soldiers were key persons in educating the public about disaster prevention. In 1997, PM Chuan Leekpai and the government announced in the Official Announcement: No. 2 Security Policy Section 2.4: To promote and support all knowledge and skill of the army special of engineering, science and technology, medical, nurse and discipline to develop and join of solving and economic plan and to produce the shortage positions for public health, the discipline in social, relieve public disaster in life and property, treatment resource, problem solving environment and coordination of private in other problems mentioned in the collaboration between government and private sector.

In 2005, PM Pol. Lt. Col Thaksin Shinawatra government announced the policy No. 4 to manage natural resource and environment that the government would protect water resources from upstream to downstream, to support the community in

the construction of the dike called maew (name of a hill tribe) dike to delay flood water based on the King's projects which had main objectives to allow all people to fully make use of the biodiversity. The government would invest in the sustainable water resource development from upstream, midstream to downstream so that people in every area can make use of it. The government shall also restore soil by stopping villagers from burning rice fields as it destroyed fertility of the soil. Chemicals use should be decreased or stopped. Faek (a special kind of grass) should be planted to cover the surface of the soil. Warning system should be well developed to reduce damages caused by disasters such as floods, droughts, earthquake and changes in atmosphere. Since then, the successive governments have followed this plan to prevent and reduce damages from disasters.

In 2008, PM Samak Sundaravej developed the natural disaster warning information such as flood, drought, tsunami and climate change and continued reduce the effect of people's suffer from disaster. This point of view, the former government expedited the economics structure development plan to accelerate more than others but seldom disaster happen then private sectors, people and others were less interested in natural disaster. Sooner the climate and the world morphology changed made more problems of natural disaster as a few incident become more difficult to access sizable lost and damages only the first figure from former government stressed the responsible to the army role, then in 2007, defined the main responsible of Disaster Prevention and Mitigation Department and considered other private sectors came to join this role in 1997 of coordination with the government that reflexing involvement of each level and work styles that changed from only government management into the cooperation between private sectors and government as shown in table 2.22.

Table 2.22 Disaster management policy of each government

Government	Policy
Cabinet no. 42 General Prem Tinsulanonda, March 28, 2523 (1980)	Defensive policy no. 8 promoted the soldiers' role to coordination of development prevention and mitigation disaster including others public assistance in the country.
Cabinet no. 43 General Prem Tinsulanonda, May 20, 2526 (1983)	Defensive policy no. 8 promoted the soldiers' role to coordination of development prevention and mitigation disaster including others public assistance in the country.
Cabinet no. 44 General Prem Tinsulanonda, August 27, 2529 (1986)	Defensive policy no. 6 promoted the soldiers' role to develop and assist people and mitigation of nation natural disaster.
Cabinet no. 45 General Chartchai Choonhavan, August 25, 2531 (1988)	Defensive policy no. 6 supported and promoted the soldiers' role to develop and assist people and mitigation of nation natural disaster.
Cabinet no. 46 General Chartchai Choonhavan, January 9, 2534 (1991)	No. 7.4 Social service policy of insurance government accelerated and hustled the law agent to activate the officers while helping of relief the social or supportive by family supported, community and private institution in the role to activate the involvement law to punish the deceivers who steeled the children and women be trade for prostitute and administrative officers, police coordination in serious working with these problems. The government rushed up the development of water supply and electricity supply through countryside and life safety in body and property security and important to relieve and revive of public danger in provincial and the region together with giving the knowledge the campaign of prevent and mitigate the accident of gas using, electricity in house to people.
Cabinet no. 47 PM Anand Panyarachun, April 4, 2534 (1991)	Defensive policy no. 5 supported and promoted the army's role to develop and activate of the King's projects to assist in public danger of people.
Cabinet no. 48 General Suchinda Kraprayoon, May 6, 2534 (1991)	As mentioned that natural resource and environment were preserved, revived and developed water resource policy, wood resource involvement energy resources to solve bad environment pollution and in defensive policy. No. 3 policy was supported and promoted the army's role to develop security and assist, relief people from public danger.
Cabinet no. 49 PM Anand Panyarachun, June 22, 2535 (1992)	-

Table 2.22 Disaster management policy of each government (cont.)

Government	Policy
Cabinet no. 50 PM Chuan Leekpai, October 21, 2535 (1992)	This pertains to accelerated development of natural water sources (and water resources in the field), as well as the construction of smaller water bodies. Development in catchment basins helps to alleviate the shortage of water for domestic and agricultural water resources in the long run, which should bring international visitors to take advantage of the country, and which should include improved management of irrigation water to be used efficiently.
Cabinet no. 51 PM Banharn Silpa-archa, July 26, 2538 (1995)	To supply enough water for agriculture and consumer goods through the development of water resources and water control, the construction of small water catchments are appropriate and necessary, as is cooperation with neighboring countries in international water resources utilisation and improving irrigation thoroughly coupled with improved effective management systems of water.
Cabinet no. 52 General Chavalit Yongchaiyudh, December 11, 2539 (1996)	Policy no. 10 was security policy to secure and life security and property in no. 10.2.3 To prevent and solve natural disaster such as flood, drought including emergency assistance and urgently revived people's living after the disaster.
Cabinet no. 53 PM Chaun Leekpai, November 20, 2540 (1997)	Policy no. 2 was security policy in no. 2.4 to promote and support the army's development in army forces to bring the knowledge as in engineering, sciences and technology, medical, nurses and discipline to develop in army and coordinate to solve the economics, produced the lack of positions and health service to people to social discipline, relief from public danger, keep security of life and property and preserved and resolved the environment and coordinated the other cases to private sectors.
Cabinet no. 54 Pol.Lt.Col. Thaksin Shinnawatra, Febuary 23, 2544 (2001)	In order to develop effective management of water resources, at all levels, and to suit production systems in accordance with local conditions, it is necessary to focus upon the participation of citizens who can fully restore conservation and the development of the watershed and river basins, such as water reservoir quality and irrigation ditch canals. This includes control of the use of surface water and groundwater effectively and systematically, especially in the development of large water sources.

Table 2.22 Disaster management policy of each government (cont.)

Government	Policy
Cabinet no. 55 Pol.Lt.Col. Thaksin Shinnawatra, March 23, 2548 (2005)	Policy no. 4 was administer natural resource and environment from the beginning to destination to support the community activated to delay current of water or Maew dike followed the King's thought into diversity to biology sustainable and the government investment development resource of physical river resource since upstream, midstream and distributed throughout of effective benefit. The government revived and preserved the soil resource by unfired of dry plant to damage soil surface, reduced
Cabinet no. 56 General Surayuth Julanond, November 3, 2549 (2006)	-
Cabinet no. 57 PM Samak Sundaravej, February 18, 2551 (2008)	Policy no. 4 was natural resource and environment of land policy no. 4.4 To have the database system development prevention and natural disaster warning as flood, drought, tsunami and climate change and the suffering of people.
Cabinet no. 58 PM Somchai Wongsawat, October 7, 2551 (2008)	Policy no. 1.14 was preparation and management water resource to increase effective water system and irrigation.
Cabinet no. 59 PM Abhisit Vejjajiva, December 29, 2551 (2008)	Policy no. 5 was the land policy, natural resource and environment no. 5.3 Prevention system management including the warning and revived the suffer of disaster by developed the database, warning setting and related structure in sensitive risk land in global warming condition as flood, earthquake or mudslide, drought, tsunami and giant wave in the sea specially in every tourist important points.
Cabinet no. 60 PM Yingluck Shinawatra, August 23, 2554 (2011)	Policy no. 5 was the land policy, natural resource and environment no. 5.6 The promotion of water administrative integration on surface and underground water in efficiency management up to the river resource and allocate enough for useful. Twenty-five river basins integration supported the farmers to diverse water for the agriculture to be the water source for the farm and garden and water diversion from other water resources and managed water structure system effectiveness distributed into the areas to support demand of economic and consumer no. 5.7 To immune and prepare in adjusting and influence of climate change and natural disaster by knowledge the development and database of climate change to increase of possible forecast, predict and speculate the risk of climate change and natural disaster in the country and in the risk areas.

Table 2.22 Disaster management policy of each government (cont.)

Government	Policy
Cabinet no. 60 PM Yingluck Shinawatra, August 23, 2554 (2011) (cont.)	The strategic of long term in preparation promoted in urgent warning and readiness of variance at present time to be the basic of long term changing to protect the disaster specially flood, tsunami, earthquake and landslide to promote mechanism object to community information and local in addition to increase the capacity to handle the climate change and disaster by local community.

2.7 Related Researches

2.7.1 Researches Related to Approach of Disaster Management

Moe and Pathranarakul (2006: 396, 410) study an integrated approach to natural disaster management Public project management and its critical success factors the investigations reveal that the country lacked a master plan for natural disaster management including prediction, warning, mitigation and preparedness, unspecified responsible governmental authority, unclear line of authority, ineffective collaboration among institutions in different levels, lack of encouragement for participation of local and international NGOs, lack of education and knowledge for tsunami in potential disaster effected communities, and lack of information management or database system.

Khaosa-ard (n.d.: 1-3) presented a report on "Suggestions on Future Flood Management" on December 7, 2011 at the Forum: 1st Think Tank on Strategies organized by Thai Universities for Healthy Public Policies (TUHPP) for brainstorming of the academics and the administrators from public and private sectors in order to find appropriate ways of flood management. The Forum can be summarized as follows:

1. Most policies on water resources in Thailand focus on water supply rather than flood management. Floods and other disasters are regarded as issues on public welfare. As a result, flood and disaster management are under Disaster Prevention and Mitigation Act. Under this act, flood management is done in

accordance with the administrative regions, which is not effective because flood management should be trans-boundary.

2. Damages from big floods usually occur in floodplains near Chao Phraya River, which is about 35,000 square kilometer or 22% of the areas near Chao Phraya River. This area can be divided into 2 parts: rural agricultural areas, with 17,000 square kilometer and 2 million people residing in this area; communities along the river, with 1,800 square kilometer and 12 million people residing in this area. According to the records on the previous floods, it was found that 91% of the damages occurred in the communities along the river. Even though the floodplain is much larger than the communities along the river, the damages are only 5%. Therefore, the government should find cheap land to be managed as detention basins and floodways.

3. Generally, there are 3 steps of flood management: 1) Floodplain Management; 2) Flood Fighting; and 3) Post Flood Management. Nowadays, the 1st step of flood management is not done in an integral way although there is sufficient data of floods. However, the data are scattered in different government offices. The issue of the 2nd step management is that there is no authority in charge of management on big and medium floods that can work trans-boundary across different ministries and different administrative regions. The authority in charge must have knowledge, records and data on floods and must be keen on mass management. The issue of the 3rd stage is about compensation for those who live in the areas to be used as floodways or detention basins.

4. There is a lack of effective mass communication. The communication is either unclear or slow. Bangkok was regarded as the economic center rather than the center of flood management. However, it is not only the center of economics but also the city with condensed population. Therefore, it should be used as the center of flood management and should be well protected for the reasons of human security because if Bangkok is damaged, it will affect other areas of the country.

5. Even though flood management emphasizes on the Constructional Strategy rather than Non-Constructional Strategy, there are no guidelines for making floodways or detention basins.

Suggestions:

1. Set up the authority in charge of preparation for big and medium floods in central part. There should be Flood Plain management Authority (FPA) with the following missions: Make master plans on flood plain management. Forecast and manage floods from the original parts to the end parts of floods, with cooperation of other authorities in getting information on weather forecast, management of water in the dams, making maps of the areas at risk, determining the levels of risks and management, cooperating with other authorities depending on the level of risks. Moreover, it shall have authority in managing the land in the areas at risk, managing conflicts of people, encouraging public participation in planning detention basins or floodways in their communities, cooperating with local authorities, making disaster warning indexes and guidelines for flood preparation, flood fighting, effective mass communication during floods, rehabilitation after floods, etc.

2. Construction of detention basins: One of the main tasks of FPA is to construct detention basins in order to slow down the floods that come to Bangkok. The authority in charge shall be under supervision of the Prime Minister. There shall be an executive board chaired by the Prime Minister. The manager of this authority must have skills and experiences in water and mass management. There shall also be local authorities in the detention basins with participation of local leaders and local administrative offices. The authority shall get consent from local authorities and people in making their lands as detention basins. Compensation shall be paid for land owners. New occupations shall be promoted such as fish raising, weaving, tourism, etc. The utility system shall be developed and revised. In exchange of their devotion, lives of people in the areas should be affected as little as possible.

3. Rehabilitation and compensation for land owners and those affected by the construction of detention basins through tax system and funds: The support during the floods was temporary. After the floods, long term support should be given to the affected people for sustainability. In case of the construction of detention basins, the government must pay compensation to the land owners and all people who are affected by the construction of detention basins. Local administrative offices shall be in charge of collecting taxes and fees from those who benefit from the construction of detention basins. The money shall then go to those whose lands are used as

detention basins. The Ministry of Finance should prepare regulations in accordance with this financial matter.

4. Compensation for agricultural areas that are used as floodways or detention basins shall be calculated based on the regulations of the guarantee of the rice price of the previous year.

5. Strengthen the communities and encourage participation from local people in managing floodways and detention basins. Promote more detention basins in the communities which are similar to those in forest areas.

6. Use internet as communication tools with the public in order to provide accurate and updated information, and to make sure that the rehabilitation and welfare cover all targets.

7. Promote cooperation of the devoted community and the benefited community. Promote proper understanding among the communities that if all communities try to protect themselves from floods, all of them will be damaged. But if one community devotes itself as a detention basin, it can save the other community. The saved community should pay compensation to the one that devoted itself as a detention basin.

8. Check all areas under state properties to see if they are in floodplains. Cancel rental contract of state properties in floodplain areas. Do not encourage the settlement of industries in floodplain areas.

9. Revise regulations on the construction of buildings in flood areas. The construction of the buildings and fences, etc. must not block water flow.

10. Raise public understanding on the nature of floods. Encourage participation of the public in management of big and medium floods.

11. Issue laws, regulations or announcements necessary for the implementation of the above mentioned suggestions.

Kamolvej (2012 cited in Khaosa-ard, 2012: 4-8) referred to the government work on flood management as, “Chasing the problems without preparation” and “Deal with the flood as if it were a merit-making festivals”. In conclusion, the problems are caused by the following reasons:

1. The mechanisms of water management before 2011 were mainly for water supply, not for flood management. The authorities in charge were the

National Committee on Water Resources and the Committee on the 25 Basins. Their main missions were to make master plans for the management of the basins with main purpose of water supplying. Many plans were launched. However, most of them were construction plans. Flood warning was not their main mission. As for the management of four Branches of the Chao Phraya River (Ping, Wang, Yom and Nan), there was a committee for each Branch that worked separately. No cooperation among them. Besides, there was no committee to manage lower Basin of Chao Phraya River. Due to the lack of cooperation among these four management committees of Ping, Wang, Yom and Nan, it was impossible to calculate water mass that runs down from these Branches along lower parts of the Chao Phraya River. Flood management was not included in the duties of these committees. In other words, they were not officially authorized to manage floods. The national policies on water resources did not include flood management either. As flood management was under the Disaster Prevention and Mitigation Act B.E. 2550 which was developed from the Civil Disaster Prevention Act B.E. 2522 and the Fire Prevention and Mitigation Act B.E. 2542, it was mostly about the management of sudden disaster such as fire, earthquake, sudden floods, landslides. It was not appropriate for the management of floods occurring in Chao Phraya Basins. It takes almost one month for water flow in the upper parts of Chao Phraya River to run down to lower parts. If the authorities cooperate well and share information among them, the flood can be managed at the very beginning stages. In order to do that, there must be a network with cooperation among local authorities of all provinces that are affected by floods.

In managing the flood in 2011, the Governor of Bangkok upheld the Disaster Prevention and Mitigation Act B.E. 2550. According to this Act, the disaster management is under the administrative offices such as Bangkok Metropolitan Administration, District Administration, Pattaya City Administration, Provincial and Local Administrative Offices. Each administrative office has authority in its administrative area only. In case there are conflicts among the administrative offices, the Minister of Interior has an authority to manage. If there are conflicts at the national level, the Prime Minister has an authority to manage the conflicts. Even though it is possible to work across administrative offices, it needs consent from the Minister of Interior (under Section 13 of the Act) and the Prime Minister (under

Section 31 of the Act). However, this Act is mainly about the response of disaster, not the preparedness for the disaster.

2. There was a lack of unity in flood management. For example, there was no information network, ineffective mass communication and failure in general management. Even though there were a lot of data on floods, they were scattered in different offices. Due to the lack of information network, water mass could not be accurately predicted. Water levels in the dams and in Ping, Wang, Yom and Nan were not informed. So it was not known how much lower basins of Chao Phraya River would be flooded. Even the rescue center at Don Muang Airport was flooded. In order to reduce the problem, the management should be done with unity. The line of commands should be direct and uncomplicated. However, the Prime Minister upheld the State Administration Act B.E. 2534, and appointed Pol. Gen. Pracha Promnog, Minister of Justice, as the Director of the Center of Flood Management, while the Minister of Interior was the deputy director. This resulted in weak line of commands. If the Minister of Interior had been the director of the Center, there would have been strong network among the governors of all provinces as well as local administrators under the provinces. Moreover, the plans under the Disaster Prevention and Mitigation were ignored. The government followed regular administrative rules and regulations, which had complicated line of commands. The Prime Minister also demanded that all contacts be in written documents, which slowed down the management process. For example, there was an issue of using pumps to release the floods. The authority in charge had to submit an official letter to the Ministry, resulting in slow response to the floods.

3. Miscommunication to the public: During the flood, many people from different authorities talked to the public through mass media. Sometimes the information they gave were contradictory. For example, the Minister of Science and Technology announced that people living in Pathumthani and Bangkok (Saimai District) should evacuate by July 13, 2012. However, at 8 PM the same day, there was an announcement from the Flood Relief Operations Center through Facebook, apologizing for the wrong information announced previously. According to the Center, there was no need for evacuation at that stage. What people in that area should do was to move things up to a higher level. Later at 9 PM, the Governor of Bangkok kept

repeating that Bangkok was not flooded. He also stated that the people in Bangkok should listen to his announcement only. Another problem was the use of technical terms. Royal Irrigation Department announced that there was 9,806 million cubic meter of water remaining in the fields. However, as laymen, most people had no idea how much it was. It should be explained to the public by making comparisons. For example, it would be easier for people to understand if the government said that it equaled the water of Bhumibol Dam in normal condition. People were not informed whether their houses were in the areas to be used as barriers or how much their lands were higher than the sea level. In addition, when the government announced that people in such and such districts should evacuate, they did not specify which parts (streets/lanes) of the districts would be affected. Another problem was lack of public relations, resulting in disobedience of the public. There were protests from some groups demanding that the water gates be opened to release water. Some water gates were destroyed by villagers in order to lower water level in the villages. However, there were no agents from the government to explain to the villagers or to mediate when there were conflicts among people in different villages or provinces. The negotiation teams should have been sent by central government under the authority of the Director General of the Disaster Prevention and Mitigation and the Minister of Interior.

4. Political problems: During the flood, all relevant authorities should have worked hand in hand to reduce the damages. However, even in such a crisis, there were still conflicts among the authorities who were from different political parties. There were conflicts between central government and Bangkok Metropolitan Administration (BMA) which is local government. These problems are perceived by the public as political conflicts (Wiriyapanpongsa, 2011). For example, BMA had sent an official letter to the Flood Relief Operations Center on November 4, 2011 asking for water pumps, but, according to the Governor of Bangkok, there was no response from the government (Thairath: November 4, 2011). On the same day, the Flood Relief Operations Center asked for donations of the pumps and donations of money to buy the pumps as the ones they had were occupied. Finally, BMA received the pumps on November 9, 2011 (Thairath: November, 2011). People in authorities paid more attention on their credits rather than public interests. Instead of spending all effort in

solving the problem, some ministers took mass media to witness their activities just to get credits from the media. There was another case at Klong Samwa District in Bangkok where the Member of Parliament (from the House of Representatives) of the district and some villagers opened the water gate without permission of BMA. At that time, BMA was assigned by the government to protect Bangchan Industrial Estate. So it could not completely open the water gate as too much water would go to the Industrial Estate. So BMA opened the water gate at the height of 75-80 cm. However, after being pressured by the villagers, the government, through mass media, ordered BMA to open the gate at the height of 1 meter. According to Section 31 of the Disaster Prevention and Mitigation Act B.E. 2530, the Prime Minister had an authority to give command to the Governor of Bangkok. No need to give command through mass media. Regarding the negotiation with the villagers and compensations for those affected by the closing of water gate, it should have been well prepared so that it could reach villagers in a timely manner.

5. Lack of preparedness of the authority and participation of the communities: The drain pipes in Bangkok were blocked by garbage and dirt. Drainage canals were not systematically linked, and there are many constructions that block the drain. BMA was not well prepared for the floods. Government Action: The government has implemented master plans and action plans to deal with floods. However, in these plans, only topics and budget were specified. Three Royal Enactments were issued in order to authorize the government to make a loan of 350,000 million baht for preparedness of flood management. Most of these plans emphasize on the constructions rather than land management of low plains in central part of Thailand. There is no clear plan to improve flood management system, and there is no specific plan to reduce the burden of all taxpayers as huge budget is spent on those who are affected by floods. There is also a lack of integral knowledge management before setting up TOR. There should be an authority that can work on this issue without political sanction. Without full participation and integration of all stakeholders, it is difficult to implement the plans effectively.

2.7.2 Research Related to the Network

Phromlert (2005) conducted the research on Social Network Cooperation on Flood Prevention in Lower Basins of Ping River and found that:

1. After the floods in lower basins of Ping River, a social network of flood prevention was created. However, there was a gap between the government and private sectors as well as civil society, and there was also a gap between district and municipality offices.

2. The network of flood prevention is under control of the government. Private sectors and civil society have less power.

3. The network of flood prevention in lower basin of Ping River is also mainly under control of the government especially in the decision making process and situation analysis. Private sectors and civil society participate only in some activities as receivers, not main actors.

4. Some actions have been taken in order to prevent flood in lower basin of Ping River. However, these actions were done under the decision of the government only. Private sectors and civil society had little participation.

5. The network of flood prevention in lower basin of Ping River was still not strong.

Anantthanakorn (2005) conducted a study on the Administration of the Network on Disaster Prevention and Mitigation: Case Study of Bangkok and found that:

1. Government should be main authority in the administration of disaster prevention and mitigation. It should create a network and encourage more participation from all relevant public sectors as well as private sectors and civil society in the whole process of the missions. Moreover, the administrative structure should be improved for more unity and cooperation among the relevant offices.

2. Manpower, budget and supplies should be well managed. The situation at that time was: there was a need for more professionals who have experiences in disaster prevention and mitigation. Budget and supplies were not well managed as there were too many offices that are in charge of one mission, resulting in less cooperation complicated line of command.

3. There were too many laws related to the disaster prevention and mitigation which caused confusion in line of command and practice. Besides, the existing laws were out of date and could not keep up with the situation.

4. There were problems in relationship among the government, private sectors and civil society. When there was a disaster, usually private sectors and civil societies arrived at the area before the government did. However, sometimes there were conflicts among different groups about work authorities, work standards and the benefits that the groups received. The government should support these groups as well as set up standards and regulations of works for all stakeholders to uphold.

Panduang (2011: 37-38) conducted a study on Administration of the Network on Disaster Prevention and Mitigation of Khao Meekiat Tambon Administrative Organization (TAO) in Sadao District, Songkla Province and found the following problems in the disaster prevention and mitigation.

1. Budget: The allocated budget was insufficient and, as the budget was provided from central government, it took time for the money to reach the areas of disaster. In addition, there were restrictions of law implementation in some emergency cases such as fires.

2. Human resources: Unlike big organizations, the TAO has limited man power. So they cannot provide services to all people in need. There are shortages of the professionals and skillful staff in disaster mitigation including firefighters. Due to the lack of budget and restricted laws, the TAO cannot get more manpower in disaster prevention and mitigation.

3. The material equipment, supplies and equipment used in prevention and relief come at a very high price. In a large agency, there is a budget in procurement outsourcing or getting support from other agencies and private organisations, such as the 'Provincial Administration', but in most of the smaller agencies in a 'Tambon Administration Organizations' there are limited budgets and lack of support from other agencies. It is thus impossible to purchase items of requirement.

4. Cooperation with other organizations: As floods usually attack many areas at the same time, it is likely that each area tries to support its people

first. Another problem is that one administrative region is responsible for many areas. Some of these areas are very far from each other. Therefore, it is difficult to provide support when there are floods in these remote areas. In case of fire, it needs immediate action to reduce damages. However, due to lack of communication and cooperation with other organizations, it takes too much time to get help. In case of car accidents, there is cooperation among nearby organizations. If there is good relationship among the executives and/or the practitioners of these organizations, it is more likely to get support. But in case of remote areas, it is difficult to get help from other organizations. Besides, there is no communication with other communities and within their own communities, which makes it difficult to get support in case of an emergency. Inefficient public relations is another problem in getting support. For example, some people do not know phone number of the nearby organizations or authorities that can help in case of an emergency.

5. Support and services: Due to lack of manpower and equipments (such as boats), sometimes support cannot be given to the disastrous areas immediately. In case of fires, as there are no professional firefighters and fire engines in Khao Meekiat Sub-District, it needs to ask for help from the authority outside their community. This slow response can cause more damages. In case of car accidents, the rescue and first aid are available within the community. However, there are fewer rescue team members at night. Moreover, due to limited number of staff, if there are more than one accident at the same time, it needs to ask for help from the authority in nearby communities.

2.7.3 Research Related to the Impact of Floods and Needs of the Affected People

College of Population Studies (1992) conducted a study on the Impact of the damages in Lam Moon Bon Dam in 2533 in different aspects as follows: support from authorities/organizations (shown in percentage): authorities at the district level 57%, military offices 50.6%, community volunteers 15.5%, people from other areas 13%, volunteer organizations 12%, private foundations 10.3%; types of shelters: schools 56.3%, relatives' houses 23.8%, temples 10.3%, temporary shelters provided by the government 9.8%; prompt responses from the government: very quick 32.4%,

pretty quick 54.3%, pretty slow 12%, very slow 1.7%; authorities/organizations that provide medical care: mobile medical unit from district hospitals 44%, provincial public health center and mobile medical unit from district hospitals 22.4%, provincial public health center, volunteer doctors and mobile medical unit from district hospitals 16.5%, no medical support 5.6%; damages or impact on properties, mental and physical health: mental health (a lot 78.4%, somewhat or a little 16.7%, not at all 4.9%), properties (a lot 32.7%, somewhat or a little 15.2%, not at all 52.1%), physical health (a lot 5.7%, somewhat or a little 15.7%, not at all 78.6%); sufficiency of the support (foods and consumed products): sufficient 77.4%, too little 12.8%, did not get any as they stayed with relatives 9.1%; conditions of emergency shelters: crowded 53.8%, comfortable 30.7%, stayed with relatives 15.2%; conditions of medical support: good/enough 87.7%, not well distributed 5.7%, did not get as they stayed with relatives 5.7%, no support at all 0.9%; general care: good 91.6%, did not get as they stayed with relatives 5.7%, did not get at all 2.7%.

Sappaisarn (2001) conducted a study on floods in Hat Yai City Municipality and Nearby Areas in November 21-23, 2000 and Guidelines for Sustainable Solutions by collecting and analyzing the existing and future research and plans. Then these research results and implementation plans were summarized, analyzed and synthesized in order to find integral guidelines to solve the problems. According to the study, floods are caused by 3 main reasons: 1) Floods in local communities; 2) Floods from basins around communities; and 3) Floods caused by overbank flows from U-Tapao Canal. There are clear guidelines to prevent these 3 kinds of floods. There is already a system to prevent floods in local communities. As for floods from basins around communities and floods caused by overbank flows from U-Tapao Canal, a project of 15 years with at least 15,000 million baht has been launched. The researcher has categorized the measures of flood prevention as short term and long term Constructional and Non-Constructional Strategies for an integration of flood prevention measures including the environmental protection, land usage and community participation.

Based on the study of related research, the areas of study were divided according to the risks of floods as follows:

1. Areas with no risk: In these areas, there are no serious floods with no loss of lives and properties.

2. Areas with low risk: In these areas, there are floods with little damages to properties.

3. Areas with medium risk: In these areas, there are floods with moderate level of severity, causing more damages to properties, but no loss of lives.

4. Areas with high risk: In these areas, there are serious floods, with loss of lives and properties.

Measures of flood prevention and mitigation in the above mentioned areas are based on their geographical conditions.

Lamlert (2003: 74-75) conducted a Study on the Needs of People Who Are Affected by Floods and How They Managed: Case Study of Ban Lam Pao, Khuan Khan District, Kalasin Province. The study found that the needs of those who are affected by the floods can be divided into 2 categories according to the period of floods.

1. During the floods, they need foods, clothes, shelters and medicines. During this stage, most of their needs were responded. Shelters: they could stay at schools during the floods. Even though the students came to study as usual, they did not find it difficult or troublesome to stay there. Medicines: They received medicines for common sickness such as pain relief pills, medicines for diarrhea and stomachache, medicines for skin diseases, etc. There were doctors and medical professionals who provided medical care at the shelters. Food: There was enough food as they got support from people within and outside the communities. They also got support from the government, private sectors and volunteers. Even though some of the foods were not in accordance with their culture, they did not refuse as they understood that it was the time of crisis and they had to adjust themselves to the situation. However, judging from the budget and the situation, better support could be provided. Those who provided foods to the people who suffered from floods should consider food cultures of people in such communities. The foods given to them were mostly preserved foods such as canned fish, cooking oil and instant noodles, which are not

always consumed by people with all cultures. Therefore, in order to meet the needs of the people, the supporters should provide foods based on their cultures.

2. After the floods: The needs of people during this period can be divided into different categories as follows:

2.1 Shelters: Most people who were affected by floods felt unsecured about their residences. Some wanted to have their houses adjusted for flood prevention, while some wanted to move from the areas. Those who wanted to stay needed equipments and materials for house reparation. All of them needed support from the government.

2.2 Food: As the floods destroyed agricultural products such as rice, sugar canes, cassava, fruit, vegetables and herd, the farmers and people in the flooded areas were directly affected as the agricultural products are sources of food and income. After the floods, the farmers need money for agriculture. Many villagers want to invest in fishery as there are many local fish called, "pla siew kaew". In the past, they were allowed to use fishing net which is not longer than 10 meter to catch pla siew kaew, but they want to get permission to use fishing net which is not longer than 30 meters as it is their main source of food and income aside from sugar canes and cassava, which are seasonal agriculture.

Flood management: The construction of Lam Pao Dam started in 1958. It was completed and started to restore water in 1969. However, it caused floods in the nearby areas and damaged houses and agricultural products. Before the construction of the dam, the government had bought the land from people. So most of them moved from the area. Some moved to higher lands which were safe from the floods. However, some of the agricultural products were damaged. So they filed a complaint and asked the authority to reconsider the policy on water restoration and water release of the dam. When the dam was newly constructed, the villagers earned their living from the fishery. After some while, they started to observe the tide and water levels and started to plant according to the tides. When water level was low, they planted and harvested before the next tide was coming. They planted in the areas that were not flooded and the areas that were flooded but in a short period of time. By this way, the villagers could solve the problems. However, in 2001, the tide and water level became unpredictable. The water level had continued rising since September, causing floods to

agricultural areas and houses. The villagers had to move to temporary shelters. After the flood, they came back and started to plant cassava instead of sugar canes because it took shorter period of time to plan and harvest cassava. Besides, it can be sold all through the year. The villagers also tried to find ways to solve the problems in the long run such as asking the government to find new areas for them to live, moving to a higher area which was safe from floods, making the land higher so that they could still stay at the same places, or move temporarily to another area and moved back after the flood.

After reviewing 9 related research, the researcher has drawn variables on the problems of disaster management and found that there are 4 most problems with the highest frequency as follows: There are no authority directly in charge of disaster management. There is a lack of cooperation among the relevant authorities/ organizations at different levels. There are no specific laws, and the problems related to the support from the government. These 4 variables are shown in Table 2.23.

The researcher made use of these variables in the interview with major informants to reconfirm and clarify the information again. Finally, it was possible to sum up 16 variables which are the main factors for disaster management as mentioned in Chapter 4.

Table 2.23 Factors affecting disaster management

Item	Factors Affecting Disaster Management	An academic									
		Moe and Pairote	Anantthanakorn	Panduang	Khaosa-ad	Kamolvej	Phromlert	Social Research Institute	Sappaisarn	Lamlert	Frequency
1	No master plans for disaster management	✓									1
2	No authority in charge of disaster management	✓	✓		✓						3

Table 2.23 Factors affecting disaster management (cont.)

Item	Factors Affecting Disaster Management	An academic									
		Moe and Pairote	Anantthanakorn	Panduang	Khaosa-ad	Kamolvej	Phromlert	Social Research Institute	Sappaisarn	Lamlert	Frequency
3	Unclear administrative line	✓									1
4	Lack of cooperation among institutes/organizations at different levels	✓	✓				✓				3
5	Lack of database and data management system					✓					1
6	No laws directly related to the matter		✓	✓		✓					3
7	Inefficient transportation, resulting in slow assistance to those who are affected by the disaster	✓									1
8	Political conflict		✓			✓					2
9	Support from the government					✓		✓		✓	3
10	There should be integrated plans on flood management.								✓		1
11	Miscommunication			✓							1

Source: Factors affecting disaster management collected and synthesized by the researcher from related research

The conceptual framework of the study is applied from the concept of Policy Process by Dunn (1994: 17). The process consists of different stages. The first stage is the formation of policies which starts from identifying problems and developing new policies to illustrate the policy content and to identify stakeholders. The severity of problem was analyzed, using related documents such as the government announcements and other official documents related to disaster

management. The second stage is policy implementation. In this context, the concept on relationship of the nation, state and local authority by Wright (1988: 17) explains a hierarchical set of power or authority relationship such as government, private and people. In addition, the network approach by Sabatier (1988: 131-132) is applied in order to study the cooperation of the authorized bodies/organizations; to find appropriate methods in disaster management and to explain the development of policies in response to the disaster caused by flood. The policies on disaster management were analyzed, using available data such as the identified problems in policy implementation and disaster management. The deficiency of each model was studied and analyzed in order to develop a new model on disaster management by the government in response to the disaster caused by flood as explained by the following framework.

The core values of the trust of Sabatier (1988: 131-132) indicated that the combination of a variety of policy makers can allow to work across agency boundaries, it must be an exchange of information and resources and should be in the interest of common policies. While the management in the past to deal with the lack of trust, the division of responsibility by separate of work led to a diffusion of the flood management. To be linked to the mutual recognition and coordination activities between agencies, the researcher, therefore, used the core values of the trust in this description and brought up the data of the situation of the problems of policy and management in the past.

CHAPTER III
RESEARCH METHODOLOGY

The following methodology is used in this study:

1. Research Method
2. Key Informants
3. Types of Data
4. Research Instruments
5. Data Collection
6. Data Analysis
7. Validity

3.1 Research Method

3.1.1 The basic philosophy of this study is to acquire knowledge and to understand the context of the phenomenon. The knowledge acquired from the study will be applied for the development of a new concept. Another objective is to find relationship of the factors in this study. The final goal is to create new knowledge as well as to expand the existing knowledge and theories.

3.1.2 This study is a qualitative study using the following methods: historical study, documentary study and case study.

3.2 Key Informants

3.2.1 Key Informants of the Qualitative Study

In order to study the policies and practices on disaster management that have been used, and to study the problems on this issue, the existing policies have to be analyzed in order to study the system and nature of the institutes that implement

these policies. The relationship of three factors (public policies, stakeholders of the policies and policy environment) is studied (Dunn, 1994: 70-71). The study has been done in the following offices that are in charge the disaster management. Two persons from each office are selected as key informants.

3.2.1.1 Ministry of Interior
3.2.1.2 Department of Disaster Prevention and Mitigation
3.2.1.3 Royal Irrigation Department
3.2.1.4 Department of Thai Meteorological Department
3.2.1.5 Bangkok Metropolitan Administration
3.2.1.6 Professionals on disaster management
3.2.1.7 Representatives from the community
3.2.1.8 Representatives from Non-governmental organizations
3.2.1.9 Representatives from Non Profit organizations
etc.

3.2.2 Criteria in Selecting the Key Informants

3.2.2.1 Representatives from government offices are selected from the following groups of people: 1) directors, professionals or experts who have 1-3 years of experiences in policy making and implementation related to flood management; and 2) those who work in the offices that are in charge of disaster management after the government reform in 2002.

3.2.2.2 Professionals on disaster management offices are selected from the following groups of people: 1) those who have at least three years of experiences in disaster management; and 2) university academic persons who have conducted research or academic works related to disaster management (focusing on flood management).

3.2.2.3 Representatives from the community are selected from those with the following qualifications: 1) residing in the areas affected by flood such as Bangrakam District and Bangchang District in Nakhon Pathom; and 2) having experiences in the community disaster management

3.2.2.4 Representatives from non-governmental organizations offices are selected from the following groups of people: 1) people who support and

rescued those who were affected from flood; and 2) people who were affected by flood themselves, for example, Thai Television Station Chanel 3.

3.2.2.5 Representatives from non-profit organizations are selected from the following groups of people: 1) people who support and rescued those who were affected from flood; and 2) representatives from the organizations that work on the environment such as Ruamkatanyu Foundation, Thai NGOs and Green Peace.

3.3 Types of Data

3.3.1 Primary Data

The primary data was collected by the semi-structured interview and focus group to find out the attitudes and general opinions of the stakeholders in order to understand the activities, participation, conditions and relationship of the issues for the development of disaster management by the government in response to the natural disaster focusing on flood.

3.3.2 Secondary Data

The secondary data are divided into 2 groups based on the sources of information. The first group is primary document, which consists of historical documents, laws, proclamations, acts, rules and regulations related to public policies and management in response to the natural disaster focusing on floods from 1942 to 2012. The second group is secondary document, which consists of printing materials, media, statistics, figures, etc. of the related offices or organizations, text books, academic articles and related research in order to study the factors affecting the efficiency and efficacy of disaster management (focusing on flood management) by the government.

3.4 Research Instruments

There are 3 parts of the research instruments as follows:

3.4.1 The Semi-structured Interview

The first instrument used for collecting data on the qualitative research is the semi-structured interview on the professionals and those who are in charge of flood management to collect data on the network of the government, private sectors and civil society in response to the natural disaster. The data were then analyzed based on the concepts and theories on public policies and policy network, focusing on public policy criticism. The data were also analyzed to explain the effectiveness of the network in response to the natural disaster. The semi-structured interview was conducted to determine the content validity by the major advisor and the Committee for Research Ethics (Social Sciences), Faculty of Social Sciences and Humanities, Mahidol University.

3.4.2 The Focus Groups

The second instrument used for collecting data on the qualitative research is the focus groups which were done in different groups of participants as follows:

3.4.2.1 Representatives of the government and private sectors as well as the civil societies and academic.

3.4.2.2 Who are in charge of flood management at the policy level and the practitioner level.

Focus group participants consist of

1) Chavalit Chantarat, TEAM Consulting Engineering and Management Co., Ltd. Water Resources Engineering Specialist;

2) Tada Sukhapunnapan, Hydrological Irrigation Association Expert, Royal Irrigation Department;

3) Angsumalin Angsusingha, Analysts policy and Planning Specialist, Department of Disaster Prevention and Mitigation; and

4) Prachern Khonthet, Chairman of the coordination center for collaboration through the disaster Nakhon Pathom and consultants We Love Tha Chin River, Nakhon Pathom province

3.4.3 The Recording Forms

The third instrument used for collecting data on the qualitative research is the recording forms consisted of historical documents, laws, proclamations, acts, rules and regulations related to public policies and management and data of situations focusing on flood between 1942 to 2012 for understanding evolution policy formation and management in the past.

3.5 Data Collection

The data were collected by the following process:

3.5.1 Data collected from the existing facts, figures and statistics of the related offices and organizations: This study focuses on flood because, based on the study on natural disaster in the past 112 years (from 1900 to 2012) done by EM-DAT, it was found that, compared with other types of natural disaster, flood has caused the most serious damage to the country. However, this study focuses on the floods during 1942-2012 as shown in Table 3.1.

Table 3.1 Top ten natural disasters in Thailand from 1900 to 2012 based on the number of people who were affected

Disaster	Time	Number of People Who Were Affected
flood	August 2011	9,500,000
flood	October 2010	8,970,653
drought	March 2010	6,482,602
Drought	January 2009	6,000,000
Drought	April 2008	10,000,000
Flood	October 2002	3,289,420
Drought	February 2002	5,000,000
Flood	January 1996	5,000,000
Flood	August 1995	4,280,984
Flood	January 1975	3,000,093

Applied from EM-DAT, 2012.

3.5.2 The data of the qualitative research derived from the semi-structured interviews and focus groups revealed the attitudes and general opinions of the key informants concerning flood management. The data were also used to study the activities, relationship, participation and conditions of the disaster, which will lead to development of practices in response to the natural disaster.

3.6 Data Analysis

3.6.1 The qualitative data were analyzed, using Time Series Data Analysis and Descriptive Analysis, and were presented by graphs to show the trends of floods in Thailand. The data were divided into different types, organized, defined and classified components to find relationship among them. The documentary data were divided into 2 types based on the sources of information. The first group is primary document, which consists of historical documents, laws, proclamations, acts, rules and regulations related to the floods and other natural disasters in Thailand during 1942-2012. The second group is secondary document, which consists of printing materials, newspapers, statistics, figures, etc. of the related offices or organizations, text books, academic articles and related research. The data were then interpreted and summarized. Three factors (the policies, systems and the institutions in which these policies are formed and implemented) were analyzed in order to find relationship of the public policies, stakeholders and policy environment (Dunn, 1994: 70-71) based on Participatory Approach and Normative Approach.

3.6.2 Data analysis from the interviews and focus groups was done to organize the data in order to define, summarize, interpret, present and to check validity of the data derived from the study (Podhisita, 2011: 337). The data derived from the interviews of key informants who have direct experiences with floods were analyzed. The Content Analysis was used for analyzing the data on the area network, and the Analytic Induction was used for analyzing the activity network. The data shall be used by relevant offices or organizations in setting up plans or policies to manage disasters focusing on floods.

3.6.3 Data Analysis on Case Study: The data related to the floods from to were grouped, using the following criteria: 1) Case study of floods around 25 rivers; 2)

Case study of floods that caused more than 100 deaths; and 3) Case study of the incidents of floods before and after the Disaster Prevention and Mitigation Act B.E. 2550.

3.7 Validity

The derived data were checked for its validity, using Data Triangulation, meaning data from different sources were collected and compared to check for its consistency (Chantavanich, 2004: 129). Another method used for validity check in this study was methodological triangulation, meaning different methods were used in collecting data i.e. documentary study, interviews, case studies and focus groups in order to check the consistency of the data derived in different time, places and from different persons. The data were presented to the experts for final check of the validity.

The procedures have as follows:

Step 1: Collecting information from agencies involved in flood management and flood incidents, such as the Department of Irrigation, Department of Disaster Prevention and Mitigation, Department of Meteorology etc., and analyze and organize information from the source / location and data collection in each of the different time to analyze the event and management in each period.

Step 2: Collecting information from the interviews with different roles such as the policy makers, the policy implementations and those involved in flood management, e.g. volunteers, academics, representatives from non-profit organization, media representatives to analyze and organize information from different individuals to analyze the factors that affecting the efficiency and effectiveness of the policy formation and the government's policy management to respond to disasters in the Thailand.

Step 3: Collecting information from the conversation of the participants with different roles such as the policy makers, the policy implementation and 4 persons who involved in flood management to confirm the results of analysis of the pattern of the flood management in the future that proposed by the researcher and provided the determination of the role of the policy players to be clear before, during and after the flood.

Step 4: Reconsidered the results of the analysis of the pattern of the flood management in the future that the researchers proposed to the experts by Dr. Pramote Maiklad, the member of the National Reform Council and Vice President of the National Disaster warning Council to provide recommendations in relation to the mechanism of action at national and provincial levels to be cleared for the practitioners can perform correctly under the policy.

Step 5: Reviewed the results of the analysis of the pattern of the flood management in the future that the researchers proposed to Bang Chang community, Sam Phran District, Nakhon Pathom Province by the participants consist of Chief Executive of the TAO, Chief Administrator of the TAO, Council Member of the TAO and 28 peoples of the resident of Bang Chang Sub-District to confirm the results of the analysis and provide the recommendations for the implementation that should be taken into account of the context of the different areas.

Step 6: Organized and interpreted the information from documents, interviews, focus groups conversation to determine the consistency of the content.

Step 7: Synthesized the information and drawn the conclusion.

Summary of Research Methodology are shown in Table 3.2

Table 3.2 Summary of research methodology

Objectives of the Study	Methodology			
	data	**Sources of Data**	**Data Collection**	**Data Analysis**
1. To study the disaster management in response to floods by government sector, people sectors and private sectors at 4 levels: international, national, provincial and local	1. National Plan on Disaster Prevention and Mitigation B.E. 2553-2557 2. Government Policies 3. Reports on the floods 4. All information related to the floods in the past 70 years (1942 to 2012) 5. News related to disasters	Primary Document 1. Relevant government offices Secondary Document 2. Online database 3. Articles from academic journals 4. Annual reports 5. Documents and reports from the seminars 6. Text and academic documents 7. Newspapers	Data were collected from primary documents and secondary documents, using data analysis recording forms.	1. The data were organized, presented, interpreted and summarized to check the validity. 2. The Participatory Approach was used to check the roles of key informants in policy making, and the Normative Approach was used to find solutions/ suggestions for policy making. 3. Time Series Data Approach was used to analyze the derived data.

Table 3.2 Summary of research methodology (cont.)

Objectives of the Study	Methodology			
	data	Sources of Data	Data Collection	Data Analysis
2. To analyze factors affecting the efficiency and effectiveness of the formation and implementation of public policies related to risk reduction and management of disaster caused by flood by the government sector, people sectors and private sectors	1. Government policies 2. Research, theses, academic documents related to disaster management in Thailand and abroad	Secondary Document 1. Database on research, theses and academic documents 2. Texts and academic documents	1. Data were collected from primary documents and secondary documents, using data analysis recording forms. 2. Data were collected from field study.	1. The data were organized, presented, interpreted and summarized to check the validity. 2. Data from the interviews were analyzed.
3. To develop a management toward government policy in responsibility to disaster in Thailand: case study on flood and previous management, current situation and appropriate approach in response to future disaster .	1. Research, theses, academic documents related to disaster management in Thailand and abroad	1. Database on research, theses and academic documents 2. Texts and academic documents 3. Data from focus groups	1. Data were collected from primary documents and secondary documents, using data analysis recording forms. 2. Data were collected from field study. 3. Data were collected from focus groups.	1. The data were organized, presented, interpreted and summarized to check the validity. 2. Data from the interviews were analyzed. 3. Data from focus groups were analyzed.

CHAPTER IV
RESULTS

Results of the analysis are as follows:

1. Analysis on the management of disaster response, with the case studies of floods by government sector, people sectors and private sectors at 4 levels: international, national, provincial and local level

2. Analysis on factors affecting the efficiency and effectiveness policy formation and management in accordance with public policies by the government sector, people sectors and private sectors in response to the disaster in Thailand: Case study on floods (analysis of data derived from key informants)

3. Analysis on management toward government policy in responsibility to disaster in Thailand: case study on flood and previous management, current situation and appropriate approach in response to future disaster

4.1 Analysis on the management of disaster response, with the case studies of floods by government sector, people sectors and private sectors at 4 levels: international, national, provincial and local level

4.1.1 The government's management in response to disasters, with the case study of floods as obtained from analysis of documents and categorized according to periods of time

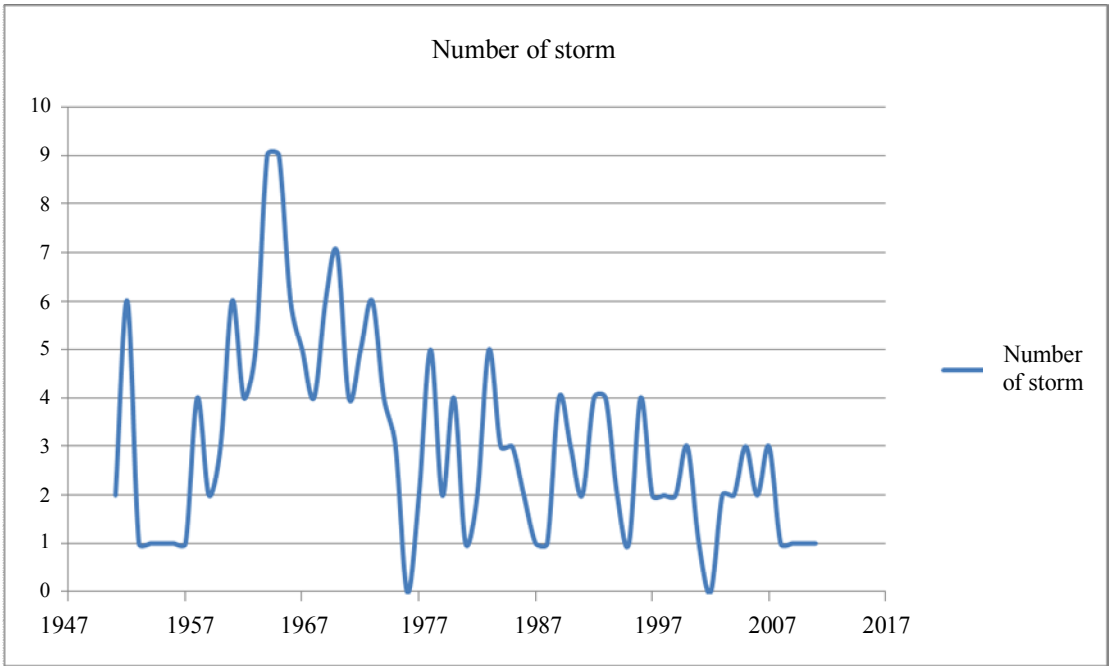

Figure 4.1 Number of storm in Thailand in the period of 61 years (1951 – 2011)

From the figure 4.1 Number of storm in Thailand reveal that Thailand frequently fall victims to natural disasters. According to records from Climatological center, the Office of Meteorological Science Development, the tropical cyclones moved towards Thailand in the period of 61 years (1951-2011) were 186 in total. Each time, the government takes on the main role in the management of disaster response, details are as follows.

Between 1942 -1952, it appears that Thailand's management in response to disasters according to the government's policy, within the case study of the aforementioned period of time, contained no explicit policies and government's management. That is, for the floods that occurred and was recorded in the history was the floods which occurred in Bangkok in 1942, Colonel B. Pibul-songkram set up a committee to collection donations given from civil servants' salary to buy rice for poor citizens; a law prohibiting storage of commodities was also implemented, and after the water decreased, dams were created to store water, namely Bhumibol dam, opened in 1964, and Sirikij dam, opened in 1964.

Between 1953-1962, it appears that there were no policies and management plans following the government's strategies to respond to disasters in Thailand.

Between 1963-1972, it reveals that there were no policies and management plans following the government's strategies to respond to disasters in Thailand.

Between 1973 -1982, it reveals that the management according to government's policy in response to Thailand's disaster, as for the case of floods, in that particular period of time, was done according to the directions of His Majesty the King on October 19th, 1980, and December 16th, 1980. The direction arranged for officers from various government agencies to be presented at the Jit-rada Grande Palace, so the search of solutions for floods in Bangkok and the eastern side of Chao-phraya river could be accomplished. As forth, 1) to hasten the release of water on the eastern side of Bangkok in the rainy season towards the Thai gulf, using various canals as pathways; while regulate and decrease the amount of water from the eastern side that flow into the central of Bangkok, 2) to arrange for 'green districts' in the eastern side of Bangkok, this green areas can be converted to an emergency water pathway towards the Thai Gulf if the need arise, 3) to create the flood prevention system in Bangkok's community district to its completion, 4) to create water storages at various locations in Bangkok according to its appropriateness, 5) to expand or open waterways at locations that passes through highway or trains in order to let large amount of water to flow through conveniently. Related government agencies are Bangkok Metropolitan Office, Royal Irrigation Department, Department of Highways, State Railway of Thailand studied together for thorough solution guideline, and created the system to mitigate and prevent the mentioned floods according to His Majesty's suggestion later on. As of now, each agency has completed projects that can mitigate the floods in the majority areas as desired (Rakkwamsuk and Worawattanasakul, 2012: 5).

Between 1983 – 1992, it was revealed that government's policy in response to disasters in Thailand entailed post-flood's procedures of reducing various types of taxes, regulating of commodities' prices, and a law implementing the storing of commodities, arrangement of have water gates on the east side, west side and at Samut-prakarn according to His Majesty's advice;

Between 1993-2002, it appears that the Thailand's governmental policies' management in response to disasters in that particular period operated according to the advices of His Majesty The King and led to the Monkey Cheek's project and Pasak-Chonlasitt Dam.

Between 2003-2012, it appears that Thailand's governmental policies' management in response to disasters become clearer. There were relevant laws, such as Disaster Prevention and Mitigation Act B.E. 2550, which designated for the bureau of disasters' mitigation and prevention to be the leading bureau in the management of disasters; there were also 2P2R guidelines and disasters management in 2011. Summary in table 4.1and figure 4.2

Table 4.1 Summary of Disaster Management by the Government: Case Study on Floods

Period	Issues			
	Government Policy	**Management approach**	**Related agency**	**Number of deaths**
1942 - 1952	No evidence	- Donations were collected from government officials in order to buy rice and distribute to those suffering from floods. Overstock of goods was prohibited. After the floods, two irrigation dams were constructed: Bhumibol Dam (opened in 1964) and Sirikit Dam (opened in 1974).	Government	No evidence
1953-1962	No evidence	No evidence	Government	No evidence

Table 4.1 Summary of Disaster Management by the Government: Case Study on Floods (cont.)

Period	Issues			
	Government Policy	**Management approach**	**Related agency**	**Number of deaths**
1963-1972	No evidence	No evidence	Government	No evidence
1973-1982	Cabinet no. 42 General Prem Tinsulanonda, March 28, 2523 (1980) Defensive policy no. 8 promoted the coordination of development prevention and mitigation disaster including others public assistance in the country.	- In 1980, flood management was done in accordance with the guidelines by H.M. King Bhumibol Adulyadej. - In 1996, there was a campaign to educate the public about disaster prevention, with support from the military in evacuation and disaster mitigation. Department of Public Works and Town & Country Planning was assigned to be in charge of flood prevention in cities.	Government	No evidence
1983-1992	Cabinet no. 43 General Prem Tinsulanonda, May 20, 2526 (1983) Defensive policy no. 8 promoted that coordination of development prevention and mitigation disaster including others public assistance in the country.	No evidence	Government, Royal Thai Armed Forces	No evidence

Table 4.1 Summary of Disaster Management by the Government: Case Study on Floods (cont.)

Period	Issues			
	Government Policy	**Management approach**	**Related agency**	**Number of deaths**
1993-2002	Cabinet no. 52 General Chavalit Yongchaiyudh, December 11, 2539 (1996) Policy no. 10 was security policy to secure and life security and property in no. 10.2.3 To prevent and solve natural disaster such as flood, drought including emergency assistance and urgently revived people's living after the disaster. Cabinet no. 53 PM Chaun Leekpai, November 20, 2540 (1997) Policy no. 2 was security policy in no. 2.4 to promote and support the army's development in army forces to bring the knowledge as in engineering, sciences and technology, medical, nurses and discipline to develop in army and coordinate to solve the economics, produced the lack of positions and health service to people to social discipline, relief from public danger, keep security of life and property and preserved and resolved the environment and coordinated the other cases to private sectors.	- In 1996, there was a campaign to educate the public about disaster prevention, with support from the military in evacuation and disaster mitigation. Department of Public Works and Town & Country Planning was assigned to be in charge of flood prevention in cities. - In 1997, the government of PM Chuan Leekpai supported the military development in the areas of engineering, sciences and technology, medicines, nursing so that it could play an important role in social and economic development. There was cooperation among public and private sectors in the areas of public health care, social security, safety, disaster mitigation, natural resources reservation, environmental protection, etc. In 1997, the government of PM Chuan Leekpai supported the military development in the areas of engineering, sciences and technology, medicines,	Government, Royal Thai Armed Forces and private sector	816

Table 4.1 Summary of Disaster Management by the Government: Case Study on Floods (cont.)

Period	Issues			
	Government Policy	**Management approach**	**Related agency**	**Number of deaths**
1993-2002 (cont.)		nursing so that it could play an important role in social and economic development. There was cooperation among public and private sectors in the areas of public health care, social security, safety, disaster mitigation, natural resources reservation, environmental protection, etc. - Based on the Cabinet Resolution dated February 29, 2000, the Department of Public Works and Town & Country Planning under the Ministry of Interior was assigned to build up constructions to prevent floods in 9 areas under the ten-year-plan, and to survey and design flood prevention system in the cities in 88 areas of 49 provinces under the five-year-plan. - Based on the Cabinet Resolution dated June 24, 2003, the Department of Public Works and Town & Country Planning was assigned to evaluate the implementation of flood prevention plans and to design the construction of flood prevention system in city areas of Samut Sakhon Province.		

Table 4.1 Summary of Disaster Management by the Government: Case Study on Floods (cont.)

Period	Issues			
	Government Policy	**Management approach**	**Related agency**	**Number of deaths**
2003-2012	Cabinet no. 55 Pol.Lt.Col. Thaksin Shinnawatra, March 23, 2548 (2005) Policy no. 4 was administer natural resource and environment from the beginning to destination to support the community activated to delay current of water or Maew dike followed the King's thought into diversity to biology sustainable and the government investment development resource of physical river resource since upstream, midstream and distributed throughout of effective benefit. The government revived and preserved the soil resource by unfired of dry plant to damage soil surface, reduced the chemical in agriculture including the prevention and revival damage soil by vetiver planted as follow The King's project and preparation of prevention and warning from natural disaster such as flood, drought, tsunami and atmospheric change and continued the standard effectiveness reduction and suffering of people.	- In 2004, the concept of community-based disaster risk management was implemented. Under this concept, several new projects were introduced such as "Mr. Warning" and "One Tambon One Search and Rescue Team (OTOS)" - In 2005, based on the Natural Resource Management Policy and Environmental Protection Policy, the government was in charge of all processes for the environmental protection. - In 2007, the Department of Disaster Prevention and Mitigation was set up. - In 2008, information system was developed for disaster warning such as floods, drought, earthquake, and climate change. - In 2008, based on the policies related to land management, environmental protection and natural resource management, prevention and warning system was set up to reduce the risk and damages. The information and communication technology was used for identifying risk areas.	Government, people, private sector and international	1,740

Table 4.1 Summary of Disaster Management by the Government: Case Study on Floods (cont.)

Period	Issues			
	Government Policy	**Management approach**	**Related agency**	**Number of deaths**
2003-2012 (conts.)	Cabinet no. 57 PM Samak Sundaravej, February 18, 2551 (2008) Policy no. 4 was natural resource and environment of land policy no. 4.4 To have the database system development prevention and natural disaster warning as flood, drought, tsunami and climate change and the suffering of people. Cabinet no. 58 PM Somchai Wongsawat, October 7, 2551 (2008) Policy no. 1.14 was preparation and management water resource to increase effective water system and irrigation. Cabinet no. 59 PM Abhisit Vejjajiva, December 29, 2551 (2008) Policy no. 5 was the land policy, natural resource and environment no. 5.3 Prevention system management including the warning and revived the suffer of disaster by developed the database, warning setting and related structure in sensitive risk land in global warming condition as flood, earthquake or mudslide, drought, tsunami and giant wave in the sea specially in every tourist important points.	- In 2011, based on the policies related to land management, environmental protection and natural resource management, the integrated water management system was used for efficient water management of the underground water and surface water in the 25 water basins of Thailand (based on the concept of 2P2R). - Based on the Prime Minister Office's order No. 193/2011, the Flood Relief Operations Center was established to be head office for disaster mitigation including evacuation, warning, providing foods and necessities to those affected by floods, watch climate changes, inform the public and manage all related works. - Based on the Prime Minister's order No. 17/2011, there were guidelines for problem solving in the areas seriously affected by the disaster (based on Section 31 of the Disaster Prevention and Mitigation Act B.E. 2550).		

Table 4.1 Summary of Disaster Management by the Government: Case Study on Floods (cont.)

Period	Issues			
	Government Policy	Management approach	Related agency	Number of deaths
2003-2012 (conts.)	Cabinet no. 60 PM Yingluck Shinawatra, August 23, 2554 (2011) Policy no. 5 was the land policy, natural resource and environment no. 5.6 The promotion of water administrative integration on surface and underground water in efficiency management up to the river resource and allocate enough for useful. Twenty-five river basins integration supported the farmers to diverse water for the agriculture to be the water source for the farm and garden and water diversion from other water resources and managed water structure system effectiveness distributed into the areas to support demand of economic and consumer no. 5.7 To immune and prepare in adjusting and influence of climate change and natural disaster by knowledge the development and database of climate change to increase of possible forecast, predict and speculate the risk of climate change and natural disaster in the country and in the risk areas.	- Based on the Prime Minister's order No. 20/2011, Royal Irrigation Department released water from eastern part of Rapeepat Canal to the Gulf of Thailand. Ridges of the following canals were raised so that they can contain more water: western part of Rapeepat Canal, Rangsit Prayoonsak Canal and lower part of Hok Wa Canal. After the crops had been harvested, Northern and Southern areas of Rangsit field were used to slow down the flow. 37 flow thrusters were equipped in Nakhonchaisri District, Nakhon Pathom Province and 14 flow thrusters were equipped in the irrigation areas of Samut Sakhon. - Based on the Prime Minister Office's order No. 253/2011, the Strategic Committee for Water Resources Management (SCWRM) was set up, according to Prime Minister Office's Regulation on Strategic Committee for Water Resources Management B.E. 2554.		

Table 4.1 Summary of Disaster Management by the Government: Case Study on Floods (cont.)

Period	Issues			
	Government Policy	**Management approach**	**Related agency**	**Number of deaths**
2003-2012 (conts.)	The strategic of long term in preparation promoted in urgent warning and readiness of variance at present time to be the basic of long term changing to protect the disaster specially flood, tsunami, earthquake and landslide to promote mechanism object to community information and local in addition to increase the capacity to handle the climate change and disaster by local community.	- In 2012, PM Yingluck Shinnawatra assigned the Department of Public Works and Town & Country Planning to build ridges along southern part of Rangsit Prayoonsak Canal, from Chulalongkorn Gate to Pak Klong Banmai Gate near Chao Phraya River.		

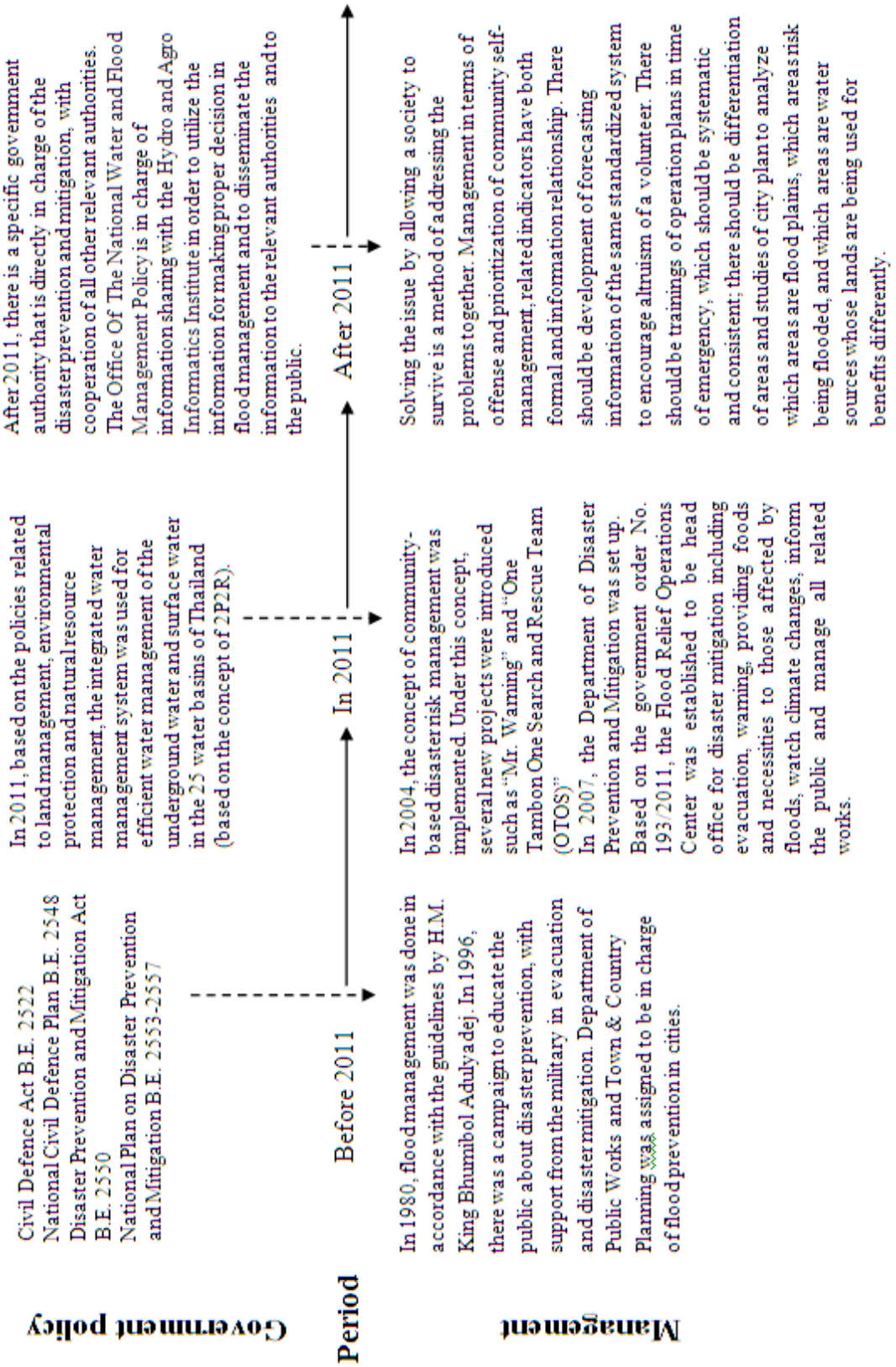

Figure 4.2 Evolution of government policy and management

4.1.2 Factors or conditions that affect the government management in response to disaster in Thailand: Case studies of floods

Documents in this study were divided into two groups: primary documents and secondary documents. Primary documents consisted of historical documents, laws, announcements, acts, rules and regulations related to disasters and floods occurring in 1942-2012. Secondary documents consisted of printed materials, newspapers, records and statistics of related organizations/offices, textbooks, research, articles and other academic documents.

The study found that these factors or conditions could be divided into three categories: technical factors, human performance and organizational performance, as adapted from Bayrak (2009: 95). He proposed that the three factors affected the system's ability to deal with a disaster. These factors are essential to the planning and implementation of the disaster management process, in addition to preparation, protection, response and recovery as table 4.2

Table 4.2 Factors or conditions that affect the government management in response to disaster in Thailand

Management	Conditions/Factors Affecting Disaster Management	Related Agencies/Institutes
Government was key performer in disaster management. In most cases, management process started after the disaster had occurred. In rehabilitation process, the government received support from many countries.	There were 3 factors or conditions that affect the government management in response to disaster: technical factors, human performance and organizational performance (adapted from Bayrak, 2009: 95). These 3 factors can be described as follows: - Technical Factors: structural and non-structural measures were not practiced because when there was a flood in 1942, reservoirs had not yet been constructed (Irrigation Development Institute, 2012: 2).	Office of the Civil Defense

Table 4.2 Factors or conditions that affect the government management in response to disaster in Thailand (cont.)

Management	Conditions/Factors Affecting Disaster Management	Related Agencies/Institutes
	The implementation of the 34 laws related to disaster management was not done in an integral manner. Lack of unity and justice in resource distribution to the related organizations/offices made matter worse (Tingsanchali, et al., 2003: 6-15). - Human Performance: These factors consisted of knowledge, skills, experiences, understanding, training and awareness. The government bodies in charge of disaster management consisted of various ministries and departments in central and local authorities. The complicated organizational structure of related government bodies made it slow in response to the disaster. Moreover, there was no preventive measure. Most of the time, the disaster management was done after the disaster had occurred (Tingsanchali, et al., 2003: 6-15). - Organizational Performance: There was lack of good cooperation between government and private sectors as well as autonomous organizations and civil society in disaster management. There was no specific government authority under the Office of Civil Defense that coordinate among these organizations (Tingsanchali, et al., 2003: 6-15).	Office of the Civil Defense
The government, with cooperation from the Military and private sectors, managed the disaster after it had already occurred. Rehabilitation was part of the response to the	- Technical factors consisted of structural measures and non- structural measures. The structural measures in flood management were done under the advice of His Majesty King Bhumibol Adulyadej. Non- structural measures consisted of laws and policies. - Human performance factors were lack of skills and experiences in responding to the disaster and ...	Office of the Civil Defense

Table 4.2 Factors or conditions that affect the government management in response to disaster in Thailand (cont.)

Management	Conditions/Factors Affecting Disaster Management	Related Agencies/Institutes
disaster. In this process, there was support from many countries.	lack of awareness on the environmental issues. - Organizational performance factors were no specific government body that was charge of this matter and complicated management process which caused confusion among stakeholders.	
The government, with cooperation from private sectors, civil society and local authorities, changed strategies in disaster management. In the past, disaster management focused on the response to the disaster and rehabilitation. In the new disaster management process, the emphasis was made on the prevention as well as the response to the disaster and rehabilitation. Support from other countries also emphasized both the prevention and rehabilitation. They provided experts and advice for Thai staff to be more prepared to the disaster.	- Technical factors consisted of structural measures and non- structural measures. The problems on structural measures were related to dikes, water flows and high tide. Non- structural measures were: conflict among people (in the area near Rangsit Canal, for example), settlement of people and use of the land in the affected areas, laws and policies. - Human performance factors were knowledge of the persons in charge in disaster prevention and preparedness, response to the disaster and rehabilitation; knowledge of general public in disaster prevention and preparedness. - Organizational performance factor was related to the communication channel of the government to the public. However, this problem was solved after the government reform in 2002 as the Department of Disaster Prevention and Mitigation, under the Civil Defence Act B.E.2522 and the National Plan on Civil Defence B.E.2545, was authorized to set up preventive measures for the government, private sectors and civil society (Tingsanchali, et al., 2003: 6-15).	Department of Disaster Prevention and Mitigation, Royal Irrigation Department, Department of Water Resource, Department of Public Works and Town & Country Planning, and Thai Meteorological Department.

4.1.3 Related laws

For the three laws directly related to disaster management (Civil Defence Act B.E. 2522, National Civil Defence Plan B.E. 2548 and Disaster Prevention and Mitigation Act B.E. 2550), they emphasize on disaster management by following regular steps. The disasters happening in the past were not complicated and could be handled by one government unit. In 2005, there was a progress in disaster management. More proactive approaches were used for disaster prevention. Communication system was developed and more participation of the community was encouraged. According to the Disaster Prevention and Mitigation Act, the main government unit in charge of disaster management (formerly known as public disaster) was the Department of Disaster Prevention and Mitigation. In this act, roles of the authority in charge are clearly defined in order to manage disasters which are getting more serious. Summary in table 4.3

Table 4.3 Civil Defence Act

Civil Defence Act B.E. 2522	National Civil Defence Plan B.E. 2548	Disaster Prevention and Mitigation Act B.E. 2550	Results of comparison
Civil Defence Act B.E. 2522 emphasized on the structure and authority of the organization in charge. The structure of disaster management was clearly stated. This approach was appropriate for the disasters that were not so complicated and could be handled by one government unit (Singhasem, 2011: 178-179).	National Civil Defence Plan B.E. 2548 was implemented under the Civil Defence Act B.E. 2522. According to this Plan, the Civil Defence Secretariat Office would make three-year plans to be guidelines and for the directions and policies for the disaster management. The emphasis was on the disaster prevention,	Department of Disaster Prevention and Mitigation was main authority in coordinating with other related sectors for drafting the Action Plan and Budget Plan B.E. 2553-2557 under the Master Plan (Singhasem, 2011: 183).	According to the Disaster Prevention and Mitigation Act B.E. 2550, the Department of Disaster Prevention and Mitigation was the government unit in charge of disaster (floods) management, policies and plans. With cooperation from all concerned sectors, a five-year plan would be drafted to be used as guidelines for

Table 4.3 Civil Defence Act (cont.)

Civil Defence Act B.E. 2522	National Civil Defence Plan B.E. 2548	Disaster Prevention and Mitigation Act B.E. 2550	Results of comparison
	using proactive approaches to reduce the risks and damages. Warning systems were developed at the local levels to the national levels. Main communication system, supporting communication system and additional communication system were well managed as they were equally important in case of an emergency. Disaster management was done in an integral way, with cooperation from the community (National Disaster Prevention and Mitigation Committee, 2009: 18).		the administration and problem solving.

The study of the policy process found that the Civil Defence Act B.E. 2522 authorized the central government unit to be in charge of all disaster management. However, the Disaster Prevention and Mitigation Act B.E. 2550 authorized several units at different levels to be in charge of disaster management, from policy formation to policy implementation. Besides, more participation from local authorities was

encouraged. The policy process of the laws related to disaster management can be compared as follows table 4.4

Table 4.4 Comparison between Civil Defence Act B.E. 2522 and Disaster Prevention and Mitigation Act B.E. 2550

Policy Process	Civil Defence Act B.E. 2522	Disaster Prevention and Mitigation Act B.E. 2550
Policy Formation	This act was formed because the existing air defense act did not cover all kinds of disaster. Based on the Civil Defence Act B.E. 2522, the available resources i.e. human resources, machines, tools, equipments, building and areas, experiences and skills would be integrated and used in an effective way (Thailand Research Fund, 2012: 4-5).	- This act was formed after the government reform, focusing on the new structure of the disaster management that emphasized on integrated resources management and administration as well as the cooperation among related sectors. **- National Plan on Disaster Prevention and Mitigation B.E. 2553-2557** was set up as a guideline for flood prevention including the mitigation and recovery for those affected by the floods. The 10th National Economic and Social Development Plan emphasized that the environmental protection should be done together with the disaster management. Under this Plan, the three-year implementation and budget plan was made for the year 2553-2012. - **The National Plan on Disaster Prevention and Mitigation B.E. 2553-2557** was set up as a guideline for flood prevention including the mitigation and recovery for those affected by the floods. The 10th National Economic and Social Development Plan emphasized that the environmental protection should be done together with the disaster management. Under this Plan, the three-year implementation and budget plan was made for the year 2010-2012.

Table 4.4 Comparison between Civil Defence Act B.E. 2522 and Disaster Prevention and Mitigation Act B.E. 2550 (cont.)

Policy Process	Civil Defence Act B.E. 2522	Disaster Prevention and Mitigation Act B.E. 2550
Policy Implementation	Central	The policies related to **the Disaster Prevention and Mitigation Act B.E. 2550** were implemented by government units at the central, local and provincial levels with cooperation of private sectors and other stakeholders (Singhasem, 2011: 182-186).
Policy Evaluation	-	-

The policy formation was done by the authorities at the national and international levels. The main international authority was the ASEAN Committee on Disaster Management (ACDM), which was set up upon the ASEAN Agreement on Disaster Management. Each state member needs to make a list of the available resources (human resources and materials) for the ASEAN Standby Arrangement for Disaster Relief and Emergency Response so that state members can cooperate with each other when there is a disaster in the region. Based on the Agreement, ASEAN Cooperation Network was set up as the humanitarian assistance coordinator for policy implementation and activities of member countries. The Agreement was signed by Foreign Ministers of member countries on July 26, 2005 and was enacted on December 24, 2009.

The AADMER was aimed for the cooperation among ASEAN countries in the activities during different phases of disaster management: pre-disaster (disaster risk assessment and monitoring, warning, prevention, preparedness), during disaster (emergency response, mitigation) and post-disaster (recovery and reconstruction) as well as cooperation in research, scientific and technical cooperation. However, member countries should make best effort in managing the disaster by themselves before asking for support from other countries (Department of Disaster Prevention and Mitigation, 2012). Guidelines of disaster management by AADMER are as follows:

1. The preparedness system was set up for disaster response and disaster mitigation. The Standard Operating Procedure (SOP) was set up. The ACDM had made a draft of standard operating procedure as a guideline for preparedness and cooperation among member countries in response to emergency. This guideline consists of 6 chapters: Preamble, Organizational Management, Preparedness, Disaster Assessment and Monitoring, Cooperation and Support, Use of the Available Resources, Capacity of the Military and Civil Sectors. Member countries shall take turn hosting the training and evacuation drills.

2. ASEAN Disaster Evaluation Team shall be set up.

3. Center for Humanitarian Assistance Cooperation shall be set up to promote cooperation and coordination among member countries, United Nations and other international organizations.

4. Ministerial Meetings of member countries shall be organized.

5. ADMER Fund shall be set up under the AADMER with donations from member countries, international organizations/agencies on a voluntary basis.

The authorities in charge at the national level consist of the Prime Minister, Disaster Prevention and Mitigation Committee and the National Safety Commission. These 3 government bodies have authorities in disaster management as stated in the Disaster Prevention and Mitigation Act B.E. 2550.

The institutional frameworks of disaster management in other member countries consist of National disaster Management centre Ministry of Home Affairs (Brunel Darussalam), National Committee for Disaster Management (Cambodia), National Disaster Management Agency (Indonesia), National Disaster Management Office, Department of Social Welfare, Ministry of Labor and Social Welfare (Lao PDR), National Security Council, Prime Minister's Department (Malaysia)

The institutional frameworks of disaster management at the national level consist of Strategic Steering Sub-Committee on Disaster Prevention and Mitigation, National Headquarter of the Disaster Prevention and Mitigation, National Administrative Office of the Disaster Prevention and Mitigation, and Local Administrative Office of the Disaster Prevention and Mitigation.

The government authorities in charge of disaster management at the provincial level consist of the Governor of the Province. The authorities at local levels are divided into: sub-district levels, municipal level, cities and districts in Bangkok. These authorities include: Chief Executive of Tambon Administration Organizations (TAO), Deputy Chief Executive of TAO, Chief Administrator of TAO, Tambon headman, village headman, mayor, municipal clerk, district chief, deputy district chief, district directors of Bangkok Metropolitan Administration (BMA), the Governor of Bangkok, Deputy Governor of Bangkok, Pattaya City Mayor, Deputy Pattaya City Mayor, rescue teams.

For the policy evaluation process, there is no particular unit assigned to be in charge of disaster management. The institutional frameworks and authorities of disaster management can be summarized in Table 4.5.

Table 4.5 Actors classified by policy process

Policy Process	Level of Government			
	International	National	Province	Local
Policy Formation	- ASEAN Committee on Disaster Management	-Prime Minister -National Committee on Disaster Prevention and Mitigation - National Disaster Defence Committee	-	-

Table 4.5 Actors classified by policy process (conts.)

Policy Process	Level of Government			
	International	**National**	**Province**	**Local**
Policy Implementation	- National disaster Management centre Ministry of Home Affairs (Brunel Darussalam) - National Committee for Disaster Management (Cambodia) - National Disaster Management Agency (Indonesia) - National Disaster Management Office, Department of Social Welfare, Ministry of Labor and Social Welfare (Lao PDR) -National Security Council, Prime Minister's Department (Malaysia)	- Strategic Steering Sub-Committee on Disaster Prevention and Mitigation -National Headquarter of the Disaster Prevention and Mitigation -Local Administrative Office of the Disaster Prevention and Mitigation	**Province** Governor	**Tambon Administration Organizations (TAO)** - Deputy Chief Executive of TAO - Chief Administrator of TAO - Tambon headman - village headman **Municipality** - mayor - municipal clerk **District** - district chief - deputy district chief - local representatives **BMA District Offices** - district directors of BMA **Rescue Teams BMA** - Governor of Bangkok -Deputy Governor of Bangkok

Table 4.5 Actors classified by policy process (conts.)

Policy Process	Level of Government			
	International	**National**	**Province**	**Local**
Policy Implementation (conts.)	-Relief and Resettlement Department (Myanmar) - National Disaster Risk Reduction and Management Council and Administrator, Office of Civil Defense (Philippines) -Singapore Civil Defense Force (Singapore) -Department of Disaster Prevention and Mitigation (Thailand) -Directorate of Water Resources, Ministry of Agriculture and Rural Development (Vietnam)			**Pattaya City** - Pattaya City Mayor -Deputy Pattaya City Mayor
Policy Evaluation	-	-	-	-

Table 4.1-4.5 illustrate public policies from past to present. From the data derived from the Ministry of Industry (2007), we can conclude that there are 3 phases of public policies, management and types of disaster.

Public Policies before 2011

Most policies before 2011 emphasized on the economic and structural development, employment, safety, security and air defenses. There was no specific government authority that was directly in charge of disaster management. Laws related to disaster management included Civil Law on Disaster Prevention Act B.E. 2522, which focused on the duties of civil society on disaster prevention. Main content of this Act focused on the hierarchy of the authority so that the disaster is managed in the same direction. This kind of management was applicable at that time as the disaster was not complicated and could be controlled by one public authority (Singhasem, 2011: 178-179).

Disaster management by the government was not proactive. Since most disaster did not affect large areas, the responses from the government were mostly about rehabilitation. Moreover, most disasters occurring before 2002 were natural disasters such as floods, landslides, mudslides. At that time, Royal Irrigation Department was the sole government authority in charge of disaster management. However, there were changes after the government reform in 2002. Roles and duties of the Departments in charge of water management were not integrated. Hence, water management was not done in an integral, cooperative way. In addition, before 2007, there were many laws related to water management. When the Disaster Prevention and Mitigation Act B.E. 2550 was issued in 2007, roles and duties of relevant authorities were clearly defined. Department of Disaster Prevention and Mitigation was set up to manage 14 types of disaster. Disaster management was done in an integral way, with cooperation of other authorities at all levels. Roles and duties of all relevant authorities were defined. So the response to the disaster is efficiently done in accordance with the 4 levels of disaster (international, national, provincial and local), which is different from the disaster management before 2002. At that time, policy setting and implementation were done by the government and military.

Public Policies in 2011

During the year 2011, public policies were set up for water management at the country level. The surface water and groundwater are efficiently managed and controlled. Water is sufficiently provided to the public. All 25 water sources are efficiently managed, with the concept of 2P2R. In this year, there was a big flood which affected large areas in Bangkok and many provinces. After the flood, several factors were analyzed: laws, the nature of the disaster, policies and disaster management done by public sectors. Concerning the nature of the disaster, in that year, there were 5 tropical cyclones which affected large areas. In term of laws, there was the Disaster Prevention and Mitigation Act B.E. 2550. According to this act, the Department of Disaster Prevention and Mitigation is the main government authority that is directly in charge of disaster management in Thailand. The missions of the Department include: Set up policies and guidelines on disaster management and, with cooperation of related authorities, set up a five-year master plan for disaster prevention and mitigation, evacuation and rehabilitation of those who are affected by floods, windstorm and mudslides. This five-year master plan shall be used as guidelines for flood management. According to this plan, the Department of Disaster Prevention and Mitigation is the main authority in charge of the activities and cooperation, and to set up action plan and budget for 2010-2014 under the master plan so that all relevant authorities can follow (Singhasem, 2011: 178-179).

The ways the government managed the disaster in 2011 were not completely in accordance with the Disaster Prevention and Mitigation Act 2007. As a result, the disaster management was slow and not done in a timely manner. Moreover, the authorities working on this issue did not follow the same directions, causing confusion and problems such as conflicts among people, conflicts between central government and Member of Parliament (MP) in the provinces. Disaster management was done separately. Good decisions were almost impossible due to unclear communication and unreliable information. Another problem was that there was no public awareness on the issue. Moreover, the Department of Disaster Prevention and Mitigation was in charge of all 14 types of disaster while there were not enough man power and resources.

Public Policies after 2011

The policies after 2011 focus on water management at the country level. The surface water and groundwater are efficiently managed and controlled. Water is sufficiently provided to the public. All 25 water sources are efficiently managed, with the concept of 2P2R. The upstream, midstream and downstream of water sources is also efficiently managed.

After 2011, there is a specific government authority that is directly in charge of flood prevention and mitigation. All relevant authorities should exchange information. The Office Of The National Water and Flood Management Policy is in charge of information sharing with the Hydro and Agro Informatics Institute in order to utilize the information for making proper decision in flood management and to disseminate the information to the relevant authorities and to the public. The response to the disaster focuses on the preparedness and prevention. However, during the 3 above mentioned periods, disaster management was done from central authority as a Single Command.

Case study analysis: Three phases of disaster management (focusing on flood management) were analyzed: The first case study was done with flood management before government reform which was based on the concept 2R (Readiness and Response). This concept was introduced by the Department of Disaster Prevention and Mitigation. After the government reform, the concept of 3E (Engineering, Education and Enforcement) and 4R (Reduction, Readiness, Respond, Recovery) were introduced (Tingsanchali, et al., 2003: 6-25). At present, the concept of 2P2R (Prevention/Preparation/Response/Recovery) is used by the current government of PM Yingluck Shinnawatra.

Case Study of Flood in 1995 under the government of PM Banharn Silpa-acha. The flood in 1995 was caused by heavy rain due to Intertropical Convergence Zone and Southwest monsoon which covered Chao Phraya River including other storms such as Gary, Helen, Lowis and Nina). The water flow of Chao Phraya River in Nakhon Sawan Province was 4,820 cubic meter/second. At that time, the Bhumibol Irrigation Dam could store all water from Ping River. But, due to excessive amount of

water, Sirikit Irrigation Dam released water into the river. The amount of water released from Sirikit Irrigation Dam from August to October was 17% of the water in Chao Phraya River. Water flow at the end of Chao Phraya Dam was 4,538 cubic meter/second, causing overflow along Chao Phraya River areas from Nakhon Sawan to Bangkok. There was also excessive rain near Pasak River, causing overflow in Rama VI Dam. Water flow at Rama VI Dam was 1,480 cubic meter/second, causing floods from the end of the Dam to Ayutthaya Province (Royal Irrigation Department, 2012: 29).

The government managed the flood by releasing water into the sea and clearing trashes from the canals. Moreover, HM King Bhumibol gave advice about 5 methods for flood management; 1) Build levees; 2) Provide Green Belt as floodways and to prevent the expansion of the city; 3) Dig new canals; expand and clean old canals; 4) Build flood storage; and 5) Expand flood ways along railroads and motorways. In conclusion, flood management in 1995 was based on 2R (Readiness and Response). Based on the top-down administration, government was key actor of flood management (Phromlert, 2005: 28) as shown in Figure 4.3.

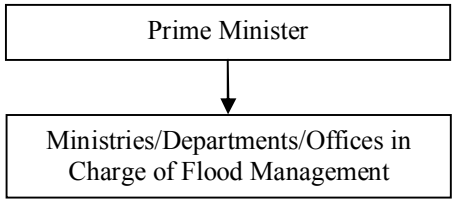

Figure 4.3 Structure of Disaster Management in 1995
Source: Applied from Santiwong, 1990: 257,313 cited in Phromlert, 2005: 27.

Case study of flood in 2006: At that time, General Surayud Chulanont was the Prime Minister of Thailand. There were floods and mudslide in lower areas of Northern part of Thailand. There was unusually heavy rain in lower areas of the North for about one week in late May 2006, causing mudslide and floods during the night of May 22 to early morning of May 23, 2006, which caused a lot of damages to lives and properties especially in Uttaradit Province. More than 75 people in this province were killed from this disaster. 116 people from 5 provinces affected by the floods and mudslide were missing or dead. Flood management was done with 3E concept

(Engineering, Education and Enforcement) and 4R (Reduction, Readiness, Respond, Recovery). Management structure was clearer. The authorities in charge were assigned to take responsibility according to the government reform in 2002 (as shown in Figure 4.4). As lesson learned from the year 1995, the constructional measures (such as the construction of irrigation dams) were used. In 2006, flood management by the community was more recognized and more effective. Examples of flood management projects included Bangrakam Model at Banrakam Sub-District, Banglen District, Nakhon Pathom Province. This project area is located about 17 kilometers from Banglen District, with the area of 18,750 rai (about 30 square meter). The soil in this area is fertile with water supply all over the year as it is located near Tha-Chin River. Banglen District is divided into 2 sides: eastern and western side. There are 9 villages in eastern part and 6 villages in western part, with 24 canals in the whole district. Northern part of the district is next to Lam Phya Sub-District and Kong Nok Krathung Sub-District of Banglen District, Nakhon Pathom Province. Southern part of the district is next to Bang Kaew Fah Sub-District and Bang Pra Sub-District of Nakhon Chaisri District, Nakhon Pathom Province. Eastern part of the district is next to Narapirom Sub-District and Klong Yong Sub-District of Puttamonthon District, Nakhon Pathom Province. Western part of the district is next to Don Putsa Sub-District and Ban Luang Sub-District of Don Toom District, Nakhon Pathom Province.

Since 1995, there had been attempts to prevent flood. In 1995, levees were built in different areas. However, in 2006, these levees were destroyed by floods. New levees were built to protect important areas such as roads, economic areas, crowded communities and government offices. Farmers were asked to plant rice twice a year instead of three times a year in order to prepare the field as flood storage toward the end of the year. The constructions after 2006 were all made to be safe from flood i.e. tall, one-storey houses. Several ways of disaster preparedness were mentioned such as evacuation and food transportation. Vegetable Seeds Bank was part of restoration and recovery program after the floods. Under this program, vegetable and plant seeds were advanced for farmers. After harvesting, they can return the seeds to the program. Local technical colleges helped fixing damaged houses as part of restoration programs (Khaosod, 2011).

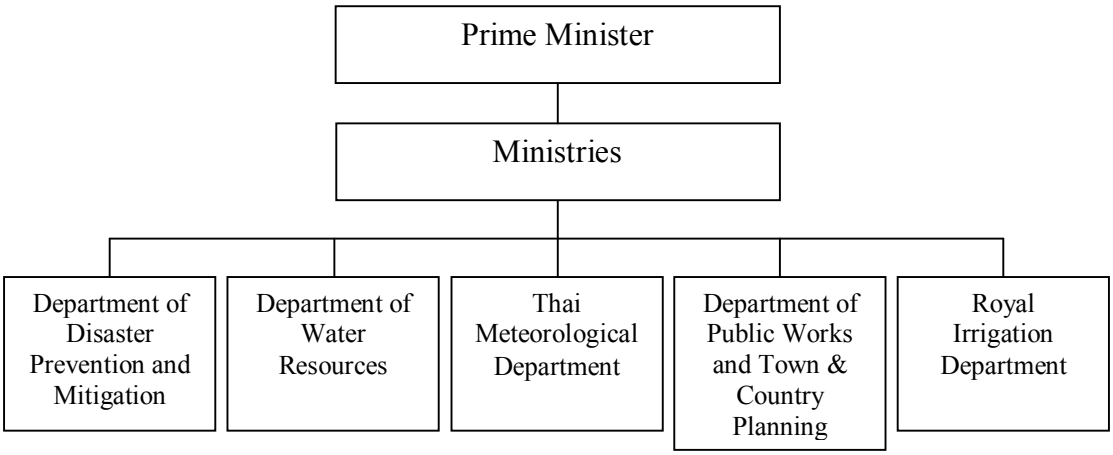

Figure 4.4 Structure of Disaster Management in 2006

Source: Applied from Santiwong, 1990: 257,313 cited in Phromlert, 2005: 27.

Case study of the flood in 2011 found that there were different ways of flood management as follows:

1. Flood management by the government (Figure 4.4);

1.1 In 2011, an Emergency Operation Center was established for the prevention and mitigation of floods, storm and landslide (Order No. MOI 281/2011 dated May 31, 2011).

1.2 Minister of Interior called for preparedness for floods, storm and landslide. Emergency Operation Centers were established at the provinces, districts and local administration offices (June 1, 2011). Two meetings were held at Central Emergency Operation Center on July 1, 2011 and August 20, 2011 with the following agenda:

- Set up measures for disaster management
- Every authority in charge was assigned to establish an emergency operation center.
- Establish monitoring center for warning and rescue

1.3 Based on the meeting of the Committee on the Emergency Operation Center concerning the prevention and mitigation of floods, storm and landslide on August 20, 2011, the Prime Minister issued the policies on the

prevention and mitigation of floods based on the concept of 2P2R (Prevention / Preparation / Response / Recovery) at the One Stop Service Center.

1.4 Based on the Prime Minister Office's order No. 137/2011 dated August 25, 2011, the Committee on the Administration and Management of Floods, Storm and Mudslide was appointed.

- Deputy Prime Minister/Minister of Interior as Chairperson

- Permanent Secretary, Ministry of Interior as Vice Chairperson

- Member, Sub-Committee of the Department of Disaster Prevention and Mitigation as Members and Secretary. and the Center for the Administration and Management of Floods, Storm and Mudslide was established.

- Permanent Secretary, Ministry of Interior was the Director of the Center for the Administration and Management of Floods, Storm and Mudslide.

1.5 The Committee on the Administration and Management of Floods, Storm and Mudslide appoint a subcommittee of the four principles 2P2R.

1.6 Based on the Prime Minister Office's order No. 193/2011 dated October 8, 2011, Flood Relief Operations Centre at Don Mueang Airport was set up.

- Deputy Prime Minister Pracha Promnok (Minister of Justice), is the director of the center.

- Deputy Prime Minister and Advisor to the Minister

- Secretary of the Interior Deputy Director of Ministry of Interior (By Department of Disaster Prevention and Mitigation) and Disaster Assistance findings led to a weekly cabinet meeting.

1.7 Minister of Interior called for preparedness for floods, storm and landslide. Emergency Operation Centers were established at the provinces, districts and local administration offices (June 1, 2011). (as shown in Figure 4.5).

Thailand: Government agencies, such as: the Flood Relief Operations Centre, Help Victims Division Patrol, and The National Police Agency organised a special performance security in life and property, and the Traffic Authority took on applicants to pay for water from December 2011, which needed to be paid no later than January 2012. The Department of Disaster Prevention and Mitigation payment remedied 5,000 Baht per family, with 62 provinces having been connected with such remedies. The army mobilised troops to distribute aid to the people, and affected civil groups and organisations also contributed as well. Volunteers helped to organise relief and assistance to some areas, and the private sector, such as the Siam Cement Group, arranged buses for the transfer of flood victims. Charoen Pokphand Group provided survival bags, while 7-eleven provided food. The Singchai Industry Company and municipal officers of Samut Sakhorn province cooperated to manage the Pradit canal project, which used a budget of more than 3 million baht.

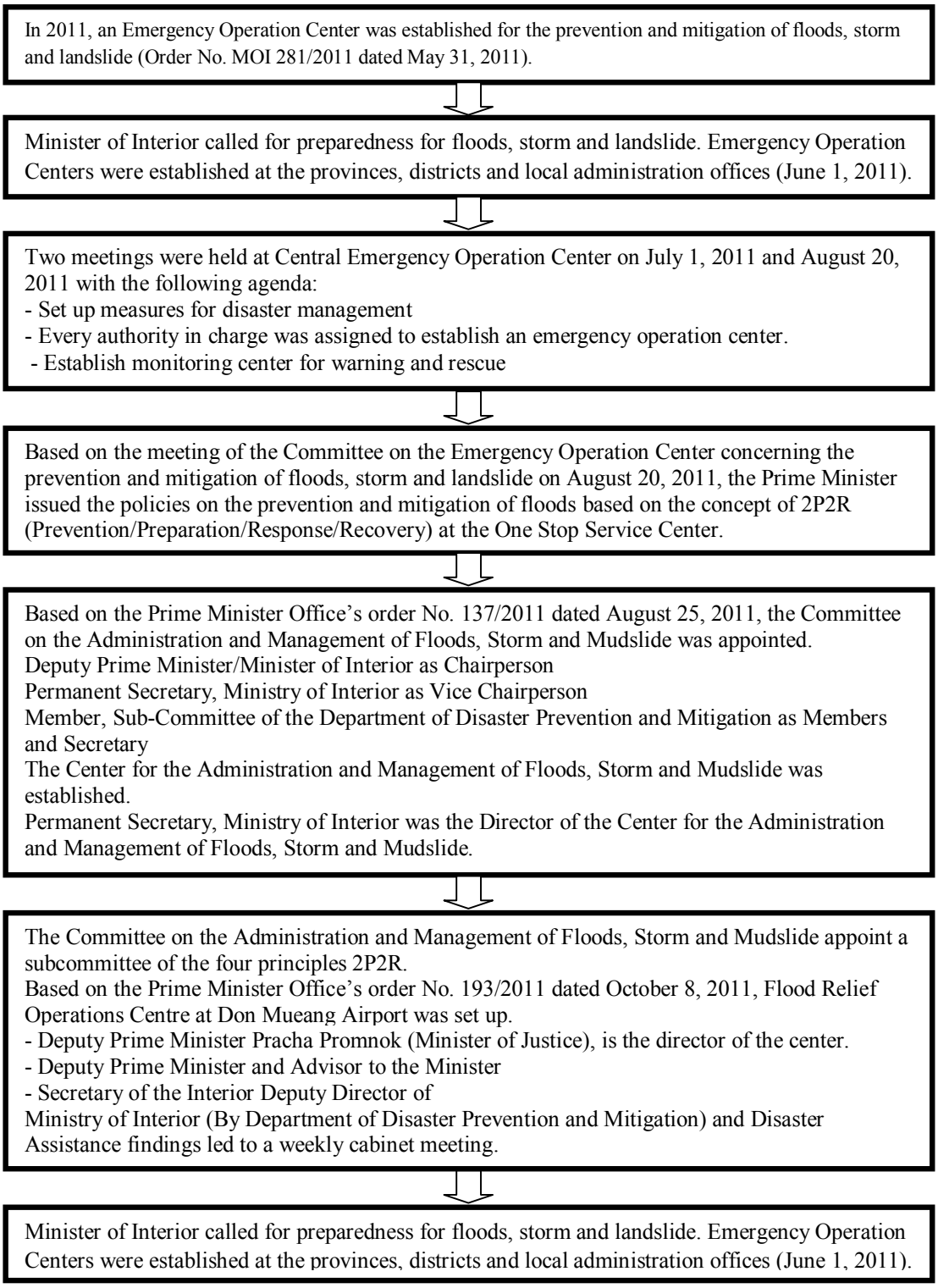

Figure 4.5 Flood Management in 2011

Source: Chanachaiwibulwat, n.d., 29-31.

2. Flood management by local authorities;

Other organizations such as local administration organizations, communities, civil society and international organizations also play some roles in the prevention, preparedness, response and recovery. Pakkred City Municipality was a good example of cooperation among local authorities in flood management. Due to the experience of floods in 1995, people in this area learned how to manage the floods in 2011. In order to reduce damages from floods, some areas needed to be used as floodways. The owners of these areas of land understood and contributed their land as flooded areas in order to protect the economically important areas. They knew that if all areas were flooded, there would be no foods and necessities for all of them. People in the community had common goals and everybody followed. So they could survive during the floods. Compared with Bangkok, the administration of Nonthaburi Province was more decentralized in term of flood management. Nonthaburi City Municipality and Pakkred City Municipality were more independent in flood administration and management. For example, they could make quick decision in negotiating with local people and providing mechanical equipments and technical support in a timely manner (Sirisrisak, 2012: 5-6).

Pakkred City Municipality Model consisted of: the Executive Board Member of the City Municipality as Chief of the Municipality Center of Flood Prevention. The Municipality Office served as the information center such as water level reporting, monitoring, preparing staff to handle the situation and cooperating with other offices. Division of Technical Services and Planning set up action plans for flood prevention and PR plans for public understanding. This division also provided information and analyzed lessons learned. The Division of Public Health and Environment was responsible for recovery, health care and environmental protection during the flood. The Division of Social Welfare was responsible for delivering foods and necessities to the victims, providing initial support and encouraging more community participation. The Office of Technical Support was responsible for providing information, building flood barriers, providing machines, equipments and construction materials, controlling water level, maintaining bridges, etc. The Division of Education was in charge of preparing schools and universities to be used as evacuation places for the victims. The Division of Finance was in charge of supplying

and controlling the use of equipments and materials, monitoring the use of donations and budget for emergency cases. (as shown in Figure 4.6).

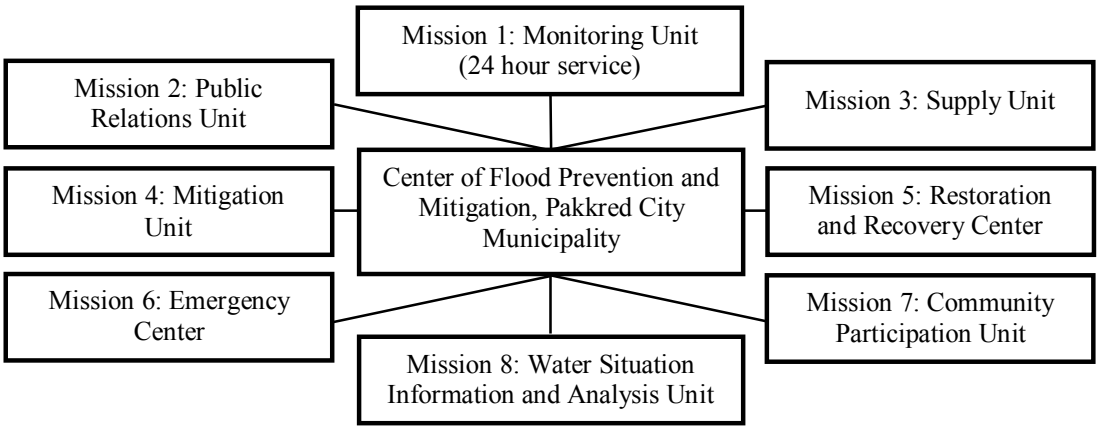

Figure 4.6 Pakkred city municipality model

Source: Pakkred City Municipality, n.d., 9.

3. Flood management by the communities.

Flood management by the communities is a self management model by local wisdom and community participation such as Mahidol Salaya model, which was an example of successful flood prevention by the community. Flood barriers were built in the front part and rear part of floodways. Sandbags used as barriers in rear part were reinforced by woods and plywood (Thai Post, 2013). The flood management by the communities is a self-management, which was based on the experience and knowledge of the community.

4. Flood management among countries.

There was also international cooperation in flood management during that period of time. For example, there was a project, “Project on the Promotion of Water Management during Crisis with Protection of the Ecosystem of the Water” as G2G cooperation between German International Cooperation (GIZ) and Department of Water Resources of Thailand. This is a three-year project with the budget of 2.8 million Euro (approximately 112 million baht). Under this project, the German government supported Thai government in disaster prevention such as floods and drought in the areas near Chee River in the Northeast of Thailand and Tadee River in Nakhon Sri Thammarat (Matichon online, 2013). There is also cooperation among

ASEAN member countries such as ASEAN Standby Arrangement for Disaster Relief and Emergency Response). Each member country of ASEAN is required to make a list of support (human and/or technical support) that they can render to other countries in case of an emergency. The ASEAN Coordinating Center for Humanitarian Assistance on Disaster Management is in charge of supporting the activities under action plans. Data shall be shared among member countries to raise awareness and to share responsibilities.

From the above 3 case studies, it can be concluded that the government managed floods under the Incident Command System (ICS). From the study of flood management in 1995 and 2006, it was found that the government handled the urgent situation case by case. There were no proactive measurements to prevent floods. During this time, constructional measurements were used such as the construction of irrigation dams, check dams, reservoirs, levees, etc. In 2006, there was more community participation in flood management. As people had experienced floods in 1995, they had lessons of how to manage floods. Flood barriers were built in order to protect important areas of the community. Bangrakam Model is a good example of flood management by the community. People learned how to survive and how to support one another during the flood. In 2011, the government had more proactive measures for flood management such as the prevention and preparedness for floods. There was also more community participation in flood management from people in the areas affected by floods at earlier periods of time. There was cooperation among people in the community as well as local authorities. Nowadays, there is cooperation at the international level to be prepared for disaster at the global level such as ASEAN Standby Arrangement for Disaster Relief and Emergency Response. Each country must do resource report, which includes material and man in order to help together in region.

During the 19th ASEAN Summit, there was a signing of an agreement to launch the ASEAN Coordinating Centre for Humanitarian Assistance: AHA Center in Jakarta, Indonesia to coordinate help between ASEAN member countries and the assistance from outside the region in case of disasters. Moreover, Thailand initiated the issuing of statement ASEAN Leaders' Statement on Cooperation in Flood Prevention, Mitigation, Relief, Recovery and Rehabilitation. It was the first time that

ASEAN clearly determined the cooperation in terms of water management as well as reconstruction and restoration after disasters.

In addition, ASEAN gained cooperation from APG, a civil society organization which is the co-working group of 7 international NGOs with the main objective to strengthen the work mechanism between the civil society and ASEAN for the development of countries in this region in various aspects (ASEAN Department, 2012: 023). When considering the assistance at international level, it was discovered that, in 2011, countries worldwide offered help mainly in the stage of response and restoration.

Presently, the remedial measure operates in accordance with the ministerial regulation which determines the criteria and the methods to compensate for the damage of sufferers from the treatment of public hazard B.E. 2554. Concerning support derived from international cooperation, it is mainly in the process of response and recovery as summarized in Table 4.6.

Table 4.6 International Support in flood in 2011

Country	Support
Israel	-Ministry of Defense provided the following support: - gave 184 life vests, 30 plastic boats, 1,000 sets of medicines for skin diseases - 2nd donation: gave 300 bags of food which cost about 300,000 baht with advice on flood management
Singapore	-Singaporean Military gave 7,500 sand bags, 1,200 bed sheets, 700 blankets, 150 tents and light bulbs, 50 generators, 54 engine boats, 60 engines to be equipped in small boats, equipments for rubber boats, blankets, water bottles which cost about 146,000 Singaporean dollars (about 3,504,000 baht) to Thai Military. - donated 2.4 million baht - Mercy Relief Singapore gave 70,000 bags of foods, 12 rescue boats -2nd donation: The government of Singapore gave 150 tens, generators

Table 4.6 International Support in flood in 2011 (cont.)

Country	Support
PR China	-Teochew Association in Guangzhou gave 457 rubber boats. - Communist Party and the Government of Guangxi Zhuang Autonomous Region stated that it would give necessities in the amount of 3 million CNY (about 15 million baht). - donated 50 million baht, 128 boats, water purifiers and water containers - Mr. Liu Ning, Deputy Minister of Irrigation came with some experts to give technical advice. - 2nd donation: 20 boats, 30 water purifiers, 20,000 shirts, 1,300 tents, 8,000 sandbags - 3rd donation: 20 water pumps -4th donation: 165 boats, 120 water purifiers, 26,000 sand bags, 5,008 solar torches - 5th donation: 90 million baht, 64 big boats, more water purifiers and another 150 million baht
Republic of Korea	-Mr. Stanley Park, Honorary Advisor on Trades, Ministry of Commerce, Republic of Korea stated that he would give 44,800 bottles of water through Sonchai Wattanaporn Foundation in Samut Sakhon Province. - Thai Embassy in Seoul and Thai Communities in Korea, Thai Embassy in New Delhi and Thai Communities in New Delhi, Thai Embassy in Brussels and Thai Communities in Belgium donated 327,584.33 baht. - The Government of Korea gave 200 tents, 10,000 canned foods and donated 6 million baht. -2nd donation: 100,000 bags to be used as sand bags - 3rd donation: big water purifier that can produce drinking water for 3,000 persons
Kuwait	The government of Kuwait donated 3.5 million US dollar (about 105 million baht) under the name of His Highness Sheikh Al-Ahmad Al-Jaber Al-Sabah, Prime Minister of the State of Kuwait, through Thai Red Cross.
USA	-US Agency for International Development (USAID) donated 500,000 US dollar (about 15 million baht) - donated 3 million baht to Thai Red Cross, provided helicopters, provided C-130, sand bags and technical support team from USMC - USS George Washington Aircraft Ship launched at the Gulf of Thailand to help in case of an emergency evacuation

Table 4.6 International Support in flood in 2011 (cont.)

Country	Support
Japan	-The Government of Japan gave 10 trucks with water pump through Thai Embassy in Tokyo and donated 12 million baht. - 2nd donation: necessities with the amount of 10 million baht i.e. 240 mobile toilets, 200 engines for boats, 450 life vests. Two teams of experts were sent to study the situation in order to prevent disaster that may occur in the future. - Honda Company donated 112 million baht.
Argentina	The Government of Argentina would give 40 boxes of water purification tablets (which could purify approximately 8 million liter of water) to the Government of Thailand.
Taiwan	Zhu Ge Buddhist Foundation in Taiwan provided 13 volunteers from the Foundation to support the victims of the floods.
Indonesia	Donated 95.5 million baht.
Malaysia	Donated 30.9 million baht.
Australia	Donated 16 million baht.
Bahrain	Donated 60 million baht.
India	Donated 6 million baht.
Germany	-The Government of Germany donated 1.7 million baht for the purchase of rescue boats and other necessities, mattress and blankets to the evacuation center at Thammasat University, Rangsit. -2nd donation: 4.2 million baht plus a team of Archaeologists to support the restoration of historic sites and ancient palaces in Ayutthaya
New Zealand	Donated 2.4 million baht.
Denmark	Donated 1.6 million baht.
Laos PDR	Donated 1.5 million baht.
Switzerland	Donated 1 million baht. 2nd donation: proposed to give more donation including food and water, technical support for water resource management and the restoration of transportation

Table 4.6 International Support in flood in 2011 (cont.)

Country	Support
Bangladesh	Donated 1 million US dollar to the Government of Thailand. UN Office for the Coordination of Humanitarian Affairs (UNOCHA) proposed to give several kinds of support: data management, reports, advice on restoration and social welfare. The International Organization for Migration proposed to give advice on the establishment of the evacuation centers and gave boats, pumps and trucks. World Food Program provided a team to advice on the rescue and support to the victims.
The Netherlands	A team of experts on water management was sent to provide technical support.

Source: Applied from the Association of Persons with Physical Disability International, 2011.

The comparison of the 3 case studies of flood management in Thailand during 1942-2012 according to public policies is shown in Table 4.7.

Table 4.7 Comparison of Disaster Management by the Government in Accordance with Public Policies: Case Study on Floods in 20 years

Year / Topics	Flood in 1995	Flood in 2006	Flood in 2011
Key performers	Government military	Government Private sectors community	Government Private sectors Local Administration Offices Community Academic Volunteer
Concepts	2R (Readiness, Response)	3E (Engineering, Education, Enforcement) and 4R (Reduction, Readiness, Respond, Recovery)	2P2R (Prevention, Preparation, Response, Recovery)

Table 4.7 Comparison of Disaster Management by the Government in Accordance with Public Policies: Case Study on Floods in 20 years (cont.)

Year / Topics	Flood in 1995	Flood in 2006	Flood in 2011
Authority in Charge of the Policy Implementation	Not specified	Department of Disaster Prevention and Mitigation	Department of Disaster Prevention and Mitigation
Management system	Government system	Government system and community	Government system Local Administration Offices Community
Management measures	Post-Disaster Management Constructional measurements	Post-Disaster Management Constructional measurements Plans for preparedness Missions after government reform	Management was done before, during and after the disaster. More concrete plans for disaster management.
International cooperation	Most support was given in the restoration process i.e. donations of money, materials, equipments and necessities.	Most support was given in the restoration process i.e. donations of money, materials, equipments and necessities.	Support was given in the prevention process (by providing advice, experts) as well as the response and restoration process. Cooperation among ASEAN member countries in disaster management

In conclusion to the flood management of 1995, the structures of public administrations in central, regional, and local government departments all had overlapping responsibilities, because no specialised agency had responsibility for the mandate of managing disasters. The main roles were those of the government and the military, and the management approach was basically reactive rather than proactive (Tingsanchali, et al., 2003: 6-15). Mostly, the role of international assistance was in the reconstruction of donated material necessities.

In 2006, flood management after bureaucratic reform was according to the Civil Defence Act B.E. 2522 and the National Civil Defence Plan B.E. 2545. The government sector, private sectors and community sectors played the main role in management, and this was due to the government's policy to support and provide opportunities for the private sector to participate more in management (Tingsanchali, et al., 2003: 6-15). In 2002, there was complete legal reform to the Department of Disaster Prevention and Mitigation Services. While the Department of Water Resources was an agency or a central organisation that hosted the centre of policy and had a master plan for water resources management, there were still problems in terms of coherence and coordination at each level. As a result of being under the 'Ministry of the Interior', the command crossing ministries in mission of disaster management lacked of unity and operations were thus unclear. In 2007, the Disaster Prevention and Mitigation Act B.E. 2550 was enacted as the main law in disaster management. The Civil Defence Act B.E. 2522 and the Fire Prevention and Control Act B.E. 2542 were repealed for, according to bureaucratic reform, with the Administrative Act B.E. 2545. The Department of Disaster Prevention and Mitigation was established for a primary mission to prevent disasters, and offer reconstruction and disaster relief (National Committee of Disaster Prevention and Mitigation, 2009: 21-22). Mostly, the role of international help was in the reconstruction of donated material necessities.

In 2011, flood management was in line with the Disaster Prevention and Mitigation Act 2007 and the 2P2R concept (Prevention, Preparation, Response and Recovery). Conditions of management retained command but added the concept of prevention and preparedness, composed of people in many areas who had experienced flooding several times. Many areas had ideas about defence and helped each other to cope, based upon management by communities and local administrators. Presently, there is international collaboration on joint planning and preparing for disasters occurring around the world; for example, including consultation together to define operational rules for both ASEAN as an ASEAN Coordinating Centre for Humanitarian Assistance (AHA Centre), and obtaining the assistance of experts from Switzerland and the Netherlands to prepare for flood management. Management of communities arises from past experience, and the role of local governments was increased through the 'Constitution of the Kingdom of Thailand 2007', in Sections

281, 66 and 67, respectively, which recognised the rights of communities to protect and use their own protection (Mala, Chinasri and Ruangsom, 2013: 174-176).

The factors that make a difference to the case study of 1995 are that the majority people lacked participation, and lacked awareness about the risks of disasters. Meanwhile, the government had not been assigned an agenda regarding disasters happening within the nation. Therefore, the coordination between stakeholders was reactive rather than proactive. In 2004, Thailand encountered a tsunami disaster, causing social networks and the participation of the community and more local governments. As a result, the law was adjusted to comply with such changes. By 2006, the private sector and the community could participate in disaster management. This also affected changes in culture (values, attitudes and behaviors), especially concerning the main roles of agencies and the public. Thus, flood management in 2011 was a time of preparation; before, during and after the collaboration of many agencies.

4.2 Analysis on Factors Affecting the efficiency and effectiveness Policy Formation and Management in accordance with Public Policies by the Government, Private Sectors and Civil Society in Response to the Disaster in Thailand: Case Study on Floods (Analysis of Data Derived from Key Informants)

4.2.1 Problems in Public Management

From documentary study and research related to the topic, it was found that the problems in public management could be divided into 3 areas: government, private sectors and communities (Yuwaboon, 2001 cited in Suwanmolee, 2009: 28-31).

4.2.1.1 Problems in Public Policies

Even though there were public policies at the national, provincial and community levels, there were no handbooks or guidelines for practice. Other problem was the lack of cooperation among the authorities as there were no plans to integrate all relevant organizations. Flood management was not done in an

integral way. Besides, the implementation of policies and plans could not be done smoothly as the executives of the authorities in charge were frequently changed. Another issue was slow process of management due to bureaucracy. Compared with private sectors, the government process was much slower.

Problems in flood management in the communities were mostly related to the top down administrative approach plus the attitudes of the government officials towards people in the communities. The officials viewed themselves as givers while people in the communities were viewed as receivers. Support to people was done in a charity-based approach rather than capacity development of the communities. Another issue was the overloaded works of local authorities. Policies and plans could not be successfully and continuously implemented partly because the local authorities had too many programs/projects to handle. Moreover, personnel of local authorities lacked skills and capacity in disaster management. Only post-disaster management was done. More proactive approaches were needed in disaster management by the local authorities.

Another problem was lack of community participation due to the attitudes of the government officials who thought of villagers as outsiders. Such attitudes excluded the communities from the implementation of policies and plans on disaster management.

The government prioritized economics of the country rather than human security. The government provided a lot of budget for tourism promotion while little attention was paid to the safety of people in the communities. Some important projects did not get much attention from the government such as recovery of mangrove forests as they can serve as barriers of the waves and can protect the villages from floods. It is also a source of foods and jobs for fishermen who live in the villages.

Problems in Private Sectors

In private sectors, there were no specific laws and practice concerning the insurance in the areas at risk. If private companies can offer this kind of insurance, it can decrease burden of the government.

Problems in Communities

Most communities did not know their rights. So they were disadvantaged when negotiating with the government sectors. If people in the

communities are well educated about their rights, they would have more power in disaster management.

Problems in Community Participation: Lack of community participation caused a lot of problems in disaster management. For example, some evacuation plans were made without sufficient knowledge about the areas. Some evacuation routes were in the areas at risk, which could be dangerous for villagers. This problem would be solved if villagers in the communities could participate in the planning process as they had knowledge and experiences within their own communities.

4.2.1.2 Problems in Coordination

Problems in government sectors: There was an overlap of work and authorities among related authorities, and the government sectors were not ready for coordinating with other sectors.

Problems in private sectors and organizations: There were many private organizations working for disaster management, but there was no cooperation among them. Each worked according to their own plans and approaches. Sometimes their work overlapped with others'. For systematic management, a coordinating body is needed.

Common problems encountered by the government, private sectors and communities: There was no clear scope of work. Data and information were gathered and kept in different places and were not shared. People in the affected areas had to answer too many questionnaires that had similar content as many organizations collected data but did not share with others. There was no unity of work among the authorities in charge. For example, some affected areas received too many foods and necessities while some got just a few because the relevant organizations did not cooperate with one another in identifying the needs of each community. Moreover, the budget provided to the affected areas were calculated per head even though their needs were different according to the severity of the damages.

4.2.1.3 Problems Concerning Knowledge and Understanding

Problems in government sectors: There was insufficient research and development in disaster management due to insufficient budget and personnel. Therefore, the Department of Disaster Prevention and Mitigation could not provide continuous drills. The executives of the government were not aware and did not prioritize this issue. When there was a disaster, the decision of the executives and politicians was based on political context. Moreover, those made decision and gave commands did not know the real situation of the affected areas, resulting complicated and difficult work.

Problems in private organizations and communities: Volunteers and private organizations did not know the needs, risks and capacity of the communities. They need to understand cultural diversity of the people in different communities. People working with villagers in the communities, including vulnerable groups, have to respect their ways of lives. For example, when making donations to Muslim communities, we have to make sure they can use. In Muslim communities like Banda Aceh in Indonesia, people there need to pray 5 times a day to worship Allah. Those who work with the communities need to be aware of these points.

The flood in 2011 reflected the gap between the government and communities. As the communities could not always rely on the government, some decide to take actions to support themselves. Pakkred City Municipality was an example of autonomous support with good cooperation between the communities and local authorities, using the incident of flood in 1995 as lessons learned. In 2011, some communities sacrificed their areas as floodways in order to protect the economic areas. They knew if the business areas were also flooded, there would be no foods and necessities for the whole community. Nobody could benefit from letting all areas be flooded. However, if they allowed some areas to be used as floodways and saved the business areas, at least some areas were safe and could support those who were affected. In this sense, there was common understanding among the communities (both the affected areas and non-affected areas). Compared with Bangkok, the administration of Nonthaburi Province was more decentralized in term of flood management. Nonthaburi City Municipality and Pakkred City Municipality were more independent in flood administration and management. For example, they could make

quick decision in negotiating with local people and providing mechanical equipments and technical support in a timely manner (Sirisrisak, 2012: 5-6).

4.2.1.4 Problems Concerning Budget

Problems of the government: Due to insufficient budget, the warning system and disaster prevention and mitigation network did not cover all areas. There were also insufficient machines and equipment for restoration. Some of them were transferred from other offices and were not in good conditions. Some could not be used because they were designed for other purposes. Hence, the restoration process was slow and could not meet the needs of the people. Other problems included: insufficient budget and unclear authority of the relevant government bodies.

Problems of the communities: lack of budget for disaster management by the communities.

4.2.1.5 Problems Concerning Warning and Communication System

Problems of the government: Due to security reason, there was limitation in information sharing among government bodies. In some situations, unclear information caused confusion among people in the communities as well as those who were in charge of disaster management. In some cases, people in the communities did not get information in a timely manner, resulting in no preparation for evacuation. Sometimes the announcement or warning had no details about the disaster i.e. the level of severity and possible damages. Bureaucratic system also caused confusion among people, making them reluctant to ask for help from the government.

Problems of the communities and private organizations: Lack of fast and accurate information and lack of information sharing among organizations caused chaos in disaster management. Information sharing among organizations including prompt warning could reduce the risks and damages caused by disaster.

The failure to inform people about the floods and evacuation during the flood in 2011 was due to the inefficiency of the government in predicting flooded areas including details of the floods such as how serious it would be or when

the flood level would be lower and how long it would take. Another problem was that the government was unable to predict which areas would be safe and which areas would be flooded. Even some evacuation centers were flooded and the victims had to move to new places again and again, causing frustration and fear among them. For example, some people moved from an evacuation center at Thammasat University to Don Muang Airport. After Don Muang Airport was flooded, they had to move to Kasetsart University. When Kasetsart University was flooded, they moved to Chulalongkorn University. Moving to many evacuation centers made them exhausted and frustrated. In Bangkok, wrong information about the areas at risks caused lots of troubles to people as they could not prepare for evacuation. Some people who did not reside in the so called areas at risk were not prepared for evacuation. However, the areas they lived were also flooded, causing fear to people in these areas (Sirisrisak, 2012: 8).

People were not satisfied with the information and warning system of Flood Relief Operations Center. According a survey, satisfaction level was rated 3.36 out of 10.0, while only 3.08% of the respondents were satisfied with warning system of the Center. More than 80% said that it was not clearly stated if the areas they lived would be flooded or not and that they were confused with the information released by the Center. Only 12.8% of the respondents said that the information released from the Center was reliable. Sometimes executive members of the Center gave contradictory information, causing confusion and panic among people (Thaipublica, 2011). In this case, Japan is a good example of effective public communication. During earthquake or tsunami, the information is broadcasted 24 hours through the government media such as NHK and public radio. The information includes the situation of the disaster, knowledge to educate people about the disaster and warning. No other programs are broadcasted in these channels until the disaster is over. Most importantly, the information must be accessible for all groups of people. For example, there is captioning and sign language interpreter on the screen for deaf and hard of hearing people (Sirisrisak, 2012: 9).

4.2.1.6 Problems Concerning Organizational Structure

The duties and authorities of the Department of Disaster Prevention and Mitigation should be clearly defined, as well as the status whether it is the "main authority" or "coordinating authority". As the Flood Relief Operations Center was an ad hoc authority, it could utilize the resources of the Department of Disaster Prevention and Mitigation, which is a permanent authority in charge of disaster management. The organizational administration should be improved so that water management can be done in an integral way. The authority in charge should be able to make prompt decision during crisis and can make a single command to avoid confusion (Kamolvej, 2013: 251). Several mechanisms can be established for disaster management at the national level and provincial level. Roles and duties of each office must be clearly defined. Good cooperation among organizations and civil society shall be encouraged. All stakeholders should participate in disaster management activities such as the meetings and drills (Prochart, 2013: 75; Janjirawuttikul, 2012: 1; Duangsrisai, 2012: 1-7; Wungaeo, 2012: 52; Gerden, 2014: 171).

4.2.1.7 Problems in Crisis Management

Crisis management in the past was found to be defective:

1) The problem of communication to inform the severity of the disaster at all level.

2) There is no unity in coordination.

3) The use of inappropriate standard operation procedure with a crisis situation.

4) Political and command redundant.

5) The lack of experience and trust in working together.

6) The operation did not go as main plans and supporting plans (Department of Disaster Prevention and Mitigation, 2012: 7).

Concluded that the problems of disaster management in Thailand consist of public policies, problems in coordination, problems concerning knowledge and understanding, problems concerning budget, problems concerning warning and communication system, problems concerning organizational structure and problems in crisis management.

4.2.2 Factors Affecting Policy Formation and Management

Efficiency of policy formation and management means how effectively the available resources are used for the activities of disaster management as an integral approach with cooperation of the organizations in charge from the government, private sectors and civil society, for quick action and effective disaster management.

Effectiveness of policy formation and management means the outcome resulted from the cooperation of the organizations in charge from the government, private sectors and civil society so that the disaster is managed in the same direction, with common goals and mutual agreement.

Result of the interviews of key informants about policy formation and management in accordance with public policies by the government, private sectors and civil society in response to the disaster can be divided into 5 categories;

1. Government: Interviewees from the government were divided into 2 groups. The first group thought that the communities should not take part in water management. In their opinions, water management should be in accordance with the Disaster Prevention and Mitigation Act B.E. 2550, and people should follow plans and manuals distributed to them. When asked to compare the current situation with the past, the organisational structure was an agency involved in floods, which was scattered within departments under the ministry, whose work was coordinated in a separate flat after the reform (Supharatid, n.d.: 6; Duangsrisai, 2012: 1). It is assigned to the Department of Disaster Prevention and Mitigation as the primary agency responsible for developing a comprehensive structure, and from there down to the field level. There are about 18 regions called the 'Disaster Prevention and Mitigation Region 1-18' (wherein, each field will contain about 4-5 provincial areas of responsibility for the place of security). Areas are located in the major cities or provinces, the centre of each sector for an agency being the 'Office of the Provincial Disaster Prevention and Mitigation' (the name of the province, or referred to as the 'Office of the Provincial Disaster Prevention and Mitigation'). Agencies at the county level, referred to as the Disaster Prevention and Mitigation Centre Region 1-18 play a role in directing and supervising the work of the agency in the provinces, known as the

"Disaster Prevention and Mitigation Provincial Office", despite the designated agencies and how they work under the Disaster Prevention and Mitigation Act B.E. 2550, yet with a large bureaucracy consisting of several departments. The management system of the government is necessary to stimulate changes and implementations (Frederickson, 1997: 222). This style of policy making is characterised by a top-down power structure, which lacks appropriate context and is inflexible in emergency situations (Sriratanaban, 2005: 259; Office of Disaster Prevention and Mitigation, 2012: 13-18). They said that in the past there had been no specific laws or policies on disaster management as stated in an interview:

> "*In the past, the government bodies just did things according to our duties. There were no specific laws for us to follow. However, in 2011, clear policies were issued for us to follow. There were short-term and long-term strategies of disaster management. Short term strategies consisted of increasing and maintaining water pumps and lowering the water level in the dams. Long term strategies were management of the upstream, midstream and downstream of water (with the budget of 3.5 billion baht). In the past, water management was done separately by different government offices. There were several meetings among related bodies but still could not solve the problems because there were many ministries and departments in charge of the issues. So there was no unity. But with this budget 3.5 billion baht, the information center would be set up. In my opinion, the conditions on good water management consist of budget, instruments, good decision making, accurate disaster prediction and single command*" (Interviewed on August 23, 2013).

The interviewees in this group thought that main problems in flood management were culture, safety of people, and people's awareness of the problems because most communities did not know their rights. So they were

disadvantaged when negotiating with the government sector, as stated in an interview with a government official:

> "*The main problem is communication between the government and the public before, during and after disaster. Sometimes people did not take the warning seriously and did not evacuate. In some cases, people called us and said they wanted to evacuate and needed our support, but when we arrived, they refused to evacuate and asked us to provide food.*" (Interviewed on September 12, 2013).

For a complex adaptive system; social behavior, awareness, knowledge and understanding all influence such adaptation as servants of the people. In this comprehensive study of all ages, all levels, all professions, both public and private sector are dependent upon state disaster responses, which need to be collaborative to form such a relationship (Rotnoknan, 2013: 36). The framework to build partnerships must be focused upon the structure and management decision-making process which, as a result, must be driven and bound together with common motivation and the ability to perform together (Emerson, et al, 2011: 2, 6).

The second group of interviewees thought that the communities should participate in water management. In their opinions, water management needed cooperation from all sectors at the national, provincial, local/community levels. People in the communities should be informed so that they are aware of the severity of the disaster, including its affect and how to get support when they experience the disaster. As for attitude adjustment, the Department of Disaster Prevention and Mitigation is required to adjust the attitudes of the people as a result. "Adversity is a matter of fate", especially when a disaster will receive assistance from the relevant authorities alone. 'No need to help themselves' changed to a new attitude, in that; 'It's disaster prevention and relief, if anything, good preparation', and this has introduced the concept of community-based disaster management applications, which began operations in 2004 under the project of 'empowering communities in prevention and

mitigation' (Department of Disaster Prevention and Mitigation, 2012: 7-8) as stated in an interview with a government official,

> "*We should prioritize the communities. People should be well informed so that they are aware of the disaster and understand how serious it is. Good communication and understanding are important to avoid conflicts. People should be prepared for the floods. Those who experienced the floods should get support and compensation*." (Interviewed on August 23, 2013).

In addition, compensation should be given to those who experienced disaster in a systematic and fair practice, not by judgment of the individuals.

The events in 2011 show that the 'Flood Relief Operations Centre's' work, along with the implementation of the Administration Act B.E. 2534, was full of confusion and thus not clear. Working with several agencies was not effective until the promulgation of the 'Prevention and Mitigation B.E. 2550', which directed operations in accordance with the policies and goals of the Flood Relief Operations Centre (Kamolvej, 2014: 198) as stated in an interview with a government official,

> "*There should be laws and regulations that specify roles and duties of stakeholders. The disaster management process should be more systematic and not based on an individual's judgment. Even though the person in charge is not available when the disaster begins, the management process should not be hindered. Water management models should be universal*" (Interviewed on August 23, 2013).

In such an urgent situation, there must be reliable, complete and consistent information so that stakeholders can judge the situation and make proper steps.

2. The experts on disaster management compared current situations of water management with the past. He said in the past, there was just one government body that was in charge of water management. After the government reform, there were more government bodies with specific roles and responsibilities according to the laws and regulations. However, there is still lack of unity in their work. There was an overlap of work and authority among related authorities and the government sector was not ready for coordinating with other sectors. Most policies on water resources in Thailand focus on water supply rather than flood management. Floods and other disasters are regarded as issues of public welfare. As a result, flood and disaster management are under the Disaster Prevention and Mitigation Act. Under this act, flood management is done in accordance with the administrative regions, which is not effective because flood management should be trans-boundary (Khaosa-ard, n.d.: 1-3).

For example, there is no mutual plan and practice in evacuation, as stated by an interviewee:

> "*In the past, water management was easy. The Royal Irrigation Department was the only authority in charge. Nowadays, it is more complicated as there are more factories and houses. There are more government bodies in charge of water management but there are still problems related to authority of these bodies. More problems include no evacuation drills and conflicts/politics. It is recommended that the command on disaster management should be "Field Incident Command". The authorities in charge have their own roles and functions. One strategy on water management is the "Adaptation to Climate Change." For example, Tung Nam Cooperatives were set up. We should adapt ourselves to nature. Regarding the information sharing, there are three main problems: 1) The information of each office is not integrated; 2) The information is not shared among the authorities in charge;*

> *3) The available information is not enough for accurate forecast. The authorities in charge do not cooperate well. It should be more systematic*" (Interviewed on September 11, 2013).

It can be seen that the former work context is different from the present, by the number of agencies involved. Upon consideration of the flood in 2011, it was found that many agencies were involved in multiple levels of field operations. From October 2nd 2011 to November 30th 2011, all units counted at 1,115 units for the number of agencies involved in network management, but there is still controversy stemming from not understanding their directions and guidelines (Kamolvej, 2014: 201, 218-219). Therefore, operations between agencies still cling to different work cultures, (Wungaeo, 2012: 52) wherein management is very inefficient. However, combinations of agencies are beneficial for exchanging resources and involvement at all levels of interaction is essential to having knowledge and the ability to work.

3. Representatives from the communities said that in the past, the government did not have clear plans on disaster management. Disaster victims did not get support or compensation for their loss. However, some strategies have been planned to reduce the loss and damages caused by floods. For example, floodways will be redirected to protect business areas which are important to the economics. However, this may cause troubles to people living in flooded areas. Other measures include: protection of business areas, redirecting floodways and compensation to the victims, as stated by an interviewee,

> "*The government needs to support those who suffer from the floods. The water management system needs to be improved. There should be enough dams and water gates that work properly. The Netherlands is a good example. It has good measures which can meet the needs of people. Hence, the government gets support from people. This is important*." (Interviewed on October 10, 2013).

Regarding people's ways of life during the floods, it was found that they could adjust themselves to the situations. The government also had more measures to prevent floods such as digging and clearing the canals. The government was more prepared for the floods. Food and necessities were given to people before flooding time. Temporary kitchens were built for cooking and food was distributed to the people who suffered from the floods.

Local communities were the main factors of the efficiency and effectiveness of water management as the government bodies lacked unity and did not cooperate well. Other important factors included information sharing, mutual planning, no barriers that block the waterway, etc. The private sector was faster in response to the floods. The government had a limited budget compared with the number of the victims. Mass media such as Thai PBS also played a key role in distributing information to the public so that the victims could get support. Some examples of the private sector that supported the victims were: PTT, Bangchak Petroleum Public Company Ltd., Thai Health Promotion Foundation. These private organizations gave support in various ways such as giving seeds for farmers and rebuilding or fixing their houses. Problems in flood management were: 1) no practical plans; 2) no specific authorities to be in charge; 3) no information management system and no database, as stated by an interviewee who was a representative from the communities:

> "*Local authorities such as Tambon Administrative Organizations (TAO or Or Bor Tor in Thai) informed villagers about the floods, some information like water level, directions of the floods. They also prepared safe places for evacuation and places to stay during the floods including temporary kitchens. We were told how to adjust our lives during the floods.*" (Interviewed on August 19, 2013).

The above information reflects all adjustments and learning from the experience of communities, for example: the Bangrakam community, the Puka community, and Amphur Banmi Lopburi province. They can manage by

themselves through the use of surveillance teams and disaster communication, thus providing shelter, arranging for transportation, preparing reconstruction after floods, and modifying calendar displays (Sidalar and Supawatworakun, 2014: 19).

4. The interview with representatives from the private sector found that there were several kinds of support to those who suffered from the floods. Regarding plans to respond to the floods, it was found that the government had plans to manage the floods. There were several government bodies related to this matter. However, hierarchy was still a problem. Regarding information and data, it was found that the information system and database were more modern so that they could keep up with the situation, but the public might not be well aware of it. In some situations, unclear information caused confusion among people in the communities as well as those who were in charge of disaster management. It was recommended that there be a TV channel reporting news about the floods only, as stated by a representative from private organizations:

> "*The government should set up an information system that reports the flood situation from upstream, midstream to downstream. Information should be available for the public. The government should set up an information center similar to Thai Flood, which is a private information center, to avoid conflicts*" (Interviewed on November 22, 2013).

5. Representatives from NGOs thought that communities should play key roles in flood management. Before doing that, thorough study needs to be done in all communities as each of them is unique in terms of the environment and other factors. They need to understand the cultural diversity of the people in different communities. People working with villagers in the communities, including vulnerable groups, have to respect their ways of life. For example, when making donations to Muslim communities, we have to make sure they can use what help is given. In Muslim communities like Banda Aceh in Indonesia, people there need to pray five times a day to worship Allah. Those who work with the communities need to be aware of these points (Suwanmolee, 2009: 28-31). As stated by a representative from NGOs,

> "*The government should gather information about the problems in the affected areas and what people in those areas need. For example, the water flow is heavier in some areas. There should be manuals for people in local communities. City planning and structures should be developed. The private sector can give support from time to time. Most information distributed by mass media is distorted. Experts and academics should play more roles to integrate information. The government should have more channels to distribute information to the public as nowadays there are many ways to communicate (like social media). The government should utilize these communication means (to answer the questions like who will use and benefit from the information.)*" (Interviewed on November 22, 2013).

In order to solve the problem, we need to consider the differences of each area in terms of environment and causes of the floods. Successful measures should contain the following 2 parts. 1) roles of people in the community and 2) network and cooperation with local communities and civil society. The government should be open for public opinions in order to get good cooperation from civil society. During flood time in 2011, a lot of support came from NGOs and other private organizations. These organizations set up their own network of support and utilized what they had learned from the floods in 2011.

From the interviews with 18 key informants, the researcher had collected and categorized the data and found that the factors affecting the efficiency and effectiveness of policy formation and disaster management according to public policies include: 1) Problems related to communication were: inefficient communication system, no standardized way of communication, non-reliable information; 2) Politics and administration; 3) knowledge/information/discipline of people. (as Table 4.8).

Table 4.8 Factors Affecting Policy Formation and Management

No.	Factors Affecting Policy Formation and Management	Key Informants																		
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	Frequency
1	Lack of main plans for disaster management - there were already plans but no implementation	✓	✓	✓	×	✓	×	×	✓	×	×	✓	×	×	×	×	×	×	×	6
2	No specific authority in charge of this matter - no unity among related organizations	✓	✓	✓	×	✓	×	×	✓	×	×	×	×	×	×	×	×	×	×	5
3	No specific authority	×	✓	✓	×	✓	×	×	✓	✓	×	✓	×	×	×	×	×	×	×	6
4	There was no unity among related organizations	×	✓	✓	×	✓	×	×	✓	×	×	×	×	×	×	×	×	×	×	4
5	No systematic information and database management	✓	✓	✓	×	✓	×	×	✓	✓	×	×	×	×	×	×	×	×	×	6
6	No specific laws related to this matter - In some cases, there were already such laws but no implementation.	×	✓	✓	×	✓	×	×	✓	×	×	✓	×	×	×	×	×	×	×	5
7	Transportation was another issue in the time of crisis	×	✓	✓	×	✓	×	×	✓	✓	✓	×	×	×	×	×	×	×	×	6
8	Politics and conflicts among different groups	×	✓	✓	×	✓	×	×	✓	✓	✓	✓	✓	✓	✓	×	×	×	×	10
9	Need of more support from the government	×	✓	✓	×	✓	×	×	✓	✓	×	×	×	×	×	×	×	×	×	5
10	No integration of the plans for disaster management	×	✓	✓	×	✓	×	×	✓	✓	×	×	×	×	×	×	×	×	×	5
11	Inefficient communication	×	✓	✓	×	✓	×	×	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓	12

Table 4.8 Factors Affecting Policy Formation and Management (cont.)

No.	Factors Affecting Policy Formation and Management	Key Informants																		
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	Frequency
12	Insufficient experienced staff in the time of crisis	×	✓	✓	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	2
13	Insufficient material	×	✓	✓	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	2
14	Land use change	×	×	×	×	×	×	×	✓	×	×	×	×	✓	✓	×	×	×	×	3
15	Lack of knowledge/information/ discipline of people	✓	✓	×	✓	✓	✓	✓	✓	×	✓	✓	×	×	×	×	×	×	×	8
16	Distorted information proposed by mass media	×	×	×	×	×	×	×	×	×	×	✓	✓	✓	✓	×	×	×	×	4

According to the documentary analysis and interview with 18 key informants, it was found out that the most influential factors are in the following orders: 1) underprovided communication systems; 2) politics and administration.; 3) the knowledge and the discipline of people which result from the lack of experience and understanding of preparation; 4) the lack of the main plan for disaster management; 5) unclear chain of command; 6) the lack of information management and database system; 7) the problem of transportation and distribution of urgent relief items; 8) the lack of specific agency for disaster management; 9) the lack of supporting law; 10) the need of help from the government; 11) the flood management plan which is not integrated; 12) the media (partial presentation); 13) the lack of cooperation between institutions/organizations at each level; 14) city plan; 15) inadequate personnel and their lack of experience in offering aid during floods; 16) insufficient ridge maintaining equipments. The data reflect that flood management will be required to be reported, in order to keep clutter-free and effective in emergency situations on social media like Facebook. Twitter is also used to report about Thailand's National Disaster Centre (NDWC), thus using Facebook and Twitter to report the situation is the same as the Bangkok Metropolitan Administration (BMA) which used Twitter to report the situation of flooding and non-profits, such as Thai floods use social media to report

flooding (Gunawong and Jankananon, 2015: 163). If considering transportation, it is found that items should be used at a collection centre of distribution, focusing upon reducing their holding period for as short as possible a time, and the number of collection centres should be increased through the distribution relief materials so that the area is clear. The design of such a production system and storage of goods should therefore be flexible (Opasanon, 2011: 7-8).

The information derived from the interviews with 18 key informants was similar in the following points. Problems related to Human Performance: lack of knowledge, skills and experiences. People's knowledge and discipline were factors of efficient management. Problems related to Organizational Performance: lack of efficient communication channel between the government and the public, lack of unity and cooperation among government bodies. These factors affect the efficiency and effectiveness of the policy formation and management by the government, private sectors and civil society, in accordance with public policies in response to disaster: case study on floods in Thailand. Hierarchy and lack of integration among government works have been problems up to the present as Figure 4.7.

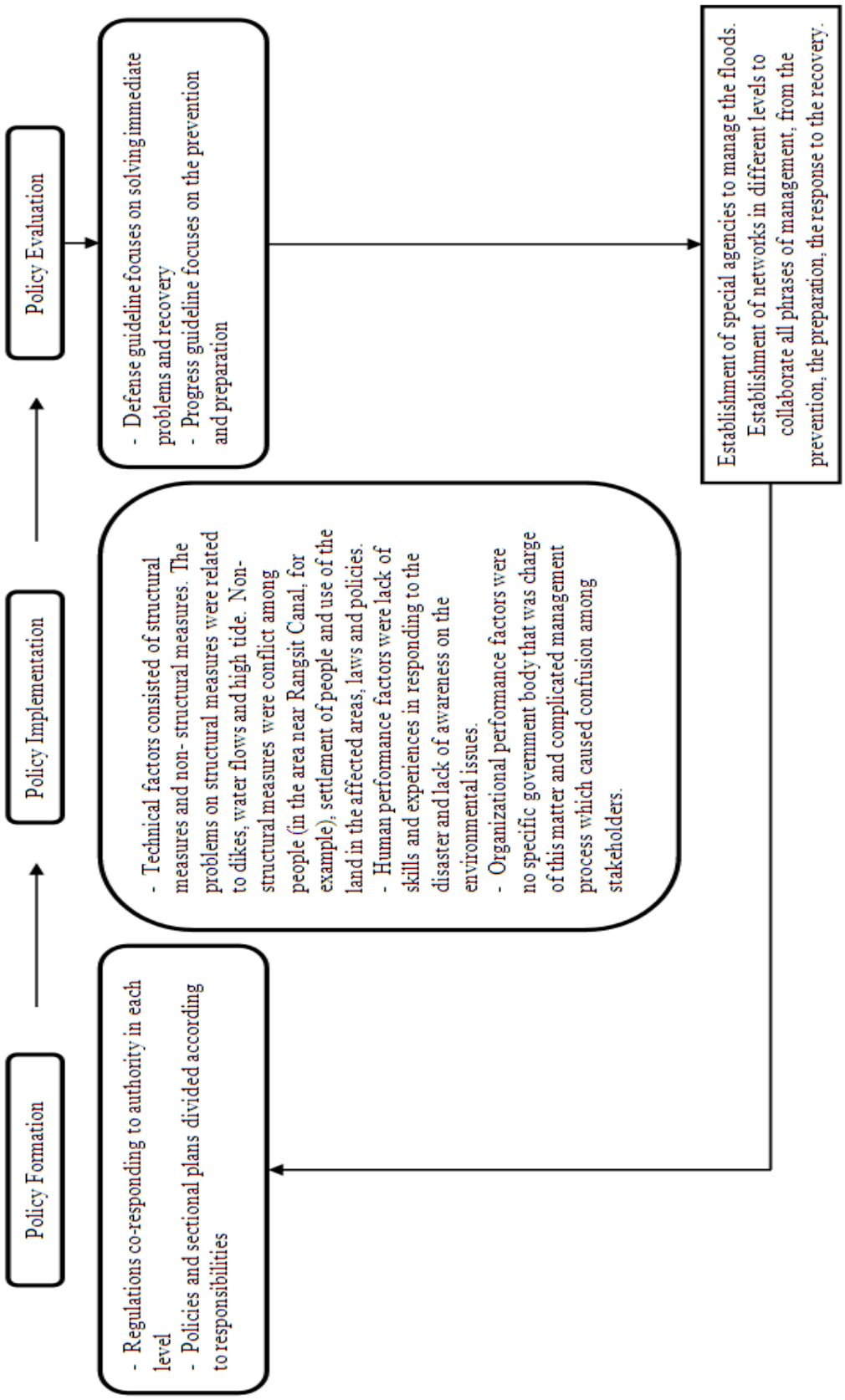

Figure 4.7 Analysis of documents and interviews

4.2.3 Suggestions for Problem Solving by Stakeholders

The Department of Disaster Prevention and Mitigation and other parties have summed up the approach to develop orders, laws, organizational structure and crisis management as follows:

1. The roles of the Department of Disaster Prevention and Mitigation should be clearly and pragmatically determined since the fact that it is defined as a central agency causes confusion whether it should be the "main agency" or the "cooperating agency" in the prevention and mitigation of disaster. The establishment of Flood Relief Operations Center is the ad hoc which can immediately apply the structure of the National Committee on Disaster Prevention and Mitigation with the Department of Disaster Prevention and Mitigation as the mechanism. The establishment of a new agency will have no main work if it has to become a permanent one. Apart from that, there should be the enhancement of power and duties of the Department of Disaster Prevention and Mitigation in protecting people's lives and properties from disaster as well as the power to control the standard of disaster prevention and mitigation which specifies that the roles and duties of the Department of Disaster Prevention and Mitigation should be clearly defined for efficient disaster mitigation (Office of Disaster Prevention and Mitigation, 2012: 19-20).

2. There should be the potentiality development of personnel so that they practice under the same standard all over the country and report directly to the management of the Department of Disaster Prevention and Mitigation and/ or the increase of disaster prevention and mitigation agencies at district level. The personnel should also be encouraged by extra payment for risk taking (in addition to salary) just like in other countries which stated that the potentiality and the professionalism of agencies are the vital factors for management (Kamolvej, 2014: 224).

3. There should be the improvement of water management organization so that it can administrate integrally and make a prompt decision during a crisis using a single command. Also, there should be the establishment of a joint mechanism with various sectors to manage disaster at provincial and national level. The roles of each agency ought to be clearly determined to solve the problems of duplicated operation and lack of unity of command for cooperative work between paralleled agencies and people's participation. There should be meetings and co-

practices constantly for the benefit of the public rather than personal gain. Therefore, the cooperation during emergency situations between government agencies is not only the preparation for them to practice working together, but it is also the creation of balance between control-order and decentralization (Janjirawuttikul, 2012: 5-7; Kamolvej, 2006: 39).

4. The government organizations should be divided into 4 groups, each group has NODE which is the central coordination center, i.e. 1) forecast group; 2) warning group; 3) support group for immediate assistance and 4) support group for long-term reconstruction. The practice should directly concern communities/ localities. The management of organizations in such manner will contribute to more comprehensible and systematic work (Pinthong, 2012: 131-132).

5. Finally, there should be the mechanism and the system which support the creation of communities' preparation plans concerning disaster prevention and mitigation which links between areas, districts and provinces. The participation process of people and local community networks should be encouraged The Disaster Prevention and Mitigation Promotion Bureau (Department of Disaster Prevention and Mitigation, 2012: 7), Department of Disaster Prevention and Mitigation, has prepared a disaster management manual for people according to the principles of disaster risk management on the community basis. This manual provides guidelines for people and is used as the training document for community leaders according to the project to strengthen communities' potentiality in terms of disaster prevention and mitigation so that communities in risky areas have strength to take care of themselves. Currently, there should be the organization of knowledge sets concerning flood events in the past as well as the improvement of information in preparation for the future (Pooncharoen, 2012: 161). It is also important to distribute knowledge and use experience to prepare for floods; for example, Baan Chang Mo Community, Kham Nam Saeb Sub-district, Warin Chamrap District, Ubon Ratchathani Province prepared a flood management plan and a flood shelter (Liengjindathaworn, 2014: 50).

4.3 Analysis on management toward government policy in responsibility to disaster in Thailand: case study on flood and previous management, current situation and appropriate approach in response to future disaster

4.3.1 Model of flood management

In 1902, the Department of Canal was set up for the purpose of water management and irrigation. In 1914, it was changed to be Department of Irrigation. Later, it was changed to be Royal Irrigation Department in 1927. The floods occurring in the past were less difficult to manage as there were not so many constructions that blocked the floods. Therefore, floods could be managed by sole authority: Royal Irrigation Department. In 1937, M.L. Chuchart Kampoo analyzed the rain level in all parts of Thailand for irrigation and water sources development. In 1942, he developed a textbook on rain and water.

In 1942-2007, floods occurring in this period of time caused different levels of damages depending on the number of storms. At the early stages, floods were managed in accordance with the hierarchy of the relevant government bodies. At that time, Royal Irrigation Department was the only authority directly in charge of flood management. There were no clear policy formation and implementation. Flood management focused on restoration and rehabilitation rather than prevention and mitigation due to the lack of experts in the area of disaster management. In addition, people were not aware of this problem. During this period, Thailand still lacked appropriate equipments to handle with the problem. The disaster management system was not decentralized. All decisions were made by just one authority. There was lack of participation from other relevant bodies. There were no clear policies and plans regarding disaster management. Priorities were given to the country security and prevention of air-raid. In 1979, the Civil Defence Act B.E. 2522 was issued. According to this act, the structure of disaster management was clearly defined.

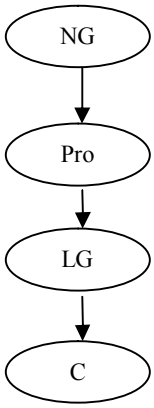

Figure 4.8 Model of flood management between 1942-2007

Explanation

NG = National Government ⟶ Authority

Pro = Province

LG = Local Government

C = Community

In 2004, there was a tsunami in Thailand, causing a lot of damages to lives and properties. So the government, private sectors and civil society started to be more aware of the disaster prevention and management. A lot of support networks were created during that time. New laws, policies and plans were issued during this period of time in order to deal with the disaster. The Constitution of the Kingdom of Thailand B.E. 2550 stated the duties and authority of the government and local authorities in disaster prevention and management. More policies and plans included: National Plan on the Prevention of Civil Calamity B.E. 2548, Master Plan on Disaster Prevention and Rehabilitation for Persons Suffering from Floods, Wind Storm, and Mudslide (five-year plan), Disaster Prevention and Mitigation Act B.E. 2550, a Three-Year Action Plan and Budget (2553-2555), National Plan on Disaster Prevention and Mitigation B.E. 2553-2557, 10th National Plan on Economic and Social Development. All these laws, policies and plans emphasized on the cooperation among all stakeholders. Priority was given on the integral work among the authorities in both horizontal and vertical administration.

In figure 4.8 main policy actors at the national, provincial and local level were shown. The authorities in charge of disaster management were changed after the government administration reform. The Department of Disaster Prevention and Mitigation had authority of disaster management, which emphasized on the restoration and rehabilitation after the disaster. There was little participation from private sectors and civil society as well as the international organizations. The tsunami in 2004 had proved that Thailand was not prepared for the disaster. There were no specific laws and plans for disaster management.

Figure 4.9 illustrated the hierarchy of the government administration which was vertical administration (according to the Disaster Prevention and Mitigation Act B.E. 2550 and National Plan on Disaster Prevention and Mitigation B.E. 2553-2557 in the Chapter of "Water and Flood Management" which classified floods as Level 4 Disaster). There were limited resources and cooperation among stakeholders even though there were more policy actors (not only at the national, provincial and local level but also at the international level as well as private sectors, communities, academics, volunteers and NPOs). However, the flood in 2011 proved that there was still a gap between policy formation and implementation as there was a lack of cooperation among stakeholders.

Disaster management during this time had discrepancies in terms of time i.e. time to make decision, warning time, evacuation time (priorities should be given to people with special needs such as the elderly, persons with disabilities, children and pregnant women). There were also discrepancies in term of communication, politics, conflict management, coordination among government offices in different ministries. The relevant government authorities worked according to their own regulations and budget. There were no pooled resources. There were also problems regarding policies and plans. Some new policies and plans were made even though such plans and policies already existed.

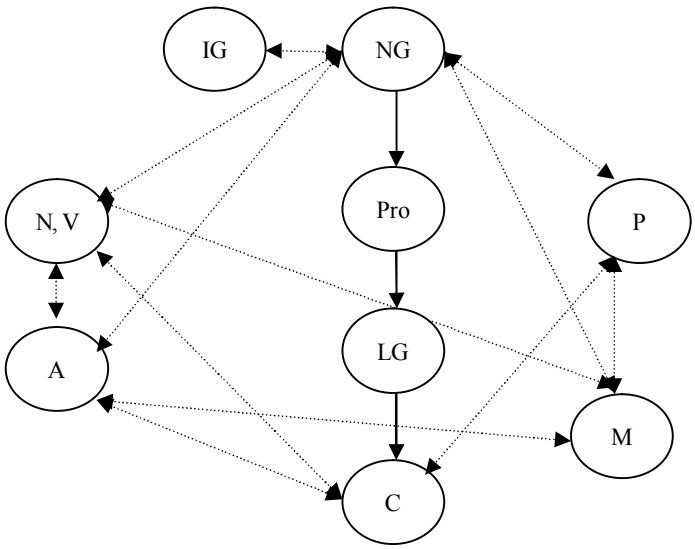

Figure 4.9 Model of flood management between 2007-2011

Explanation

IG = International Cooperation

NG = National Government

Pro = Province

LG = Local Government

C = Community

P = Private

N = Non Governmental Organization

M = Media

A = Academic

V = Volunteer

Collaboration

Authority

Hierarchical relationship between central and local government caused problems in disaster management. Authority and resources were not decentralized to local government. Even though the Department of Disaster Prevention and Mitigation was authorized as the office in charge, the administration and disaster management were still influenced by politics. Moreover, duties and responsibilities of each authority were not clearly defined.

Flood management in 2011 was not in accordance with the Disaster Prevention and Mitigation Act B.E.2550 as many new regulations were made during that time. For example, the Prime Minister Office Regulation on Strategies for Water Resources Management was issued on November 11, 2011. Under this Regulation, the Strategic Committee for Water Resources Management (SCWRM) was appointed in accordance with an Order of the Prime Minister Office No. 253/2011. On February 14, 2012, the Prime Minister Office Regulation on Flood Management was issued. The National Water Resources and Flood Policy Committee and Water and Flood Management Commission were appointed in accordance with this Regulation in order to give advice, consideration and revision on flood management. The Office of Policy and Administration of Water and Flood Management was authorized to collect data on flood which is classified as Level 4 Disaster.

Based on the analysis of water management by the government as shown in Figure 4.8 and 4.9 the researcher then developed Figure 4.10 using the data and lessons learned from previous water and flood management strategies. Figure 4.10 illustrated additional policy actors after 2004, which were key actors in decentralization of the authority. Resources and information were shared among central and local authorities. There was more balance in horizontal and vertical administration. The government authorities worked in accordance with the Disaster Prevention and Mitigation Act B.E. 2550 and National Plan on Disaster Prevention and Mitigation B.E. 2553-2557 in the Chapter of "Water and Flood Management". The administration was revised, from top down to decentralized administration. Local government had more authority in decision making. The officials from central government go to local areas to work with local government officials in the areas at risk of floods. All government offices in charge of flood management should have data which can be shared among these offices for fast decision making and management. Such data should be collected and managed in the same system so that they are compatible and can be shared with other offices.

Horizontal relationship occurs when there is a "common value on safety of lives and properties, awareness and culture on safety" as well as the "co-benefits". The objectives of the horizontal relationship are to cooperate with each other in problem

solving and conflict management. Key performers are not only the government but also all stakeholders.

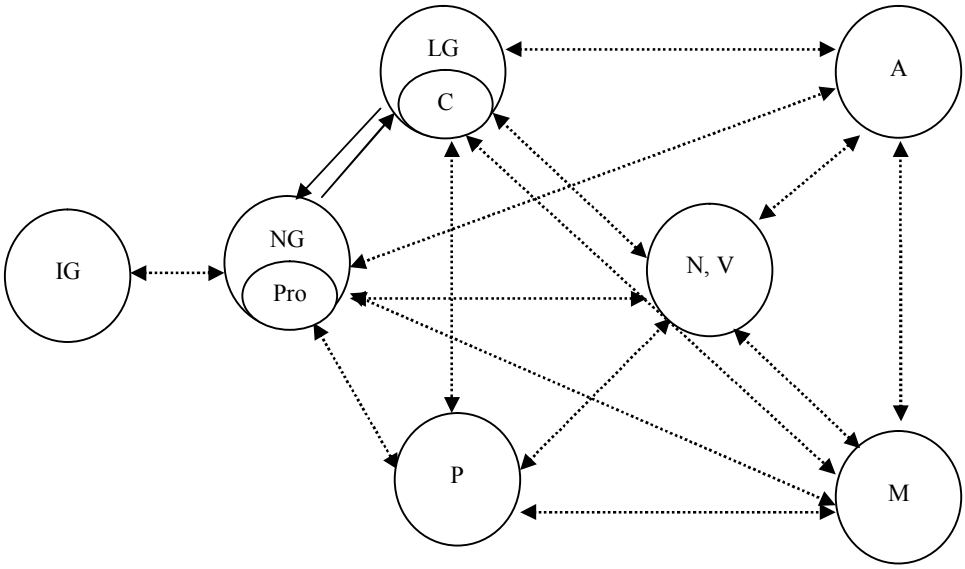

Figure 4.10 Model of flood management in future

Explanation

IG = International Cooperation
NG = National Government
Pro = Province
LG = Local Government
C = Community
P = Private
N = Non Governmental Organization
M = Media
A = Academic
V = Volunteer

Collaboration
Authority

The management model shown in Figure 4.10 is an example of self-management by the community, which can be used as a model of community-based disaster management. This kind of management prioritizes cooperation among stakeholders at all levels, which can promotes self-dependency of the community, resulting in sustainable development. According to this concept, stakeholders

participate in all steps of the process, from evacuation drills to the consent on the construction of dams and other kinds of irrigation constructions as these constructions affect their lives in various ways.

Figure 4.10 which is the model for future flood management was derived from the study of relevant research on flood management consisted of Wright, Dunn, Sabatier and Macdonald. It could be summarized that Model 3 of Flood Management has 3 key elements: prioritize the issues in the community, co-values of partners and cooperation among different authorities and organizations in both formal and informal manner as shown in Table 4.10.

Wright (1988) explained the policy actors, the relationship and the exchange of data and resources between agencies, i.e., government agencies, private agencies and people (Sabatier, 1988: 137; Macdonald, 2012: 579). In this case, there were 10 actors which were international level, national level, provincial level, local level, community level, private agencies, NGOs, volunteers, academics and the media. The relationship between policy actors were created according to the roles and duties which were determined by the policy process. For clear explanation of flood management pattern, the researcher assigned network analysis units as policy actors with nodes which consisted of 10 actors. The straight line with an arrow represented the relationship between levels according to the legal power which was, in this case, the Disaster Prevention and Mitigation Act B.E. 2550. The dotted line represented the informal relationship between coordination levels which supported the management system according to the defined objectives (Tuner, 1991: 504-505).

In conclusion, the flood management pattern consists of 3 main topics, which are the emphasis on issues which take place in communities, the mutual values which lead to the partnership in the problems and the cooperation across agency boundaries in formal, informal and related manners. This pattern is developed for the more efficient and effective flood management. It is different from public administration which utilizes government agencies as the mechanism to respond to government policies. This pattern also has the characteristic of innovative management. Even though the researcher still insists on the more complete management according to the current law, the researcher also suggests the cancellation of some actions, the improvement of inappropriate parts of the traditional management

and the creation of new management (see innovation concept in Suttawet, 2013: 58) by learning from the management lessons of other countries and the presentation which demonstrates how Thailand has overcome the problems that used to exist by the new or the more suitable relationship management approaches or strategies as follows:

1. The relationship between international level and national level is a cooperative relationship. At international level, there is the establishment of ASEAN Coordinating Center for Humanitarian Assistance in order to coordinate help between ASEAN member countries and the assistance from outside the region in case of disasters. The results of the operation of ASEAN Coordinating Center for Humanitarian Assistance consist of the flood in Jakarta in January, Typhoon Mahesen in Myanmar in May, the earthquake in Aceh, Indonesia in July, the flood in Manila which resulted from Maring thunderstorm in August, the floods in the central and Northern parts of Laos in August, the earthquake in Bohol, the Philippines in August and Typhoon Haiyan in the Philippines in November, which totaled 7 times of help. Nevertheless, regarding the aid in the past, the Director of Cross Sectoral Cooperation of the ASEAN Secretariat Mr Larry Maramis mentioned that the roles of ASEAN in helping the Philippines were not as evident as should be, which might be due to the lack of good public relations. The meeting has agreed that AHA Centre should collect data regarding the disaster from Typhoon Haiyan in the Philippines so that the agencies which are related to the disaster management in ASEAN can continue to study and learn from the experience in the Philippines (Ministry of Foreign Affairs, 2013).

2. The relationship between national level and provincial level is the legal relationship in which the national level is able to determine the roles and duties of the provincial level. In case of severe floods, the prime minister has the power to give orders to the minister of the Ministry of Interior and the governors to follow up with the situations and present information to support the consideration according to Section 6 of the Disaster Prevention and Mitigation Act B.E. 2550.

3. The relationship between national level, provincial level and local level is the legal relationship in which the national level is able to determine the roles and duties of the provincial level and the local level. However, the local level has freedom to self-administrate according to Section 281 of the Constitution of the

Kingdom of Thailand B.E. 2550. Therefore, the responsible persons at local level are the local directors whose duty is to assist provincial directors and district directors as assigned according to Section 20 of the Disaster Prevention and Mitigation Act B.E. 2550.

4. The relationship between national level, provincial level and private sector is a cooperative relationship according to the 10th National Economic and Social Development Plan which emphasizes the decentralization and the participation of private sector. In case of severe floods, the private sector plays the role of resource sponsor. Also, the private sector has informal relationships with local level, community level, NGOs, volunteers and the media.

5. The relationship between academics and national level, provincial level and local levels is the cooperative relationship in which the academics provide information for the preparation, the prevention and the response to floods in order to manage situations accurately and to minimize loss. As for the relationship between academics, community level, NGOs and volunteers, it is the cooperative relationship in which the academics provide information for the preparation, the prevention and the response to floods in the way that is appropriate for the area context of each community. Finally, the relationship between academics and the media is the cooperative relationship in which the academics provide and distribute flood information to the public.

6. The relationship between NGOs, volunteers, community level, private sector, academics and the media is the cooperative relationship which provides help for the affected communities. The academics are the ones who give knowledge and information while the media ask for help from various sectors and the private sector provides sponsorship. However, NGOs and volunteers do not only communicate through the media. They also use online social media for the communication with other people. Additionally, in the future flood management pattern presented by the researcher, NGOs belong to the same group as volunteers since the database of the National Statistic Office in 2006 indicated that there were 65,457 NGOs in Thailand which could be divided into 7 types: 1) social welfare services; 2) cremation associations; 3) trade associations and Chamber of Commerce; 4) employer's associations and Trade Union; 5) religious organizations; 6) political

parties and 7) international NGOs (Chunsom, 2012: 2). None of these 7 types specified the missions which were related to specific flood management.

As a result, the clear information regarding NGOs' responsibilities in flood management was not found. Besides, considering flood incidents from the past until 2011, NGOs were considered the organizations which were not part of the government. They could be in the forms of sports clubs, community organizations, foundations, social associations or clubs, religious organizations, etc. The management of floods from the past until 2011 was the relationship between volunteers which was created by the congregation of members who had volunteer spirits and shared the same objectives. The congregation was in the forms of groups such as the volunteer club for the development of the old city of Ayutthaya and the volunteers for flood in Pathum Thani. Parts of the volunteers came from NGOs like Friends in Need (of "Pa") Volunteers Foundation, Mirror Foundation, etc. Hence, volunteers and NGOs are connected.

7. The relationship between the media and the management at national level, provincial level and local level should be informal. The communication, the interview and the presentation of information through the media like newspapers, televisions, radios and publications should be done through the broadcast media production system which is not operated by the government to reduce direct control on the media. Instead, they should be the public media which can access people and independently distribute clear information using diverse means of presentation. The media under the control of the government or the private sector have limitations in the presentation. Therefore, the public media should perform their duties truly for people by presenting the contents that are missing from the government's and the capital groups' media (Pongsudhirak and Kanchuchat, 2003: 13-76). Besides, the relationship between the media, community level, private sector, academics, NGOs and volunteers is an informal relationship which involves the communication and the distribution of information to the public.

4.3.2 Flood management approach according to new model

Central government should play a key role in making strategic plan on flood management and set up guidelines for the stakeholders to follow. Even with political changes, flood management should be done continuously. Moreover, flood management should be done with consideration on the different characteristics of the communities. Some communities are located in the areas that are affected by rain while some are located in the areas affected by high tides. Therefore, the floods in different areas need different management strategies. The provinces and districts are key mechanisms in local administration on flood management. They are coordinators of central government and local authorities i.e. Provincial Administrative Organizations (PAO), Tambon Administrative Organizations (TAO), Pattaya City Administration and Bangkok Municipality Administration.

The local authorities should have information about their own communities especially in the areas at risk of floods. Some areas in the communities have been changed, resulting in more challenges in flood management. For example, some areas that used to be floodways were changed to be industrial areas, while some areas were changed to be houses or business areas. Some constructions in these areas blocked floodways, causing serious floods which are more difficult to manage. Private sectors also play an important role in flood management in the communities. They provide technical support, budget and other kinds of resources. The cooperation between private sectors and local authorities is necessary especially in emergency because the support from central government may not be provided in a timely manner due to bureaucratic ways of work. Nonprofit organizations are also important performers for flood management in the communities. The NPOs, together with the academics and experts, can give advice and support local governments in planning and implementing the strategies and practices as flood management is a multidisciplinary approach that needs support from various groups of experts. International cooperation is also important in flood management because we need to learn from other countries how they manage the floods in their countries/which strategies and knowledge can be applied for our communities. Information and resource sharing among member states is important for future flood management. The international cooperation between the

governments should be bilateral. Cooperation among ASEAN member states should also be promoted for flood management.

Roles of the authorities in charge of flood management: The researcher divided performers of flood management into 2 groups: key performers and supporting performers.

Key roles include: policy making and implementation, planning, setting guidelines, issuing laws and regulations, identifying roles and power of the authorities at the national, provincial, local and community level.

Supporting roles include: providing resources and general support, participating in flood management as co-projects between two authorities, and other kinds of support which are not specified. Supporting roles can be at the international level or local level. It can be done by NPOs, private sectors, mass media and volunteers.

According to the focus group discussion among experts in flood management, it was concluded that, in explaining the model of flood management, roles of each performer should be explained as their roles change according to the situations. It was also concluded that there should be standards and guidelines for the authorities and stakeholders to follow in order to avoid confusion.

Disasters are divided into 4 levels. Each level is managed by specific authority. First Level of disaster is managed by directors in the districts or local authorities (in case of local government) and/or assistant directors in Bangkok Municipality Administration (in case of Bangkok). Second Level of disaster is managed by directors in the provinces and/or directors in Bangkok Municipality Administration. Third Level of disaster is classified as a serious one that affects large areas. This level of disaster needs to be managed with high expertise by main authority. The third level of disaster is under the authority of the Chief Commander on Disaster Prevention and Mitigation. Fourth Level of Disaster is classified as the most severe one which causes the most damages. It is under the authority of the Prime Minister or Deputy Prime Minister (as appointed by the Prime Minister).

For First Level Disaster, the management can also be divided into 3 stages: pre-disaster stage, disaster stage and post-disaster stage.

Pre-disaster stage : Key performers in this stage include: the performers at the provincial and local level, including the communities, academics, private sectors, NPOs, mass media and volunteers.

Disaster stage : Key performers in this stage include: the performers at the provincial and local level, including the communities.

Post-disaster stage: Key performers in this stage include: the performers at the provincial and local level, including the communities and mass media.

For Second Level Disaster, the management can also be divided into 3 stages: pre-disaster stage, disaster stage and post-disaster stage.

Pre-disaster stage : Key performers in this stage include: the performers at the provincial and local level, including the communities, academics, private sectors, NPOs, mass media and volunteers.

Disaster stage : Key performers in this stage include: the performers at the provincial and local level, including the communities.

Post-disaster stage: Key performers in this stage include: the performers at the provincial and local level, including the communities and mass media.

For Third Level Disaster, the management can also be divided into 3 stages: pre-disaster stage, disaster stage and post-disaster stage.

Pre-disaster stage : Key performers in this stage include: the performers at the national, provincial and local level, including the communities, academics, private sectors, NPOs, mass media and volunteers.

Disaster stage : Key performers in this stage include: the performers at the national, provincial and local level, including the communities.

Post-disaster stage: Key performers in this stage include: the performers at the national and local level, including the communities and mass media.

For Fourth Level Disaster, the management can be divided into 3 stages: pre-disaster stage, disaster stage and post-disaster stage.

Pre-disaster stage : Key performers in this stage include: the performers at the international, national, provincial and local level, including the communities, academics, private sectors, NPOs, mass media and volunteers.

Disaster stage : Key performers in this stage include: the performers at the national, provincial and local level, including the communities.

Post-disaster stage: Key performers in this stage include: the performers at the national and local level, including the communities and mass media

Roles of Performers;

Pre-Flood Stage

Roles of performers at the international level include:

1. Discuss with other organizations about standards and guidelines at the ASEAN level such as the ASEAN Coordinating Centre for Humanitarian Assistance: AHA Centre and at the bilateral level.
2. Exchange experts on flood management.
3. Provide resources for disaster preparedness.
4. Learn about disaster management from other countries and apply to Thai context.
5. Promote understanding among the authorities about their roles in flood management i.e. Ministry of Foreign Affairs
6. Set up the center to collect and distribute necessities to those who suffer from the floods
7. Administer the information in the areas.

Roles of performers at the national level include:

1. Set up policies, study related laws and regulations in order to make revisions as necessary.
2. Get information about city plan and flood management. Collect and analyze the data. Then keep in database in a compatible format so that it can be shared with other organizations.
3. Set up the center of information distribution related to flood prevention and management.
4. Learn from previous flood management and develop appropriate approaches in accordance with the context of the community.

5. Encourage civil society to participate in flood management.

6. Act as the center of logistics management for the distribution of the necessities to those who suffer from the floods.

Roles of performers at the provincial level include:

1. Give advice and promote cooperation among the authorities at the national and local level.

2. Provide resources for the preparation of the budget, human resources and other kinds of resources.

3. Make plans on the preparation of manpower.

4. Encourage local authorities to have evacuation drills and to provide resources to the provinces.

Roles of performers at the local level include:

1. Make plans on flood management by the communities in accordance with the national laws and regulations.

2. Set up the ad hoc working groups or units to be in charge of the information system management and resource management such as the information evaluation unit, public relations unit, resource provision unit.

3. Collect data of the communities at risk of floods including the flooded areas.

4. Support the communities in making physical maps.

5. Set up budget as compensation for those who are affected by floods. In emergency, budget should be provided and allocated as compensation to those who are affected by floods and other kinds of disaster. The allocation of such budget shall be in accordance with the Regulations on Budget Provision and Allocation under the Authority of Provincial Administrative Organizations, Municipality and Tambon Administrative Organizations B.E. 2543.

Roles of private sectors include:

1. Collect information of the areas around the affected communities including information about previous floods.

2. Provide support for the preparation of human resource, budget, places, etc.

3. Cooperate with other organizations in the preparation and implementation of flood management plans.

Roles of the academics include:

1. Collect information about previous floods and affected areas.
2. Conduct research on the preparedness for flood management.
3. Study and analyze previous works related to flood management and give advice on the preparedness for flood management.
4. Participate in flood management planning and the implementation of the plans.
5. Educate people in various ways such as organizing workshop.

Roles of volunteers include:

1. Recruit volunteers, educate and train volunteers.
2. Plan for community visits in order to collect data about floods.
3. Train themselves to be ready for flood management.

Roles of NGOs include:

1. Provide resources.
2. Educate people and promote knowledge management for the disaster preparedness

Roles of the communities include:

1. Get information about the disaster in that community i.e. types of disaster, the year that the disaster occurred; make survey in the community; identify the available resources in the areas.
2. Appoint Committee on Disaster Prevention and Mitigation in the community.
3. Educate people in various ways such as organizing workshop for disaster preparedness.

4. Promote campaign on the safety in the community.

5. Co-organize drills with relevant organizations from the government, private sectors and local authorities according to the plans for disaster prevention and mitigation.

6. Develop effective warning system in the communities such as using the signs.

7. Clean canals and water bodies in the communities.

8. Set up community fund for disaster management

Roles of mass media: News and information released by mass media should be reliable. All information released to the public should have references and needs to be analyzed. Moreover, mass media should avoid creating panic among people.

Flood Stage

At the international level: Provide resources to support those who are affected by floods.

At the national level: Coordinate with local authorities and other organizations in rehabilitation for people affected by floods.

At the provincial level: Identify the affected areas as disastrous areas. Follow the national plans and emergency plans for flood prevention and management in the provinces/districts/sub-districts/local authorities. The governors of the flooded provinces have authority to announce their provinces as disastrous areas and can support people in their provinces according to Ministerial Regulations of the Ministry of Finance B.E. 2546. In Bangkok, the Director General of the Department of Disaster Prevention and Mitigation has authority to identify the disastrous areas according to the Ministry of Interior. In other provinces, the Provincial Offices of Disaster Prevention and Mitigation have authority to announce disastrous areas in the provinces in order to get support.

At local level: The administrative centers of disaster prevention and mitigation are set up in local communities as coordinators between the national and local authorities in order to reach people in all areas of the communities. In case somebody in the community gets injured and needs to be transferred, the communities should get support from other organizations. In addition to the administrative centers,

some other units are set up in the communities such as the unit to evaluate flood situations, mitigation and rehabilitation unit, emergency units, and community units such as temples and volunteers' units.

Private sectors provide human resources, budget, places, etc. for disaster preparedness.

The academics educate people about how to survive during the floods. In addition, they conduct research on flood management in order to find out the obstacles and weak points for the improvements in flood management.

Volunteers can do several things, from packaging to coordinating and fund raising. They provide various types of support according to their expertise and skills.

NGOs also provide several types of support, from packaging to coordinating and fund raising.

Roles of the communities include: follow guidelines and instructions according to the plan on flood management, check electricity system, clean up the areas, keep dangerous tools in a safe place, inform people the ways to protect themselves from snakes and other poisonous animals, not to walk in flooded areas.

When there are floods in the country or in the communities, mass media should inform the public about the floods in all dimensions, with the emphasis on people's participation and mental rehabilitation.

Post-Flood Stage

After the floods, the international community's usually support by providing resources for restoration and rehabilitation.

At the national level: Provide resources for the rehabilitation and to review the work done before and during the floods in order to find weak points and make improvements in flood management. Provide support to those who were affected by the floods in accordance with the laws and regulations issued in 2003 and 2008 regarding the 9 areas of support to people as follows: 1) support to those affected by disaster; 2) rehabilitation and welfare to people who are affected by disaster; 3) medical and health care; 4) crops; 5) fishery; 6) livestock; 7) agriculture; 8) disaster preventions and mitigation; and 9) emergency rescue.

At the provincial level: Provide resources for restoration and rehabilitation.

At local level: Coordinate and share information with organizations/ authorities at the provincial level, trying to communicate with people in the areas where it's difficult to reach. In case of an emergency transfer, local communities may need help from other authorities. Some units are set up in the communities such as the unit to evaluate flood situations, mitigation and rehabilitation unit, emergency units, and community units such as temples and volunteers' units.

Private sectors: Provide various types of resources for restoration and rehabilitation.

The academics: Collect all relevant information, analyze and evaluate the work done before and during the floods, and make suggestions for future work and improvements.

Volunteers: Promote information sharing among relevant organizations for restoration and mental rehabilitation.

NGOs: Promote information sharing among relevant organizations, analyze information regarding floods, raise funds, and provide support for restoration and mental rehabilitation.

Communities: Evaluate damages caused by floods, provide support in restoration and mental rehabilitation.

Mass media: Inform the public not only about the damages but also other types of information in different dimensions including the restoration, rehabilitation, suggestions for flood prevention and management.

Conclusion in table 4.9 and 4.10

Table 4.9 Compare model of flood management

Model / Difference	Model of flood management between 1942-2007	Model of flood management between 2007-2011	Model of flood management in future
Policy	There were no clear policy making and implementation because floods occurring in this period of time were not so difficult to manage.	Policy making and implementation was done in accordance with the Disaster Prevention and Mitigation Act B.E. 2550 and other related laws. Management framework, types of disaster, policies and guidelines were clearly defined. The Department of Disaster Prevention and Mitigation had power and authority in flood management and administration. Flood management was done in 3 levels: at the national level (by central government), provincial and local level.	Policy making and implementation was done in accordance with the Disaster Prevention and Mitigation Act B.E. 2550 and Prime Minister Office Regulations on Flood Management B.E. 2555. National Office of Flood Management and Policy was set up. The work and authority of this new office overlaps with that of the Department of Disaster Prevention and Mitigation. Besides, this new office took manpower from many other offices, resulting in more complicated and confusing way of work. Therefore, these rules and regulations should be reviewed for clear power and duties of the authorities in charge of flood management.
Structure	There was no decentralization of power at that time. Flood management was done in accordance with the hierarchy of authority.	There were both vertical and horizontal management.	The administration should be decentralized. Local authorities and communities should participate more in the decision making process. More resources should be available in local communities. The vertical administration lines should be short and clear. Empower local authorities.

Table 4.9 Compare model of flood management (cont.)

Model / Difference	Model of flood management between 1942-2007	Model of flood management between 2007-2011	Model of flood management in future
Approach management	Flood management emphasized on rehabilitation rather than prevention.	Proactive strategies in order to prevent disaster and reduce damages. Community participation was strongly encouraged.	Promote proactive approaches of flood management. Develop relationship among formal and informal key performers. Flood management should emphasize on the disaster prevention and mitigation. Provide rehabilitation systematically. Risk assessment and disaster prevention plans should be done in the communities at risk.

Some issues were raised in the focus group discussion such as the criteria to decide whether certain areas should get restoration and rehabilitation. For example, some areas were not at risk of floods but due to the constructions and the alteration of land use, floodways were blocked, causing serious damages to those areas. In this case, there was a debate whether it was appropriate or not to give them same support with other areas that cannot avoid floods. (In general, the areas in the community can be divided into 3 types. The first type consists of areas that are flooded every year due to their locations. The second type means the areas at risk of floods. When there are some other factors such as storms or high tides, these areas can be flooded. The third type means the areas that, due to their locations, are not likely to be flooded i.e. the areas on the highland. But due to the constructions or inappropriate change in the use of land, those areas become flooded. In this case, the floods are caused by men.

Therefore, laws related to city plans and rehabilitation for flooded areas should be revised. Another issue raised in the focus group discussion was the structure of work. Village heads and district heads play important roles in coordinating between authorities at the national level and local authorities/communities. Hence, the structure of flood management should be reviewed and revised. Roles of some authorities

should be changed (from commanders to coordinators or administrators, for example) so that their works will not overlap with other authorities. For more effective works, the relevant authorities should exchange their resources and cooperate with each other. The last issue raised during the focus group discussion was "lack of communication among government authorities". In Thailand, there are laws and regulations related to disaster management (Disaster Prevention and Mitigation Act B.E. 2550 and the Government Administration Regulations B.E. 2534) for the authorities in charge of flood management to follow. These laws and regulations had been enacted long before the flood time in 2011. However, new authorities were set up because the government was not informed. Then a question was raised, "How much information is shared among the government bodies?"

Table 4.10 Compare the role of actors in other periods of flood management

Periods / Actors	Before the floods	During the floods	After the floods
International level	1. Discuss with other organizations about standards and guidelines at the ASEAN level such as the ASEAN Coordinating Centre for Humanitarian Assistance: AHA Centre and at the bilateral level. 2. Exchange experts on flood management. 3. Provide resources for disaster preparedness. 4. Learn about disaster management from other countries and apply to Thai context.	Provide resources to support those who are affected by floods.	Support by providing resources for restoration and rehabilitation.

Table 4.10 Compare the role of actors in other periods of flood management (cont.)

Periods / Actors	Before the floods	During the floods	After the floods
International level (cont.)	5. Promote understanding among the authorities about their roles in flood management i.e. Ministry of Foreign Affairs 6. Set up the center to collect and distribute necessities to those who suffer from the floods 7. Administer the information in the areas.		
National level	1. Set up policies, study related laws and regulations in order to make revisions as necessary. 2. Get information about city plan and flood management. Collect and analyze the data. Then keep in database in a compatible format so that it can be shared with other organizations. 3. Set up the center of information distribution related to flood prevention and management.	Coordinate with local authorities and other organizations in rehabilitation for people affected by floods.	Provide resources for the rehabilitation and to review the work done before and during the floods in order to find weak points and make improvements in flood management. Provide support to those who were affected by the floods in accordance with the laws and regulations issued in 2546 and 2551 regarding the 9 areas of support to people as follows: 1) support to those affected by disaster; 2) rehabilitation and welfare to people who are affected by disaster;

Table 4.10 Compare the role of actors in other periods of flood management (cont.)

Periods / Actors	Before the floods	During the floods	After the floods
National level (cont.)	4. Learn from previous flood management and develop appropriate approaches in accordance with the context of the community. 5. Encourage civil society to participate in flood management. 6. Act as the center of logistics management for the distribution of the necessities to those who suffer from the floods.		3) medical and health care; 4) crops; 5) fishery; 6) livestock; 7) agriculture; 8) disaster preventions and mitigation; and 9) emergency rescue.
Provincial level	1. Give advice and promote cooperation among the authorities at the national and local level. 2. Provide resources for the preparation of the budget, human resources and other kinds of resources. 3. Make plans on the preparation of manpower. 4. Encourage local authorities to have evacuation drills and to provide resources to the provinces.	Identify the affected areas as disastrous areas. Follow the national plans and emergency plans for flood prevention and management in the provinces/districts/sub-districts/local authorities. The governors of the flooded provinces have authority to announce their provinces as disastrous areas and can support people in their provinces according to Ministerial Regulations of the Ministry of Finance B.E. 2546.	Provide resources for restoration and rehabilitation.

Table 4.10 Compare the role of actors in other periods of flood management (cont.)

Periods / Actors	Before the floods	During the floods	After the floods
Provincial level (cont.)		In Bangkok, the Director General of the Department of Disaster Prevention and Mitigation has authority to identify the disastrous areas according to the Ministry of Interior. In other provinces, the Provincial Offices of Disaster Prevention and Mitigation have authority to announce disastrous areas in the provinces in order to get support.	
Local level	1. Make plans on flood management by the communities in accordance with the national laws and regulations. 2. Set up the ad hoc working groups or units to be in charge of the information system management and resource management such as the information evaluation unit, public relations unit, resource provision unit. 3. Collect data of the communities at risk of floods including the flooded areas.	The administrative centers of disaster prevention and mitigation are set up in local communities as coordinators between the national and local authorities in order to reach people in all areas of the communities. In case somebody in the community gets injured and needs to be transferred, the communities should get support from other organizations.	Coordinate and share information with organizations/authorities at the provincial level, trying to communicate with people in the areas where it's difficult to reach. In case of an emergency transfer, local communities may need help from other authorities. Some units are set up in the communities such as the unit to evaluate flood situations, mitigation and rehabilitation unit, emergency units, and community units such as temples and volunteers' units.

Table 4.10 Compare the role of actors in other periods of flood management (cont.)

Periods / Actors	Before the floods	During the floods	After the floods
Local level (cont.)	4. Support the communities in making physical maps. 5. Set up budget as compensation for those who are affected by floods. In emergency, budget should be provided and allocated as compensation to those who are affected by floods and other kinds of disaster. The allocation of such budget shall be in accordance with the Regulations on Budget Provision and Allocation under the Authority of Provincial Administrative Organizations, Municipality and Tambon Administrative Organizations B.E. 2543.	In addition to the administrative centers, some other units are set up in the communities such as the unit to evaluate flood situations, mitigation and rehabilitation unit, emergency units, and community units such as temples and volunteers' units.	
Private sectors	1. Collect information of the areas around the affected communities including information about previous floods. 2. Provide support for the preparation of human resource, budget, places, etc. 3. Cooperate with other organizations in the preparation and implementation of flood management plans.	Provide human resources, budget, places, etc. for disaster preparedness.	Provide various types of resources for restoration and rehabilitation.

Table 4.10 Compare the role of actors in other periods of flood management (cont.)

Periods / Actors	Before the floods	During the floods	After the floods
The academics	1. Collect information about previous floods and affected areas. 2. Conduct research on the preparedness for flood management. 3. Study and analyze previous works related to flood management and give advice on the preparedness for flood management. 4. Participate in flood management planning and the implementation of the plans. 5. Educate people in various ways such as organizing workshop.	Educate people about how to survive during the floods. In addition, they conduct research on flood management in order to find out the obstacles and weak points for the improvements in flood management.	Collect all relevant information, analyze and evaluate the work done before and during the floods, and make suggestions for future work and improvements.
Volunteers	1. Recruit volunteers, educate and train volunteers. 2. Plan for community visits in order to collect data about floods. 3. Train themselves to be ready for flood management.	Do several things, from packaging to coordinating and fund raising. They provide various types of support according to their expertise and skills.	Promote information sharing among relevant organizations for restoration and mental rehabilitation.
NGOs	1. Provide resources. 2. Educate people and promote knowledge management for the disaster preparedness	Provide several types of support, from packaging to coordinating and fund raising.	Promote information sharing among relevant organizations, analyze information regarding floods, raise funds, provide support for restoration and mental rehabilitation.

Table 4.10 Compare the role of actors in other periods of flood management (cont.)

Periods / Actors	Before the floods	During the floods	After the floods
Communities	1. Get information about the disaster in that community i.e. types of disaster, the year that the disaster occurred; make survey in the community; identify the available resources in the areas. 2. Appoint Committee on Disaster Prevention and Mitigation in the community. 3. Educate people in various ways such as organizing workshop for disaster preparedness. 4. Promote campaign on the safety in the community. 5. Co-organize drills with relevant organizations from the government, private sectors and local authorities according to the plans for disaster prevention and mitigation. 6. Develop effective warning system in the communities such as using the signs. 7. Clean canals and water bodies in the communities. 8. Set up community fund for disaster management	Follow guidelines and instructions according to the plan on flood management, check electricity system, clean up the areas, keep dangerous tools in a safe place, inform people the ways to protect themselves from snakes and other poisonous animals, not to walk in flooded areas.	Evaluate damages caused by floods, provide support in restoration and mental rehabilitation.

Table 4.10 Compare the role of actors in other periods of flood management (cont.)

Periods / Actors	Before the floods	During the floods	After the floods
Mass media	News and information released by mass media should be reliable. All information released to the public should have references and needs to be analyzed. Moreover, mass media should avoid creating panic among people.	Mass media should inform the public about the floods in all dimensions, with the emphasis on people's participation and mental rehabilitation.	Inform the public not only about the damages but also other types of information in different dimensions including the restoration, rehabilitation, suggestions for flood prevention and management.

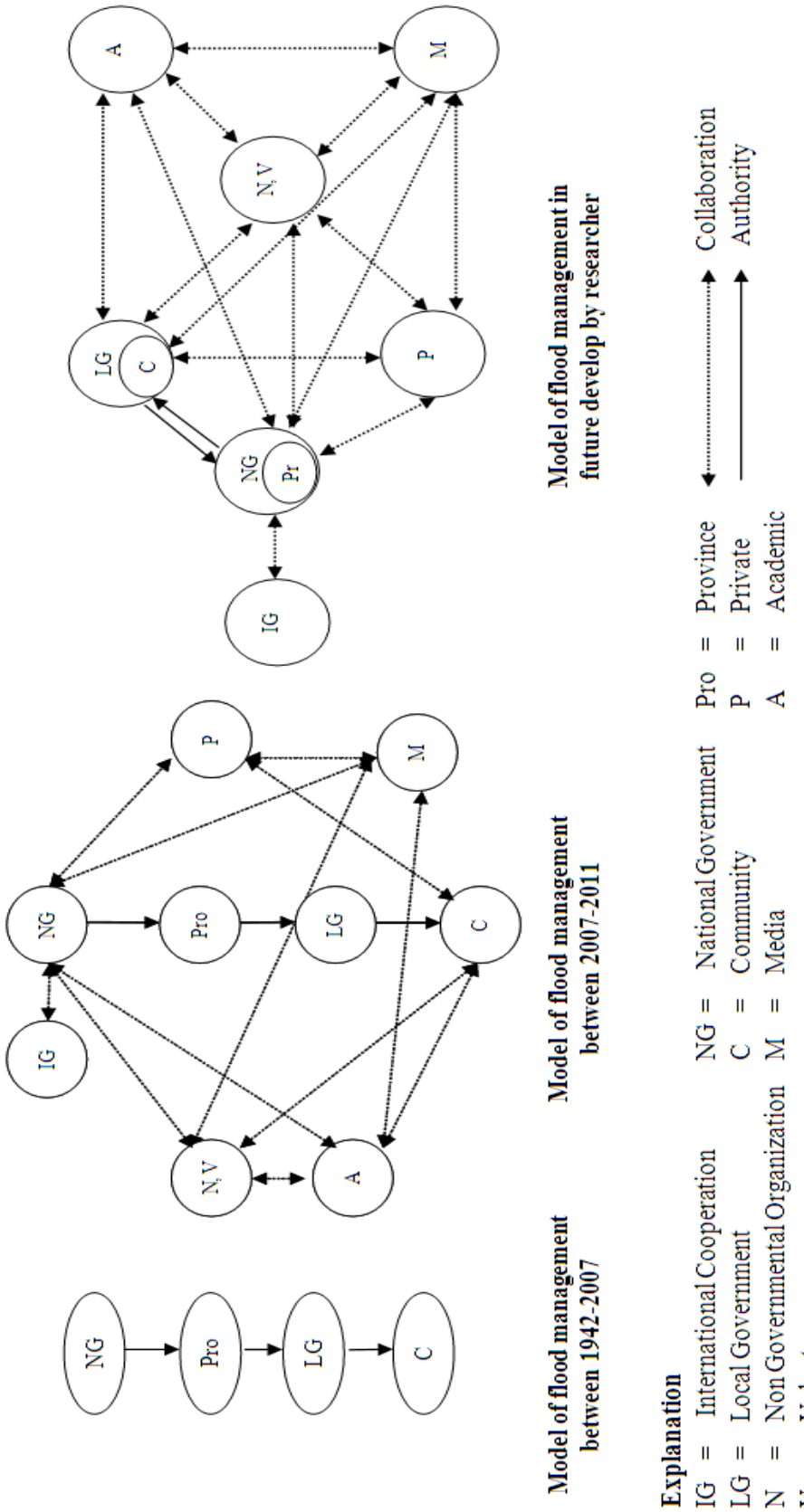

Figure 4.11 Compares model of flood management

CHAPTER V
DISCUSSION

Discussions of the analysis are as follows:

1. Discussion on the management of disaster response, with the case studies of floods by government sector, people sectors and private sectors at 4 levels: international, national, provincial and local level

2. Discussion on factors affecting the efficiency and effectiveness policy formation and management in accordance with public policies by the government sector, people sectors and private sectors in response to the disaster in Thailand: case study on floods

3. Discussion on management toward government policy in responsibility to disaster in Thailand: case study on flood and previous management, current situation and appropriate approach in response to future disaster

5.1 Discussion on the management of disaster response, with the case studies of floods by government sector, people sectors and private sectors at 4 levels: international, national, provincial and local level

According to records from Climatological center, the Office of Meteorological Science Development, the tropical cyclones moved towards Thailand in the period of 61 years (1951-2011) were 186 in total. Each time, the government takes on the main role in the management of disaster response, details are as follows.

In period 50 years (1942-1992) defense approach focuses on solving immediate problems and use structural measures such as Bhumibol dam, opened in 1964, and Sirikij dam, opened in 1964.

During 10 years later (1993-2002) changed from the first 50 years, with an opportunity for private sector participation in management and 10 years later (2003-2012) it appears that Thailand's governmental policies' management in response to

disasters become clearer. For the three laws directly related to disaster management (Civil Defence Act B.E. 2522, National Civil Defence Plan B.E. 2548 and Disaster Prevention and Mitigation Act B.E. 2550), they emphasize on disaster management by following regular steps. The disasters happening in the past were not complicated and could be handled by one government unit. In 2005, there was a progress in disaster management. More proactive approaches were used for disaster prevention. Communication system was developed and more participation of the community was encouraged. According to the Disaster Prevention and Mitigation Act B.E. 2550, the main government unit in charge of disaster management (formerly known as public disaster) was the Department of Disaster Prevention and Mitigation.

The study found that these factors or conditions could be divided into three categories: technical factors, human performance and organizational performance

In 1942-1992, these three factors can be described by time as follows: Technical factors: structural and non-structural measures were not practiced because when there was a flood in 1942, and reservoirs had not yet been constructed. The implementation of the 34 laws related to disaster management was not done in an integral manner. A lack of unity and justice in resource distribution from the related organizations/offices made matters worse. Human performance factors: These factors consisted of knowledge, skills, experience, understanding, training and awareness. The government bodies in charge of disaster management consisted of various ministries and departments in the central government and local authorities. The complicated organizational structure of related governmental bodies made it slow to respond to the disaster. Moreover, there were no preventive measures. Much of the time, disaster management was done only after the disaster had occurred. Organizational performance factors: There was a lack of efficient cooperation between governmental and private sectors, as well as autonomous organizations and civil society in disaster management. There was no specific government authority, under the Office of Civil Defence, coordinating efforts among the organizations.

In 1993-2002, the factors are composed as follows: Technical factors consisted of structural measures and non- structural measures. Human performance factors were a lack of skills and experiences in responding to disasters and a lack of awareness about the environmental issues. Organizational performance factors were a

lack of a specific governmental body that was in charge of such matters and a complicated management process, which caused confusion among the stakeholders.

In 2003-2012, the factors are composed as follows: Technical factors consisted of structural measures and non-structural measures. The problems in structural measures were related to dikes, water flows and high tide. Non-structural measures consisted of conflict among people (in the area near Rangsit Canal, for example), settlement of people, land use in the affected areas, laws and policies. Human performance factors were knowledge of the people in charge in disaster prevention and preparedness, response to the disaster and rehabilitation and knowledge about the general public in disaster prevention and preparedness. Organizational performance factors were related to the communication channels from the government to the public. However, this problem was solved after government reform in 2002 as the Department of Disaster Prevention and Mitigation, under the Civil Defence Act B.E. 2522 and the National Plan on Civil Defence B.E. 2545, which authorized setting up preventive measures for the government, private sectors and civil society.

The authorities in charge at the national level consist of the Prime Minister, Disaster Prevention and Mitigation Committee and the National Safety Commission. These 3 government bodies have authorities in disaster management as stated in the Disaster Prevention and Mitigation Act B.E. 2550.

The institutional frameworks of disaster management in other member countries consist of National disaster Management centre Ministry of Home Affairs (Brunel Darussalam), National Committee for Disaster Management (Cambodia), National Disaster Management Agency (Indonesia), National Disaster Management Office, Department of Social Welfare, Ministry of Labor and Social Welfare (Lao PDR), National Security Council, Prime Minister's Department (Malaysia)

The institutional frameworks of disaster management at the national level consist of Strategic Steering Sub-Committee on Disaster Prevention and Mitigation, National Headquarter of the Disaster Prevention and Mitigation, National Administrative Office of the Disaster Prevention and Mitigation, and Local Administrative Office of the Disaster Prevention and Mitigation.

The government authorities in charge of disaster management at the provincial level consist of the Governor of the Province. The authorities at local levels are divided into: sub-district levels, municipal level, cities and districts in Bangkok. These authorities include: Chief Executive of Tambon Administration Organizations (TAO), Deputy Chief Executive of TAO, Chief Administrator of TAO, Tambon headman, village headman, mayor, municipal clerk, district chief, deputy district chief, district directors of Bangkok Metropolitan Administration (BMA), the Governor of Bangkok, Deputy Governor of Bangkok, Pattaya City Mayor, Deputy Pattaya City Mayor, rescue teams.

For the policy evaluation process, there is no particular unit assigned to be in charge of disaster management.

In this particular case study, the researchers have categorized them into 3 case studies: incidents of disasters, the case study of floods. Prior to the reformation, the public sector had the structure using 2R ideologies, which are Readiness and Response, from the Bureau of disasters' prevention and mitigation. After the reformation, the public sector uses the ideology of 3E (Engineering, Education, Enforcement) annexed with 4R (Reduction, Readiness, Respond, Recovery) (Tingsanchali, et al., 2003: 6-25) and nowadays use the ideas of 2P2R (Prevention/ Preparation/ Response/ Recovery) within the government led by Ms.Yingluck Shinnawatra.

From the case studies of 1995 and 2006, the response towards disasters in this period inclines to be more of a defense than offense, and often focuses on addressing immediate problems, as well as using infrastructure, such as dams, dikes, reservoirs and ridges etc. to take in water and protect economic areas. As for the citizens, in 2006, there was a clearer management of aids in communities, this may be because the majority of the citizens have experienced from the past – and thus are using those experiences to create prevention guideline and protect the essential areas of the community. Examples are such as Bang-ragum community's management format which relied on real experiences and adjustment of lifestyle to live peacefully with the water and receive mutual benefits; and in 2011, the management of government still has a commanding characteristic, but there were changes in train of

thoughts – not only defensive, but have prevention measures and preparations in addition.

Furthermore, citizens of many areas went through a number of floods, they thus have produced community-operated defense measures, and aid provision. The management of local government, nowadays, receives corporation between nations in the planning and preparations for disasters worldwide; also, in consideration to international aid, it appears international aids are provided in response and recovery. From the above information, it can be seen that main content of disaster management is written in The Constitution of the Kingdom of Thailand B.E. 2550 and other laws, public policies, National Economic and Social Development Plan. Roles of relevant organizations and the disaster management previously done by the government are in accordance with the study on the disaster management in case of the tsunami in Thailand shows that the policies were effectively implemented in case of an emergency.

The process of each policy is effectively integrated to some extent. There is also the coherence of policies and the rehabilitation process at the community level. However, during the transition period to the rehabilitation and development, there is a gap in the policy process especially in term of the cooperation between the community and the organizations in charge because the government authorities and policies are not flexible enough. In Thailand, the Department of Disaster Prevention and Mitigation is the authority in charge of disaster management. It was established in 2002, after the government reform. Even though the department has authority, there are some obstacles in dealing with the disaster as it is under Bangkok Metropolitan Administration (BMA), which mostly deals with urgent issues. However, there is a lack of cooperation in a longer term (Wungaeo, et al., 2006: 24, 28; Mulwanda, 1999: 43; Atmanand, 2003: 293-294) which stated that in order to make disaster management efficient, laws need to be developed and public awareness should be raised. In the past, the government work in Thailand was slow.

However, after the issuance of the Disaster Prevention and Mitigation Act B.E. 2550, there was a clearer structure of work. Roles and duties of the organizations in charge are clearly defined. People in the communities are given highest priorities as they are victims of the disaster. This is in accordance with the study of Patterson, et al.

(2010: 127); Newport, et al. (2003: 33); Jahangiri, et al. (2011: 83-84); Said, et al. (2011: 89-92) which stated the communities should have more participation in risk management, starting from the prevention, preparedness, response and restoration. Decentralization should be promoted (Rhodes and Marsh, 1992: 1-26); Price, 2009: 14). In crisis, local governments should have authority to make decision (Kamolvej, 2006: 39). In this way, there shall be more balance of power, more participation and more cooperation (Brinkerhoff, 2002: 325-326).

This is in accordance with the study of Phakdeetham (2011: 31-33). It was concluded that the participation of people in law and the 'National Economic and Social Development Plan No. 10' guidelines, was developed to maintain an ecological balance of resources and to raise awareness. The resource base is the common property of society. Everyone has the benefit to participate in shared responsibilities in doing so. The cognitive capacity to build awareness is an important tool for decision-making; in order to maintain a balance between conservation and exploitation concerning the short-term and long-term benefits, and between the stakeholder groups. It is also necessary to create a social network which is a partnership between the public sector, private sector, local communities, NGOs and academics, in order to achieve the power to drive it. Moreover, such a relationship is a relationship which includes the exchange of knowledge and resources between the government, private non-profit organisations, and other agencies; thus, increasing the performance of the community under the same purpose (Varda, 2011: 897).

5.2 Discussion on factors affecting the efficiency and effectiveness policy formation and management in accordance with public policies by the government sector, people sectors and private sectors in response to the disaster in Thailand: case study on floods

Concluded that the problems of disaster management in Thailand consist of public policies, problems in coordination, problems concerning knowledge and understanding, problems concerning budget, problems concerning warning and communication system, problems concerning organizational structure and problems in

crisis management. Efficiency of policy formation and management means how effectively the available resources are used for the activities of disaster management as an integral approach with cooperation of the organizations in charge from the government, private sectors and civil society, for quick action and effective disaster management. Effectiveness of policy formation and management means the outcome resulted from the cooperation of the organizations in charge from the government, private sectors and civil society so that the disaster is managed in the same direction, with common goals and mutual agreement.

According to the interview, it was found out that the most influential factors are in the following orders:

1) underprovided communication systems; for example, incomplete communication systems which lack continuation and reliability. Since the communication systems all over the country are different, they are divided and are in conflict with one another, causing people's confusion and political conflicts. The efficient management of disasters which have happened requires well-organized information and a proficient communication system since these things affect risk identification and impact assessment at each level if there is a political conflict. Practices that do not go in the same direction will make it difficult to manage things (Kamolvej, 2006: 42; Janssen, Lee, Bharosa and Cresswell, 2010: 4). Also, in order to reduce the gap between policies, it is totally necessary that the management should be in the form of a management network which recognizes the importance of problems in the same direction with mutual belief (Viessman and Welty, 1985: 52-53; Sabatier, 1988: 141);

2) politics and administration. When considering Thailand's contexts and theories that are related to politics and administration, Sementelli (2007: 499) explained regarding 4 theories that are related to disaster management, which are: theory of decision, theory of administration, economic theory and sociological theory. Such theories demonstrate that, in emergency situations, limitations in terms of decision due to incomplete information, lack of ability to anticipate and impossibility to comprehend every approach of practice as well as the democratic form of governance with representatives may cause politicians who are voted to become the representatives of such areas to have conflicts of interest (Simon, 1976 cited in Bowornwattana, 1998: 113). The major elements of the formation of conflicts of interest are: (1) the fact that

government officials have personal interests; (2) the official duties and responsibilities according to government positions or public positions for the practices which correspond to professional standards or standard of conducts that must be neutral; and (3) the intervention of forethought (Wannathepsakun, 2012: 121). Such reasons cause politics and administration to become inseparable, which leads to conflicts of interest (Wilson, 1973 cited in Bowornwattana, 1998: 16-17). Thus, to reduce such problem, the administrative concepts should be separated from politics. Intervention must be lessened for efficient administration. At the same time, the allocation of limited resources must be done thoroughly and fairly to reduce conflicts and distribution problems among victims. However, the sociological theory is the one that enables us to see the important things which are acquired from the learning of the past and which could lead to the improvement of policies and working processes that are increasingly uncertain. Working without enough understanding causes the management of situations to be inefficient (Williams, 2008: 1115-1117);

3) the knowledge and the discipline of people which result from the lack of experience and understanding of preparation; 4) the lack of the main plan for disaster management; 5) unclear chain of command; 6) the lack of information management and database system; 7) the problem of transportation and distribution of urgent relief items; 8) the lack of specific agency for disaster management; 9) the lack of supporting law; 10) the need of help from the government; 11) the flood management plan which is not integrated; 12) the media (partial presentation); 13) the lack of cooperation between institutions/organizations at each level; 14) city plan; 15) inadequate personnel and their lack of experience in offering aid during floods; and 16) insufficient ridge maintaining equipments.

This result was congruent with the study of Tingsanchali, et al. (2003: 8,11) Prochart (2013: 75); Janjirawuttikul (2012: 1); Duangsrisai (2012: 1-7); Sriratanaban (2005: 259); Office of Disaster Prevention and Mitigation (2012: 13-18); Anantthanakorn (2005); Moe and Pathranarakul (2006: 339); Kamolvej (2006: 39); Price (2009: 15-16) Kamolvej (2012 cited in Khaosa-ard, 2012: 4-8); Khaosa-ard (n.d.: 1-3), According to the conclusion of factors such as communication system, politics and administration, knowledge and discipline of people, information management and transportation problem, it has been discovered in terms of

communication that an efficient communication requires a ready sender and a clear message. Also, there should be the organization of data which will be communicated at each period during disaster to support decisions (Kuljitjuerwong, 2013: 111-112). When comparing problems and factors at different periods of time, the differences can be seen as displayed in Table 5.1

Table 5.1 Compares factors at different periods of time

Factors found from problem conditions	Model of flood management between 1942-2007	Model of flood management between 2007-2011	Model of flood management in future
1. Related laws and policies/ plans and management			
1.1 Main plans for disaster management	Unclear	Disaster Prevention and Mitigation Act B.E. 2550	Disaster Prevention and Mitigation Act B.E. 2550
1.2 Specific agencies for disaster management	None	Department of Disaster Prevention and Mitigation	Department of Disaster Prevention and Mitigation
1.3 Laws	Various and unspecific	National Disaster Prevention and Mitigation Plan B.E. 2553-2557 on water and flood management	National Disaster Prevention and Mitigation Plan B.E. 2553-2557 on water and flood management
1.4 Flood management plan	None	the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 on water and flood management	the National Disaster Prevention and Mitigation Plan B.E.2553-2557 on water and flood management
1.5 Politics and administration	Generated from duplicated work and unclear power and duties	Generated from duplicated work and unclear power and duties with conflicts among people	Clear determination of roles and duties as well as reduction of political issues and conflicts

Table 5.1 Compares factors at different periods of time (cont.)

Factors found from problem conditions	Model of flood management between 1942-2007	Model of flood management between 2007-2011	Model of flood management in future
1.6 City plan	Plain areas with simple city plans in the past	Lots of building with complicated city plans	Cooperation and city plan arrangement while communities prepare disaster prevention and mitigation plans for communities/villages
1.7 Cooperation between institutions	Cooperation according to roles	Cooperation according to roles	Cooperation from various stakeholders in the forms of area network and activity network
1.8 Chain of command	In accordance with chain of command	In accordance with chain of command	Chain of command reduced and decentralization emphasized
2. Information and communication			
2.1 Communication system	Many systems, lack of connection and continuation	Many systems, lack of connection and continuation	One system
2.2 Database	From various agencies	From various agencies	From different areas depending on communities' characteristics. Database stored in one place.
2.3 Media (partial presentation)	Limited presentation and role	Limited presentation and role	More presentation and bigger role
3. Resources			
3.1 Knowledge and discipline of people	None- low	Low	Moderate-high
3.2 Transportation and distribution of relief items	Centralized	Centralized	Decentralized

Table 5.1 Compares factors at different periods of time (cont.)

Factors found from problem conditions	Model of flood management between 1942-2007	Model of flood management between 2007-2011	Model of flood management in future
3.3 Personnel/ experience	Low	Low	Moderate-high
3.4 Need of government's help	High	High	Low
3.5 Ridge maintaining equipments	High need	High need	Low need

The flood management pattern in the future with different levels of stakeholders, i.e., international level, national level, provincial level and local level will determine the roles and duties from the national level which sets up the form of administrative mechanism according to the chain of command for the provincial level in correspondence to the Disaster Prevention and Mitigation Act B.E. 2550. The National Disaster Prevention and Mitigation Plan B.E. 2553-2557 regarding water and flood management indicates that the laws and the policies concerning flood management should be clear and have legal power and duties with The Department of Disaster Prevention and Mitigation as the main agency. Besides, the roles and duties of local level should be enhanced in preparation for flood management, including knowledge distribution and trainings according to the principles of risk management on the community basis. Such operation will be able to reduce the problems and the factors in terms of law, plan, politics/conflict and chain of command.

When the local level and the communities have more knowledge, they can utilize their experience from past events in the cooperation with various agencies and people to collect data of communities and to create communities' maps to analyze their potentiality and the risks. Maps indicate safe areas, the parts that can be used for transportation and the zones that can be the locations of relief centers, which will reduce the problems of data and communication, transportation, knowledge and discipline of people which are gained from various agencies that provide knowledge. Such agencies include the Information and Public Relations Division, Department of Disaster Prevention

and Mitigation, the Ru Soo Phai Phibat program on Thai PBS, etc. which will make people realize the effects from floods and other disasters that may happen. The roles of many agencies are increased, making it possible to reduce the problem/factor of need of help from the government since people will learn from all parties and help each other. Thus, the flood management pattern in the future is the compilation of stakeholders from various levels who trust and cooperate with each other. They become members and work reactively while exchanging resources and knowledge in the forms of area network and activity network.

5.3 Discussion on management toward government policy in responsibility to disaster in Thailand: case study on flood and previous management, current situation and appropriate approach in response to future disaster

The analysis of management done according to governmental policies in response to Thailand's disaster reveals that the model and structure of the disaster management according to Disaster Prevention and Mitigation Act B.E. 2550, proceeded according to bureaucratic lines which takes priority then, causing the administration and the operation to proceed slowly. Therefore, the management model according to the future should have the structure that supports relations stemming from sharing believes and collaborative camaraderie with trust created from 3 main mechanisms: the government sector, people sectors and private sectors; all these with relationships of camaraderie who are aware and understand the true issues, share more than one belief with each other.

Furthermore, the structure designating the relationships according to duties of Disaster Prevention and Mitigation Act B.E. 2550, which differentiated differentiate responsibilities according to districts (Khaosa-ard, n.d.: 1-3), was in consistent with Wright (1988: 17) that illustrates the relationship between agencies, which are the government sector, private sector, people sector, network management is to bring together all the agencies that benefit common policies. The exchange of specific information and for the same purpose (Goodsell, 2006: 628), disaster management should be multi-agency and each level is a clear relationship. Although the flood

management in the past would have problems with coordination but the flood management managed to control a multi-agency partnership will demonstrate a partnership of government, private sector, non-profit organization, charitable organizations and people for a common goal. The structure is an informal and temporary activities (Simo and Bies, 2007: 125; Brinkerhoff, 2002: 325-326; Provan and Milward, 2001: 416; Macdonald, 2012: 586; Luangprapat, 2010: 62; Sirorot, 1999: 263). The flood management is the management component that analyzes the three areas such as public policy, stakeholders involved in policy and environment policy (Dunn, 1994: 70-71) in order to reduce the decision problem errors from the lack of information and no unity of communication system.

Central government should play a key role in making strategic plan on flood management and set up guidelines for the stakeholders to follow. Even with political changes, flood management should be done continuously. Moreover, flood management should be done with consideration on the different characteristics of the communities. Some communities are located in the areas that are affected by rain while some are located in the areas affected by high tides. Therefore, the floods in different areas need different management strategies. The provinces and districts are key mechanisms in local administration on flood management. They are coordinators of central government and local authorities i.e. Provincial Administrative Organizations (PAO), Tambon Administration Organizations (TAO), Pattaya City Administration and Bangkok Municipality Administration. The local authorities should have information about their own communities especially in the areas at risk of floods. Some areas in the communities have been changed, resulting in more challenges in flood management.

For example, some areas that used to be floodways were changed to be industrial areas, while some areas were changed to be houses or business areas. Some constructions in these areas blocked floodways, causing serious floods which are more difficult to manage. Private sectors also play an important role in flood management in the communities. They provide technical support, budget and other kinds of resources. The cooperation between private sectors and local authorities is necessary especially in emergency because the support from central government may not be provided in a

timely manner due to bureaucratic ways of work. Nonprofit organizations are also important performers for flood management in the communities.

The NPOs, together with the academics and experts, can give advice and support local governments in planning and implementing the strategies and practices as flood management is a multidisciplinary approach that needs support from various groups of experts. International cooperation is also important in flood management because we need to learn from other countries how they manage the floods in their countries/which strategies and knowledge can be applied for our communities. Information and resource sharing among member states is important for future flood management.

The international cooperation between the governments should be bilateral. Cooperation among ASEAN member states should also be promoted for flood management. To handle crisis situations, the trust is an important factor that causes working cooperation. The trust is essential to reduce the performance gap (Simo and Bies, 2007: 125). If the work of the local authority and the government has failed and the structure of the partnership will be formal or informal, it depends on the level and size of the trust (Simo and Bies, 2007: 137). Therefore, the development of a sustainable flood management should be changed the culture (values, attitudes and behaviors) for readiness to face emergency situations (McEntire, Fuller, Johnson and Weber, 2002: 270) before, during and after disasters (Thammasang, 2010: 15-27).

CHAPTER VI
CONCLUSION AND SUGGESTIONS

Conclusions of the analysis are as follows:

1. The management of disaster response, with the case studies of floods by government sector, people sectors and private sectors at 4 levels: international, national, provincial and local level

2. The factors affecting the efficiency and effectiveness policy formation and management in accordance with public policies by the government sector, people sectors and private sectors in response to the disaster in Thailand: case study on floods

3. The management toward government policy in responsibility to disaster in Thailand: case study on flood and previous management, current situation and appropriate approach in response to future disaster

4. Suggestions

6.1 The management of disaster response, with the case studies of floods by government sector, people sectors and private sectors at 4 levels: international, national, provincial and local level

According to records from Climatological center, the Office of Meteorological Science Development, the tropical cyclones moved towards Thailand in the period of 61 years (1951-2011) were 186 in total. Each time, the government takes on the main role in the management of disaster response, details are as follows.

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disasters become clearer. For the three laws directly related to disaster management (Civil Defence Act B.E. 2522, National Civil Defence Plan B.E. 2548 and Disaster Prevention and Mitigation Act B.E. 2550), they emphasize on disaster management by following regular steps. The disasters happening in the past were not complicated and could be handled by one government unit. In 2005, there was a progress in disaster management. More proactive approaches were used for disaster prevention. Communication system was developed and more participation of the community was encouraged. According to the Disaster Prevention and Mitigation Act, the main government unit in charge of disaster management (formerly known as public disaster) was the Department of Disaster Prevention and Mitigation.

The policy formation was done by the authorities at the national and international levels. The main international authority was the ASEAN Committee on Disaster Management (ACDM), which was set up upon the ASEAN Agreement on Disaster Management. The authorities in charge at the national level consist of the Prime Minister, Disaster Prevention and Mitigation Committee and the National Safety Commission. These 3 government bodies have authorities in disaster management as stated in the Disaster Prevention and Mitigation Act B.E. 2550.

The institutional frameworks of disaster management in other member countries consist of National disaster Management centre Ministry of Home Affairs (Brunel Darussalam), National Committee for Disaster Management (Cambodia), National Disaster Management Agency (Indonesia), National Disaster Management Office, Department of Social Welfare, Ministry of Labor and Social Welfare (Lao PDR), National Security Council, Prime Minister's Department (Malaysia)

The institutional frameworks of disaster management at the national level consist of Strategic Steering Sub-Committee on Disaster Prevention and Mitigation, National Headquarter of the Disaster Prevention and Mitigation, National Administrative Office of the Disaster Prevention and Mitigation, and Local Administrative Office of the Disaster Prevention and Mitigation.

The government authorities in charge of disaster management at the provincial level consist of the Governor of the Province. The authorities at local levels are divided into: sub-district levels, municipal level, cities and districts in Bangkok. These authorities include: Chief Executive of Tambon Administration Organizations

(TAO), Deputy Chief Executive of TAO, Chief Administrator of TAO, Tambon headman, village headman, mayor, municipal clerk, district chief, deputy district chief, district directors of Bangkok Metropolitan Administration (BMA), the Governor of Bangkok, Deputy Governor of Bangkok, Pattaya City Mayor, Deputy Pattaya City Mayor, rescue teams.

For the policy evaluation process, there is no particular unit assigned to be in charge of disaster management.

In this particular case study, the researchers have categorized them into 3 case studies: incidents of disasters, the case study of floods. Prior to the reformation, the public sector had the structure using 2R ideologies, which are Readiness and Response, from the Bureau of disasters' prevention and mitigation. After the reformation, the public sector uses the ideology of 3E (Engineering, Education, Enforcement) annexed with 4R (Reduction, Readiness, Respond, Recovery) (Tingsanchali, et al., 2003: 6-25) and nowadays use the ideas of 2P2R (Prevention / Preparation / Response / Recovery) within the government led by Ms.Yingluck Shinnawatra. From the case studies of 1995 and 2006, the response towards disasters in this period inclines to be more of a defense than offense, and often focuses on addressing immediate problems, as well as using infrastructure, such as dams, dikes, reservoirs and ridges etc. to take in water and protect economic areas. As for the citizens, in 2006, there was a clearer management of aids in communities, this may be because the majority of the citizens have experienced from the past – and thus are using those experiences to create prevention guideline and protect the essential areas of the community. Examples are such as Bang-ragum community's management format which relied on real experiences and adjustment of lifestyle to live peacefully with the water and receive mutual benefits; and in 2011, the management of government still has a commanding characteristic, but there were changes in train of thoughts – not only defensive, but have prevention measures and preparations in addition. Furthermore, citizens of many areas went through a number of floods, they thus have produced community-operated defense measures, and aid provision. The management of local government, nowadays, receives corporation between nations in the planning and preparations for disasters worldwide; also, in consideration to international aid, it appears international aids are provided in response and recovery.

The factors that make a difference to the case study of 1995 are that the majority people lacked participation, and lacked awareness about the risks of disasters. Meanwhile, the government had not been assigned an agenda regarding disasters happening within the nation. Therefore, the coordination between stakeholders was reactive rather than proactive. In 2004, Thailand encountered a tsunami disaster, causing social networks and the participation of the community and more local governments. As a result, the law was adjusted to comply with such changes. By 2006, the private sector and the community could participate in disaster management. This also affected changes in culture (values, attitudes and behaviors), especially concerning the main roles of agencies and the public. Thus, flood management in 2011 was a time of preparation; before, during and after the collaboration of many agencies.

6.2 The factors affecting the efficiency and effectiveness policy formation and management in accordance with public policies by the government sector, people sectors and private sectors in response to the disaster in Thailand: case study on floods (analysis of data derived from key informants and data grouping)

Concluded that the problems of disaster management in Thailand consist of public policies, problems in coordination, problems concerning knowledge and understanding, problems concerning budget, problems concerning warning and communication system, problems concerning organizational structure and problems in crisis management. Efficiency of policy formation and management means how effectively the available resources are used for the activities of disaster management as an integral approach with cooperation of the organizations in charge from the government, private sectors and civil society, for quick action and effective disaster management. Effectiveness of policy formation and management means the outcome resulted from the cooperation of the organizations in charge from the government, private sectors and civil society so that the disaster is managed in the same direction, with common goals and mutual agreement.

According to the interview, it was found out that the most influential factors are in the following orders: 1) underprovided communication systems; 2) politics and administration; 3) the knowledge and the discipline of people which result from the lack of experience and understanding of preparation; 4) the lack of the main plan for disaster management; 5) unclear chain of command; 6) the lack of information management and database system; 7) the problem of transportation and distribution of urgent relief items; 8) the lack of specific agency for disaster management; 9) the lack of supporting law; 10) the need of help from the government; 11) the flood management plan which is not integrated; 12) the media (partial presentation); 13) the lack of cooperation between institutions/organizations at each level; 14) city plan; 15) inadequate personnel and their lack of experience in offering aid during floods; 16) insufficient ridge maintaining equipments.

These factors or conditions can be divided into 3 categories: technical factors compose of the lack of the main plan for disaster management, the lack of supporting law the flood management plan which is not integrated, city plan, human performance compose the knowledge and the discipline of people, inadequate personnel and their lack of experience in offering aid during floods of and organizational performance compose of underprovided communication systems, politics and administration, unclear chain of command, the lack of information management and database system, the problem of transportation and distribution of urgent relief items, the lack of specific agency for disaster management, the need of help from the government, the media (partial presentation), the lack of cooperation between institutions/organizations at each level and insufficient ridge maintaining equipments.

6.3 The management toward government policy in responsibility to disaster in Thailand: case study on flood and previous management, current situation and appropriate approach in response to future disaster

The analysis of management done according to governmental policies in response to Thailand's disaster reveals that the format and structure of the disaster management according to Disaster Prevention and Mitigation Act B.E. 2550,

proceeded according to bureaucratic lines which takes priority then, causing the administration and the operation to proceed slowly. Therefore, the management format according to the future should have the structure that supports relations stemming from sharing believes and collaborative camaraderie with trust created from 3 main mechanisms: the government sector, people sectors and private sectors; all these with relationships of camaraderie who are aware and understand the true issues, share more than one belief with each other. Furthermore, the structure designating the relationships according to duties of Disaster Prevention and Mitigation Act B.E. 2550.

Central government should play a key role in making strategic plan on flood management and set up guidelines for the stakeholders to follow. Even with political changes, flood management should be done continuously. Moreover, flood management should be done with consideration on the different characteristics of the communities. Some communities are located in the areas that are affected by rain while some are located in the areas affected by high tides. Therefore, the floods in different areas need different management strategies. The provinces and districts are key mechanisms in local administration on flood management. They are coordinators of central government and local authorities i.e. Provincial Administrative Organizations (PAO), Tambon Administrative Organizations (TAO), Pattaya City Administration and Bangkok Municipality Administration. The local authorities should have information about their own communities especially in the areas at risk of floods. Some areas in the communities have been changed, resulting in more challenges in flood management. For example, some areas that used to be floodways were changed to be industrial areas, while some areas were changed to be houses or business areas. Some constructions in these areas blocked floodways, causing serious floods which are more difficult to manage. Private sectors also play an important role in flood management in the communities. They provide technical support, budget and other kinds of resources. The cooperation between private sectors and local authorities is necessary especially in emergency because the support from central government may not be provided in a timely manner due to bureaucratic ways of work. Nonprofit organizations are also important performers for flood management in the communities. The NPOs, together with the academics and experts, can give advice and support local governments in planning and implementing the strategies and practices as flood management is a

multidisciplinary approach that needs support from various groups of experts. International cooperation is also important in flood management because we need to learn from other countries how they manage the floods in their countries/which strategies and knowledge can be applied for our communities. Information and resource sharing among member states is important for future flood management. The international cooperation between the governments should be bilateral. Cooperation among ASEAN member states should also be promoted for flood management.

6.4 Suggestions

6.4.1 Suggestions from research

6.4.1.1 The working mechanism in the form of a new flood management is the work in a social network that has a link to the social structure, because the flood management will have a lot of players, which will connect to the coordination from the national, provincial, local levels, defined by the authority specified by law, and operating by the Disaster Prevention and Mitigation Act B.E. 2550. Meanwhile, the academic, community volunteers and nonprofit organizations have also form an informal relationship and collaborate on the norms, cultural and social learning process. However, the regulations and the formal and informal structures must be structured and drafted the mutual administration and management, which clearly determined that all levels within the organization and between the organizations will have a relationship with each other by the cooperated and variable of duties or self-management manners based on the operational guidelines of the agency and the community. In this case, the researcher concluded the practices in each level for preparing in accordance with the time of the disaster, which classified as before the disaster, during disaster and post-disaster as shown in Figure 6.1, that will contribute to reduce the loss of life and property as well as help promoting the participation of all parties to the joint flood management.

6.4.1.2 In the process of policy setting, there should be participation of all stakeholders as it is necessary to get input from people in the communities such as community map, the areas that are usually affected by floods,

number of population and population density in the community, information about city plans, management of irrigation dams, etc. These kinds of information are useful for policy setting and decision making process for the disaster prevention and mitigation and for the cooperation of all stakeholders at the international, national, provincial and local level.

6.4.1.3 There should be a mechanism to raise public awareness on safety such as providing handbook that explains about the risks and severity of disaster. The handbook should use simple, easy-to-understand language and should be available in various languages.

6.4.1.4 Good relationship among stakeholders should be promoted at the international, national, provincial and local level so that they can build trust and follow the same directions in disaster management. This shall be acquired through drills and practices according to the plans because, through drills and practices, we can identify weak points of the plans and challenges in the implementation.

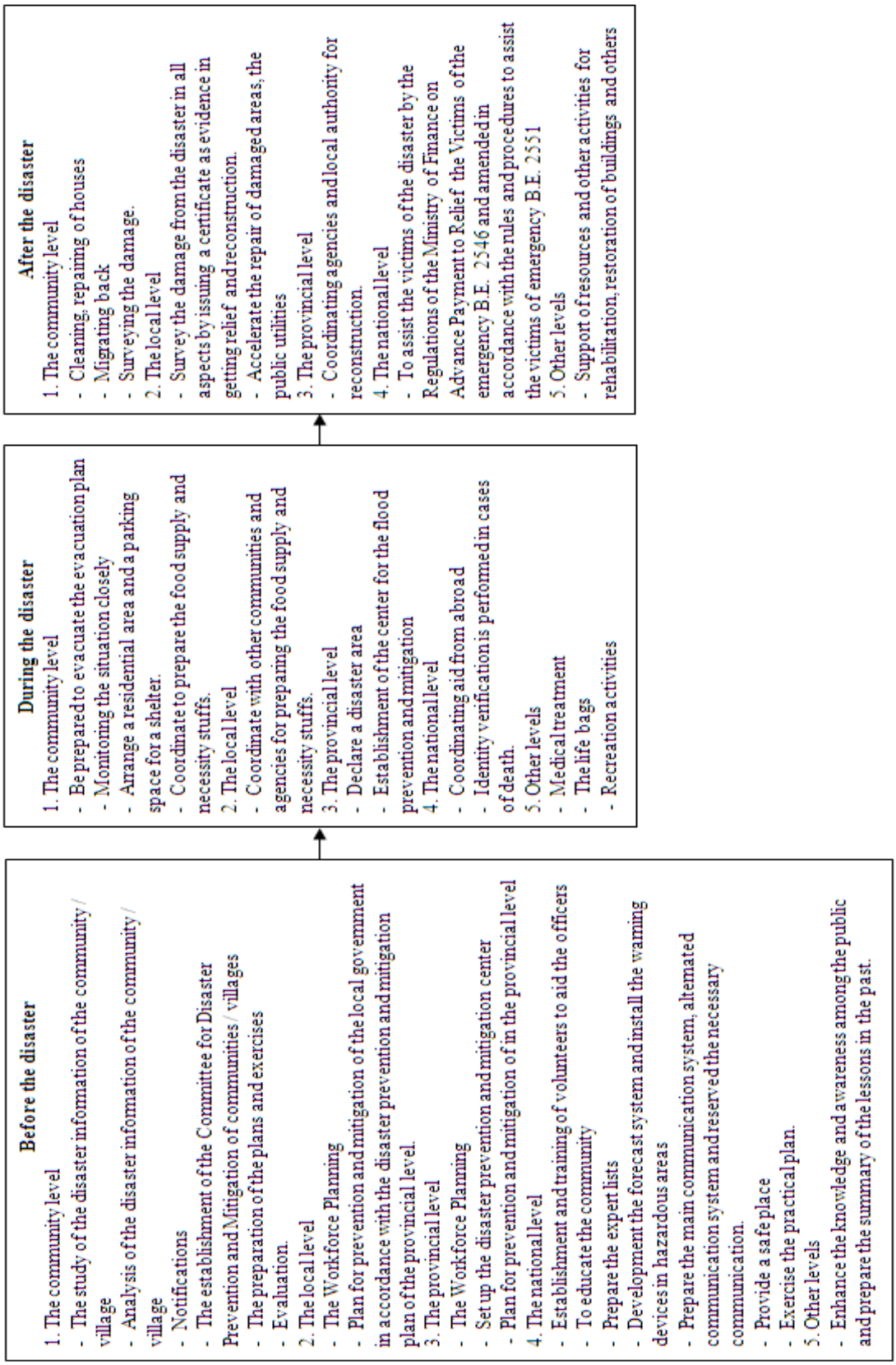

Figure 6.1 The practical guides should be done by the time of the disaster

6.4.2 Suggestions for implementation

6.4.2.1 The proposals to deal with the technical factors

1) There should be an implementation of the Disaster Prevention and Mitigation Act B.E.2550 immediately afire the serious flooding in accordance with the administrative structure, the mobilizing of resources and compliance with the regulations in the same direction. The authorized decision maker and command the action by the Disaster Prevention and Mitigation Act B.E. 2550 is the premier and the agencies that serve to fulfill is the Department of Disaster Prevention and Mitigation, and should have a committee for consideration and making decision for not over 15 persons.

2) Should study and lay out city plan as well as to analyze the possibility of using all measures I'm many aspects. In addition, the government agencies should provide the good understanding among the public about the using of all measures and sharing with each other to get a reasonable agreement in water management, which should consistent with the topography of each area, from the national, regional, provincial, district, sub-district, city and community levels, in order to foster the distribution activities and economic growth. The settlement of the town and communities should be located in the appropriate areas to avoid risk areas. The infrastructure development and public transport should be done in line with the potential of the area. The management of the flow of water, the maintenance of the rivers and the dredge- up- canals that are available in the system and taking care of the upstream, midstream and downstream to getting the highest benefit—all need to be done.

3) Should promote the decentralization and the strengthening of the community by allow them to learn and recognize the rights of the community in the management of natural resources and the environment, including promote the participation in the preparation, prevention, response and rehabilitation at the national, provincial, district and community levels as well as to work in a transparent manner.

6.4.2.2 The proposals to deal with the factor of the performance of the human

1) The values, basic culture and social structures are the factors that affect the learning of individuals. The skill development is to make the learners become a part of their learning and extension to other people and create the implementation in the society.

2) Should adjust the distribution of relief materials from a centralized distribution to decentralized distribution and the area should be clearly separated. The centralized system focuses on controlling the stability and reduces uncertainty; it prefers the capacity and resources are collected at the same level and ignore the interaction across and between the levels, which affects the delay of response and not throughout. The decentralized distribution, on the other hand, helps the vast distribution and reduces the losses during transportation.

3) Should practice the rehearse at all levels from the community, local, provincial and national levels, including international level in the forms of Tabletop or Fixed Exercise, and arrange the exercise activities among the ASEAN countries such as the ASEAN annual training for disaster relief or the annual exercise for disaster relief under the framework of ASEAN on the political and security cooperation in the Asia – Pacific region. Also, there should be formed the cooperation between the Ministry of Defense , Ministry of Interior and Ministry of Foreign Affairs regularly every two years for the capacity development and cooperation with international countries.

6.4.2.3 The proposals to deal with the factors of the system and the performance of the organization

1) There should be an agency to prepare the information and plan about the warning system in all levels and clearly specify the roles of the relevant agencies to reduce the duplication of work, including to prepare these databases as part of the organization. This knowledge should be added apart from the knowledge of flooding such as knowledge of Hydrology, Meteorology, water and environmental engineering, etc.

2) The separated operations as fragmented works and competitive performances will only lead to a gap of service.

3) Should be used of the social media, television, radio, running alphabet, sign language in providing information about flood to the public and regarded this mean as a part of life for the benefit of the children, the elderly and people with disabilities. Besides, the use of technology may strengthen the information of the mainstream media and promote the quickly distribution of information, for example, the Social Media can pinpoint the presence of a photo taken from a real place and a short message. This kind of communication is effective and it should provide the agency to handle the screening and monitoring data to obtain the accuracy and completeness. The communication must be clear before the crisis, during the crisis and after the crisis, and should be publicized through the Television Pool of Thailand as a medium of communication during severe flooding.

4) To publicize the News, the sender must publicize the complete information with comprehensive and useful for the decision of the audience, rather than presenting for political results, and create the coverage of the information, knowledge about water, prevention and solve the problem, monitor and adapt to meet the situation as well as act as the center to receive donations to help victims and carry on the help to the victims in areas where assistance is not accessible.

5) Should develop the preparation system for disaster relief and emergency response of ASEAN countries and strengthen in both resources and readiness to reduce disaster risk.

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APPENDICES

APPENDIX A

COA.No.	2013/209.1507

Documentary Proof of The Committee for Research Ethics (Social Sciences)

Title of Project:	Management Toward Government Policy in Responsibility to Disaster in Thailand: Case Studies Floods between 1942-2012
Principal Investigator:	Miss Nipapan Jensantikul
Name of Institution:	Faculty of Social Sciences and Humanities, Mahidol University
Approval includes:	1) MU-SSIRB Submission form version received date 9 July 2013 2) Participant Information sheet version 13 June 2013 3) Informed Consent form version date 13 June 2013 4) Interview Guideline received date 13 June 2013

The Committee for Research Ethics (Social Sciences) is in full compliance with International Guidelines of Human Research Protection such as Declaration of Helsinki, The Belmont Report, CIOMS Guidelines and the International Conference on Harmonization in Good Clinical Practice (ICH-GCP)

Date of Approval:	15 July 2013
Date of Expiration:	14 July 2014

Signature of Chairman:.....
(Assoc. Prof. Pichet Kalamkasait)

Signature of Head of the Institute:.....
(Assoc.Prof.Dr.Wariya Chinwanno)
Dean of Faculty of Social Sciences and Humanities

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APPENDIX B
INTERVIEW FORMS

Guidelines of Question for Interview forms

1. What were the plans and practices of the government in response to the floods?

2. How many authorities/organizations (both formal and informal) participated in flood management, and how?

3. Please explain the models of flood management in the past and at present. In your opinion, what parts of these models need to be improved?

4. What are the factors of the effectiveness and efficiency of flood management?

5. In your opinion, was the government's response to the floods successful/appropriate or not? Please explain.

6. Do you think the network of flood management necessary? If yes, what should be the form of interaction/relationship among members of the network?

7. What were the models of flood management? In which stage did the communities participate?

APPENDIX C
FOCUS GROUP CONVERSATIONS

Guidelines of Questions for Focus Group Conversations

1. What is your attitude towards the government's management conditions according to the flood management policies from the past until the present?
2. What is your viewpoint towards the future flood management pattern (as proposed by the researcher)?
3. What is your point of view towards the possibility to apply the future flood management pattern (as proposed by the researcher) in real practice?

BIOGRAPHY

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