DEVELOPMENT OF MILITARY LOGISTICS MODEL FOR DISASTER RELIEF OPERATIONS (FLOODING) OF THE ROYAL THAI ARMY

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ABSTRACT

Title of Dissertation	Development of Military Logistics Model for Disaster Relief Operations (Flooding) of The Royal Thai Army
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This research aimed to 1) investigate the conditions and problems of military logistics for disaster relief operations (flooding) of the Royal Thai Army (RTA), 2) to examine the factors affecting the success of military logistics for disaster relief operations (flooding) of RTA, and 3) to develop the military logistics model for disaster relief operations (flooding) of RTA. The research was based on mixed method between survey research with a questionnaire as a data collection tool, and qualitative research with documentary research, in-depth interview, and focus group discussion as the data collection tools.

The findings could be divided into 5 parts. Firstly, the disaster relief operations of RTA were divided into 2 types: 1) to follow the order of the government, and 2) the management initiated by RTA itself. Secondly, all phases of military logistics for disaster relief operations (flooding) of RTA were interrelated with the Strategic Response Plan which required Ministry of Defence (MOD) to function merely as a supporter of Ministry of Interior (MOI). As a consequence, military logistics for disaster relief operations (flooding) of RTA went the similar way as MOD Disaster Relief Plan B.E. 2554 (2011). However, when the disaster grows stronger to level 3 or above, logistics for disaster relief operations (flooding) of RTA would become more flexible as they would be based on MOD Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004). Thirdly, the problems about military logistics for disaster relief

operations (flooding) of RTA in 2011 could be divided into 2 groups: policy problems and management problems. Fourthly, regarding the factors affecting the success of logistics for disaster relief operations (flooding) of RTA, it was found that in practice, there were flaws, problems, or insufficiencies about policy implementation which could be divided into 6 groups: 1) characteristics of the policy i.e. trial practice and quality of feedback, 2) objectives of the policy i.e. success indicator of the policy and accuracy of information, 3) sufficiency of resources i.e. budget, manpower quality and number, and management, 4) technical or theoretical possibility i.e. characteristics of the technology, 5) characteristics of the organization implementing the policy i.e. structure, supervision, and procedure of open communication, and 6) relationship of the mechanisms in the organization or between organizations implementing the policy i.e. number of relevant organizations, number of decision making points, and interference from higher organization. Regarding the factors affecting the success or failure of logistics in disaster relief operations (flooding) of RTA in the preparation and reconstruction phases, no flaws, problems, or insufficiencies were found to significantly affect the policy implementation. Finally, the military logistics model for disaster relief operations (flooding) of RTA in the response phase consists of 6 factors: 1) characteristics of the policy i.e. trial practice in the pilot area and continuous improvement of evaluation system, 2) objectives of the policy i.e. continuous development of indicator and establishment of effective communication system, 3) sufficiency of resources i.e. revision of regulations and policy to meet the actual situation, development of relevant doctrines, and suitable allocation of equipment, 4) technical or theoretical possibility i.e. development and application of technology that fits the external environment of the organization, 5) characteristics of the organization implementing the policy i.e. restructuring the supervision style to be more flexible and development of formal and informal relationships with other organizations, and 6) relationship of the mechanisms in the organization or between organizations implementing the policy i.e. close and continuous coordination with other agencies, minimization of operation process, and establishment of correct understandings with other organization. The evaluation results of the military logistics model for disaster relief operations (flooding) of RTA showed that the model was suitable, complete, and practical.

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Major Weerawat Punquejana

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CHAPTER 1

INTRODUCTION

1.1 Background and Rationale

Over the past decades, our planet has been suffering from various forms of natural disasters, and the tendency of such occurrences is to continue to rise (Phorn Phisek, 2015: 25) (Figure 1.1 and Figure 1.2). In 2010, for example, the earthquake in Haiti took 222,570 lives and 3,900,000 were affected. The economic damage was as high as 8,000 million US dollars (Guha-Sapir, Vos, Below and Ponserre, 2011: 1). Natural disasters have an extensive impact on people, both directly and indirectly, in the economic, social, psychological, and environmental aspects. By considering merely the impact on the economy, natural disasters have been found to have a negative relationship to the GDP. To clarify, flood disasters drop the GDP by 0.996 percent and drought by 0.606 percent (Loayza, Olaberría, Rigolini and Christiansen, 2009: Abstract).

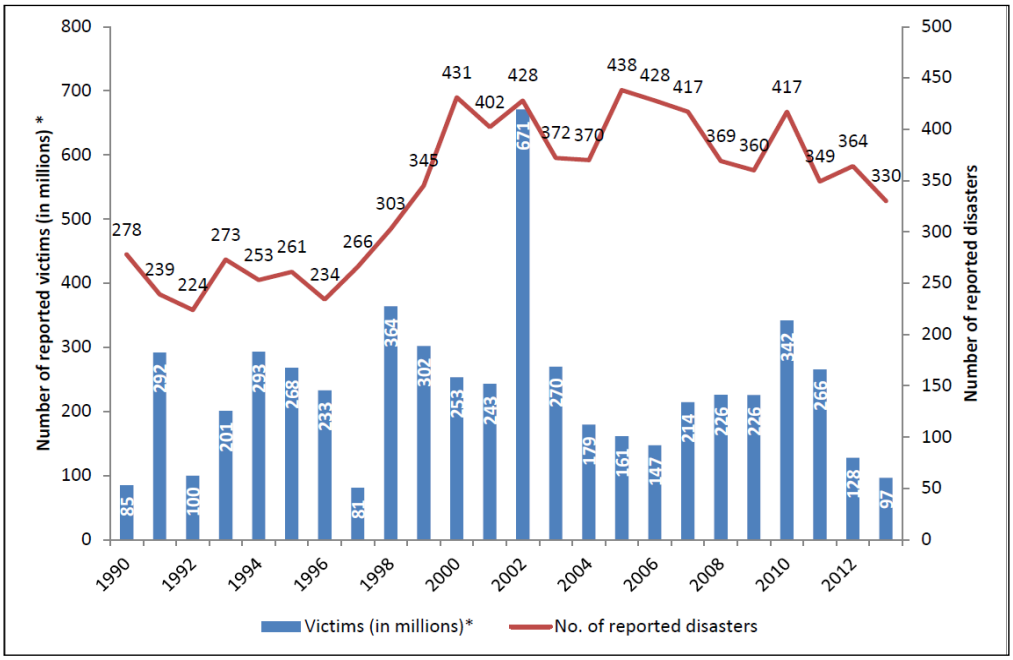

Figure 1.1 Natural Disasters Reported Worldwide from 1990-2013

Source: Guha-Sapir, Hoyois and Below, 2014: 4.

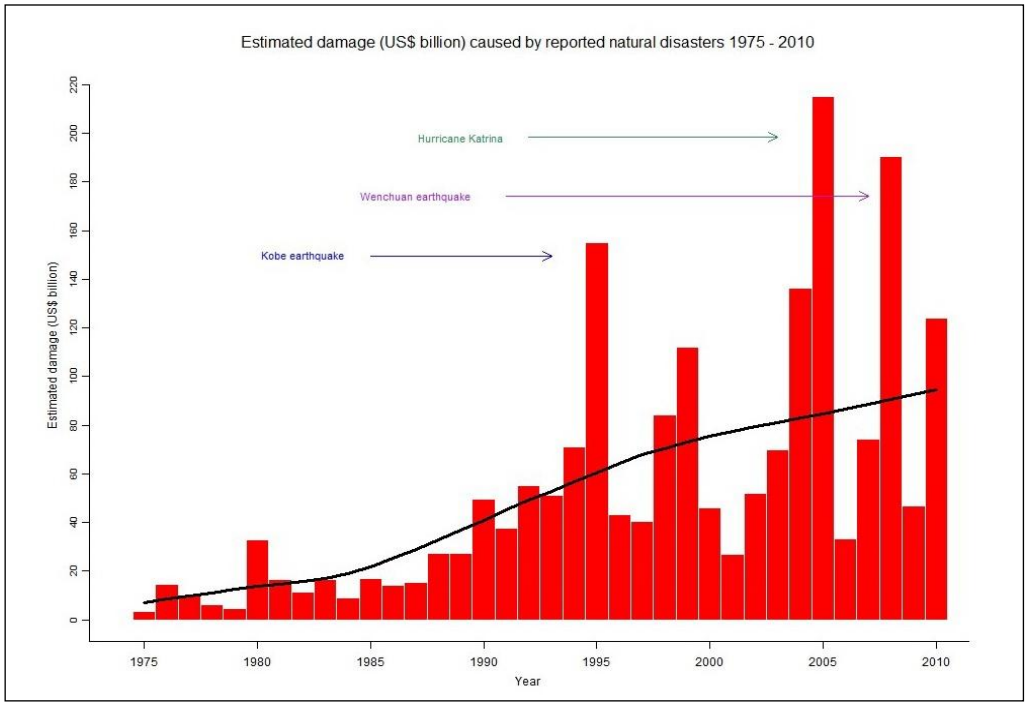

Figure 1.2 Estimated Damage Caused by Reported Natural Disasters Worldwide from 1975-2010

Source: Guha-Sapir, Vos, Below and Ponserre, 2011: 35.

The Asian Disaster Reduction Center (2011: 1-3) reported the following interesting statistics on natural disasters in Asia in 2010. There were two major natural disasters; the Great East Japan Earthquake and the Great Flood of 2011 in Thailand. The former affected 400,000 people and its damage cost 210,000 million US dollars while the latter affected 9,500,000 people and its damage cost 40,000 million US dollars.

The Great Flood of 2011 was the worst flooding that Thailand has witnessed in 70 years. It has not been this severe since 1942. According to the Emergency Operations Center of the Department of Disaster Prevention and Mitigation, the Ministry of Interior, the flooding from 25th July 2011 to 16th January 2012 was triggered by Tropical Storm Nock-ten and a number of monsoons, ranging from moderate to strong. Over 12.8 million people were affected by the flooding. The World Bank estimated 1.44 billion baht in economic losses. It was considered the 4th most damaging disaster event that brought the 4th most damage in world records. Agricultural and industrial areas covering 150 million rai in 684 districts of 65 provinces nationwide suffered from the flood. The inundation affected 4,086,138 people from 13,595,192 households. A total of 2,329 houses were completely destroyed and 96,833 others partially. By tracing back to the flood records in Thailand, it was found that a disaster occurred every year from 1989-2006 (Table 1.1). The critical flood that caused the most damage was in 2002. In that incident over 10.44 million rai and 18,510 villages from 72 provinces were affected. The flood of 2002 resulted in 13,385.32 million baht in economic damage. The flood disaster that cost the lowest was in 1992 with 13,385.32 baht loss (Wichit Wong, 2011; National Board for Natural Disaster Prevention, 2013: 5). However, by considering the number of households affected by the Great Flood of 2011, the province that suffered the most was Bangkok.

> Bangkok Metropolitan Administration declared a flood emergency area in 42 out of its 50 districts. According to the cabinet resolution, 945,454 households were affected. There were a total of 133 casualties. Drowning, electrocution, and untimely medication accounted for many of the cases (data as of 14th March 2012). (Office of Disaster Prevention and Mitigation, Bangkok Metropolitan Administration, 2012: 8)

Table 1.1 Statistics of Flood Disasters and Economic Losses to Thailand from 1989 -2009

Year	Number of		Damages		
	Times	**Provinces**	**Injured (persons)**	**Casualty (persons)**	**Value (million baht)**
1989	9	52	5,495	602	11,739.56
1990	12	58	19	50	6,652.23
1991	14	66	26	43	4,562.31
1992	10	66	-	16	5,240.58
1993	9	42	254	47	2,181.61
1994	11	74	12	46	5,058.88
1995	8	73	11	442	6,123.52
1996	10	74	21	158	7,160.68
1997	7	64	427	98	3,842.22
1998	12	65	3	8	1,706.03
1999	9	69	30	53	1,381.64
2000	12	62	-	120	10,032.94
2001	14	60	68	244	3,666.29
2002	5	72	-	216	13,385.32
2003	17	66	10	44	2,050.26
2004	12	59	3	28	850.65
2005	12	63	-	75	5,982.28
2006	6	58	1,462	446	9,627.41
2007	13	54	17	36	1,687.86
2008	6	65	16	113	7,601.79
2009	5	64	22	53	5,252.61
Total	**213**		**7,896**	**2,938**	**115,786.67**

Source: National Board for Natural Disaster Prevention, 2013: 15.

The Great Flood of 2011 sparked off a crisis for Thailand in many ways, including social psychology, economic, and political. One of the main factors that saw Thailand through the crisis was the unity of the citizens nationwide, including governmental agencies, private organizations, and the public. A key player in resolving the situation of the Great Flood of 2011 was the Ministry of Defence and especially The Royal Thai Army . RTA was assigned to be responsible for the majority of areas in Bangkok because it had plenty of manpower and equipment and effective operations (Ministry of Defence, 2011: 5; Wutthisan Luangjinda, 2012: 2; Royal Thai Air Force, 2013: 1). The Royal Thai Army played a vital role in flood mitigation under the emergency management project called the Army Disaster Relief Center (ADRC). With the presence of this center, the operations of protecting and providing aid to flood victims from The Royal Thai Army was quick, effective, and conformed to the rules and regulations of civil operations as well as other government agencies (The Royal Thai Army, 2013: 33). The operations of RTA as an agency to support and mitigate disasters were in accordance with the National Plan for Prevention and Mitigation of Disaster B.E. 2553-2557 (2010-2014). They were done in consideration of the Ministry of Defence as stipulated in Section 8 of Ministry of Defence Reorganization Act B.E. 2551 (2008) and its amended editions which states that "(3) protect and maintain national interests and the democracy with the King as head of the state, develop the nation for national security, and support the government's mission to develop the country, prevent and mitigate the problems caused by disasters", and Section 19, stating that "It is the duty of The Royal Thai Army to prepare its forces, protect the kingdom, and operate military missions according to the authority of the Ministry of Defence, responsible to the Commander in Chief." In addition, the operations were to satisfy royal guidance delivered on the occasion of the oath and marching ceremony on 2 December 2001 at the Equestrian Plaza, Dusit Palace, Bangkok. An excerpt from the royal guidance states that:

> The nation consists of the territory and its people. Maintaining natural security is, therefore, not just to secure the territory with our power but also to keep our people happy and free from suffering. As such, when the people are facing difficulties or a disaster, it is the army's

> duty to join the operation so that the people feel secure, assured, and proud that Thailand is the best place to live in and that everyone should help each other to keep it safe

The flood mitigation mission in 2011 brought credibility and acceptance to RTA, especially in its ability to perform duties both in times of war and disasters (The Army Training Command of RTA. Center for Doctrine and Strategy Development, 2012: 1-3). Some of the successful missions included the prevention of disasters, evaluation of victims, sending supplies to the affected areas, providing medical assistance, construction of temporary housing, and repair of damaged houses. These disaster mitigation activities are part of the mission of logistic support under the responsibility of the Army Disaster Relief Center. However, it should be noted that the disaster relief missions are coordinated with many important agencies that are systematically interrelated; including the Personnel Division, the Intelligence Division, the Operation Division, the Logistics Division, the Civil Affairs Division and the Comptroller Division. The collaboration of these departments requires the integration of resources with limited time and a dynamically changing situation for optimal efficiency.

To provide some understanding about the Logistics Department the researcher would like to explain the definition of logistics of the army. It is a branch of combat support, which consists of five operations, planning and other activities apart from combat. The five operations are: 1) policy making, planning, research and development and budget planning for logistics, 2) design and development, procurement, storage, distribution, mobilization, maintenance, return and disposal of weapons, 3) mobilization and medical support for personnel, 4) procurement or construction, repair, operations, and establishment of facilities, and 5) procurement or provision of services (Military Doctrine on Logistics in Normal Situations, 2011: 2-5). Military logistics is a very important support unit in military missions. In other words, it is a basic requirement for victory in combat. Field Marshall Erwin Rommel said that, "…the huge advantage of the German army over the Allies ended when the logistic mission of materiel could not be sufficiently successful. In each combat, what determines a victory or loss are the military logistics" (Marut Limcharoen, 2012).

According to the quote, military logistics is vital during times of war. The same also applies in times of disasters although the purpose of logistics is different in this case from war. Simply put, the intention of the latter is to reduce the number of disaster victims and minimize damage, especially casualties.

There are three main reasons that inspired this research entitled “Development of Military Logistics Model for Disaster Relief Operations (Flooding) of The Royal Thai Army”. Firstly, the context of disaster relief logistics is totally different from the context of war. To clarify, in the former, it is impossible to forecast the number of the victims and predict what will happen, when it will happen, how large the affected area will be, and how long it will last. In addition, the procedures and operations of military logistics and disaster relief are vastly different (Larson, 2011: 21-23). In normal situations, military logistic missions are meant for preparation and collection of supplies or weapons at the determined level to support and resupply the mission of national defense. These missions are mainly regulated by regulations of the Office of the Prime Minister on Procurement B.E. 2535 (1992) and its revised editions. On the other hand, military logistic missions for disaster relief shall conform to the procurement procedure according to the Ministry of Finance Regulations on Emergency Relief Fund B.E. 2546 (2003) and its revised versions and the Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004) and its revised editions. Secondly, the budget required for disaster logistics is higher than for other activities in assisting disaster victims. That is to say, disaster logistics accounts for more than 80% of the entire budget (Van Wassenhove, 2006), which is consistent with the demand for the budget of military logistics for disaster victims, which requires about 65-70% of the entire budget (LTG Supphakon Sa-nguanchatsorakrai, in-depth interview). Therefore, if it is possible to increase the efficiency of military logistics for disaster relief missions, it would reduce the budget and optimize the expenditures. This agrees with Christopher and Tatham’s (2011: 2) opinion on budgets for assisting disaster victims:

> Given that the overall annual expenditure of such agencies is in of the order of US $20 billion, the resultant logistics spend of some US $15 billion provides a huge potential area for improvement, and consequential benefit to those affected by such disasters

Finally, the study on disaster logistics officially originated in the United States in 1955, which is considered to be not a long time ago. It is common for a young discipline to have limited knowledge about it. Furthermore, the Thai army has never had the military doctrine for logistics for disaster relief missions before. This results in some limitations in the coordination and the operation of logistics with other government or private organizations, or even with the public. Such limitations affect the success in bringing into practice the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014). Supachai Yavaprabhas (2014) very interestingly emphasized the importance of such matters as follows:

> Public policy is not only a responsibility of the national government, but also the regional and provincial agencies, including all local administrations, public and private sectors. The general public and charity organizations have also played a role in bringing policy into practice, especially in times of crisis such as flood and storm. The role of every sector makes it more possible for public policy to come into practice at the areal level and target group

This quote reflects that both the army and civil organizations have equally important roles to play in disaster relief missions. However, in order to point out the limitations, due to the deficiency of knowledge to correctly integrate such collaboration, the researcher would like to give an example of the real situation of military logistics in the disaster mitigation mission of the Great Flood of 2011 as below:

> At the local level of a certain province, there was a military agency planning to request vehicles to carry boats to distribute supplies the following morning to people who had been cut-off for a long time. The following morning, the provincial governor requested the agency to supply meal boxes in the city. As a result the planned mission had to be cancelled due to a conflict of priorities. This was in part because of the bad habit of the Thai civil servant whose concept is the importance and urgency of the mission depends on whose order it is, not the necessity of the mission itself (Nat Kanchanahoti, 2014: 9)

Based on the three reasons mentioned above, the author believes that the development of a military logistics model for disaster relief operations (flooding) for The Royal Thai Army will increase the knowledge of bringing into practice public policy in the dimension of time e.g. before, during, and after the disaster by applying military logistics originally intended for warfare, to disaster relief. It is also the researcher's intention to make other organizations understand the scope of the military logistics of disaster relief missions by RTA. This research is also expected to reduce the obstacles of coordination and collaboration between the logistic unit and other government and private organizations, as well as the public, which will result in success in bringing into practice the policy of the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014). In addition, the research can also form the basic database for RTA to develop a doctrine for military logistics for disaster (flooding) mitigation which is in line with the objectives defined in the Ministry of Defence's Disaster Mitigation Plan B.E. 2554 (2011).

1.2 Research Questions

1) What are the conditions and problems of military logistics of The Royal Thai Army for disaster relief operations e.g. flooding?

2) What are the factors affecting the success of military logistics for military logistics operations for disaster (flooding) mitigation missions of RTA and what are the effects?

3) What should the military logistics model for disaster relief operations (flooding) of The Royal Thai Army be like?

1.3 Objectives

1) To investigate the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army .

2) To examine the factors affecting the success of military logistics for disaster relief operations (flooding) of The Royal Thai Army

3) To develop the military logistics model for disaster relief operations (flooding) of The Royal Thai Army

1.4 Scope

This research is a mixed method research, consisting of qualitative research and survey research, aiming to develop the military logistics model for disaster relief operations (flooding) of The Royal Thai Army (The Great Flood of 2011). The scope of this research is as explained below.

1.4.1 Scope of the Content

1) This research investigates the military logistics for disaster relief operations of RTA during the flood in Bangkok in 2011.

2) The conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army are investigated by using the management principle that can increase the efficiency of operation according to the McKinsey 7-S Framework (Peter, Waterman & Phillips, 1980) which is generally accepted to evaluate the strengths and opportunities to improve the operation processes and outcomes. The framework consists of 7 elements: structure, strategy, systems, staff, skills, style, and shared values.

3) The factors affecting the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA are examined from the perspective of military logistics operations. These start from planning,

combat support operation, and other activities other than from war of RTA in a normal situation. And then include additional activities according to the national defense plan, or other organization, that is designed to operate as assigned by senior organizations and is effectively based on the RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army .

4) The development of a military logistics model for disaster relief operations (flooding) of The Royal Thai Army is done by integrating 1) the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army and 2) the factors affecting the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA. The qualitative research methodology of grounded theory is applied with the case study under the framework of bringing into practice the RTA's Disaster Mitigation Plan B.E. 2013 and the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010- 2014) in three steps of operations: preparation before the disaster, operation during the disaster, and restoration after the disaster.

1.4.2 Scope of Time

The study of military logistic operation for disaster relief operations (flooding) of RTA is examined from October 2011 to January 2012. Data was collected from October 2014 to September 2016.

1.4.3 Scope of Area

The studied area covers 42 districts of Bangkok declared as disaster areas including; Khlong Toei, Khlong San, Khlong Sam Wa, Khan Na Yao, Chatuchak, Don Mueang, Dusit, Taling Chan, Thawi Watthana, Thon Buri, Bangkok Noi, Bang Khen, Bang Kho Laem, Bang Khae, Bang Sue, Bang Phlat, Phra Nakhon, Phasi Charoen, Min Buri, Yan Nawa, Rat Burana, Lat Krabang, Lat Phrao, Wang Thonglang, Sathon, Sai Mai, Samphanthawong, Nong Chok, Nong Khaem, Lak Si, Din Daeng, Bangkok Yai, Bang Bon, Bueng Kum, Huai Khwang, Bang Khun Thian, Prawet, Bang Kapi, Saphan Sung, Chom Thong, Phayathai, and Suan Luang.

1.4.4 Scope of Population

The population in this research is divided into 2 groups. The first group includes 96 people selected by purposive sampling for the survey research. They were personnel working during the flood of 2011. Data was collected from 83 samples of which 76 could be analyzed because they worked in the Logistics Department of The Army Disaster Relief Center (ADRC). They were assigned to be in charge of the 42 districts of Bangkok declared in 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior. The second group included 30 people selected using purposive sampling for qualitative research. For in-depth interviews, 16 samples were studied, including 6 samples which were from high level commanders of RTA, 5 samples were from senior personnel of the Logistics Department of The Army Disaster Relief Center (ADRC), and 5 others were commanders under RTA or logistic officers. For the focus group discussion, 14 samples were chosen as participants, including 7 logistic experts of RTA, and 7 others from relevant sectors.

1.5 Anticipated Benefits

1) RTA knows the factors affecting the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA, which are different from the normal military logistic functions. The knowledge will enable RTA to set a more accurate and appropriate budget.

2) RTA can use the military logistics model for disaster relief operations (flooding) of The Royal Thai Army , ranging from the preparation before the disaster, operations during the disaster, and restoration after the disaster. This will result in success in bringing into practice the RTA's Disaster Mitigation Plan B.E. 2013 and the National Disaster Prevention and Mitigation Plan B.E. 2553 – 2557 (2010 – 2014).

3) Civilian agencies and other organizations understand the military logistics for disaster relief operations (flooding) of The Royal Thai Army . The understanding will facilitate the coordination and collaboration among the agencies to be more effective in times of disaster.

4) RTA has a secondary database to develop the logistic doctrine for disaster relief operations (flooding) which meet with the objectives of RTA's Disaster Mitigation Plan B.E. 2554 (2011).

1.6 Limitations of the Research

1) Some information, documents, official letters, or interviews are confidential according to the Regulations of the Office of the Prime Minister on Maintenance of Official Secrets B.E. 2544 (2001) and the Regulations of the Office of the Prime Minister on Maintenance of National Security B.E. 2552 (2009). In other words, these documents may affect national security and may not be disclosed to the public.

2) The military logistics model for disaster relief operations (flooding) of The Royal Thai Army is based on the Great Flood of 2011 and has certain specific characteristics such as the manner of the disaster and the affected area. Therefore, it may be difficult to apply the model universally.

3) Some samples of the questionnaire respondents have retired or transferred to take another position in another workplace. This makes the data incomplete or the sample size smaller.

4) The military logistics model for disaster relief operations (flooding) of The Royal Thai Army is based on the Great Flood of 2011. It may be incomplete in terms of data collection from informants because the researcher started collecting the data in 2015. At the time of data collection, the informants may not be able to provide complete and accurate information because the disaster occurred several years ago (recall effect).

1.7 Definitions of Specific Terms

Management refers to the management principles that can be applied to increase the efficiency of operations according to the McKinsey 7-S Framework which is generally accepted to evaluate the strengths and opportunities to improve operation processes and outcomes. The framework consists of 7 elements. 1) Structure refers to the structure of the organization establishment based on the process

and responsibilities. 2) Strategy refers to a set of response actions or adaptations to the change of environment of an organization. 3) Systems refer to the processes and procedures which are systematic, constant, conforming, and interwoven in every level of the operation according to the strategy of the organization. 4) Staff refers to the procurement of staff for the organization. 5) Skills refer to the knowledge, ability, and skills of work, as well as specialties for working in the organization. 6) Style refers to the behavior pattern of the leader or executive of the organization. 7) Shared values refer to the common goal of staff in the organization and something that the organization wants to achieve. The shared values connect all the elements together.

Logistics (sometimes referred to as military logistics) refers to a branch of combat support work, consisting of planning, combat support operations, as well as five activities apart from warfare, including; 1) policy making, planning, research and development and budget planning for logistics, 2) design and development, procurement, storage, distribution, mobilization, maintenance, return and disposal of weapons, 3) mobilization and medication of personnel, 4) procurement or construction, repair, operation and establishment of facilities, and 5) procurement or provision of services for the army required under normal situations and to be added according to the national defense plan, or other organization as defined, to operate as assigned by the senior organizations based on the RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army .

Disaster relief operation (disaster mitigation operation) refers to a form of military operation for non-traditional threats or non-war threats, which could be a result of a natural disaster, such as flood and drought, or threats caused by humans such as acts of terrorism, strikes, or riots.

The Disaster (flooding) refers to the Great Flood of 2011 in Thailand which widely affected people's lives and properties, as well as the country.

Preparation refers to preparing the measures and activities to operate before a disaster takes place. This preparation is meant to enable the operation team to handle the impact of the disaster in a timely and effective manner.

Response refers to the operation to rescue disaster victims based on the urgency and appropriateness. The main goal is the relief of suffering for the victims of the situation rather than remedies.

Reconstruction refers to the restoration of what has been damaged or destroyed by war back to normal or better conditions and for the lives of those affected to be returned to normal as soon as possible.

Development refers to a gradual change of something through the systematic process. Development should be improved and be more suitable for disaster (flooding) mitigation operations of RTA.

Model refers to the implementation, the study process, and the construction of the concept of a military logistics model for disaster relief operations (flooding) of RTA.

Doctrine refers to a military doctrine or combat section used as a practical guideline to support the objective or national goal. The doctrine should be believable, but the decision to use it should be made carefully.

CHAPTER 2

RELEVANT THEORIES, CONCEPTS, AND LITERATURES

In the research titled "Development of Military Logistics Model for Disaster Relief Operations (Flooding) of The Royal Thai Army", the theories and concepts employed from official letters, documents, and relevant studies are as follows:

2.1 Theories and concepts about disaster logistics

2.2 Theories and concepts about military logistics

2.3 Theories and concepts about management according to McKinsey 7-S Framework

2.4 Theories and concepts about policy implementation

2.5 Theories and Concepts about new public service (NPS)

2.6 Important laws, regulations, plans, orders, and practices about disaster relief operations of The Royal Thai Army

2.7 Logistics Division, the Army Disaster Relief Center (ADRC)

2.8 Relevant studies

2.1 Theories and Concepts about Disaster Logistics

2.1.1 Definitions of Disaster

1) Weeks (2007) defines a disaster as an event that causes extensive impacts, casualties, and damage to infrastructure. Disasters usually have three characteristics; 1) causing casualties, 2) occurring abruptly allowing no possibility for effective warning, and 3) causing extensive impact on social psychology, culture, and morphology.

2) Ministry of Defence. Concepts and Doctrine Centre (2008: 1-1) defines a disaster as a catastrophe that affects or costs lives and/or poses the risks to live a normal life. The severity and scope of a disaster is too extensive that the society could manage to fix with their available resources.

3) Disaster Prevention and Mitigation Act B.E 2550 defines disasters as fires, storms, flooding, drought, human epidemics, land animal epidemics, aquatic animal epidemics, pest outbreaks, and other disasters that affect general public, either happening by nature or human, accident, or other causes, which are harmful to lives and properties of people and the country. Disasters also include air threats and acts of terrorism. National Board of Disaster Prevention and Mitigation defines the scope of such disasters into 2 elements; 1) natural disaster, and 2) national security (Table 2.1) (National Board of Disaster Prevention and Mitigation, 2013: 29)

Table 2.1 Scope of Disasters in Thailand

Natural Disaster	National Security
1) Flooding and landslide	1) Acts of terrorism
2) Cyclones	2) Underwater mine and landmine
3) Fire hazard	3) Air threats
4) Hazardous chemicals and substances	4) Strikes and riot threats
5) Hazard in transport and logistics	
6) Drought	
7) Cold weather	
8) Wildfire and smoke	
9) Earthquake and building collapse	
10) Tsunami	
11) Human epidemic	
12) Threats from disease, insect, animal, and pest outbreaks	
13) Land animal and aquatic animal epidemics	
14) IT threats	

4) Ministry of Finance Regulations on Emergency Relief Fund B.E. 2556 (2013) defines disaster as public dangers including fires, storms, flooding, drought, rain shortage, dry spell, hailstorm, wildfire, epidemic, pest and insect

outbreaks, unusual cold, war, acts of terrorism, forces from outside of the country, either caused by nature, humans, or animals, which result in casualties or injuries of the people, or damage to properties.

According to the definitions above, it can be concluded that disasters or public dangers are the events that cause extensive impacts or losses of lives and properties of the people or the country, or the damage on infrastructure. Public dangers can be divided into 2 groups; 1) disaster or natural hazard, and 2) national security threats or the threats caused by human.

2.1.2 Definitions of Disaster Logistics

1) Kovacs and Spens (2011) define disaster logistics or humanitarian logistics as "an interdisciplinary field that combines aspects of logistics with water and sanitation, health care, development studies, and disaster management" as well as operation management, process engineering, public health, geography, IT management science, corporate social responsibility (CSR), disaster management, development aid, and public policy.

2) Thomas and Kopczak (2005: 2) states that disaster logistics or humanitarian logistics is

> The process of planning, implementing, and controlling the efficient, cost-effective flow and storage of goods and materials, as well as related information, from the point of origin to the point of consumption for the purpose of alleviating the suffering of vulnerable people. The function encompasses a range of activities, including preparedness, planning, procurement, transport, warehousing, tracking and tracing, and customer clearance

3) According to Apte (2009), disaster logistics refers to

> Special branch of logistics which manages response supply of critical supplies and services with challenges such as demand surges, uncertain supplies, critical time-windows in face of infrastructure vulnerabilities and vast scope and size of the operations

According to the above definitions of disaster logistics or humanitarian logistics, it can be concluded that it is an interdisciplinary field concerning logistics in time of disaster as well as humanitarian assistance with the scope covering at least two attributes; 1) the logistic response in time of disaster under the limitations of situation, timeframe, uncertainty of demand and supply, limited budget, and effectiveness of supplies, health care, transportation, housing management, and reconstruction (Figure 2.3).

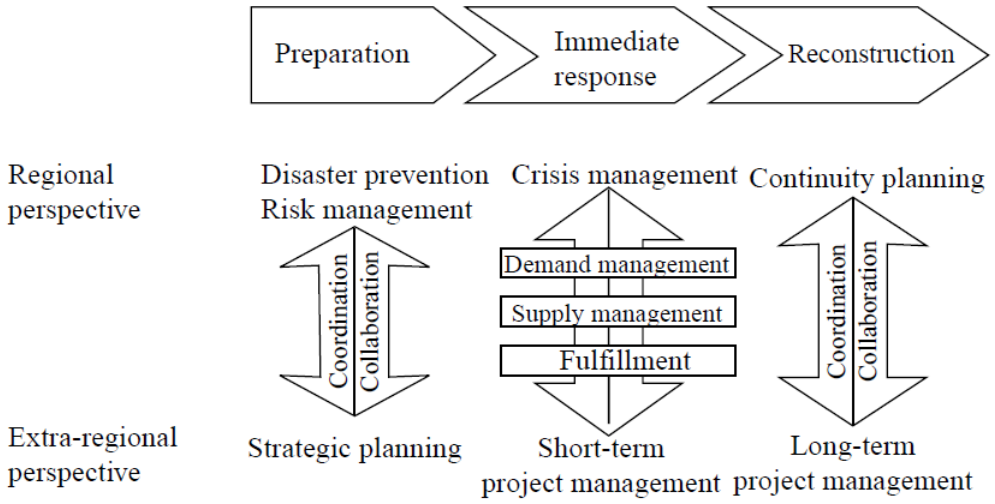

Figure 2.1 The Framework of Disaster Logistics

Source: Kovacs and Spens, 2007.

Table 2.2 Characteristics of Disaster Logistics

Characteristics	**Details**
Objective	To relieve sufferings of the disaster victims
Relevant parties	Many relevant parties such as the public, army, press, and donors government,
3-phase setup	Preparation, response, and reconstruction
Fundamentals of operation	A variety of suppliers, supplies, activities, endless demand, and ever-changing limitations

Table 2.2 (Continued)

Characteristics	Details
Philosophy of logistics	Suppliers are the push force sent to the affected area in response to disaster while the pull force is the operations during reconstruction period.
Transport and infrastructure	Unreliable infrastructure, transportation failure, possibility to food and medical supply/device shortage
Time factor	The delay may affect the number of casualties
Bounded knowledge actions	The nature of disaster demands a fast and immediate response. It is, therefore, necessary that disaster logistics model be designed and used appropriately to satisfy the uncertain situation.
Supplier structure	There are limitations to be considered.
Control	The control during disaster operations is limited.

Source: Kovacs and Spens, 2007.

2.1.3 Relevant Parties in Disaster Logistics

A number of scholars who study the relationships among relevant parties in disaster logistics or humanitarian logistics include Balick, Beamon, Krejci, Muramatsu and Ramirez (2010), Thomas and Kopczak (2005), Van Wassenhove (2006), and Kovacs and Tatham (2009). They discussed the roles of relevant parties in disaster logistics differently. However, Kovacs and Spens (2007) mentioned most clearly the roles of relevant parties to be divided into 6 main groups; 1) donor, 2) aid agencies, 3) NGOs, 4) The Royal Thai Armed Forces, 5) government, and 6) logistics providers (Figure 2.2).

1) Donors are very important because they provide money and relief supplies for the agencies to forward to the victims.

2) Aid agencies mostly providing assistance are usually international organizations such as International Federation of the Red Cross and Red Crescent Societies (IFRC) and World Health Organization (WHO).

3) NGOs play a role in relief operations like aid agencies. The only difference is that they are non-government. Some examples of NGS are World Vision and Cooperative for American Remittances to Europe (CARE).

4) The Royal Thai Armed Forces have the major role in disaster mitigation operations because they have the manpower and equipment.

5) Government has the role in coordination, policymaking, and setting the practice guideline for helping disaster victims for the whole country. Sometimes, G-G aid is also possible.

6) Logistics providers can facilitate and help the disaster victims. They are usually large corporates such as Deutsche Post DHL Group and UPS Supply Chain Solutions.

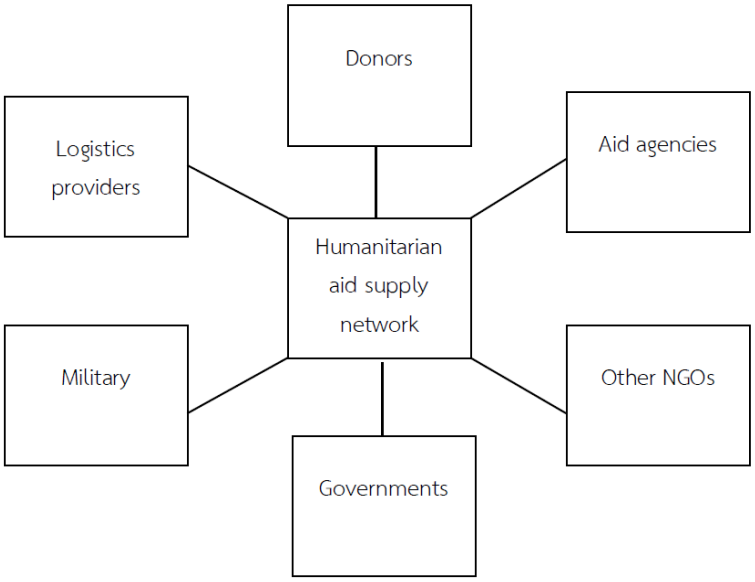

Figure 2.2 Relevant Parties in Disaster Logistics
Source: Kovacs and Spens, 2007.

2.1.4 Critical Success Factors for Disaster Logistics

The concept of critical success factor (CSF) was first developed by Daniel in 1961. The CSF concept emphasized on the Factors affecting the success or failure of an organization (Daniel, 1961), the factors that have to be developed or created to

drive an organization toward success according to the determined vision. Each organization has a concrete CSF to connect all levels of operation toward the same direction. The CSF will enable the staffs at operational level and executives aware of what they need to do to achieve the success of their organization.

In a general logistics context, especially business or military logistics in developed countries like the USA, Canada, or United Kingdom, the way CFS is established is very clear, unlike in Thailand where there is a limitation of national security factor. This makes the country in short of the quantitative and qualitative indicators (Parapob, Suthikarnnarunai and Buranaprapa, 2009). On the other hand, in the context of disaster logistics, it was found that the number of studies of CFS has been increasing since 2005 (Kovacs and Spens, 2011). All the characteristics of disaster logistics, including the philosophy of logistics, fundamentals of operations, and relevant parties, affect the complication of establishing CSF. This is because it can neither evaluate in term of money nor compare the value of human lives and operation efficiency although donors as the major sponsors focus mainly on the effectiveness of victim assistance as the top priority. Therefore, it is important to develop knowledge on establishing Critical success factors for disaster logistics. In this matter, Pettit and Beresford (2009) mention that there are 10 Critical success factors for disaster logistics; 1) strategic planning, 2) inventory management, 3) transport planning, 4) transport capacity planning, 5) information management, 6) technology utilization, 7) human resource management, 8) continuous improvement, 9) relationship with suppliers, and 10) logistics strategy (Table 2.3).

Table 2.3 Critical Success Factors for Disaster Logistics

Critical Success Factors	Details	Key Topics
Strategic planning	Long-term decision, planning, management, and leadership	Characteristics and size of business, location, outsourcing, budget, interrelationship, care for customers, standardization, and monitoring of performance, management, support of infrastructure of the organization, procedures, and activities
Resource management	Supplies management	Planning and coordinating the agreement between the flow of supplies, quantity, time, and collection of supplies
Transport planning	Channels and limitations of transport	Means of transport, capacity, maintenance schedule, and integrated transport methods
Transport capacity planning	Storage, procedure, and capacity of transport	Short-term and long-term demand, quantity of supplies/ available capacity, the number of vehicle, and capacity of the tools for acquiring supplies
Information management	Strategic information management and resource planning	Information about performance and usage, type of work, and quality of integration
Technology utilization	New technology utilization	Innovation for adaptation, leadership or followership of technology, data connection, and training
Human resource management	Participatory management	The number of personnel relating to capacity, training, and education

Table 2.3 (Continued)

Critical Success Factors	Details	Key Topics
Continuous improvement	Comparison to success index standard	Precision, flexibility, time, cost-effectiveness, value-added, and evaluation
Relationship with suppliers	Cooperation system	Competitive relationship management between suppliers and service/price negotiation
Logistics strategy	Just-in-time, flexibility, and lean supply	Supplies management and surge, integrated strategy between hub and spoke, in-bound-outbound and 3PL

Source: Modified from Pettit and Beresford, 2009.

2.2 Theories and Concepts about Military Logistics

2.2.1 Definitions

1) Etymologically, the term "logistics" comes from Greek, referring to a branch of mathematics that Greek people used to calculate military figures. The term was used to determine how the Chief of Operations or Director should perform their duties regarding mobilization of forces, camping, and supply of food. The United States Army started using the term in 1944 (Doctrine of Military Logistics, 2009: 1; Sombat Phetpradabwong, 2011: 45).

2) Department of Army (2009: 1-4) defines military logistics as below:

> Logistics is the planning and executing the movement and support of forces. It includes those aspects of military operations that deal with: design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel; movement, evacuation, and hospitalization of personnel; acquisition or

> construction, maintenance, operation, and disposition of facilities; and acquisition or furnishing of services

3) The Royal Thai Army has received military logistics supports, both in the forms of doctrine and gratuitous assistance from the USA since WWII. As a result, the RTA has followed the military logistics doctrines of the USA as the guideline until today (Doctrine of Military Logistics, 2009: 1; Sombat Phetpradabwong, 2011: 4-5, 45). Phetpradabwong also defines military logistics as below.

> Military logistics is a branch of combat support which consists of planning and other operations about combat support, as well as other activities apart from combat; 1) policymaking, planning, research and development, and budget planning for logistics, 2) design and development, procurement, storage, distribution, mobilization, maintenance, return, and disposition of weaponry, 3) mobilization and medication of personnel, 4) procurement or construction, repair, operation, and establishment of facilities, and 5) procurement or provision of services.

In addition, Phetpradabwong very specifically establishes the objectives for military logistics: to do every support effort until the combat unit notches up the victory. In other words, the logistics units shall procure sufficient equipment and service in a timely manner as requested by the combat unit.

In this research, the researcher summarized the definitions of military logistics and classified the branches of military logistics given by Phaithoon Lueangtrakun (2009: 58) and Wade (2005: 1-17 - 1-18). Military logistics in normal situation is used as the framework of the study. Military logistics for disaster operations can be divided into 4 groups; 1) operation planning e.g. policymaking, determining the demand, and locating the quarter of logistics, 2) procurement, 3) inventory management e.g. storage, distribution, maintenance, and disposition, and 4) services e.g. transport and medical services.

2.2.2 Military Operations in the Battlefield

The doctrine for join operations of The Royal Thai Army in 2007 (2007: 1-1 -1-3) mentions 3 types of military operations: 1) combat, 2) combat support, and 3) combat service support.

1) Combat refers to a military operation with direct engagement with the enemy. Combat is operated by combat units such as infantry, troopers, Special Forces, warships, and aircraft fighters.

2) Combat support refers to a military operation to empower the combat. Combat support is operated by bombardiers, army engineers, signalers, scientist, flying combat support units, and logistics ships.

3) Combat service support refers to a military operation that enables the combat and combat support to be operated continuously for a long time. Combat service support consists of 3 main activities; logistics, personnel, and civil affairs Apart from the above activities, combat service support also includes other activities such as combat zoning, arrangement of combat service support, rear area protection, communication for combat support, planning for combat support, and mobilization.

However, considering the context of national security as of the present, the possibility of full-scale war is declining (Prayuth Chan-ocha, 2008a: 13; Ministry of Defence, 2013) The Royal Thai Army has to adjust its role and response toward the contemporary national security accordingly. Therefore, the army has determined the military operations in response to threats in 2 different ways (Figure 2.3); 1) military traditional operations such as border defense and warfare, and 2) non-traditional or asymmetrical operations such as protection of the Monarch, maintaining order in the country, and disaster mitigation (The Army Training Command of RTA. Center for Doctrine and Strategy Development, 2012: 1-13-1-15; Ministry of Defence, 2013: 13).

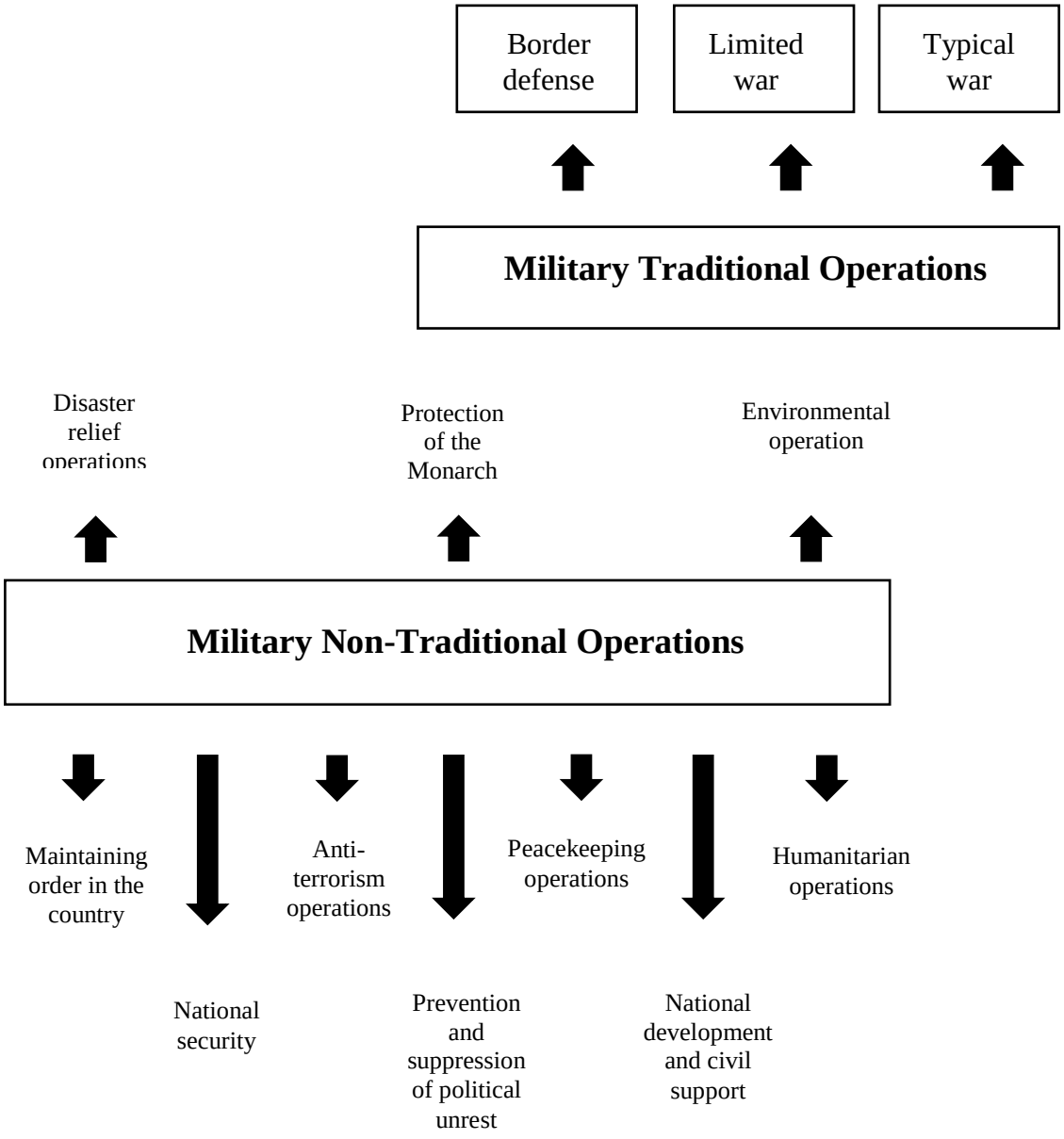

Figure 2.3 Scope of Operations of The Royal Thai Army

Source: The Army Training Command of RTA. Center for Doctrine and Strategy Development, 2012: 1-14.

2.2.3 Missions of Military Logistics

The Royal Thai Army has defined 5 missions of military logistics; 1) supply, 2) maintenance, 3) transportation, 4) health service support, and 5) other services

(Doctrine of Military Logistics of RTA, 2009: 4-32; Sombat Phetpradabwong, 2011: 9-84).

2.2.3.1 Logistics refers to the operations on demand, procurement, distribution, and disposition of equipment, as well as the control of such procedures (Figure 2.4).

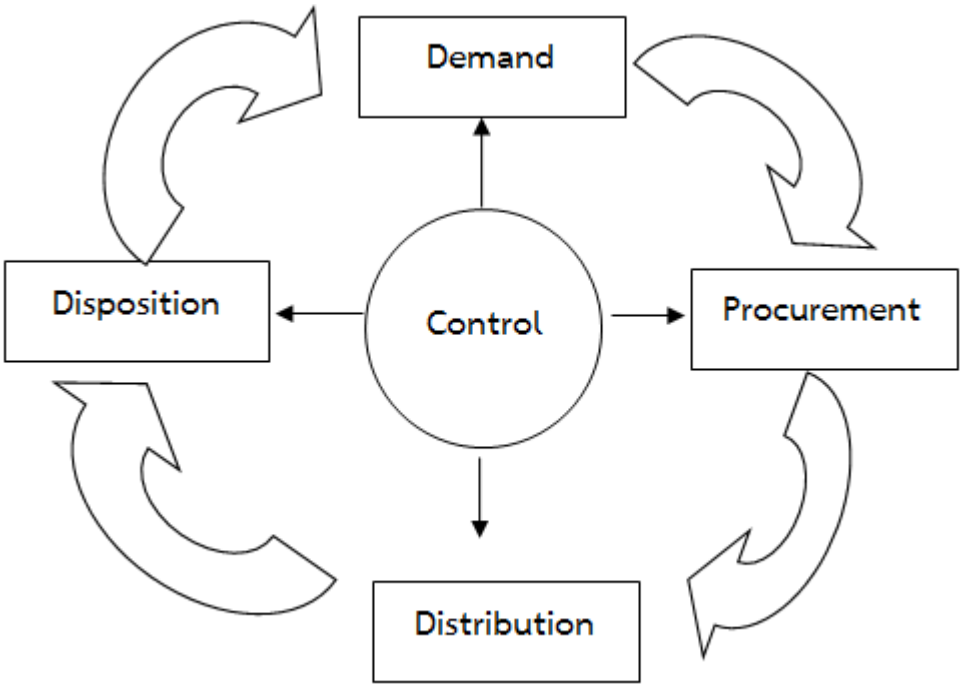

Figure 2.4 The Cycle of Logistics
Source: Doctrine of Military Logistics of RTA, 2009: 4.

According to Figure 2.4, the cycle of logistics or life cycle of equipment moves from one step to another, from the demand, procurement, distribution, to disposition, with the control at the center of cycle. In fact, any step of the cycle can be the start, but usually it starts with the demand. The demand comes as a result of shortage. In this case, shortage refers to the state of deficiency. When something is short, there is a demand to increase the quantity or to procure another to replace the existing one. After the procurement, the equipment will come to the distribution system. Distribution includes reception, storage, distribution, and transportation of equipment. After the process of procurement, equipment is received, stored in the inventory, and distributed to

the units using a means of transportation such as ships, trains, and airplane. When the equipment is in possession of the requesting unit, it is used. After a certain period of time, the equipment is deteriorated, and it needs to be deleted from the system. This process is called disposition. Again, disposition of equipment is the cause of another shortage, and that is how the cycle works.

1) Demand refers to the specification, proposal, or request to acquire certain equipment at a specific time or within a period of time. Demand can be divided into 4 types; original demand, replacement demand, demand for maintaining the level of supplies, and demand by project.

(1) Original demand includes the demand for equipment that an officer or military unit wants to have for their operations, and that equipment has not been in the inventory system before. Original demand can be divided into 8 cases; 1) new recruits, 2) establishment of a new unit, 3) new equipment standard, 4) increasing the number and items due to changed allowance, 5) the items approved to be given for the first time to the unit that has not been approved of the allowance, 6) items approved for the first time more than the allowance, 7) approval of distributing new equipment to replace the old one returned from military unit, and 8) fist distribution to a unit outside of the RTA according to RTA's command.

(2) Replacement demand refers to the demand to replace the equipment that a unit has received before. This also covers the demand for equipment in these 3 cases; 1) to replace the consumed or damaged equipment due to usage as well as damaged parts, 2) to replace the equipment to be disposed of, destroyed by the enemy, stolen, or damaged by other reasons, and 3) to replace equipment under maintenance with the spare equipment.

(3) Demand for maintaining the level of supplies refers to the demand for the equipment that logistics unit needs to fulfill its capacity, including the operational level or the cycle of procurement, safety level, and time for withdraw and delivery or advance time for procurement.

(4) Demand by project refers to the equipment other than normal demand aimed for supporting a project or a special operation according to the plan and objective of RTA, for example, non-traditional equipment, a project of establishing a new unit, and mobilization project.

2) Procurement refers to the process of acquiring equipment and services in conformance to relevant laws. Procurement can be made by the following means; 1) procurement according to the Regulations of the Office of the Prime Minister on Procurement B.E. 2535 (1992) and its revised editions, 2) exchange, 3) rent, 4) self-invention, 4) recruitment according to the Act on Enlistment to Help Military Affairs B.E. 2530 (1987), 6) confiscation according to Martial Law B.E. 2457 (1914), 7) donation, 8) assistance from foreign countries, 9) procurement for research and development, 10) procurement with loans, 11) procurement via Foreign Military System, 12) procurement from other countries in the form of G-G trade, 13) withdrawal, borrow, and transfer.

3) Distribution refers to the implementation on the received equipment until it is delivered to the users. Distribution covers from reception, storage, and transportation of the equipment. Distribution can be done in 2 ways. In one way, the distribution at the logistics quarter is the process of distributing the equipment of the distributing unit. Staff from the using unit shall bring the vehicle to load the equipment from the distributing unit at the logistics quarter or distributing quarter that provides the support. Another way is the distribution at the using unit. In this case, it is the process of distributing equipment by which staff of the distributing unit brings the equipment to the using unit, or the users directly. The direct distribution makes it more systematic. The Royal Thai Army has established 5 fundamentals of distribution. 1) The distribution system should be flexible according to the situation. 2) The equipment in possession must be sufficient to replace the daily consumption before the operation of the next day. 3) The equipment should be stored at the suitable quarter. 4) The distribution shall be done by using the transportation in the optimal manner and removing unnecessary transportation and double handling. 5) The using units should possess the equipment only at the level necessary to accomplish the missions.

4) Disposition refers to deleting the equipment from the system because it is consumed, damaged, destroyed, impossible to be restored to the good condition, deteriorate and dysfunctional, lost, dead, oversupplied, or too outdated to be used. The causes of disposition can be divided into 3 groups; 1) damaged by normal usage, 2) damaged or lost because of a natural disaster, 3)

damaged or lost because of human, including the enemy, accident, or negligence of the user.

5) Control refers to the process of making the inventory of logistics, distribution, repair, and/or disposition of equipment. This process is done through the system of report, calculation, and estimation. It makes the logistics operations more reliable. Controls can be divided into 2 manners. 1) Logistics control is the process of controlling each item by the logistics system, including specification of demand, reception, storage, transportation, division, marking, and accounting. 2) Accounting control is the process of keeping the data of balance and condition of the receivable, available, and payable items and equipment. The purpose of accounting control is to know the quantity of the available items and equipment and/or demand for distribution, and for the convenience of distributing the equipment.

2.2.3.2 Maintenance refers to an act aimed to maintain the equipment in an operational condition or repair the broken equipment to an operational condition. Maintenance also covers inspection, test, service, repair, overhaul, rebuilding, modification, and reclamation as required by RTA.

1) Preventive maintenance refers to the care and service by staff aimed to maintain the equipment and tools in an operational condition. Preventive maintenance is performed before a defect occurs or worsens.

2) Inspection refers to the check of using condition of the equipment by comparing physical, chemical, mechanical, and electrical specifications according to the predetermined standard. Inspection is divided into 3 types; inspection by the superior, specific inspection, and technical inspection.

3) Test refers to verifying the operational condition of the equipment and finding the electrical, chemical, and mechanical errors of the equipment using different tools and testing methods.

4) Service refers to cleaning, care, electric charge loading, gas refilling, lube refilling, coolant refilling, compressed air refilling, and other special services as additionally required such as painting and lubricating.

5) Repair refers to restore the damage or broken equipment back to an operational condition, including changing parts, welding, clinching, and reinforcing.

6) Overhaul refers to restore the broken equipment to the fully operational condition. The standard of maintenance is clearly written in a separate document. Overhaul can be done by disassemble the components, check the components, and assemble components and parts. However, overhaul requires the inspection and test before using the overhauled equipment.

7) Rebuilding refers to the repair of equipment to nearly the original condition in terms of dimension, performance, and useful life. Rebuilding can be done by removing damaged parts and components and using the good parts and components to make new equipment.

8) Modification refers to modifying the equipment as ordered. The modification does not have to leave the original dimension of the equipment, but it is meant to change the mission or function, or desired outcome of such modification. Modification can be a way to increase safety for users.

9) Reclamation refers to the process of making use of the equipment that is not being used, abandoned, or damaged, including its parts and components, before they are introduced to the logistics cycle again.

10) Cannibalization refers to the removal of components as approved from the full equipment or relevant components, which are reparable, but not worth it, or the components already disposed for other equipment.

11) Cannibalize refers to removal of parts of components from one equipment to be used with another.

12) Maintenance floats refer to the equipment that the repair unit keeps to replace the using units in case the former regards that the repair is noteworthy or it is impossible to repair it within the specified time. And if the repair unit does not replace it with the old one right away, the using unit will not be ready for combat and cannot accomplish the urgent operation.

In addition, to make it easier and more flexible for maintenance division and its sub-divisions, The Royal Thai Army defines the different duties of maintenance, ranging from normal preventive maintenance that the users can perform themselves, to more complicated repair which must be performed by depot maintenance technicians. Maintenance is divided into 4 types. First, maintenance at unit level refers to the maintenance task that a certain unit is allowed to do and is

under responsibility of the using unit. This type of maintenance consists of inspection, cleaning, care, lubrication, adjustment, changing minor parts that do not require technical knowledge. Basically, maintenance at unit level is responsible by the supervisor of the unit that uses the equipment. Second, direct maintenance refers to the maintenance approved to perform by the maintenance unit assigned to support the unit that uses the equipment. Direct maintenance covers a limited repair to the entire equipment or some parts of the dysfunctional component to support the using unit. This is done by repairing and changing of the un-operational parts, and repairing and changing of the components and minor components. Direct maintenance is responsible by the direct maintenance unit. Third, general supporting maintenance refers to the repair of un-operational equipment, which is beyond the ability of the direct maintenance unit. This repair is meant to send the equipment back to the logistics cycle or support the direct exchange. This may include the repair the components and minor components to send the equipment back to the logistics cycle. General supporting maintenance is responsible by the supervisor of general supporting maintenance unit. Fourth, depot maintenance refers to the maintenance task performed by depot maintenance technicians of Support Service Department. The technicians in this department will perform the overhaul maintenance to restore or rebuild the broken equipment back to the fully operational condition according to the technical manual. Depot maintenance is under the responsibility of Director of Support Service Department.

2.2.3.3 Transportation refers to the use of tools and facilities to support the military mobilization. The purpose of transportation is to get the mission accomplished effectively. The key principle is to mobilize personnel, equipment, and utilities from one place to another via road, railway, waterway, air, pipe, and other routes. Transportation is divided into 2 types. The first one is tactical transportation which involves military units and equipment for combat operations under warfare while there is no land engagement with the enemy. The person responsible for tactical transportation is the operation officer (other than air combat). The second is administration transportation, which involves mobilization of military units, equipment, and tools at a distance from the enemy. This the second case, there will be no disturbance or pressure from the enemy. The person responsible for administration transportation is logistics officer.

2.2.3.4 Medical service refers to provision of medical service to military units in the battlefield. The purpose of medical service is to maintain the quality and health suitable military operations. Medical preventive service is provided to keep soldiers in good health. Medication is provided effectively, as well as other services as assigned. In normal situations, the medical service of RTA includes health promotion, preventive medicine, treatment, evacuation, dental service, pathological service (diagnosis), hematological service, psychological service, diagnostic, first aid, and medical checkup for private Royal Thai Armed Forces.

2.2.3.5 Other services refer to the services provided to military units other than Items 2.2.3.1-2.2.3.4 such as construction and repair in normal situations and in battlefield, property-related services, infrastructure, fire-fighting, housing, water, prevention of nuclear, chemical, and biological war, destruction of explosives, and camouflage.

2.2.4 Categories of RTA Equipment

Supplies include all the necessary items for military units, both for survival and operations such as food, clothing, fuels, animals, vehicle, weapons, ammunitions, explosives, machinery, and other tools. Supplies can be divided into 5 categories as follows:

1) Supplies Type 1 refer to food for consumption of humans and animals.

2) Supplies Type 2 refer to the supplies provided for each unit or soldier as RTA specified in the allowance of equipment, inventory, or other accounts such as weapons, vehicle, and communication radios.

3) Supplies Type 3 refer to oil, gas, and mechanical oil which are under responsibility of Quartermaster General Department. These fuels are meant to be used for vehicles, machinery, aircraft, lighting equipment, and heating equipment.

4) Supplies Type 4 refer to the equipment that RTA does not define a specific distribution quantity to the unit. This includes the equipment that RTA has to procure from time to time to satisfy the demand of the units. These are considered outside of allowance such as special clothing, special weapons, special vehicles, and field fortification materials.

5) Supplies Type 5 refer to ammunitions, explosives, and chemicals under responsibility of Quartermaster General Department and Chemical Department. Supplies Type 5 include cannonballs, bullets, grenades, and dynamites.

Apart from the 5 categories above, RTA also assigns responsibility in the equipment to Support Services Department and other relevant departments of special affairs.

2.2.5 Logistics Management of The Royal Thai Army

Logistics management of The Royal Thai Army is classified into 4 levels; logistics management at The Royal Thai Army level, logistics management at regional level, logistics management at division level, and logistics management at sub-division level.

1) Logistics units at The Royal Thai Army level include 1) 2 Staff Departments i.e. Logistics Department and Directorate of Intelligence, 2) 9 Support Services Departments i.e. Ordnance Department, Chemical Department, Medical Department, Quartermaster Department, Engineer Department, Post Engineer Department, Transportation Department, and Veterinary Department, 3) Special Affairs Department i.e. Adjutant General Department, Welfare Department, and Territorial Defense Command.

2) Logistics units at regional level are responsible for logistics operations for Army Area, as well as other units that RTA assigned to establish, and other operations within the area of the Army Area's responsibility or the area assigned by RTA. Logistics units at regional level include Logistical Brigade, Army Support Command, and Military Circle.

3) Logistics management at division level consists of 2 characteristics. 1) Support Services Line consists of 5 other divisions including Quartermaster Company, Ordnance Battalion, Medical Battalion, Signal Battalion, and Engineer Battalion. These military units are in charge of supplying the equipment under their responsibility. 2) Mission Line is supported by a department to run logistics operations. The logistics management depends on the assigned tasks and missions.

4) Logistics management at sub-division level is not clearly responsible by any specific unit. The logistics units are usually included in the combat

unit such as signal platoon, service platoon, medical platoon/squad, logistics officer, and kitchen sergeant.

2.2.6 Principles of Logistics of The Royal Thai Army

The RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army defines 2 policies of logistics; 1) the logistics operations according to the logistics principle, and 2) logistics operation using the equipment and manpower of the RTA as available from procurement. For the budget, it is managed within the allocated sum from the government. The logistics units at every level under RTA shall hold on to the 9 principles as follows:

1) Integration supports: Logistics capacity of all units is integrated to support combat units for the success of the assigned tasks.

2) Back-to-front supports: The logistics supports are sent from the back units or the units close to the logistics base by prioritizing the units closest to the battlefield. This also includes the support provided from the superordinate to the subordinate units so minimize the logistics burden of the subordinate units.

3) Reliability: Logistics operation should be of good level sufficiently guaranteed that it can provide the supports at the requested time and place. However, it is important to have reserve logistics and backup plan. The commanders at every level shall protect their logistics support from being damaged by any means and from extravagant consumption.

4) Simplicity: Complication of logistics system should be at the minimum. A good logistics system should avoid redundant filling of forms without using those data in the forms. It should not require a long process of work units and staff and too many approvals. Simplicity could also include the ability to share equipment which are easy to use, disassemble, and perform maintenance for.

5) Timeliness: The logistics operations should be sufficiently available at the defined time and place. Therefore, timing is of the essence e.g. neither late nor too early.

6) Proportional: Logistics management should be appropriate to the demand e.g. not too little that the strategic unit loses the combat due to the shortage of

supports. The planning of logistics units should also be in good proportion. For example, provision of maintenance staff should be proportional to the logistics staff, or the evacuation unit proportional to the medical unit.

7) Authority: Although the responsibility of logistics falls on the supervisor alone, the authority should be sufficiently given to the logistics supervisor for the accomplishment of the logistics operations and flexibility of performing the task without interference from a third party.

8) Safety: The logistics operation must neither be blocked with critical act of the enemy nor the restrictions from the safety measures from the same side.

9) Economy: Manpower, equipment, services, and facilities for logistics operations shall be used only as necessary and to the best value for money based on the financial status of the country. It is also important to consider the care and maintenance of the equipment for prolonged useful life and good conditions.

In order that these 9 principles can be implemented, The Royal Thai Army has established 8 additional concepts of logistics. 1) Use the same logistics system both in normal situations and in time of war as much as possible. 2) The practice should be under the same standard with allowable minor differences due to the varied locations, weather, and situations. 3) Logistics operations are assigned to the nearest Army Area as much as possible by distributing equipment, services, and facilities to the regional logistics bases. 4) Equipment should be in the condition ready to be used at all times by procuring in normal situation and holding on to the policy on military industrial affairs of the Ministry of Defence. 5) Necessary war equipment should be prepared as well as manpower for logistics. 6) Services, constructions, infrastructure, and facilities should be prepared to sufficiently support the need of each unit. 7) Logistics units should be sufficient in number and in proportion to the combat units. The existing logistics unit should be trained to improve the performance and the new units can be established as necessary. 8) The logistics system should be improved and up-to-date.

2.3 Theories and Concepts about Management According to the McKinsey 7-S Framework

2.3.1 Elements

The implementation of every organization; be it government, private, or public, requires model management process to achieve the objectives. One of the principles generally accepted to analyze the working process and performance very effectively is the framework of (Figure 2.5) which consists of 7 interrelated factors; 1) structure, 2) strategy, 3) systems, 4) staff, 5) skill, 6) style, and 7) shared values/superordinate goals. The factors from 1-3 are called hard-side while 4-6 are soft-side. The hard-side and soft-side are connected with the 7th factor (Waterman, Peter, and Phillips, 1980; Peter and Waterman, 1982: 10; Wanchai Meechart, 2009: 86-87)

1) Structure refers to the structure created according to the process or assigned tasks. Personnel or staffs from different fields are assigned to work together to achieve the goal. Structure can also refers to the process of arranging orders for 2 people or more to achieve the goal because the organization is big. Good organization management will enhance flexibility of the operation, minimize redundancy or conflict of duties, and make the staff know their scope of responsibility. In addition, good organization management also makes it easier to coordinate, enables the executives to make the right and timely decision. Taking a close look on the structure of the organization may be beneficial for setting the strategy of the organization. In other words, if the structure is suitable and agrees with the chosen strategy, it will become the strength of the organization. However, if it is unsuitable and disagrees with the strategy, it will be nothing but the weakness.

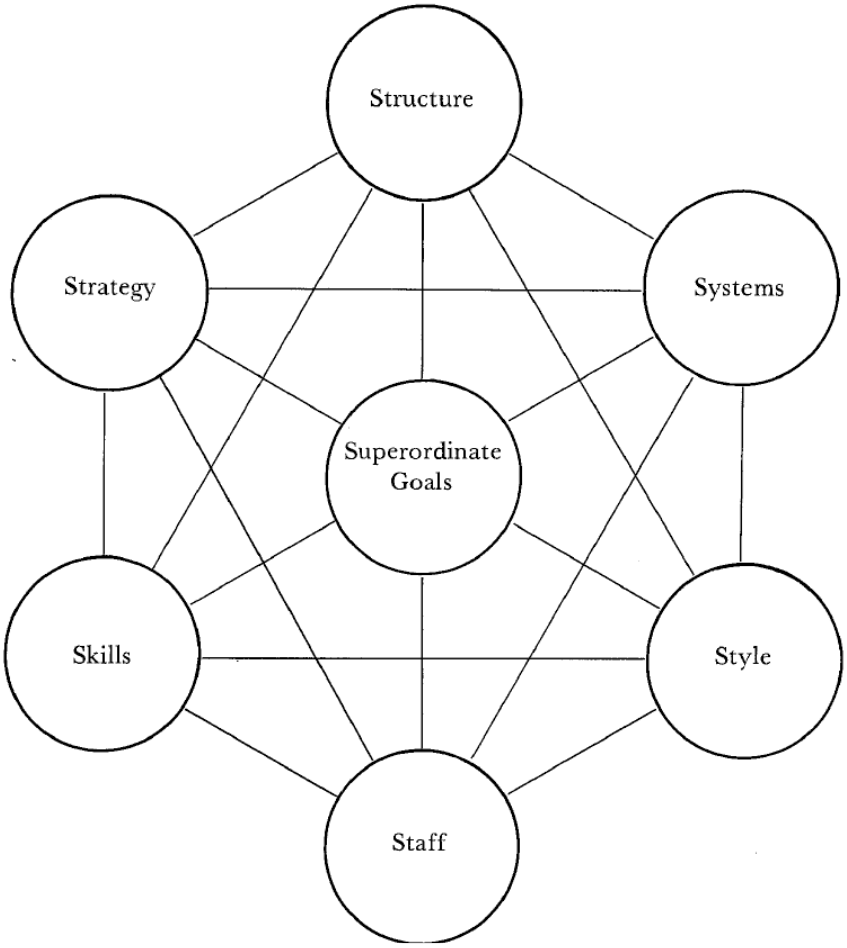

Figure 2.5 Management According to the McKinsey 7-S Framework
Source: Waterman, Peter and Phillips, 1980.

2) Strategy refers to a set of actions to satisfy or adapt to the changing environment of the organization, including customers or competitors. Strategies should be based on strengths and weaknesses of the organization. Therefore, strategic management is a process that helps executives answer important questions such as where our organization is, where the goal of the organization is, and what the mission of the organization is, what the mission of the organization should be like, and who the service receiver is. It is noted that strategic management is very essential for the organization because it will enable the organization to determine and develop competitive advantage. It can also be the guideline that staffs at all levels in the organization look at to acknowledge and step toward the same direction.

3) System refers to a process and sequence of operation which is systematic, continuous, consistent, and connected at all levels of operation according to the strategy in order to achieve the goal. Systems include the budget system, inventory system, IT system, and monitoring system.

4) Staff refers to the process of human resource management based on the belief that human resource is the important factor for operation of the organization. That is to say, the success of the organization depends on the suitable human resource management. If an organization needs to have human resource management that is in accordance with the strategy in order to move toward the determined direction.

5) Skills refer to knowledge, ability, and working skills, including specialties for working in an organization. Working skills of human resource can be divided into 2 types; 1) occupational skills, and 2) aptitudes and special talents. Occupational skills qualify a person to work in the position such as finance and marketing. Occupational skills are earned from education or additional training. On the other hand, aptitudes or special talents are what make a person outstanding from other persons. These make the person outperform and outgrow other people in the organization. However, an organization needs to focus on both types of skills.

6) Style refers to the working style of the head or executive of the organization about order, control, and motivation. Working style is an important element of working environment. It is known that leaders play an important role to success or failure of an organization. Successful leaders or executives should be able to establish the organization culture by connecting the excellence of the organization and ethical behaviors.

7) Shared value or superordinate goal refers to the common goal among personnel in the organization and something that the organization wants to achieve. The shared value links other factors together. Shared value is like a common goal for every staff and section of the organization. It represents the necessity of existence of the organization or main duty of the organization.

2.3.2 McKinsey 7-S Summary of Studying Based on the McKinsey 7-S Framework

The McKinsey 7-S Framework is a result of comparing the data from 62 leading companies in the United States using the same evaluation criteria. It was found that only some companies were classified as excellent companies which are very outstanding, especially in term of innovations and new inventions.

The important characteristics that excellent companies have in common are as follows:

1) Structure: Excellent companies usually have simple forms, limited support personnel, division sorted by product type, and decentralized power for each division.

2) Strategy: Most excellent companies use 2 organization strategies; closeness to the customer and focusing on the businesses they are good at and those business are related. For the first strategy, the companies may take advantage of the quality of service and reliability of the product and listen to the feedbacks from customers. For the second, the companies do not try to do a completely different business, but they may develop similar products.

3) Systems: These companies focuses on 3 subjects; 1) system flexibility, 2) system trial operation, and 3) system simplification.

4) Staff: Excellent companies give freedom and entrepreneurship to their employees. They decentralize the power and in the meantime encourage participation and a sense of ownership. They encourage the employees to develop new products and services all the time, and focus on increasing the performance through human resource.

5) Skills: Excellent companies are both strict and flexible at the same time. To clarify, they take thing seriously so that the staffs believe in the value of customers, and the quality of products and services. In contrast, the informal communication, creating innovations, and giving employees freedom are part of the flexibility.

6) Style: Leaders or executives work closely with the staff and believe in the value. In other words, the executives need to know the job really well instead of sitting in their office. They need to also make everyone in the organization believe in good values of the company.

7) Shared value/ superordinate: Excellent companies use shared value to drive the organization. The shared value has three characteristics; 1) focusing on qualitative goals than quantitative goals, 2) allowing staffs to show their full potentials, and 3) truly believing in the shared value.

2.4 Theories and Concept about Policy Implementation

Policy implementation is the process that takes place after the policy is approved and proved legal. Straightforwardly, policy implementation is to bring the abstract policy into activities, guideline, measure, and practice. Unfortunately, policy implementation is usually taken for granted despite its importance as indicator of success of failure of the policy (Supachai Yavaprabhas, 2014: 87). Most literatures focus on policymaking and result evaluation, but lack the study that aims to explain the phenomenon or the actual condition in policy implementation, which is the key link between policymaking and evaluation. Therefore, it is the gap that has not been addressed properly. In most cases, the policy or project plan is accepted as good at the beginning or expected to solve problems when it is implemented. But when it comes to practice, it turns out to be a failure which results in cancellation of the policy or project. (Voradej Chandarasorn, 2009: 1)

2.4.1 Definitions

1) Williams (1971: 144) mentions that policy implementation refers to the ability of an organization to use all the administration resources to achieve its goals. It requires the procurement and preparation processes as well as continuous effort for a certain time to make policy implementation successful.

2) Van Meter and Van Horn (1975) states that policy implementation refers to an implementation by a group of persons in government or private sectors aiming to accomplish the predetermined goal.

3) Mazmanian and Sabatier (1989: 20-21) formally define policy implementation as the decision to bring the basic policy in the form of law or order from administrative authority or ruling of court into practice. Ideally, policy determination concerns problem identification and setting objectives and structure of

the process of policy implementation. These processes usually consist of many steps, starting from law passing to decision making of operational level agencies, abidance of the target group, the direct and indirect effects of the decision, realization of the effect by the decision maker, and finally review and effort to review the fundamental law.

4) Pressman and Wildavsky (1979: xx-xxi) define policy implementation as the interaction between setting the goal or objective and the effort to achieve the goal and objective.

5) Voradej Chandarasorn (2009: 16) defines policy implementation as a study that focuses on the ability to drive the key mechanisms to achieve the predetermine goal. The content and scope of the study focus on and cover the attempt to explain the phenomenon or actual condition in the process of policy implementation in order to learn, develop the guideline, and create the strategy that can result in the success of policy implementation.

6) Supachai Yavaprabhas (2014: 90) summarizes the definitions of policy implementation of many scholars and leaves an interesting note on the definitions of policy implementation in 2 issues. 1) Policy implementation is a process; namely it is nonstop activity in which each step is interconnected rather than periodical activities. 2) Policy implementation is an implementation to accomplish the goal of the policy. By the hint of the second point, policy implementation needs to have the policy, the goal, or the objective before the actual implementation.

The researcher has analyzed the definitions of policy implementation above and summarized that it refers to a study that focuses on the ability to propel all the key working mechanisms to achieve the predetermined policy, and the process to do so is nonstop, continuous, systematic, and interrelated (Figures 2.6 and 2.7).

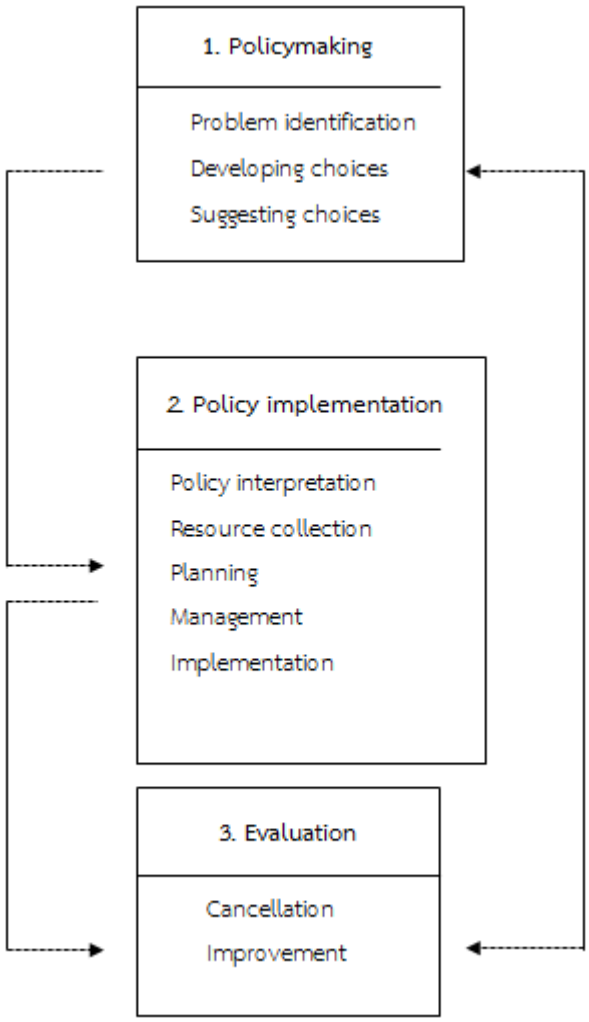

Figure 2.6 Procedure of Public Policy

Source: Supachai Yavaprabhas, 2014: 35.

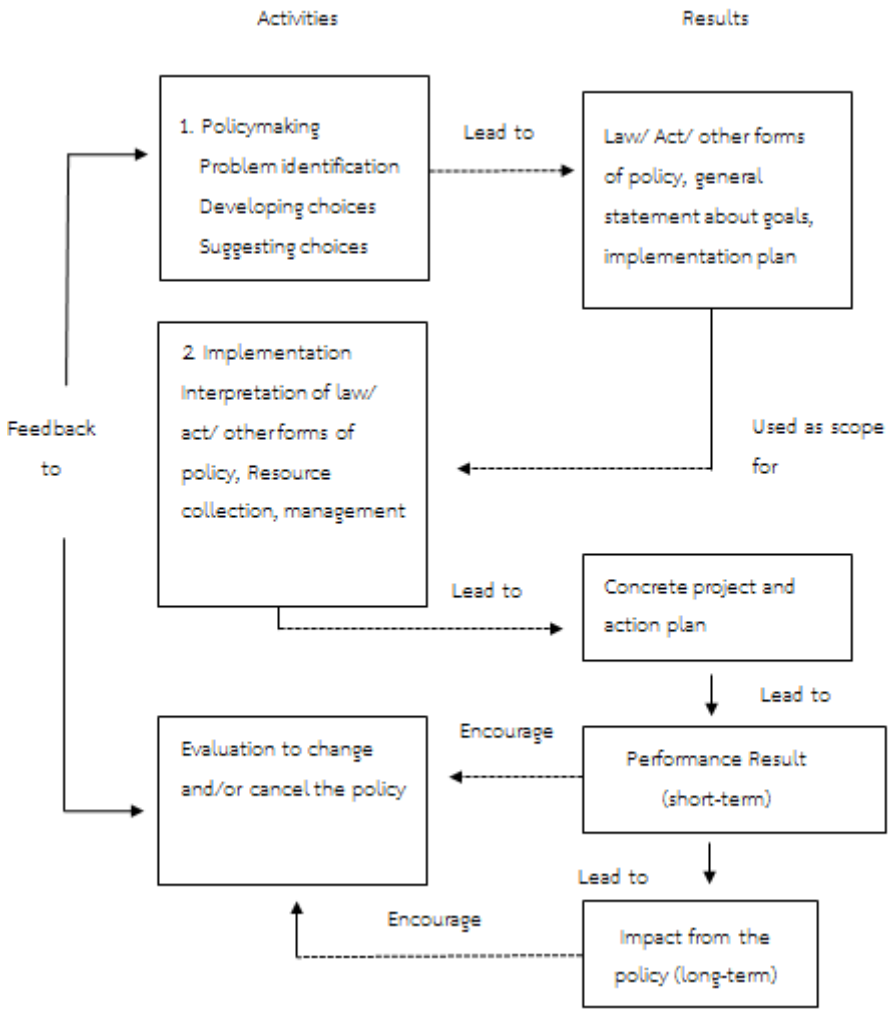

Figure 2.7 The Relationship between Policy Implementation and Other Procedures in the Process of Public Policy

Source: Supachai Yavaprabhas, 2014: 99.

According to Figures 2.6 and 2.7, it is seen that policy implementation is closely related to policymaking and evaluation. It consists of 5 sub-processes; 1) interpretation of the policy, 2) resource collection, 3) planning, 4) management, and 5) implementation. Figure 2.6 clearly demonstrates the interrelationship among the procedure of public policy.

2.4.2 Factors Affecting the Success or Failure of Policy Implementation

Literature review about the Factors affecting the success or failure of policy implementation revealed that they are usually similar with only minor differences as summarized below.

2.4.2.1 Supachai Yavaprabhas (2014: 101-118) gathers the suggestions about 8 success or failure factors of policy implementation; 1) characteristics of the policy, 2) objectives of the policy, 3) political possibility, 4) technical possibility, 5) resource sufficiency, 6) characteristics of the organizations implementing the policy, 7) attitude of the implementers of the policy, and 8) relationship among the mechanisms inside the organization or among the organizations implementing the policy.

1) Characteristics of the Policy

(1) The type of the policy: The implementation will be utterly successful if it requests minimal changes and highly agrees with the relevant objectives. On the other hand, if the policy requests a lot of changes and does not agree much with relevant objectives, the possibility to success is low accordingly.

(2) Relative benefits of the policy includes the weight of economic and social impact as a result of the policy. The more the society realizes that the policy is more beneficial than other policies, the chance of success of the policy implementation rises accordingly.

(3) Agreement between the policy and the values, experience, and needs of the people affected by the policy: If the policy agrees with the values, experience, and the needs of people, the chance of success of the policy implementation rises accordingly.

(4) Practicality: The success or failure of most policies depends on their practicality. If it is possible to launch the policy in a trial mode, the chance of success is higher.

(5) Visibility of the result: If the result of the policy is clear and substantial, the chance of successful implementation is higher.

(6) Quality of feedbacks: If the feedbacks are taken care of and evaluated continuously, it will contribute to higher chance of success.

2) Objectives of the Policy

An indicator that can indicate the objectives or goals of a policy is a success factor of the policy. An indicator should have 5 characteristics as follows:

(1) The objectives need to be clear, not vague.

(2) The objectives must agree with one another instead of contradictive. Objectives should be arranged according to priority of the importance to make it more possible to be successful in practice.

(3) The objectives must be easy to understand for the implementers of the policy.

(4) It is compulsory to determine the success indicators of the policy implementation whether it accomplishes the objects or goals.

(5) Information reported to the implementers, including the orders from the policymakers must be clear and accurate.

3) Political Possibility

Political context is also important for policy implementation. Therefore, it should not be overlooked. The following factors are as follows:

(1) Negotiation between the government and private sector: The success of a policy depends on support or objection of private businesses that may be affected by the policy.

(2) Supports from relevant parties such as stakeholder, political figures, and bureaucracy system also play an important role to success or failure of a policy.

(3) The impact of the policy on the powerful professional groups: The policy to be implemented must not cause negative impact on such professional groups because it may lead to the failure of implementation.

4) The policy should gain strong supports from leading class, especially in developing countries.

(5) Supports from press and the public may affect and play an important role on the success of a policy.

(6) Approval for voters: A public policy will be supported if it can satisfy the real needs of the people who have the right to vote and call for participation as much as possible.

4) Technical or Theoretical Possibility

Changes in technology is important, may happen, and when they do, they usually change quickly. Each change usually has major impact on the policy implementation. There are 4 issues that need to be carefully considered:

(1) If the policy drafting process is not too complicated and involve too many people, the chance of success is higher.

(2) The request for the policy implementers to change their behaviors will pose a chance of failure of implementation. This may be addressed by setting a standard operating procedure which helps them decide on what they are doing regularly without wasting time.

(3) Reliable theories such as the framework of the right way for looking at the problem are important for the success of policy implementation. If the theoretical knowledge is not advanced enough, it may result in a mistake.

(4) Characteristics of technology: In practice, it is important to use the technology suitable for the situation and environment. For example, consultants from other countries may give suggestions that do not fit to use in the context of a developing country.

5) Resource Sufficiency

A successful policy shall have resource supports, including manpower or budget. Otherwise, the policy is just a piece of paper. There are 3 important issues to consider as follows:

(1) Financial support: A successful policy should have sufficient financial support. Financial shortage is usually an excuse when the implementation is facing some problems.

(2) Capacity of staffs: Most of the time, the actual number of staff implementing the policy is usually lower than that is required to make it successful. The manpower shortage directly results in ineffective implementation. Apart from the number, quality is also an issue, especially when it requires technical and specialized knowledge.

(3) Management: The success of policy implementation largely depends on management, such as availability of supplies, working space, equipment, land, and utilities.

6) Characteristics of the Organizations Implementing the Policy

The characteristics of the organizations implementing the policy will contribute to success or failure of the policy. Therefore, the following characteristics should be carefully considered:

(1) Type of organization: The successful policy is usually given to the organization that already exists and it should support the organization. In addition, the organization should have enough manpower and other resources. In case of a new organization, it should be established by the political group currently in power. Small and new organizations usually face fewer problems than bigger organization, and the chance of success is likewise higher.

(2) Structure and level of mastery: Level of mastery and the number of subordinates may largely contribute to the success or failure of policy implementation. In addition, communication and supervision are also vital for the policy. It is found that smaller organizations have fewer levels of mastery and subordinates and have higher chance of success than larger organizations with more levels of master and higher number of superordinate yet lower number of subordinates.

(3) Ability of the leader: Strong leadership skills to gather supports and the ability to create new things are common characteristics of the successful projects. In short, leadership is an important factor of successful policy implementation.

(4) Relationship with the policymaking organization: It was found that the more informal relationship between the policy implementing organization and the policymaking organization is, the higher chance of success is.

(5) Level of open communication opportunity: It was found that giving the opportunity to communicate with third parties is a way to create good relationship of staff both in vertical and horizontal direction. It is also a key factor for success or failure of a policy.

7) Attitude of the Policy Implementers

Public policies in which the implementers do not have interests may be brought in to practice in a sincere way. In contrast with the policies that are

against the basic feelings or interests of the implementers, the implementers are not willing to perform their tasks and may even change the implementation from the original objectives. There are 4 issues to take into consideration;

(1) The attitude toward the objective of the policy: If the implementers understand and agree with the objective of the policy, and feel involved, the implementation is more likely to be successful.

(2) Impact on behaviors of the implementers: The policy that changes the behaviors of implementers from what they are used to doing for a long time usually turns out a failure. On the other hand, those that do not change their habit have more chance to be successful.

(3) The conflict on the values of the implementers: If the implementers do not agree with the policy, they usually ignore or are not willing to follow the policy, or take action only on the parts that are not against their values or beliefs. This will eventually result in the failure.

(4) The impact on profession, power, dignity, and benefits of the implementers: Implementers are always trying to avoid or ignore the actions that go against their benefits. Therefore, the assignment of policy to the persons whose interests disagree with the policy is like calling for troubles.

8) Relationship among the mechanisms inside the organization or among the organizations implementing the policy.

The following factors can contribute to success or failure of a public policy.

(1) Relevant organizations: If there are many organizations involved in the policy implementation, it is more like to see the problem of communication among them.

(2) The number of decisions: The more chances implementers have to make a decision, the more chance for the implementation to be delayed.

(3) The original relationship among the organizations following the policy: If the implementing organizations have a good relationship, it is more likely that the policy will be successful.

(4) Intervention from higher level organization: Even with a few decisions and short level of mastery, the policy may face difficulties if it is intervened from higher level organizations more than necessary.

2.4.2.2 Thosaporn Sirisumphand (1996: 145) says that the issues that most policies face about implementation is the gap or incompleteness of policy implementation. The gap is caused by limitations or uncertainty of the situations. Therefore, he proposes 3 factors of unsuccessful policy implementation according to the theory of Hogwood and Gunn; 1) management problems, 2) policy problems, and 3) bad luck.

1) Management problems refer to the problems occurring to the implementing organization, such as insufficient planning and control, limited capacity, internal conflict, and unwilling implementers.

2) Policy problems refer to the difficulties of policy implementation. For example, it requires high technology, huge behavioral changes of implementers, objections or strikes against the implementations, or other problems arisen from confusion or contradicting policies.

3) Bad luck refers to the economic, political, and social situation that do not support the implementations such as flooding, drought, critical economic fluctuations, or political revolution.

2.4.2.3 Mayuree Anumanrajadhon (2006: 220-226) mentions 10 factors that occur before policy implementations that contribute to the success; 1) external environment suitable for implementation, 2) sufficient time and resource for plan/project implementation, 3) resource planning, 4) policy based on reliable theories/principles and results, 5) direct relationship between cause and effect without other intervening relationship, 6) low dependence between organizations, 7) mutual understanding in and agreement with the objectives, 8) good prioritization of activities, 9) effective communication and coordination, 10) true acceptance of the policy implementers

1) External environment suitable for implementation: External environment has certain influence on the policy implementation. In other words, some environmental conditions may be adversary to the implementation such as drought, flooding, higher oil prices, or political crisis. These conditions are beyond control of

the management and will certainly affect the policy itself as well as the implementing organization. However, there is nothing the implementers can do, but inform the policymakers so that the latter can improve or revise the policy.

2) Sufficient time and resource for plan/project implementation: Time is the limitation outside of the policy. Over-expectation of the stakeholders of the policy within a short time may not be satisfied. Limitation in budge may pose the issue of insufficient resources. What needs to be considered is that budget is not resources and the change of budget may result in delay.

3) Resource planning: In each step of policy implementation, good planning of resource is very important. Having only budget but no resources may cause critical damage because budget cannot be turned into resources at the time of need, such as land, equipment, and labor.

4) Policy based on reliable theories/principles and results: The failed policies could be a result of incorrect theory/ principle rather than that of bad implementation.

5) Direct relationship between cause and effect without other intervening relationship: The policy should employ the cause-and-effect relationship. If there are too many parties involved in this cause-and-effect relationship, it becomes more complicated and is very likely that relevant parties may not fully understand the policy, eventually leading to failure in practice.

6) Low dependence between organizations: In general, for the policy implementation to be highly successful, it is important to have it done by one organization. In other words, the success of policy implementation should not depend on other organizations. If it is really necessary, the dependence and importance of dependence should be low. The more dependence, the more complicated the implementation becomes. This is because it requires the organizations to agree or accept the policy and the practice.

7) Mutual understanding in and agreement with the objectives: The relevant organizations must fully understand and agree with the objectives. This is vital throughout the process of policy implementation. The plan/ project should specifically define the objectives that can be evaluated quantitatively. In addition, the objectives should be consistent and supportive to each other so that the organization can use as the guidance for direction and control of the plan/ project effectively.

8) Good prioritization of activities: In the activities of policy implementation, it is important to include the details and sequence in the networking technique in planning and control of the project. The order of activities should be related and arranged logically.

9) Effective communication and coordination: The organizations, including their staff, must fully and effectively communicate and coordinate with each other with regards to the plan/ project. The full implementation can be realized only with united management system without internal conflicts. This is because the departments, organizations, specialists, or operators inside an organization commonly have their own values, and most importantly their objectives and benefits that they want to keep.

10) True acceptance of the policy implementers: The policy implementers need to have the authority to make other people; internal and external, accept them because it will bring righteousness and good coordination in the plan/ project, leading to the success of implementation as a whole.

2.4.3 The Process of Public Policy Implementation

The process of public policy implementation concerns the implementation of the policy from top-down or centralized policy. This process is usually used in large organization. The policy implementation consists of 2 steps; 1) major steps and 2) minor steps (Jumpol Nimpanich, 2004: 164-189).

2.4.3.1 The major step of public policy implementation consists of 2 sub-steps 1) turning the policy into practice, program, or project, and 2) accepting the practice, program, or project.

1) Turning the policy into practice, program, or project: National level politicians, including the parliament and the cabinet, establish national policies while civil system and civil servants implement the policies. In practice, policies of the government are announced in the form of law, national plan, resolutions of the cabinet, rules, notification, regulations, and requirements of government agencies. After that, the central agencies such as ministries and departments shall change the policies into practice, program, or projects, and assign provincial government agencies and local administrative organizations. The programs

or projects that local administrative organizations propose and implement shall agree with the objectives of the policy and intention of the central policy maker, and answer to the issues which are the cause of the policy.

There are two types of relationship between public policy and planning (Thawanrat Worathepphutthiphong, 1998: 69-70; Jumpol Nimpanich, 2004: 165). The first one is the vertical relationship which concerns the hierarchy relationship between the policy and plan. From the order, it is seen that policy comes before the plan. Likewise, a program is part of the plan, and a project is part of the program, respectively. This type of relationship can be studied from the previous National Economics and Social Development Plans which define the hierarchy relationship between plan, program, and project. However, after the 9th National Economics and Social Development Plan B.E. 2544-2549 (2001-2006), the style has been changed to the directive plan. The directive plan goes in line with the Constitution of B.E. 2540 (1997) that promotes decentralization of authority to local administrative organizations. In consideration of Constitution of B.E. 2540 (1997), a lot of municipalities and Sub-district Administrative Organizations were established. Since then, the central agencies have transferred the authorities to local administrative organizations to develop their locality, resulting in the change of relationship from hierarchy to horizontal (Figures 2-8 and 2-9). The second type is the horizontal relationship that has a plan as the connection between the policy and the implementation. In other words, there needs to be an abstract policy before it is transformed into a concrete plan or a program. After having the concrete policy, it is then implemented. Considering the mechanism, it is seen that the program/ project consists of 6 steps: 1) understand the objectives and essence of the policy, 2) analyze the objectives to set up the program/ project for the policy, 3) define the objectives and indicators, 4) analyze the pros and cons of each program/ project, 5) analyze political, financial, management, and technical possibilities of the program/ project, and 6) make a conclusion of analysis and determine the best choice with more details.

For this matter, the policy implementers need to avoid 4 conditions as follows. 1) They should avoid the policy with vague objectives because it requires them to make a decision. 2) The policy has many objectives and they are contradicting, which may be difficult to arrange the priority. 3) The responsible

organization misunderstands the intention of the policy maker. 4) The responsible organization does not cooperate and is not willing to sincerely implement the policy.

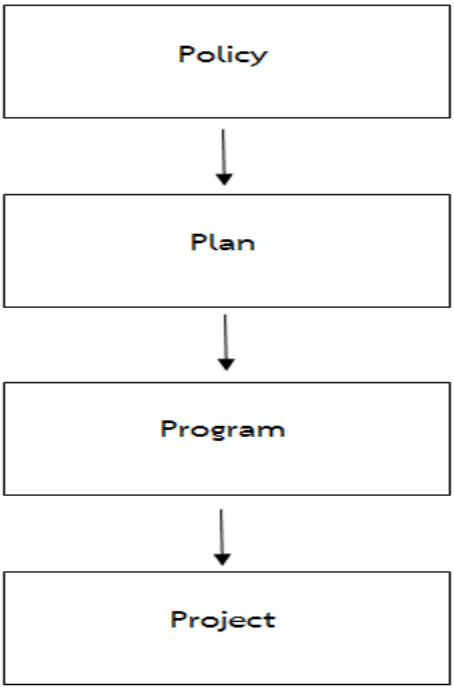

Figure 2.8 Hierarchy Relationship between Policy, Plan, Program, and Project
Source: Samrit Yossomsakdi and Anurat Anantanatorn, 2012: 275.

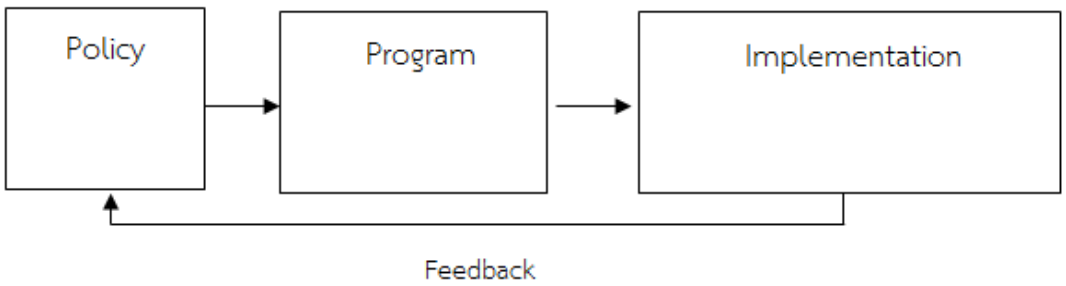

Figure 2.9 Horizontal Relationship between the Policy and Plan
Source: Samrit Yossomsakdi and Anurat Anantanatorn, 2015: 275.

2) Accepting the practice, program, or project: When the central government agencies bring the policy into practice in the form of program or

project, they need to make subordinate agencies in the regional and local levels accept the practice, program or project. In this stage, there are many factors that can make the subordinate agencies accept and propose a project to satisfy the policy such as the characteristics of the local agencies, economic, political, and social environment of the locality, as well as the benefits that the central government should offer to the local.

2.4.3.2 The Minor Step of Public Policy Implementation

When provincial and local agencies accept the practice, program, or project from the central agencies, they will implement under their context or change their practice to agree with the policy set by the central agencies. After certain changes, they will accept and hold on to as part of their routine missions or cancel the practice defined by the central agencies. To implement public policy at minor level consists of 3 sub-steps; 1) gathering supports, 2) implementation, and 3) solidarity.

1) Gathering supports refer to the tasks that minor level organizations are responsible for, such as local administrative organizations. The process includes two activities; 1) consideration about accepting the policy, and 2) gathering supports. In the first activity, the local organizations would decide whether the policy from the central agencies is suitable and how urgent it is. The decision is the deciding point whether it will be successful or not. Acceptance of the policy received from the central agencies does is not about the attitude of the local toward the policy. If the local agencies decide that the central policy does not agree with their needs, the level of acceptance will be low. However, they might accept the policy because they want the budget. When the local organizations accept the policy from the central agencies, the next step is to acquire support from public figures or other local organizations. This is the important success factor apart from encouraging participation from every relevant party.

2) Implementation covers the process of modifying the project received from gathering supports. It concerns implementers or service providers directly. Implementation can occur in two cases. In the first case, the implementers agree to change their behavior to match with the plan or project according to the policy. In the second case, the implementers may revise the plan or project to match with their normal operation. With none of the above, implementation will never come

to reality. In short, there are a lot of uncertainties in policy implementation because the context may be varied in different localities. If an inflexible project or program is introduced to every locality using the same standard, such project or program may be objected by some localities. Therefore, it would be great if the implementers had a chance to use their discretion to revise the program/ project to match their localities. However, with flexibility of implementation, it does not mean that local organizations can change the program/ project as they want. The central organizations need to find the way to adjust the program/ project together with the local organizations for the agreement between the intention of the central and local organizations or the actual implementers. This will eventually result in the acceptance of program/ project.

3) Solidarity is the step made for long-term success or results. Solidarity will not exist without the continuous conformance to the policy. Solidarity or continuance is a result of accepting and modifying the project by implementers. The continuous conformance to the policy is vital. Local administrative executives should consistently behave themselves as good examples in turning the policy into routine tasks.

2.4.4 Evaluation of the Success of Policy Implementation

It is important to identify the success or failure of policy implementation because the sole objective of implementation is success. Voradej Chandarasorn (2009: 17-18) clarifies success or failure of public policy implementation into 3 criteria; 1) evaluation from cooperation of implementers with the commander or policy maker, 2) evaluation from achievement and seamless implementation by the responsible organization, and 3) evaluation from short-term results and/or desirable consequences.

1) Evaluation from cooperation of implementers with the commander or policy maker: If the level of cooperation is high, the success of implementation is also high. On the contrary, if the level of cooperation is low, the success of implementation is low.

2) Evaluation from achievement and seamless implementation by the responsible organization: If the implementation is full of conflicts or obstructions, it has high chance of failure.

3) Evaluation from short-term results and/or desirable consequences: If the implementation results in short-term results and/or desirable consequences, it is likely that the implantation will be successful.

Based on the 3 evaluation criteria of policy implementation above, the first concerns the behavior of bureaucracy system, which is interested by organization theorists, but not by political science or economic scholars. This is because no matter how much cooperation there is, the policy will be useless if there is no actual implementation. The second criterion has some flaws itself because in reality most policies implemented will have problems and conflicts. Such conflicts are very common to public policy implementation. The last one is studied by many scholars because its scope is wide and more to the point than the first two.

2.4.5 Relevant Parties of Public Policy Implementation

Policy implementation is complicated because there are many people involved. Each relevant party has expectations for different benefits, goals, and objectives, but they have to work together under different roles and influences on policy implementation. To implement a policy, there are at least 4 relevant parties; 1) politicians, 2) bureaucracy system, 3) government officials, and 4) those affected by the policy (Voradej Chandarasorn, 2009: 43-47).

1) Politicians, including those in the parliament and the cabinet, are responsible for allocating the budget and assign potential organizations to implement the policy. Their duties also cover the improvement, support, and cancellation of the policy. It could be said that if the politicians approves the policy and monitor its implementation closely, the organization responsible for implementation will be more committed to their jobs. However, the role of politicians in implementation is lower than administrative/ bureaucracy system.

2) Bureaucracy system includes government agencies. It could be said that bureaucracy system is the most important for public policy implementation because it can overpower politicians. This is because bureaucracy system collects, analyzes, and provides data to politicians. Bureaucracy system also directs the program and project. This gives them power and makes it hard to control them. Normally, bureaucracy system will choose only the policy that benefits itself. When implementing the policy, the organizations may not cooperate/ coordinate despite

agreement with the objective/goal of the policy. In addition, they might have contradicting opinion on the method to achieve the objective/goal because of conflicting interest, objectives, and values of different organizations.

3) Government officials include organization system executives, project executives, and project service providers. These officials have different inspirations, goals, and values, resulting in different behaviors in policy implementation. These figures are responsible for different tasks. Organization system executives are responsible for support and connect the assigned policy. Project executives or leaders of government officials are responsible for making the implementation successful. Project service providers include operational level officials who are closely related to the service receivers. The last group has free power and discretion that higher level executives cannot control. Therefore, when the objectives of the policy, program, or project are unclear or the objectives affect the benefits of the officials or their organizations; they might ignore the project or interpret the objectives in a different way when it is implemented.

4) Those affected by the policy are the people who receive the serves form the public policy, including public organizations and non-profit organizations, or other form of incorporations like benefit groups or influential groups for to take advantage from politicians or government officials by negotiation or combining the benefits.

2.4.6 The Model of Policy Implementation

One of the popular approaches in the study of public policy is the study on the policy model. Speaking of a model, it refers to simulation or juxtaposition of key characteristics of the policy to devise the explanation that helps researchers see and understand the policy more easily. Moreover, it is also an effective tool to predict the result of the policy (Kaeokam kraisoraphong, 2005: 56). In other words, it is the study of public policy using the model to conceptualize the framework that leads to analysis of the public policy, both in the part of policymaking and implementation.

1) Definitions of a Model

(1) Thawanrat Worathepphutthiphong (1998: 21-23) defines a model in 4 aspects. 1) A model refers to a simple model of a real thing. A model looks completely like its real counterpart, only smaller in size, for example, a model of

school building, commercial building, or houses designed by an architect or engineer. 2) A model may refer to an ideal model the desired characteristics which may be difficult to realize, especially when the desired thing and the ability to achieve it is so much different. For example, an ideal city is the city that most people want to have. Ideal woman or man refers to the imagined qualities of single women or men that they want to marry e.g. smart, beautiful, handsome, and rich. In reality, it would be hard to find someone with all those qualities. 3) A model could also refer to the scope of analysis used for analyzing a problem or situation to understand the real world better and easier. 4) A model is a set of theories proven to be accurate and believable. It can identify and forecast the relationship between independent variables, or between independent and dependent variables in mathematics or statistics.

(2) Dye (1984: 15) defines model as a framework used for analyzing a public policy developed for 5 objectives; to simplify and clarify political and public policy concepts, 2) prioritize the importance of policy problems, 3) communicate the mutual understanding based on the actual political circumstance, 4) promote the attempt to understand public policy by pointing out the differences between the important and the unimportant issues, and 5) explain the public policy and predict the results.

(3) Tin Prachayapruit (1999: 1) defines the systematic connection between a model and a theory. A theory refers to the relationship between generalizations which are true by nature. A theory is used by scholars as the symbol to represent a situation or behavior. If a hypothesis has not been proven with objective approach, it is called a model. However, if it is already proven with objective data, it is called a proposition. And if the proposition has been tested for many times and the results are always the same or almost always the same, it is called generalizations, which are the fundamental of a theory.

(4) Mayuree Anumanrajadhon (2006: 7) defines a model about public policymaking that it refers to a basic framework of the reality of a certain situation used to explain what happens, why it happens, and what results it brings. A model usually demonstrates the visible relationship while a theory is developed from a proven model.

Based on the definitions above, the researcher summarizes that a model is an implementation, process of study, as well as something that demonstrates

conceptual structure for analyzing a certain problem or situation to contribute to the better and easier understanding of some part of the world. However, a model may be suitable for a study of a certain public policy, but not for another (Thanyawat Rattanasak, 2003: 44; Sombat Thamrongthanyawong, 2010: 198). Therefore, it is important to carefully choose the model for the study of public policy based on thorough understanding.

2) A Study on the Model of Public Policy Implementation

The researcher has reviewed literatures relevant to public policy implementation and would like to discuss 6 models; 1) the model and approach of Van Meter and Van Horn (1975), 2) the model and approach of Sabatier and Mazmanian (1980), 3) the model and approach of Edward (1980), 4) the model and approach of Sabatier (1986), 5) the model and approach of Goggin, Bowman, Lester, and O' Toole, Jr. (1987), and 6) the model and approach of Voradej Chandarasorn (1984).

(1) The model and approach of Van Meter and Van Horn (1975) (Van Meter and Van Horn, 1975: 200-217): In 1975, Van Meter and Van Horn proposed a model for analyzing policy implementation process called "A Model of Policy Implementation Process" (Figure 2.10), which consists of 6 key factors. 1) Objectives or standard of public policy: It is important to clearly identify what the objectives of a policy are. Objectives are a more detailed explanation of the overall goal of the policy, which is easier to understand. They are like the criteria of success of failure of policy implementation. 2) Resources: It is important to identify the necessary resource for policy implementation. Resources may include human resources, supplies, and budget. Budget, in particular, should be flexible enough in the process of withdrawal. 3) Communication between organizations and the policy implementation: The communication between the policy maker and organization responsible for implementation, or even internal communication is very important. Responsible personnel in each organization should have the identical information in term of objective. The communication should be accurate, quick, and nonstop. The relevant organization should be open and honest to each other. 4) Characteristics of the implementing organization: There are a number factors affecting the success or failure of the policy implementation such as the number of human resource and the ability of staff in the responsible organization, level of hierarchy control, sub-

organizations inside the responsible organization, and political resources of the responsible organization. Political resources may include support from administrative and legislative sides. In addition, the importance of the responsible organizations, level of open and free communication between staffs at the same level and different levels in the responsible organization, formal and informal relationships that the responsible organizations have with policymakers are also very important for success or failure of implementation. 5) Social, economic, and political conditions: It is advisable to consider the success or failure factors of policy implementation. For example, economic resources in the area of implementation should be considered whether they are sufficient to push the implementation toward success. It would be great if the potential impact of the implementation on the economic and social in the implementation area. It would be helpful to know how people in the implementation area think about the implementation, and how factual those opinions area, how much the local leaders agree or disagree with the implementation, popular political parties in the local and how the parties think about the policy, as well as the benefits group who may start a movement or act against the policy. 6) Cooperation of the implementer: If the implementers cooperate well, the chance of success is high accordingly.

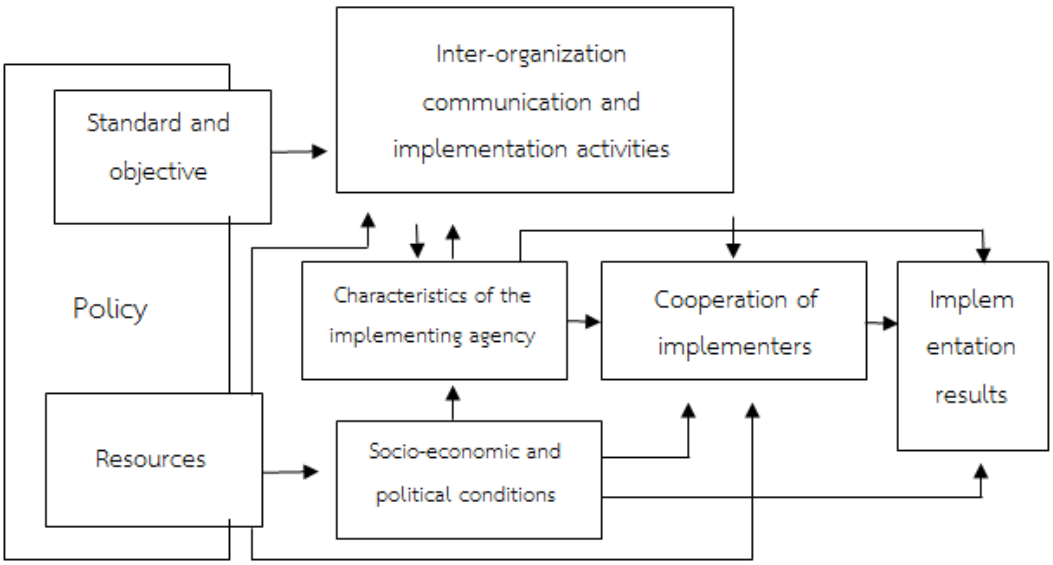

Figure 2.10 The Model and Approach of Van Meter and Van Horn (1975)

Source: Van Meter and Van Horn, 1975: 208.

(2) The Model and Approach of Sabatier and Mazmanian (1980)

In 1980, Sabatier and Mazmanian (Sabatier and Mazmanian, 1983: 20-22) studied the implementation of public policy from top-down. In other words, they focus on the policymaking and control from the policy controller. The researchers comment that there are 3 success factors of a policy (Figure 2.11); 1) the policy's ability to solve the problem, 2) the structure of the policy, and 3) non-conditional factor of the policy. For policy implementation, there are 5 success factors; 1) products of the policy, 2) willingness to follow the policy, 3) the actual impact of the policy, 4) awareness of the impact of the policy, and 5) the review and revision of the policy.

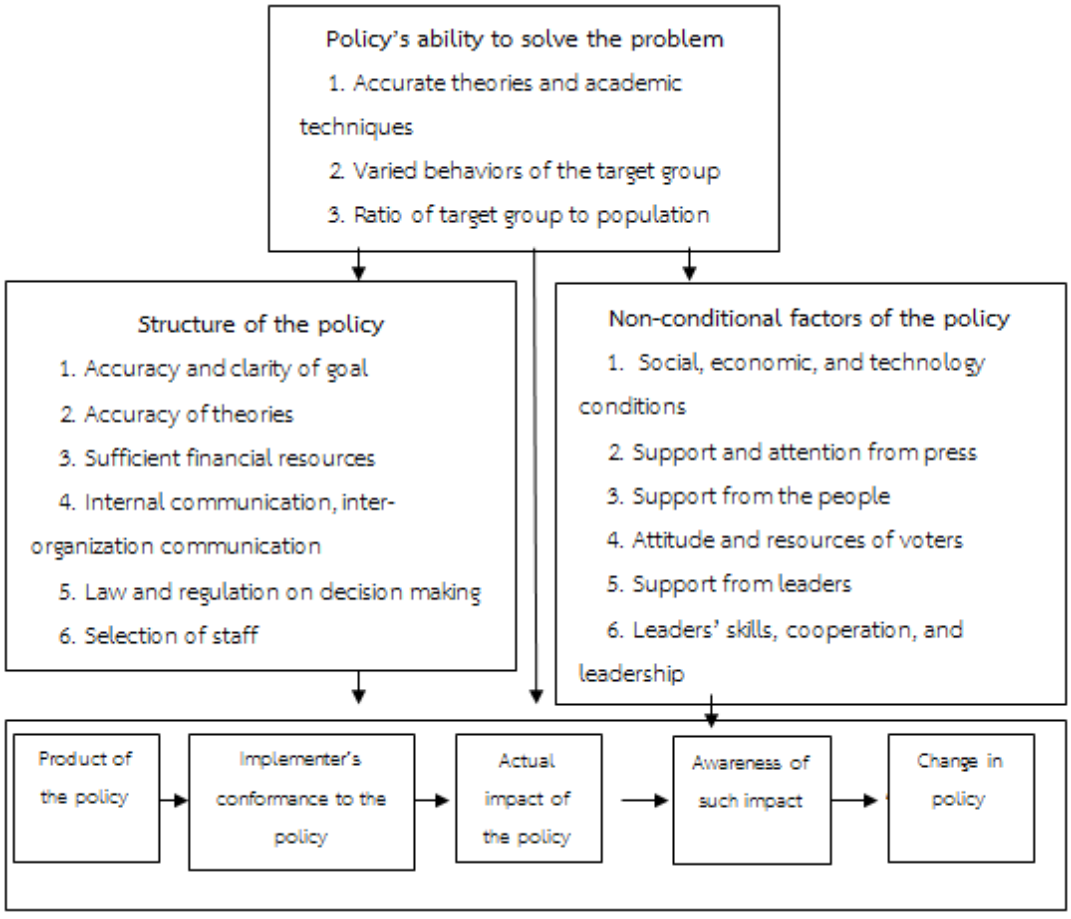

Figure 2.11 The Model and Approach of Sabatier and Mazmanian (1980)

Source: Sabatier and Mazmanian, 1983: 22.

(3) The Model and Approach of Edward (1980)

In 1980, Edward (1980: 147-150) summarized that there are 4 success factors of public policy implementation. 1) Communication includes the communication between the policy maker and other relevant parties. The information has to be correct, clear, and identical to the understanding of all relevant parties. 2) Resources consist of the number of staffs, the scope of authority of the policy implementers or the power to enforce, information, tools, and equipment for implementing the policy as well as other supporting tools and specialized staffs. 3) Attitude of the implementers refers to acceptance of the policy of the implementers. 4) The structure of the implementing organization refers to the size and structural complication, standard and procedures of work, as well as the number of organization assigned to implement the policy (Figure 2.12).

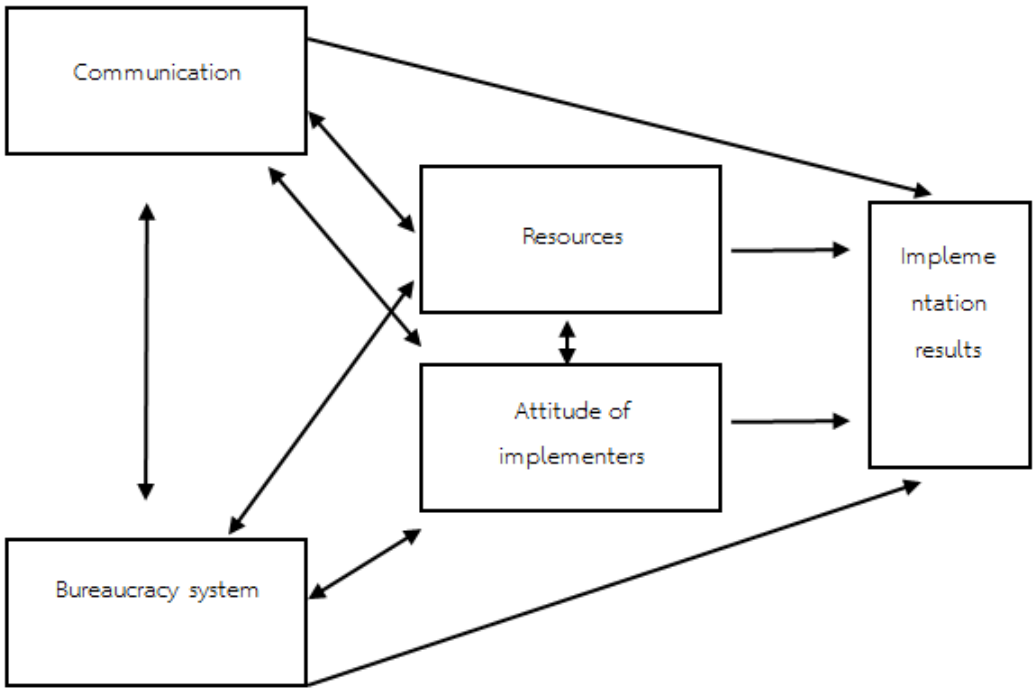

Figure 2.12 The Model and Approach of Edward (1980)

Source: Edward, 1980: 148.

(4) The Model and Approach of Sabatier (1986)

In 1986, Sabatier (1986) improved the model of policy implementation by combining the approach of top-down and bottom-top together. It was found that the factors affectinged the implementers and resources are the external factors which can be divided into 2 types; fixed factors and 2) unfixed factors. It is necessary to analyze these 2 types of factors to set the policy based on the top-down policy implementation. However, Sabatier regarded that there are sub-system of the policy which is the analysis of bottom-top policy implementation. This refers to the cooperation from many parties such as politicians, government officials, and benefit groups. If there are conflicts arisen from the implementation, they will be decided by these 3 groups. They are called policy brokers, who will relieve the conflict and make it possible to implement the policy until the results are obtained (Figure 2.13).

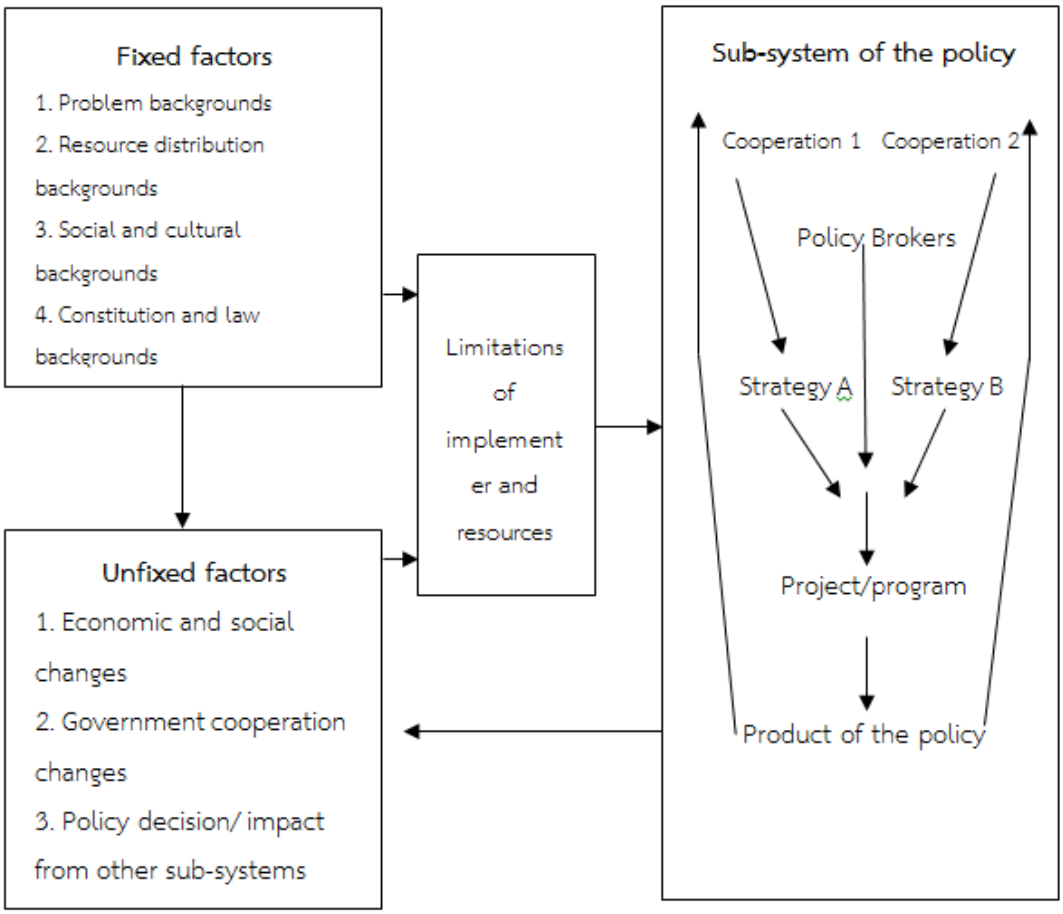

Figure 2.13 The Model and Approach of Sabatier (1986)

Source: Sabatier, 1986.

(5) The model and approach of Goggin, Bowman, Lester and O' Toole, Jr. (1987)

These scholars think that policy implementation is the obligation of and the condition for having policy implementers. The implementers are assigned by the central, state, or local government and depend on the tendency to implement by the state and its potentials. However, the decision of the state may not be consistent with the integrity of logics, but come as a result of political negotiation among many groups, both internal and external. Therefore, this model is based on the assumption that the policy implementation depends on the factors from both top-down and bottom-top approaches. There are 2 independent variables; 1) direction and limitation of the central government, and 2) direction and limitation of the local governments, and 3 extraneous variables; 1) results of the decision of the state, 2) potentials of the state, and 3) feedback making of a new policy, and 1 dependent variable; policy implementation (Figure 2.14).

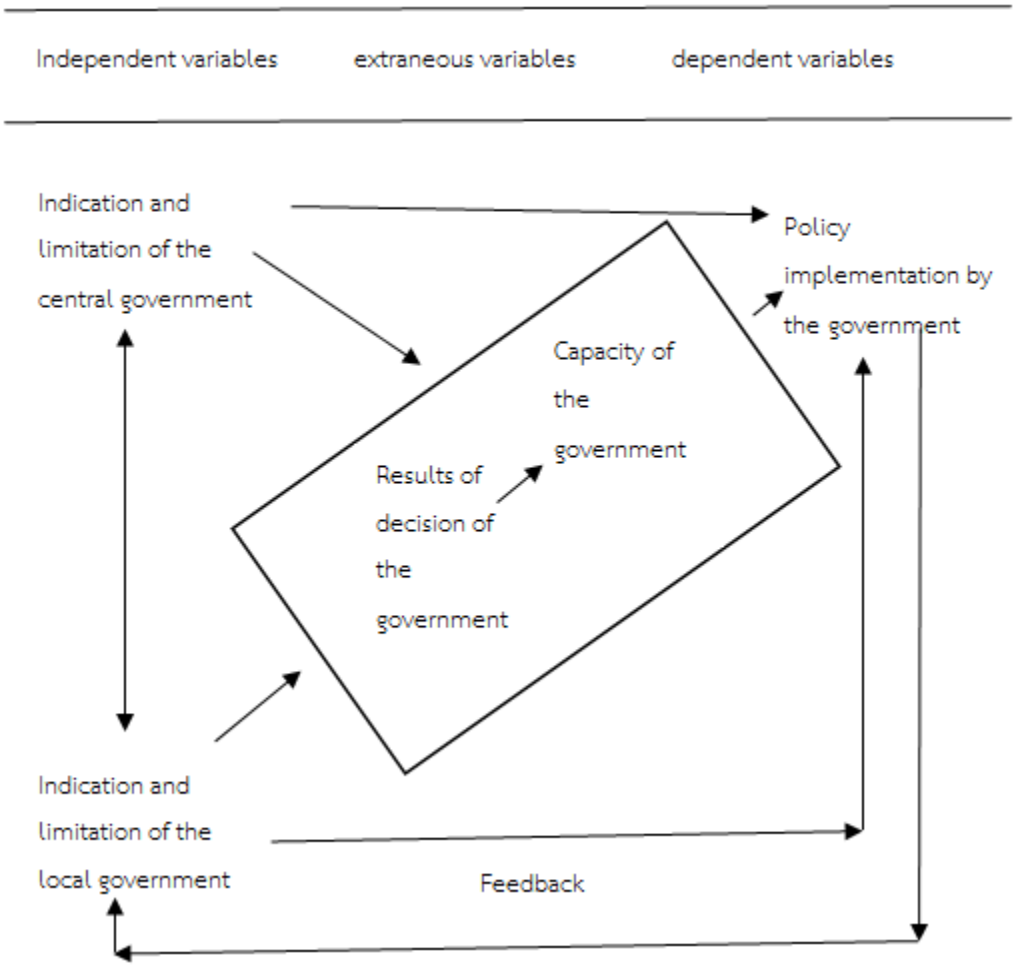

Figure 2.14 The Model of Goggin, Bowman, Lester, and O' Toole, Jr. (1987)
Source: Goggin, Bowman, Lester and O' Toole, Jr., 1987.

(6) The Model and Approach of Voradej Chandarasorn (1984)

In 1984, Voradej Chandarasorn (1984) gave an academic presentation on "Policy Implementation: Model and Values". He proposed 6 models of public policy implementation; 1) logical model, 2) management model, 3) organizational development model, 4) bureaucracy process model, 5) political model, and 6) general model. In 1997, Voradej Chandarasorn developed a new model by combining all the above. The new model is called the integrated model. In this new model, there are 3 dimensions of success or failure of policy implementation. 1) The first dimension involves the evaluation of success or failure based on products, results, and the

ultimate outcome. 2) The second measures the impact of the policy. 3) The third dimension decides whether the policy can benefit the entire nation. There are 4 independent variables including 1) potentials of the organization, effectiveness of planning and control, 3) leadership and cooperation, and 4) politics and management of external environment (Figure 2.15).

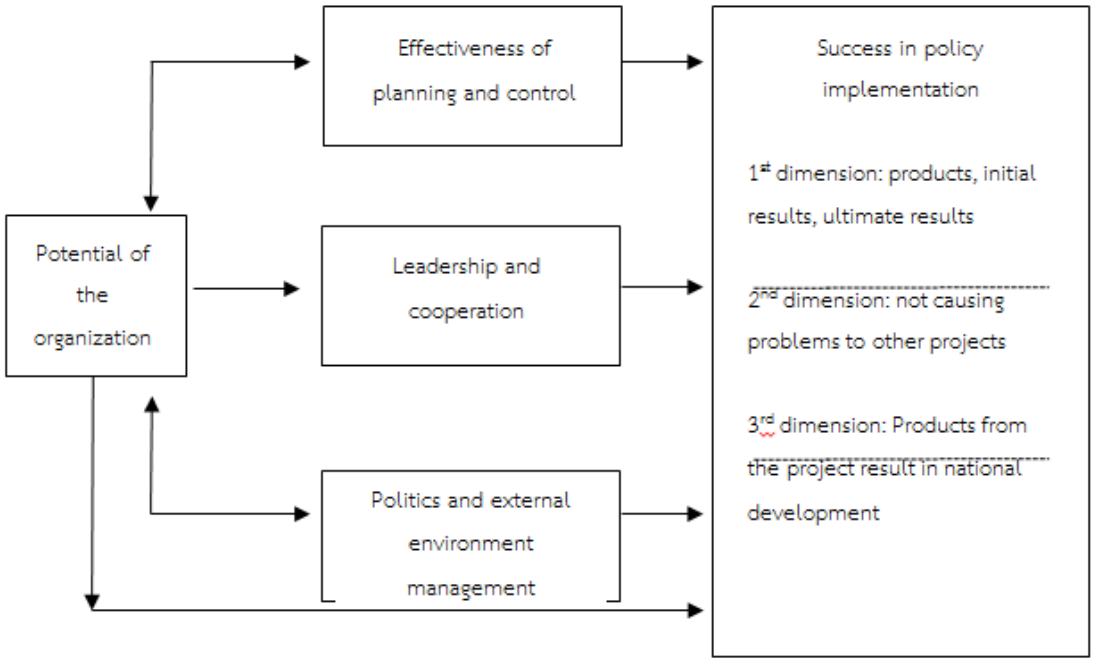

Figure 2.15 The Model of Voradej Chandarasorn (1984)
Source: Voradej Chandarasorn, 2009: 144.

2.5 Theories and Concepts about New Public Service (NPS)

Public administration in the 21st century is undergoing dramatic changes, especially in advanced economies and many parts of the developing world. Globalization and pluralization of service provision are the driving forces behind these changes. Policy problems faced by governments are increasingly complex, wicked and global, rather than simple, linear, and national in focus. And yet the prevailing paradigms through which public sector reforms are designed and implemented are relatively static and do not fully encompass the significance or

implications of these wider changes. While public sector reforms in the developing world are influenced by policy experiments and organizational practices originating in OECD countries, they tend to operate within the traditional public administration paradigm. (Alford, 2002)

Models of public administration and approaches to public sector reform

There are numerous studies of public administration and public sector reforms in advanced industrialized countries. (Osborne, 2006; Stoker, 2006) Models of public administration in developing countries have generally drawn on experience in advanced countries and public sector reforms have often mirrored reform initiatives originating in OECD countries. Several frameworks have been developed to classify and analyze different approaches to public administration and public sector reforms in advanced industrialized countries. Most of these focus on the transition from the Old Public Administration to the New Public Management that occurred in the 1980s and 1990s. Since 2000, there has been a discernible trend towards an emerging model variously termed the "new public service", the "new public governance" or the "post-New Public Management" (Dunleavy and Hood, 1994; R. B. Denhardt and J. V. Denhardt, 2000; Osborne, 2006).

Each of these approaches to public administration is associated with a distinct philosophy and conceptual framework. The traditional approach to public administration is predicated on a top-down and elitist approach in which public officials are instilled with values of hierarchy, independence, and integrity, and are insulated from politicians and citizens. The focus in this approach is on structure and organizational efficiency, epitomized by command and control and underpinned by a clear public sector ethos. In contrast, the New Public Management approach is based on public choice theory and the principal-agent approach in which public officials require oversight and supervision to constrain their self-interested behavior and thereby prevent inefficiency and corruption. The new public service perspective, rooted in democratic theory, emphasizes the accountability of officials to citizens, whereby officials serve and respond to citizens rather than steering society. (R. B. Denhardt and J. V. Denhardt, 2000; Stoker, 2006) It assumes that public officials will be motivated to serve by virtue of a commitment to the public interest and will respond to citizens' expectations of a healthy and responsive public service (Osborne, 2006; Stoker, 2006). (Figure 2.16) Many developing countries have followed a similar

trajectory of approaches and reforms to those in more advanced countries through broader governance agendas supported by aid donors. Other approaches to public sector reforms have also featured in these countries, notably decentralization, pay and employment reforms, integrity and anti-corruption reforms and "bottom-up" reforms, designed to improve the development effectiveness of government agencies. (Dunleavy and Hood, 1994)

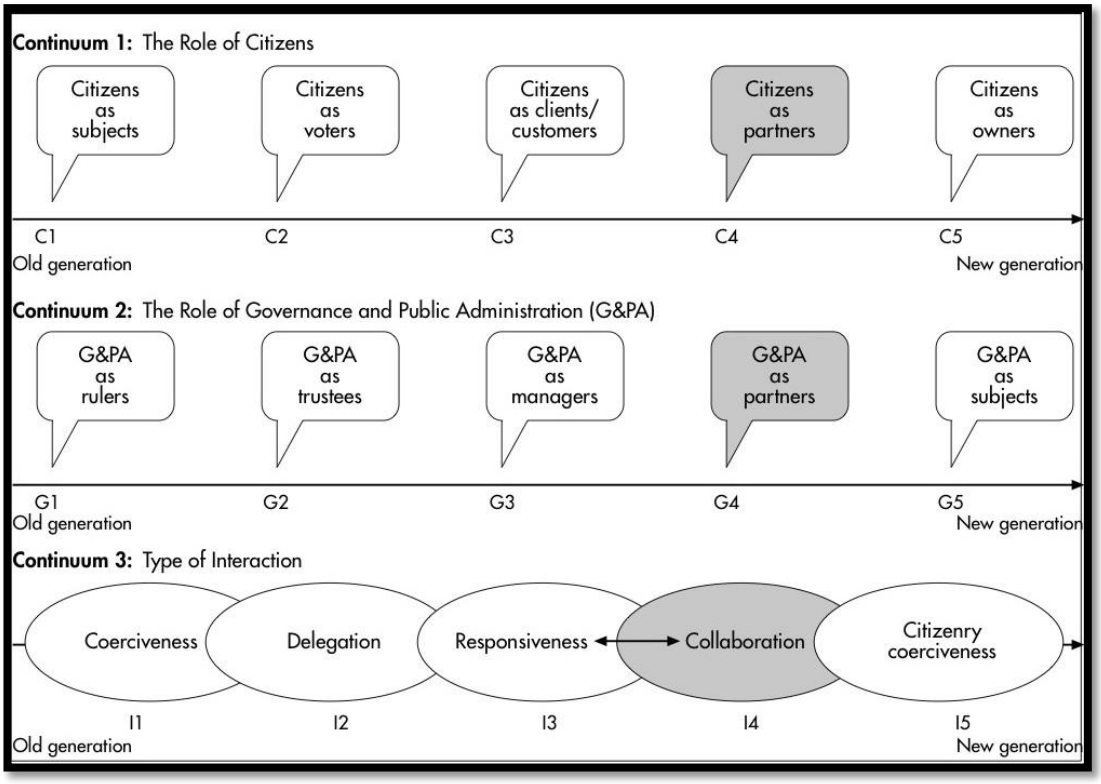

Figure 2.16 Relationship between Role of the Citizens and Role of Governance and Public Administration and Type of Interaction between Citizens and Governance and Public Administration (Sorted by Development of Public Administration)

Source: Vigoda, 2002.

2.5.1 The Traditional Public Administration

Influenced by the ideas of Max Weber, the prevailing approach to public administration for much of the 20th century drew on a model of bureaucracy based on the twin principles of hierarchy and meritocracy. It was initially introduced as part of

wide-ranging bureaucratic reforms in the United Kingdom and Prussia in the late 19th century to overcome patrimonial systems of administration where patronage and favoritism dominated government decisions and public appointments. This approach had a number of distinctive features. It relied on centralized control, set rules and guidelines, separated policymaking from implementation, and employed a hierarchical organizational structure (Osborne, 2006). The watchwords were efficiency and effectiveness in the management of budgetary and human resources. (Table 2.4)

Table 2.4 Differences Among Traditional PA, NPM and PVM or NPS

	Traditional Public Administration	New Public Management	Public Value Management
Key objectives	Politically provided inputs; services monitored through bureaucratic oversight.	Managing inputs and outputs in a way that ensures economy and responsiveness to consumers.	The overarching goal is achieving public value that in turn involves greater effectiveness in tackling the problems that the public most cares about; stretches from service delivery to system maintenance.
Role of managers	To ensure that rules and appropriate procedures are followed.	To help define and meet agreed performance targets.	To play an active role in steering networks of deliberation and delivery and maintain the overall capacity of the system.
Definition of public interest	By politicians or experts; little in the way of public input.	Aggregation of individual preferences, in practice captured by senior politicians or managers supported by evidence about customer choice.	Individual and public preferences produced through a complex process of interaction that involves deliberative reflection over inputs and opportunity costs.
Approach to public service ethos	Public sector has monopoly on service ethos, and all public bodies have it.	Skeptical of public sector ethos (leads to inefficiency and empire building); favors customer service.	No one sector has a monopoly on public service ethos; maintaining relationships through shared values is seen as essential.
Preferred system for service delivery	Hierarchical department or self-regulating profession.	Private sector or tightly defined arms-length public agency.	Menu of alternatives selected pragmatically and a reflexive approach to intervention mechanisms to achieve outputs.
Contribution of the democratic process	Delivers accountability: Competition between elected leaders provides an overarching accountability.	Delivers objectives: Limited to setting objectives and checking performance, leaving managers to determine the means	Delivers dialogue: Integral to all that is undertaken, a rolling and continuous process of democratic exchange is essential.

Source: Stoker, 2006.

2.5.2 The New Public Management

The New Public Management (NPM) refers to a series of novel approaches to public administration and management that emerged in a number of OECD countries in the 1980s. The NPM model arose in reaction to the limitations of the old public administration in adjusting to the demands of a competitive market economy. While cost containment was a key driver in the adoption of NPM approaches, injecting principles of competition and private sector management lay at the heart of the NPM approach. (Osborne, 2006) The NPM approach took root in the UK, New Zealand, the USA and Scandinavia from the mid-1980s. Its theoretical foundations lay in public choice and principal-agent theory, which claim that individual self-interest drives bureaucratic behavior. Competition, delegation, performance and responsiveness offer yardsticks to regulate bureaucratic behavior and generate improved outcomes (Dunleavy and Hood, 1994) NPM resulted in significant changes in the public sector ethos and approach, especially the cultivation of new management practices, marketization and contracting out of core services to private companies and non-profit organizations, and the creation of "arms-length" executive agencies responsible and accountable for implementation. A greater focus on management by results replaced a public sector orientation governed by inputs and outputs, while performance management increasingly pervaded the public sector (Dunleavy and Hood, 1994). (Table 2.4)

2.5.3 The New Public Service

The new public service (NPS) approach is perhaps the most coherent of these approaches. It starts with the premise that the focus of public management should be citizens, community, and civil society. In this conception the primary role of public servants is to help citizens articulate and meet their shared interests rather than to control or steer society (R. B. Denhardt and J. V. Denhardt, 2000). This is in sharp contrast to the philosophical premise of the NPM approach in which transactions between public managers and customers reflect individual self-interest and are framed by market principles. It is also distinct from the old public administration approach where citizens related to the bureaucracy as clients or constituents and were treated as passive recipients of top-down policymaking and service delivery mechanisms

(Bourgon, 2007). Control and hierarchy rather than plurality and engagement characterized these relationships. (Table 2.4) The new public service model approaches public management from the vantage point of democratic theory, premised on the notion of an active and involved citizenship. Citizens look beyond narrow self-interest to the wider public interest and the role of public officials is to facilitate opportunities for strengthening citizen engagement in finding solutions to societal problems. Public managers need to acquire skills that go beyond capacity for controlling or steering society in pursuit of policy solutions to focus more on brokering, negotiating and resolving complex problems in partnership with citizens. In seeking to address wider societal needs and develop solutions that are consistent with the public interest, governments will need to be open and accessible, accountable and responsive, and operate to serve citizens. Prevailing forms of accountability need to extend beyond the formal accountability of public servants to elected officials in the management and delivery of budgets and programs to accommodate a wider set of accountability relationships with citizens and communities. Finally, the NPS approach also reasserts the importance of a public service ethos, emphasizing the values and motivations of public servants dedicated to the wider public good (R. B. Denhardt and J. V. Denhardt, 2000).

In placing a fresh emphasis on the public interest and citizens as the focus of public service, the new public service model provides a useful corrective to prevailing notions of control and steering associated with earlier models of public administration and management. (Figure 2.16) But it is still far from providing an all-encompassing paradigm that offers the comprehensive solutions which public sector reforms grounded in earlier approaches have failed to deliver (Christensen and Laegreid, 2011). With its emphasis on engaging citizens as the primary focus of public management the NPS framework is highly normative and value-driven. Other scholars also highlight the importance of integrating inter-organizational dimensions of the new public service to capture the significance of the pluralization of service provision (Perry, 2007). Several other strands of the "post-New Public Management" perspective therefore merit attention in the pursuit of a more comprehensive approach. (R. B. Denhardt and J. V. Denhardt, 2000) These respectively focus on whole-of-government approaches, digital governance, and motivation to redress the problems of

organizational coherence and responsiveness associated with NPM, placing the needs and interests of citizens at the center of public management endeavor and extolling a public sector ethos.

The whole-of-government approach arose in response to the lack of coherence and the coordination problems associated with NPM. In particular, the transfer of central government responsibilities to specialized single-purpose organizations such as regulatory authorities and service delivery agencies has undermined the coherence of central government authority and weakened its capacity to respond to crises and complex problems. (Christensen and Laegreid, 2007) Strengthened central oversight and increased horizontal collaboration implied in the whole-of-government approach is seen as a necessary corrective to the problems of fragmentation generated by NPM, though efforts to coordinate government policymaking and service delivery across organizational boundaries are not a new phenomenon. In addition, the "whole-of-government" approach emerged in countries such as Australia, New Zealand and the UK which had progressed furthest with NPM reforms and in which problems of coordination were most evident, though whole-of-government initiatives have tended to complement rather than supplant NPM reforms in their entirety, in effect rebalancing the pure NPM model (Christensen and Laegreid, 2007).

A second strand of the post-New Public Management literature is rooted in the transformative potential of digital governance. Much of the early literature on digital governance focused on the efficiency gains that could be realized by the use of new technology to improve service delivery, which is consistent both with the old public administration and NPM models of public management (Yildiz, 2007). Several analysts have drawn attention to the potential for new digital technologies to change the relationship between government agencies and civil society and to transform the way the government transacts its business (Dunleavy, Margetts, Bastow and Tinkler, 2006). Others point to the complementarity of digital governance with a revitalized approach to the co-production of public services that recognizes its potential to generate genuine user and citizen engagement in public service delivery (Osborne, Radnor and Nasi, 2013). The potential of new technologies for opening up government information to public access and scrutiny has gained considerable momentum with the advent of the new transparency agenda and the increasing

sophistication and prevalence of digital governance. Technological innovations designed to increase transparency and accountability offer the potential to bring citizens closer to the policymaking process through new and improved channels of participation as well as citizen monitoring of government (Dunleavy, Margetts, Bastow and Tinkler, 2006).

A third strand in the contemporary public management literature focuses on the motivation of public officials, arguing that changes in organizational arrangements need to be complemented by greater attention to the values and incentives that govern behavior and performance. The question of the motivation of public officials has given rise to a voluminous literature concerned with explaining how rewards and sanctions have a critical bearing on motivation and in turn on organizational performance. One of the early analysts of motivation in public service distinguished between intrinsic motivations associated with a public sector ethos and extrinsic motivations that focus on rewards and incentives (Perry and Wise, 1990). There are also compelling linkages with the emerging agenda that relates democracy to the new public service approach (Perry, 2007). The agenda is rich and demands more research, especially in developing countries where there is growing interest in motivation but relatively little empirical work to date (Perry, Hondeghem and Wise, 2010).

2.6 Important Laws, Regulations, Plans, Orders, and Practices about Disaster Relief Operations of The Royal Thai Army

Ministry of Defence is a support unit according to the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014). The Plan defines 5 duties of the Ministry of Defence. 1) The Ministry of Defence needs to find the measures for prevention and mitigation of disasters that affect people, building, places, and properties of the armies and make a plan for evacuating families and military affairs by coordinating with Department of Disaster Prevention and Mitigation. 2) The Ministry of Defence needs to provide academic knowledge and military operations about disaster prevention and mitigation, including air threat, disarming of explosives, protection from and cleaning of chemicals, and bio-radiation, for authorities, volunteers, and civilians. 3) The Ministry of Defence needs to

coordinate the implementation, practice, and support operation of disaster prevention and mitigation, and protection of rear area for the integrity of operation in times of war. 4) The Ministry of Defence needs to support, coordinate, command, and supervise the operation to assist the affected and resolve problems at hand, restoration of the damage in the central and regional area in a timely, effective, and integrated manner. The Ministry of Defence needs to assist the disaster victims according to the Ministry of Finance Regulations on Emergency Relief Fund B.E. 2546 (2003) and its revised editions (National Board of Disaster Prevention and Mitigation, 2013: 90). In order to that disaster management of Thailand moves to the same direction, the Plan defines 4 strategies according to the cycle of disaster management. 1) Operation before the disaster consists of 2 strategies; (1) prevention and minimization of impact, and (2) preparedness. 2) Operation during the disaster consists of 1 strategy; the rehabilitation and reconstruction (Figure 2.13). The disaster mitigation operations under the Ministry of Defence shall start right away upon the occurrence of the disaster with criticality rank of 3 with extensive damage and requiring specialized experts and equipment. The Ministry of Defence will prepare manpower, equipment, and tools to launch the operations to help the local/national disaster prevention and mitigation administrations as specified in the plan. For other procedures, the units under the Ministry of Defence shall prepare, monitor, and watch the situation closely so that they can take action immediately when the criticality level is higher. To do so, they need to call for a meeting to get ready if the situation worsens and tends to affect a lot of people (Ministry of Defence, 2011: 22-23).

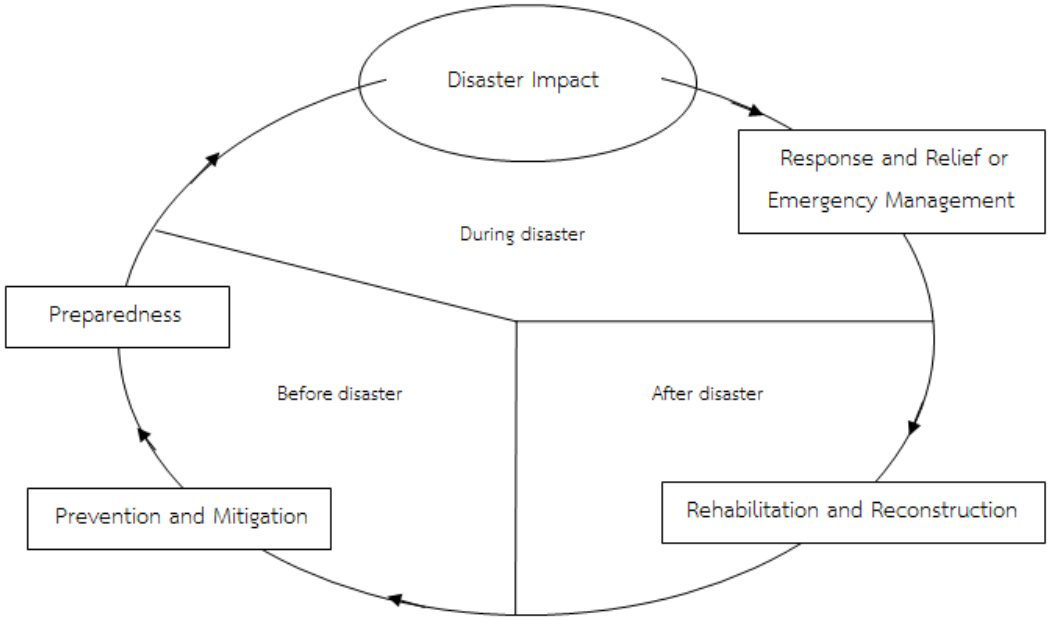

Figure 2.17 Cycle of Disaster Management in Thailand
Source: National Board of Disaster Prevention and Mitigation, 2013: 31.

The above civil support and disaster mitigation of the Ministry of Defence are implemented according to the Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004) and its revised editions. The implementation can be summarized in short into 7 groups. 1) Planning, supervision, coordination, and public relation about the disaster assistance in the responsible zone, and supporting civilian organization according to the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014). 2) Support in term of manpower, equipment, tools, communication kits, and vehicle used for disaster mitigation. 3) Support the evacuation of disaster victims and properties from dangerous to safe areas, with civilians' lives as the top priority. 4) Support hospitalization of the injured or provide mobile medical unit to the scene. The medical fees can be compensated as equal to the actual cost define by the Ministry of Public Health, but not more than 50,000 baht/ person. 5) Distribute supply bags filled with necessary food and other items to the affected people, the value of each bag not more than 500 baht/ person. 6) Other supports as requested by civilian agencies such as removal of remains and objects blocking the roads, construction of temporary shelter,

restoration of drown ships, evacuation of civilians, traffic control, sandbag wall construction, and bridge construction. 7) Run public relation campaign so that the affected people are aware of the disaster and know how to keep themselves safe from it. This will help the mitigation operation of the Ministry of Defence go more smoothly and enable it to support the implementation of the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014) more effectively, according to the Disaster Prevention and Mitigation Act B.E 2550, and Ministry of Finance Regulations on Emergency Relief Fund B.E. 2556 (2013) and its revised editions. The Disaster Relief Center is established under the Ministry of Defence (Figure 2.17) to have 5 key powers. 1) The Disaster Relief Center shall make a policy and guideline of the Ministry of Defence on the prevention, solution, and mitigation of disaster and accident, as well as the procedure of helping the victims. The Disaster Relief Center shall be a center for coordination between the government and relevant civilian agencies and private sector to prevent, resolve, and mitigate disasters and accidents with regard to the Ministry of Defence. 3) The Disaster Relief Center shall monitor the situations and events continuously to supervise and coordinate the agencies under the Ministry of Defence to help the victims in a timely manner, and run the PR campaign using the tools of the Ministry of Defence. 4) The Disaster Relief Center shall be subject to the Ministry of Defence and the armies to support the manpower and information to back up the operation of the secretariat of the Disaster Relief Center of the Ministry of Defence when requested. The center has to also invite representatives from government agencies or qualified personnel to give advice, work together, and request the information as necessary. 5) The Disaster Relief Center shall approve financial support for the emergency relief fund as additionally requested by government agencies under the Ministry of Defence.

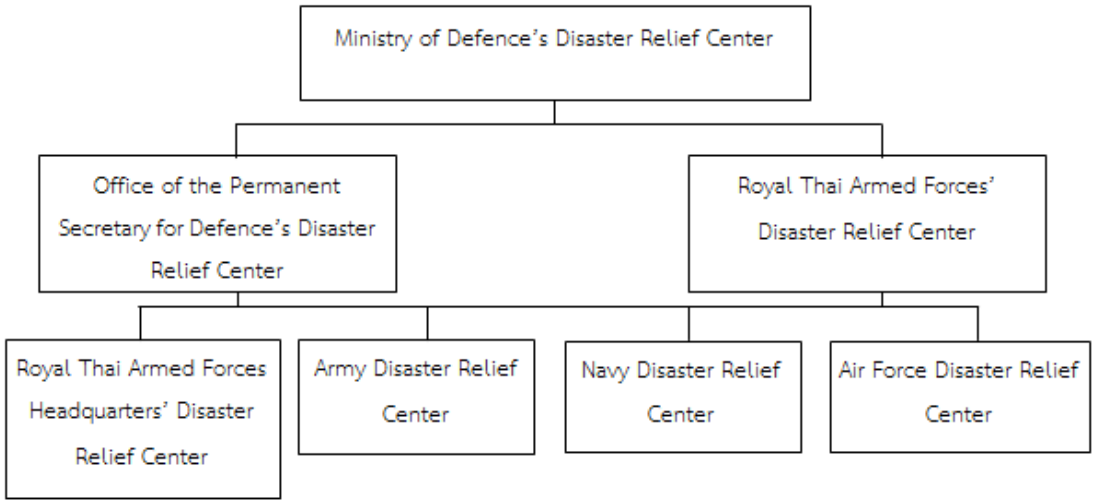

Figure 2.18 The Structure of the Ministry of Defence's Disaster Relief Center
Source: Ministry of Defence, 2011: 17.

In addition, for the concrete practice, the Ministry of Defence assigns Office of the Permanent Secretary for Defence, Royal Thai Armed Forces Headquarters, and the Royal Thai Armed Forces to found the disaster relief centers at every level to join hands with the operations of the Ministry of Defence's Disaster Relief Center and to be responsible for the operations about prevention, solution, and mitigation of disaster, and assistance for victims by the Ministry of Defence (Figure 2.19). They also have to define the procedure of the disaster relief operations for the Ministry of Defence's Disaster Relief Center at all levels as follows:

1) The assigned agencies shall make a disaster prevention and mitigation plan based on the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014) as the main plan for disaster management in Thailand. The new plan shall function as the scope and direction for all agencies, from local to national levels, to work together systematically with integration toward the same direction. Therefore, the Ministry of Defence has improved and established its disaster mitigation plan to support the National Disaster Prevention and Mitigation Plan so that the agencies under the Ministry of Defence's Disaster Relief Center use as the guideline for making the plan.

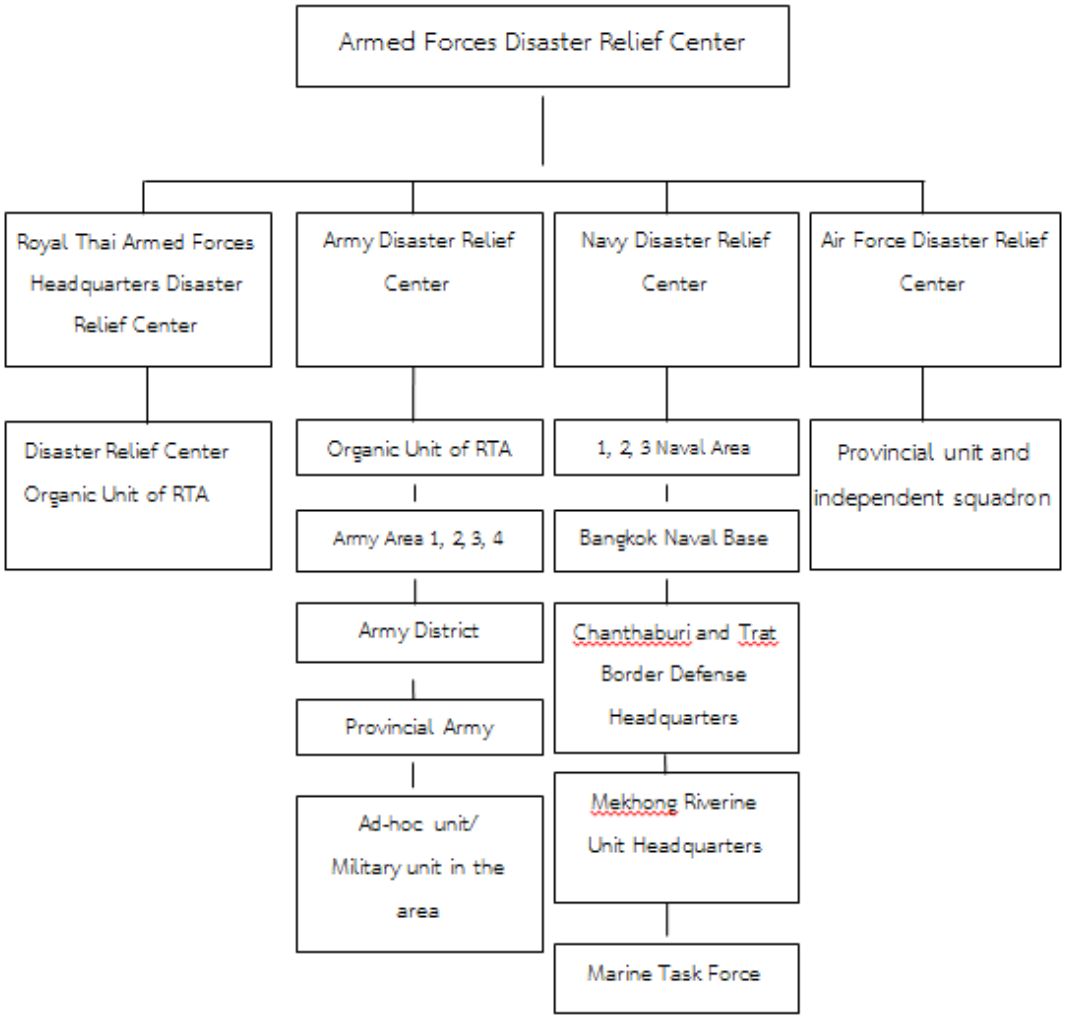

Figure 2.19 The Structure of the Royal Thai Armed Forces' Disaster Relief Center
Source: Ministry of Defence, 2011: 19.

2) Responsibility zoning: In the disaster assistance operation, it is important to assign many organizations under the Ministry of Defence to take charge for immediate operation and systematic and effective management. On the other hand, without zoning, the assigned organization will be confused and it is likely to encounter double assistance or redundancy. Therefore, to make the operation run smoothly as it should, different areas are assigned for different organizations, ranging from the level of regional armies, military district, regiment, to battalion.

3) Preparation before the disaster refers to the process of preparing to prevent the disaster in normal situation. This process focuses on the advance

preparation in the preventive measure to minimize the impact of the disaster. Responsibilities are assigned and supervised for the most effective result. The Office of the Permanent Secretary for Defence's Disaster Relief Center, Royal Thai Armed Forces Headquarters' Disaster Relief Center, and the Royal Thai Armed Forces' Disaster Relief Center are responsible for the following. 1) Plan, supervise, coordinate, and run public relation campaign to help the disaster victims in the assigned area, support civilian agencies as requested. 2) Monitor and watch the disaster closely, collect the statistics about disaster in the assigned area as well as related data; evaluate the risk and chance of seasonal disaster, and notify relevant organization and civilians as soon as possible about the disaster. 3) Coordinate with civilian agencies to assign the zones and tasks clearly. 4) Prepare the operation plan, training, and education about rescue of disaster victim together with civilian agencies at the suitable time frame. 5) Prepare manpower, equipment, tools, and communication kits to be prompt when requested. 6) Participate in the training of civil disaster prevention and mitigation plan so that the military's personnel and units understand the operation plan. An example of such training is C-MEX. 7) Coordinate with civilian agencies to prepare safe zones for the purpose of evacuation and minimize the impact in case of disaster.

4) Monitor and evaluate the results: When the situation is settled, the assigned unit shall monitor and evaluate the operation results, give recommendations to solve the problems. The evaluation results shall be reported to their superior according to the Form of Disaster Mitigation Operation Report of Ministry of Defence, ranging from the Office of the Permanent Secretary for Defence's Disaster Relief Center, Royal Thai Armed Forces Headquarters' Disaster Relief Center, and the Royal Thai Armed Forces' Disaster Relief Center. The purpose of the report is to collect the data and statistics of operation for the purpose of further improvement in the future.

The Royal Thai Army has established the Army Disaster Relief Center (ADRC) according to the Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011) to control the overview of the operations of protecting and saving disaster victims. The organizations under RTA are also assigned to establish their own disaster relief center at all level as well as the 5 operation guidelines as follows:

1) Mission: RTA shall support the operations of protecting and saving disaster victims to be consistent with the policy of the Ministry of Defence.

2) Establishment of organization

(1) The Army Disaster Relief Center (ADRC) is responsible for control and supervision of the operations by the Army Area's Disaster Relief Center and other organizations in RTA in the mission of saving the disaster victims.

(2) Army Area's Disaster Relief Center shall control and supervise the disaster relief operations of Disaster Relief Centers subject to the Army Area.

(3) Other Disaster Relief Centers subject to RTA shall control and supervise the operation of minor disaster relief center.

3) Responsibility Allocation

(1) Army Operations Center functions as the Army Disaster Relief Center (ADRC), with the Chief of Staff, Royal Thai Army, as the director subject to the Commander in Chief. Army Operations Center is responsible 1) planning, supervision, command, control, and provide relevant supports to RTA's operations to help disaster victims and the process of rehabilitation, 2) being the coordination center with other organizations both inside and outside of RTA to help disaster victims, 3) support and run PR in different media of RTA or other press regarding the warnings, report of situation, and operations of RTA and/or relevant organizations, give the practice guideline, and 4) follow the order from the Ministry of Defence's Disaster Relief Center.

(2) Army Area uses its headquarters as the headquarters of Disaster Relief Center. Army Area Commander or any assigned personnel functions as the director of Army Area's Disaster Relief Center. The responsibilities include 1) establishing and control of Disaster Relief Center subject to the Army Area, 2) following the orders about disaster victim assistance from Army Disaster Relief Center (ADRC) and initiatives of an ad-hoc unit in the responsible area.

(3) Special Warfare Command, Army Air Defense Command, 2nd Cavalry Division King's Guard, Field Artillery Division, 15th Infantry Division, 16th Infantry Division, Army Support Service Department, Army Aviation Center, and Provost Marshal General Department function as the operation support units for Army Area Disaster Relief Center.

(4) Other disaster relief centers subject to RTA function as the disaster relief center and undertake the mission promptly when there is a situation or when commanded by Army Disaster Relief Center (ADRC). The commander of the unit or the assigned personnel is the director, responsible for establishing and control of its subordinate disaster relief centers according to the situation and capacity of the unit.

4) Practice: Every unit shall act in conformance with the Regulations on Army's Disaster Prevention and Mitigation B.E. 2540 (1997) when undertaking the mission of helping the disaster victims.

5) Responsibilities of the support division shall be the same as those in normal situation. The Civil Affairs Division of Army Disaster Relief Center (ADRC) is the main support unit for the operation.

2.7 Logistics Division, Army Disaster Relief Center (ADRC)

Logistics Division, Army Disaster Relief Center (ADRC) in 2011 consisted of 2 sections; logistics and support (Figure 2.20). There are 96 ad-hoc staff members from 3 sources; 1) 16 members from Directorate of Logistics of RTA, 2) 52 members from Logistics Division, Army Disaster Relief Center (ADRC), and 3) 28 others supporting logistics operations. The responsibilities of logistics support are 1) logistics support for civilians and units under RTA affected by flood, and 2) logistics support for agencies under RTA. The logistics operation of Logistics Division, Army Disaster Relief Center (ADRC) shall conform to the doctrine on military of RTA, consisting of 5 groups; 1) manpower, 2) maintenance, 3) transport, 4) medical service, and 5) other services.

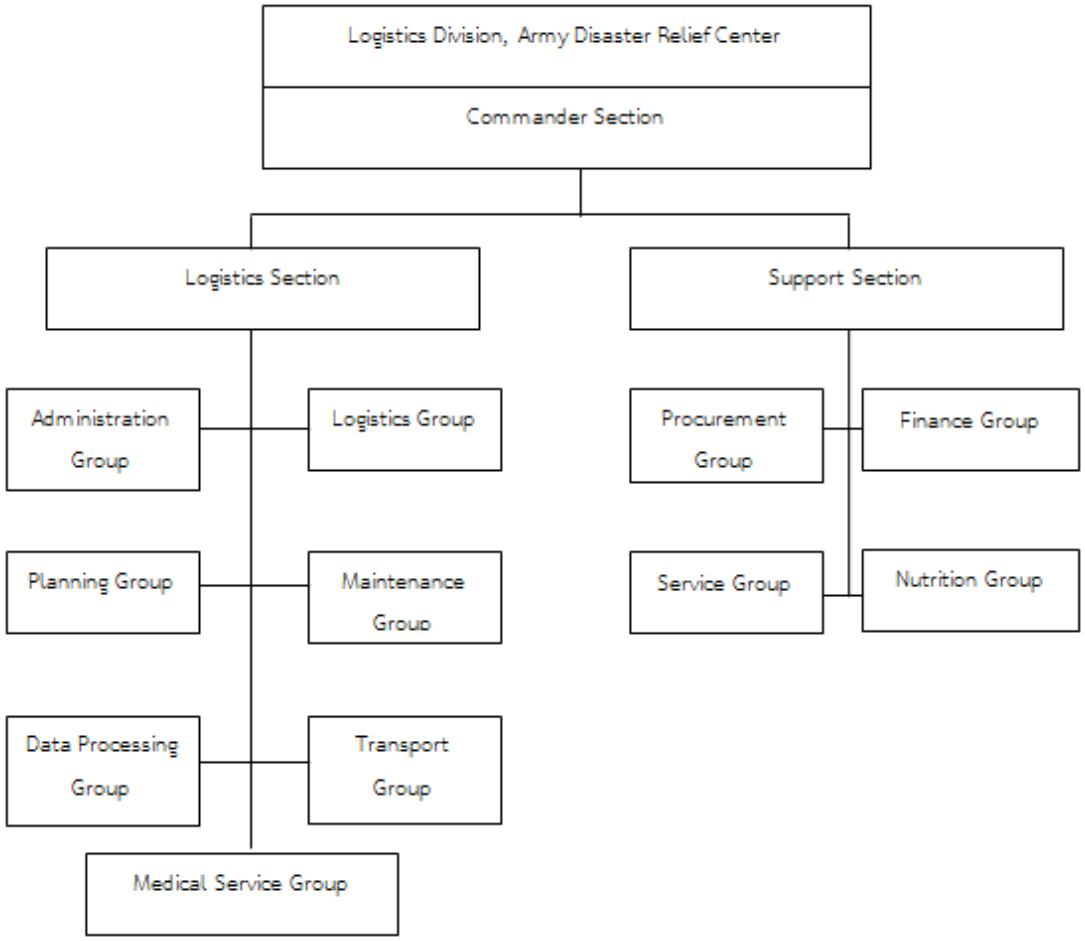

Figure 2.20 Logistics Project of Army Disaster Relief Center (ADRC)

2.8 Relevant Literatures

2.8.1 Tabbara (2008: Abstract) conduct a study of "Emergency Relief Logistics: Evaluation of Disaster Response Models, Based on Asian Tsunami Logistics Response". The study revealed that the response of logistics support in the event of 2004 Tsunami was sensitive and encountered logistics insufficiency. It was also discovered that the implementation of relevant parties were unclear and the personnel did not have enough skills and knowledge, eventually resulting in failure. Therefore, all relevant parties need to understand clearly their roles and communicate very well at the response action in time of disaster and rehabilitation.

2.8.2 Phaithoon Lueangtrakun (2009: Abstract) examined “The Relationship Between Logistics Activities and Military Logistics of The Royal Thai Army ” with 21 executives ranked from battalion direction in the Directorate of Logistics of each armed force. The study discovered that 1) RTA thinks that the level of logistics activities in terms of operation planning and procurement is high while that of inventory, service, and distribution is the highest; 2) RTA thinks that the level of military logistics activities in term of operation planning, procurement, supplies management, and service is high; 3) different armed forces do not have different opinions on each scope of work of logistics activities; 4) different armed forces do not have different opinions on each scope of work of military logistics activities, and 5) there is a relationship between activities in logistics system and military logistics, especially in distribution and procurement.

2.8.3 Chonlaphum Saengduean (2005: Abstract) conducted research of “Logistics Management for Mechanical Equipment to Support the Operations of The Royal Thai Army in the Age of Globalization: A Case Study of Engineer Department” with high level executives, experts, and relevant implementers. The study revealed that the problems and obstacles about logistics management for mechanical equipment concern three issues; 1) management, 2) tools and technology, and 3) logistics. These problems can be solved by applying and integrating knowledge of public administration and information technology.

2.8.4 Wutthisan Luangjinda (2012: Abstract) conducted research of “The Role of Military in Disaster Relief: Case Study On the Relationship Between The Royal Thai Army and Government Agencies in Flood 2011 in Bangkok”. The study revealed that the obstructions that RTA faced can be divided into 2 levels; policy level and implementer level. There are different opinions and concerns. The common obstruction of both levels is the unpreparedness for a prolonged disaster. The disaster relief operations are usually aimed for ad-hoc tasks and the implementers lack knowledge and experience. That being said, there are a lot of difficulties helping the victims. The key obstruction in the policy level is the law and structure. To be specific, the role of the army in disaster mitigation is to support which means that it requires a request from other agencies. On the other hand, the obstruction at the implementer level is the equipment. The equipment of RTA is not designed to operate

in the prolonged disaster mitigation. In addition, the research also showed that awareness and preparedness in the overview are not sufficiently promoted, and not even included in the national plan for disaster response.

2.8.5 Surayut Rattanacharu (2010: Abstract) researched "Efficiency Improvement of Disaster Mitigation by the 2nd Development Division". The study revealed that the important factors that affected the efficiency development of disaster mitigation by the 2nd Development Division are the shortage of personnel and equipment due to the lack of budget. Regarding personnel problem, it was found to be caused the supervisors and implementers lacked the skills and understanding of the disaster mitigation plan and the coordination with other agencies outside of RTA. To address the issues, the researcher recommended the solution; 1) propose additional budget for establishing Disaster Relief Company, 2) revise the disaster mitigation plan to match with the operation, 3) set the suitable guideline for logistics operation for the type of disaster, 4) procure the modern equipment, 5) make an action plan and train the relevant staffs and agencies for the integrated operation of disaster prevention and mitigation, 6) improve the skills of personnel by providing training and education for relevant parties, and 7) determine the performance indicator, monitoring tool, and result evaluation which will bring the success according to the objectives of the mission.

2.8.6 Prayuth Chan-ocha (2008a: Abstract) investigated "Changing the Role of The Royal Thai Army to Be Prepared for New Threats" and found that there are 7 types of new threats for Thai society; 1) security issues in the 3 southern provinces, 2) international terrorism and crime, 3) drugs, 4) alien labor and illegal immigrants, 5) disaster caused by changing environment and epidemics, 6) imbalance natural and environmental resources management, and 7) poverty. These threats seem to be more intensified while the apparent role of RTA is to provide support and prevention of the new threats. However, the problems that RTA is facing in the management area 1) there is no law to authorize the operation, 2) most personnel do not have knowledge and experience, 3) budget is insufficient, 4) military doctrine is not clear, 5) personnel in the army have different opinions, 6) implementation is not concrete, and 7) political policy is not clear and does not reflect the necessity to restructure the army. The recommendations from this study are 1) RTA should play a role as supporter in the

management of new threats, 2) RTA should interpret and take advantage from the Internal Security Act, B.E. 2551 (2008) through the structure of Internal Security Operations Command, 3) non-war military doctrine should be revised and enforced more extensively, 4) there should be a coordination center according to the new types of threats, 5) there should be an education program on the new threats, and 6) the operations of the army should be more publicized through a better PR campaign.

2.8.7 Nithinan Chaiwatthanaphan, Karawadi Phiphatphongsathon, and Piyachat Sunyakhanit (2007: Abstract) studied "Integration of Military Communication System to Help Disaster Victims" from the leaders and members of communication team who helped flood victims. The study revealed that in order to achieve effective communication in the disaster victim rescue operation, there should be plans to coordinate the cooperation and understanding of all relevant parties. 1) Communication preparation plan: Agencies responsible for communication should be equipped with manpower, vehicles, and tools for helping civilians, communication tools, budget, and proper coordination in order to achieve an immediate and timely assistance. 2) Affected area access plan: Agencies responsible for communication must be able to enter the flooded area quickly and not get lost. This can be achieved by quick and accurate information. The transportation time should be short and the access needs to go as the plan that has been prepared beforehand. 3) Communication plan in the flooded area: Agencies responsible for communication need to use communication tools as the channel for receiving and sending information between the affected victims and the assisting agencies, both in term of replacing the lost channel or additional channel if insufficient. Radio communication should be the main communication channel. 4) Transfer (delivery) and evacuation plan: Agencies responsible for communication need to plan the transfer of communication and evacuation from the flooded area at the suitable time in order not to interrupt the rescue operation or affect the victims. 5) The Ministry of Interior by the Information Technology and Communication Center or other agencies responsible for information of the province should be the organization that coordinates about all the communication during the flood relief operation. The communication of military side should perform the support task together with civil and private organizations.

2.8.8 Prasarnchoke Thuvanuti (2003: Abstract) investigated "The Implementation of Downsizing of The Royal Thai Army " from personnel of Special

Warfare Center, Directorate of Operations, and Army Weapons Production Center. It was found that the above military agencies can downsize their manpower with different strategies. The Special Warfare Center downsized their manpower by not recruiting new personnel to replace the vacancies, Directorate of Operations and Army Weapons Production Center by transferring them to Office of the Permanent Secretary for Defence instead of recruiting replacement and downsizing the manpower to -2 level, and Directorate of Personnel by reducing the manpower and restructuring the manpower to the small size. All the agencies can implement the government policy of downsizing of The Royal Thai Army without reengineering, connection, incentive for the strategy of downsizing, and promoting the culture of downsizing.

2.8.9 Khamphan Konkham, Nittaya Pensirinapa and Somjai Puttapitukpol (2011: Abstract) investigated "Relationship of Personal Factors, Management Factors, and Quality of Life of Professional Nurses in Hospitals in Inspection Area 13". The results are as follows. 1) Management factors are at the medium level whereas strategy is high while 6 others medium. Quality of life of professional nurses is at the medium level. The relationship with the society is high while 7 others are at the medium level. 2) The experience of working in hospital in general has a positive relationship with the quality of professional life at the high level. Management factors in specific attributes have a positive relationship at the medium level with the quality of professional life with the significance level of 0.001. 3) The most common problems are the shortage of nurses and low remuneration compared to the overloading responsibilities. The research suggested that the number of nurses be increased and quality of professional life of nurses be improved by adding welfare and salary to match their responsibilities.

From the discussed literatures, the researcher categorized them into 4 groups; 1) research about the military roles and duties on handling of new issue of national security, especially in disaster mitigation in the Great Flooding of 2011, 2) research about public policy such as public policymaking and implementation, 3) research about management, and 4) research about military logistics for disaster mitigation. Each of them has differences in detail. The researcher will further synthesize the knowledge from the relevant literatures above to develop a military logistics model for disaster relief operations (flooding) for The Royal Thai Army.

CHAPTER 3

RESEARCH METHODOLOGY

The research "Development of Military Logistics Model for Disaster Relief Operations (Flooding) of The Royal Thai Army " aims to investigate three areas of study; 1) to investigate the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army , 2) examine the factors affecting the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA, and 3) develop the military logistics model for disaster relief operations (flooding) of The Royal Thai Army . The research applied the mixed method between survey research and qualitative research methodologies.

3.1 Research Design

3.1.1 Research Frameworks

1) Survey research: The researcher used survey research for investigating items 1 and 2 of the objectives. The conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army are investigated by using the management principle that can increase the efficiency of operation according to the McKinsey 7-S Framework (Peter, Waterman & Phillips, 1980) which is generally accepted to evaluate the strengths and opportunities to improve the operation processes and outcomes. The framework consists of 7 elements: structure, strategy, systems, staff, skills, style, and shared values. The factors affecting the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA are examined from the perspective of military logistics operations. These start from planning, combat support operation, and other activities other than from war of RTA in a normal situation. And then include additional activities according to the national defense plan, or other organization, that is designed to operate as assigned by senior organizations and is

effectively based on the RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army. Military logistics for disaster operations can be divided into 4 groups; 1) operation planning e.g. policymaking, determining the demand, and locating the quarter of logistics, 2) procurement, 3) inventory management e.g. storage, distribution, maintenance, and disposition, and 4) services e.g. transport and medical services.

2) Qualitative research: The researcher adopted the qualitative research for investigating items 1 and 2 of the objectives by using grounded theory methodology by Glaser and Strauss (1967). According Glaser and Strauss, grounded theory methodology does not concern the theory test, but a systematic collection and analysis of data. The scholars also provided the guideline for studies with such methodology in 3 aspects. 1) Any theory or relationship shall be based on the systematically collected and analyzed data. In other words, raw data are important fundamentals for a research project. 2) Researchers should not formulate the hypothesis or theory before collecting data because data and systematic analysis will lead to the hypothesis or theory. 3) Researchers need to carry out constant comparative analysis until the data are saturated (Bencha Yoddumnern-Attig and Kanchana Tangchonlatip, 2009: 77-78) together with a case study research. The tools used in this research include in-depth interview, focus group discussion, and documentary research for development of military logistics model for disaster relief operations (Flooding) of The Royal Thai Army. The data were integrated from the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army and factors that affect the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA. The policy implementation was based on the Army Disaster Relief Plan B.E. 2556 (2013) and the National Disaster Prevention and Mitigation Plan B.E. 2553–2557 (2010–2014). The implementation procedure is divided into 3 parts: preparation, response, and reconstruction. The analysis is performed at the organization level i.e. The Royal Thai Army.

3.2 Survey Research

3.2.1 The population and samples were 96 logistics personnel at the Army Disaster Relief Center assigned to be in charge of 42 districts of Bangkok declared in 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior. However, the data from 76 persons were collected and analyzed.

3.2.2 The tool in this research is a questionnaire used for investigating the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army and the factors affecting the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA. The questionnaire was given to 76 logistics personnel at the Army Disaster Relief Center who worked during the Great Flood of 2011. The questionnaire is divided into 4 parts as follows:

1) Part 1 features general information of the informants. The questions are in the form of checklist of gender, age, education, and years of experience.

2) Part 2 concerns the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army. There are totally 43 questions; 1) structure (7 questions), 2) strategy (7 questions), 3) systems (7 questions), 4) staff (6 questions), 5) skills (6 questions), 6) style (6 questions), and 7) shared values (6 questions). The rating scale ranges from 1-10 as showed below.

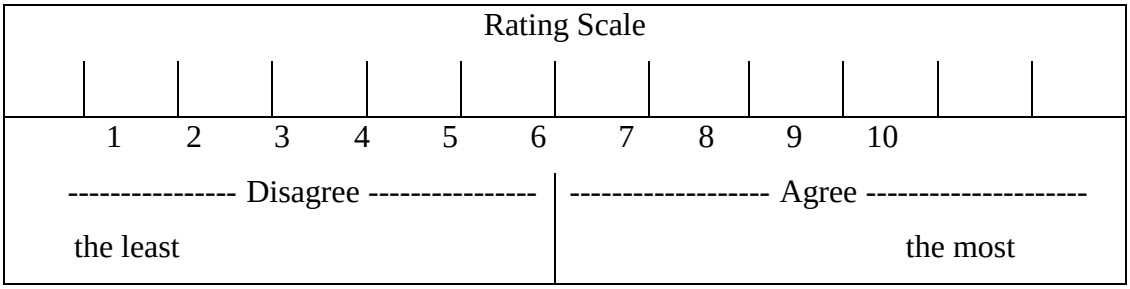

Figure 3.1 Rating Scale

3) Part 3 is about the factors affecting the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA. This

part is composed of 20 questions divided into 4 groups of factors: 1) operation planning e.g. policymaking, determining the demand, and locating the quarter of logistics (4 questions), 2) procurement (5 questions), 3) inventory management e.g. storage, distribution, maintenance, and disposition (5 questions), and 4) services e.g. transport and medical services (20 questions). The rating scale ranges from 1-10 like the above section.

4) Part 4 is a room for informants' recommendations about the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army and the factors affecting the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA.

3.2.3 Research tool testing: The researcher verified the content validity of the questionnaire by calculating the index of item objective congruence (IOC). The test was conducted by 3 military logistics experts; 1) Col Dr. Charat Unsamrit, Operation Officer at Directorate of Operations, 2) Col Suksan Bunchit, Director of Academic Division, the RTA Logistics School, and 3) Col Dr. Manat Yongthai, Director of Academic Division, Veterinary Department. The test results must have the minimum IOC of 0.7 (Table 3.1).

3.2.4 Data collection: The researcher, in 2014, gave 96 copies of the questionnaire to Col Parinya Sonsamran, Chief of Staff to RTA's Assistant Chief of Staff in Logistics (LTG Supphakon Sa-nguanchatsonkrai) to forward to logistics staffs at the Army Disaster Relief Center assigned to be in charge of 42 districts of Bangkok declared in October 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior. Before Col Parinya Sonsamran was given the questionnaire, he was thoroughly explained about the importance of the research, how to answer the questions, meaning of each questions, and information confidentiality, as well as academic freedom. The reason that the questionnaire was given to Col Parinya Sonsamran is due to confidentiality issue within the RTA Headquarters when martial law was in effect. Four months later (in January 2015), the researcher received the questionnaire for further analysis.

3.2.5 Data analysis: Data from the questionnaire were analyzed by using descriptive statistics i.e. average and standard deviation. Average was interpreted by using class with based on the principle of range. The criteria of average are divided into 5 levels (Siriwichai Phongwichai, 2013) as follows:

1) Average 8.21-10.00 refers to the events or operations that reflect the reality at the level of the highest.

2) Average 6.41-8.20 refers to the events or operations that reflect the reality at the level of high

3) Average 4.41-6.40 refers to the events or operations that reflect the reality at the level of medium.

4) Average 2.21-4.40 refers to the events or operations that reflect the reality at the level of low.

5) Average 1.00-2.20 refers to the events or operations that reflect the reality at the level of the lowest.

Table 3.1 Index of Item Objective Congruence (IOC) Used in the Study

	Before Evaluation			**After Evaluation**		
Subject	**No of Item**	**IOC**		**No of Item**	**IOC**	
		<0.7	**1.00**		**<0.7**	**1.00**
McKinsey 7-S Framework						
Structure	10	3	7	7	-	7
Strategy	12	5	7	7	-	7
Systems	11	4	7	7	-	7
Staff	10	4	6	6	-	6
Skills	11	5	6	6	-	6
Style	9	3	6	6	-	6
Shared values	7	3	4	4	-	4
RTA Military Logistics						
Planning	6	2	4	4	-	4
Procurement	8	3	5	5	-	5
Management	7	2	5	5	-	5
Service	9	3	6	6	-	6

3.3 Qualitative Research

In this qualitative research, the grounded theory methodology was used together with a case study. The research tools are documentary research, in-depth interview, and focus group discussion to discuss the survey research result, determine the guideline for military logistics for disaster relief operations (flooding) of The Royal Thai Army, and develop a military logistics model for disaster relief operations (flooding) of The Royal Thai Army. These shall be implemented under the framework of the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014) in three steps; preparation, response, and reconstruction.

3.3.1 Documentary Research. The researcher reviewed the theory and concepts related to the development of military logistics model for disaster relief operations (flooding) of The Royal Thai Army . The emphasis of the review included the following: 1) Theories and concepts about disaster logistics, 2) theories and concepts about military logistics, 3) theories and concepts about management according to McKinsey 7-S Framework, 4) and concepts about policy implementation, 5) theories and concepts about new public service (NPS), 6) important laws, regulations, plans, orders, and practices about disaster relief operations of The Royal Thai Army, 7) Logistics Division, the Army Disaster Relief Center (ADRC), 8) Relevant studies

1) Sources of the data: The data were derived from secondary sources e.g. from books/ academic journals, law, official regulations, relevant studies, dissertations, theses, news coverage, and article in printed media, as well as relevant electronic documents.

2) Research tool testing: The researcher verified reliability of data in parallel with tri-angulation verification method. The principle is that the data shall be consistent from at least 3 sources.

3) Data analysis: The main analysis was content analysis.

3.3.2 In-depth interview collected the data by interviewing the key informants in detail. The manner of interview included open-ended interview and structured interview.

1) Sampling: The researcher used purposing sampling method. All the 16 samples were divided into 3 groups: 1) top level supervisors of RTA (6 persons), 2) heads of logistics division of ADRC (5 persons), and 3) unit commanders or logistics officers (5 persons) assigned to be in charge of 42 districts of Bangkok declared in 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior (Table 3.2).

2) Criteria for selecting key informants

(1) Top level supervisors of RTA must 1) be top level supervisors of RTA who operated in ADRC with the minimum rank of major general, and 2) performed the duty in military logistics for disaster relief operations (flooding) of The Royal Thai Army in 2011.

(2) Heads of logistics division of ADRC must 1) be heads of logistics division of ADRC and 3) performed the duty in military logistics for disaster relief operations (flooding) of The Royal Thai Army in 2011.

(3) Unit commanders or logistics officers who were assigned to be in charge of 42 districts of Bangkok declared in 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior

3) The research tool was the interview form, which shall be used to discuss the survey research result, determine the guideline for military logistics for disaster relief operations (flooding) of The Royal Thai Army , and develop a military logistics model for disaster relief operations (flooding) of The Royal Thai Army . These shall be implemented under the framework of the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014) in three steps; preparation, response, and reconstruction. The interview form is divided into 5 parts.

(1) Part 1: General information of the interview informants

(2) Part 2: The guideline of military logistics for disaster relief operations (flooding) of The Royal Thai Army (preparation process) consists of 4 groups of factors: 1) operation planning e.g. policymaking, determining the demand, and locating the quarter of logistics, 2) procurement, 3) inventory management e.g. storage, distribution, maintenance, and disposition, and 4) services e.g. transport and medical services.

(3) Part 3: The guideline of military logistics for disaster relief operations (flooding) of The Royal Thai Army (response process) consists of 4 groups of factors: 1) operation planning e.g. policymaking, determining the demand, and locating the quarter of logistics, 2) procurement, 3) inventory management e.g. storage, distribution, maintenance, and disposition, and 4) services e.g. transport and medical services.

(4) Part 4: The guideline of military logistics for disaster relief operations (flooding) of The Royal Thai Army (reconstruction process) consists of 4 groups of factors: 1) operation planning e.g. policymaking, determining the demand, and locating the quarter of logistics, 2) procurement, 3) inventory management e.g. storage, distribution, maintenance, and disposition, and 4) services e.g. transport and medical services.

(5) Part 5: The guideline of military logistics for disaster relief operations (flooding) of The Royal Thai Army in the 3 processes (preparation, response, and reconstruction) consists of 4 groups of factors: 1) operation planning e.g. policymaking, determining the demand, and locating the quarter of logistics, 2) procurement, 3) inventory management e.g. storage, distribution, maintenance, and disposition, and 4) services e.g. transport and medical services.

Table 3.2 List of Informants from the 3 Groups

No./Group	Title-Name-Surname	Position	Collection Date	Remark
1./ 1	Gen Prayuth Prayuth Chan-ocha	Former Commander in Chief, RTA	20 January 2015	Prime Minister
2./ 1	LTG Supphakon Sa-nguanchatsonkrai	Former Assistant Chief of Staff, Logistics Division, RTA	3 September 2015	Deputy Chief of Staff, RTA
3./ 1	LTG Phalawut Klapcharoen	Director of Civil Affairs, RTA	11 February 2015	
4./ 1	LTG Somchai Yangphithak	Director of Logistics, RTA	11 February 2015	
5./ 1	LTG Thawi Chaemcharat	Former Commanding General of Quartermaster Department, RTA	23 October 2014	
6./ 1	MG Buntoem Saengdit	Expert from RTA	23 October 2014	
1./ 2	Col Chanin Waramit	Head of Planning Section	10 February 2015	
2./ 2	Col Suchat Wongmak	Head of Logistics Section	11 February 2015	
3./ 2	Col Chaimontri Phothong	Head of Maintenance Division	10 February 2015	
4./ 2	Col Achawat Traidet	Head of Transport Division	10 February 2015	
5./ 2	Col Phaisan Muendet	Assistant Head of Support Section	10 February 2015	
1./ 3	LTG Thawi Chaemcharat	Former Commanding General of Quartermaster Department, RTA (Dusit District)	23 October 2014	RTA Logistics School

Table 3.2 (Continued)

No./Group	Title-Name-Surname	Position	Collection Date	Remark
2./ 3	LTG Nanthaphon Chamratromran	Former Commander of 2nd Cavalry Regiment (King's Guard) (Phayathai District)	24 October 2014	
3./ 3	Col Surasak Chindaprasan	Operation Officer, RTA (Nong Khaem District)	24 October 2014	
4./ 3	Col Kittipan Chupiputt	Director of Technical Support, Veterinary and Remount Department, RTA (Thawiwatthana District)	2 March 2015	Deputy Chief of Veterinary Service, RTA
5./ 3	Col Chirarot Thupthianrat	Commander of 1st Artillery Regiment (King's Guard) (Phanakhon District)	16 February 2015	Dep Regt Co of 1st Artillery Regiment (King's Guard) (Phanakhon District)

Note: 1) Refers to top level supervisors of RTA

2) Refers to heads of logistics division of ADRC

3) Refers to unit commanders or logistics officers assigned to be in charge of 42 districts of Bangkok declared in 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior

Table 3.3 List of Participants of Focus Group Discussion on 13 August 2015 at 10.00 a.m. at a Meeting Room of RTA Logistics School

No.	Title-Name-Surname	Position	Remark
1)	LTG Thawi Chaemcharat	Former Commanding General of Quartermaster Department, RTA Special lecturer of RTA Logistics School	Head of the focus group discussion
2)	MG Chamnan Koetphon	Deputy Commander of RTA Logistics School	Expert of RTA
3)	Col Suksan Bunchit	Director of Academic Group, RTA Logistics School	
4)	Col Athicha Wongsuwan	Lecturer of RTA Logistics School	
5)	Col Sawangchit Kanchanakomon	Lecturer of RTA Logistics School	
6)	Col Prasai Phutrakun	Lecturer of RTA Logistics School	
7)	Col Phaisan Muendet	Assistant Head of Support Section, Logistics Division, ADRC Special lecturer of RTA Logistics School	

Table 3.4 List of Participants of Focus Group Discussion on 10 September 2016 at 10.00 a.m. at a Meeting Room of RTA Logistics School

No.	Title-Name-Surname	Position	Role	Remark
1)	LTG Thawi Chaemcharat	Former Commanding General of Quartermaster Department, RTA Special lecturer of RTA Logistics School	Military	Army commander in the affected area Head of the focus group discussion
2)	Mr. Darong Traiwongphaisan	General Manager Seagull Logistics (Thailand) Co., Ltd.	Logistics Providers	Transfer relief supplies in the affected area
3)	Mr. Montri Chanachaiwibunwat	Director of Disaster Prevention and Mitigation Office, Department of Disaster Prevention and Mitigation	Government	The overall support provider
4)	Mr. Sanya Chinimit	Director of Department of Drainage and Sewerage, BMA	Government	Support provider in the affected area
5)	LTG. Amnat Bali	Director of Relief and Community Health Bureau, The Thai Red Cross Society	Aid agencies	Support provider in the affected area
6)	Mrs. Parina Prayukwong	President of the Network for Sustainable Development (Thailand)	NGO	Help flood victims together with government and private sectors
7)	Mr. Wirot Laohaphan	Former Committee of Ajinomoto Foundation	Donor	Donate money and relief supplies

4) Data Collection

(1) Contact, coordination, and writing a letter of cooperation request for conducting the dissertation from Faculty of Public Administration, National Institute of Development Administration, to collect data from the key informants.

(2) Collection of data from the 3 groups of key informants (a total of 16 persons) to analyze the content and develop the military logistics model for disaster relief operations (flooding) of The Royal Thai Army .

5) Research tool testing: The basic quality test of the interview form were informally performed with 5 person from other groups who had similar characteristics of the sample in order to test the accuracy, relevance of the interview, appropriateness of language, and coverage of the key topics and data. The topics of interview were improved before sending to qualified persons to verify content validity. The interview form was then submitted to the adviser for mutual decision before it was used to collect the actual data.

6) Data analysis: The researcher verified reliability of data from each group of the key informants together with content analysis.

3.3.3 Focus group discussion: The researcher decided to use focus group discussion to evaluate the military logistics model for disaster relief operations (flooding) of The Royal Thai Army.

1) Sampling: The researcher used purposive sampling to select the participants of focus group discussion. The selected participants were 7 military logistics experts from RTA (Table 3.3) and 7 relevant parties from other sectors (Table 3.4).

2) The criteria for selecting the participants of focus group discussion are 1) the minimum of 5 years' experience in military logistics operations or disaster relief operations and 2) performed the duty or participated in military logistics for disaster relief operations (flooding) of The Royal Thai Army in 2011.

3) The research tool is focus group discussion aimed to evaluate the military logistics model for disaster relief operations (Flooding) of The Royal Thai Army under the implementation according to the Army Disaster Relief Plan B.E. 2556 (2013) and the National Disaster Prevention and Mitigation Plan B.E. 2553–2557 (2010–2014).

4) Data Collection

(1) Contact, coordination, and writing a letter of cooperation request for conducting the dissertation from Faculty of Public Administration, National Institute of Development Administration, to collect data from the participants of focus group discussion and the RTA Logistics School.

(2) Data were collected from 7 RTA logistics experts on 13 August 2015 at 10.00 a.m. at a meeting room of RTA Logistics School, Bangkok, and 7 relevant parties from other sections on 13 September 2015 at 10.00 a.m. at a meeting room of RTA Logistics School, Bangkok. Content analysis was performed with the results. The military logistics model for disaster relief operations (flooding) of The Royal Thai Army was evaluated.

5) Data analysis: Content analysis was performed together with comparative analysis.

3.4 Summary of Research Steps

The researcher has divided the research into 8 steps as follows:

3.4.1 Step 1: Concepts, theory, documents, and relevant literatures are reviewed and analyzed/synthesized for the conditions, problems, and factors that affect the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA to develop the military logistics model for disaster relief operations (flooding) of The Royal Thai Army. These data are to be used to determine the framework of the research and develop the research tools.

3.4.2 Step 2: The outcome data and guideline are used to develop the questionnaire and interview form to cover the content according to the concepts and theories for content validity. After that, the questionnaire and interview form are submitted to the adviser for comments and recommendation for improvement.

3.4.3 Step 3: The improved questionnaire and interview form are submitted to 3 scholars with experience in military logistics of RTA to verify the content validity using the index of item objective congruence (IOC).

3.4.4 Step 4: The questionnaire and interview form are improved according to the experts' advice before they are used to collect the actual data of the research.

3.4.5 Step 5: Data collection: The questionnaire is distributed to 76 logistics personnel at the Army Disaster Relief Center who worked during the Great Flood of 2011. The interview form is used to interview top level supervisors of RTA (6 persons), heads of logistics division of ADRC (5 persons), and 3) unit commanders or logistics officers (5 persons) assigned to be in charge of 42 districts of Bangkok declared in 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior. Purposive selection was used to select the research samples.

3.4.6 Step 6: The data from the questionnaire and the interview form are then formulated into the model for focus group discussion to develop the military logistics model for disaster relief operations (flooding) of The Royal Thai Army. The policy implementation was based on the Army Disaster Relief Plan B.E. 2556 (2013) and the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014). The implementation procedure is divided into 3 parts: preparation, response, and reconstruction

3.4.7 Step 7: The military logistics model for disaster relief operations (flooding) of The Royal Thai Army is to be evaluated by using with 2 focus group discussions. The first evaluation is performed by 7 logistics experts from RTA and the second by 7 relevant parties from other sectors.

3.4.8 Step 8: The military logistics model for disaster relief operations (flooding) is improved once again and submitted for the adviser to consider.

Table 3.5 Summary of Research Methodology

Topic	**Research Methodology**	
	Quantitative Research	**Qualitative Research**
Research objectives	1) To investigate the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army	1) To examine the factors affecting the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA

Table 3.5 (Continued)

Topic	**Research Methodology**	
	Quantitative Research	**Qualitative Research**
	2) To examine the factors affecting the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA	2) To develop the military logistics model for disaster relief operations (flooding) of The Royal Thai Army
Methodology	Survey research	1) grounded theory methodology 2) case study
Research tool	1) questionnaire/ secondary	1) interview form/ in-depth interview 2) focus group discussion form/ focus group discussion 3) documentary research/ secondary
Sources of data	Questionnaire (76 copies)	1) books/ academic journals, law, official regulations, relevant studies, dissertations, theses, news coverage, and article in printed media, as well as relevant electronic documents 2) key informants (a total of 16 persons from 3 groups) according to the specific criteria. 3) participants of focus group discussion (a total of 14 persons), 7 of which are logistics experts from RTA and 7 others are relevant parties from other sectors, selected by the specific criteria.

Table 3.5 (Continued)

Topic	**Research Methodology**	
	Quantitative Research	**Qualitative Research**
Objectives of data collection	To investigate the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army and the factors affecting the success of military logistics for military logistics operations for disaster relief operations (flooding) of RTA	1) to investigate and explain the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army 2) to understand the determine the guideline for analyzing the research data 3) to describe, explain, develop, and evaluate the military logistics model for disaster relief operations (Flooding) of The Royal Thai Army
Research tool testing	Content validity/ IOC	Content validity
Data analysis	Descriptive statistics	Content analysis, comparative analysis, and tri-angulation test

3.5 Research Framework

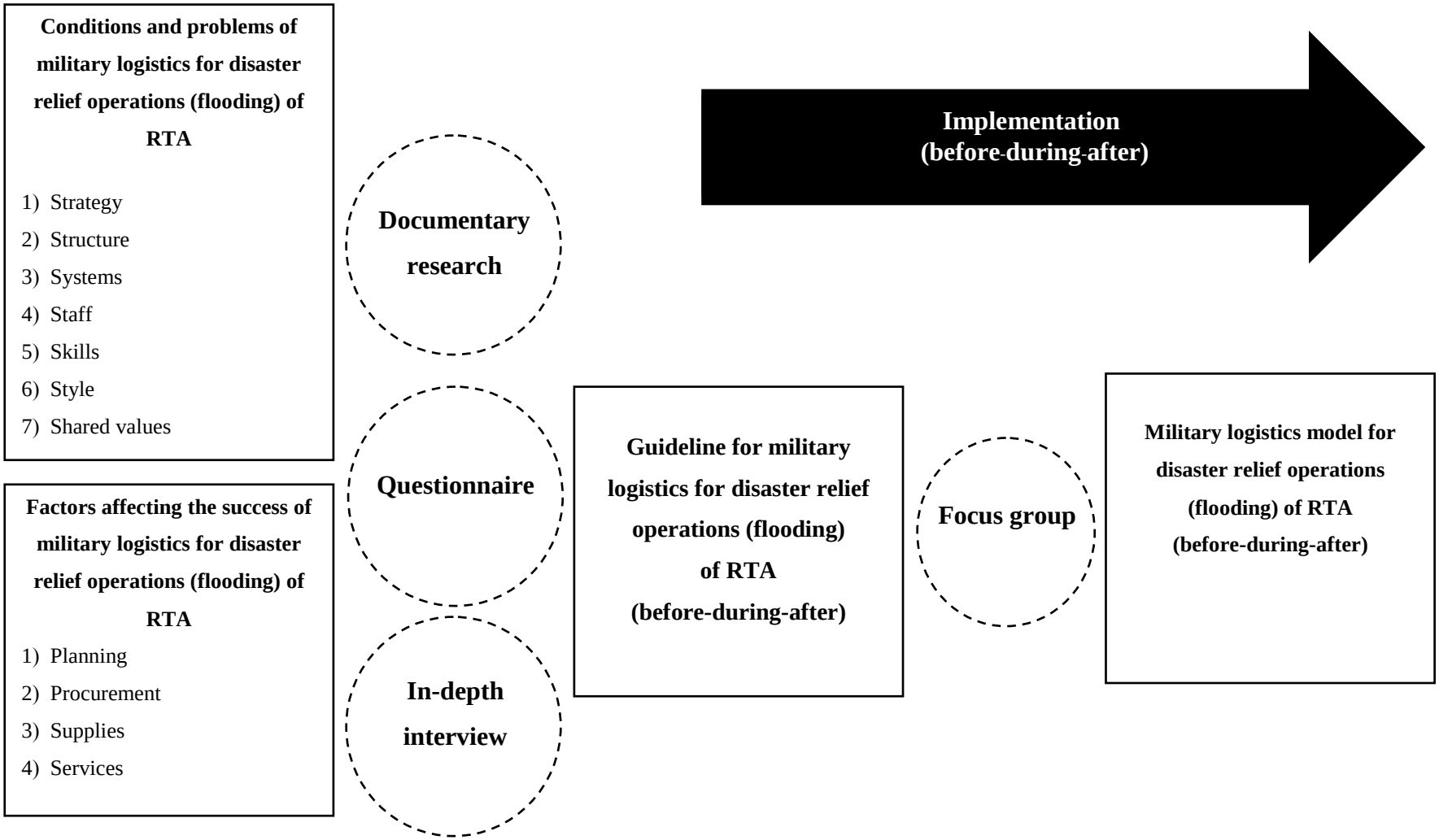

Figure 3.2 Research Framework

CHAPTER 4

RESULTS

The results of the research "Development of Logistics Model for Disaster Relief Operations (Flooding) of The Royal Thai Army" are divided into 4 parts: 1) the overview of disaster relief operations (flooding) of RTA in Bangkok area in 2011, 2) the conditions and problems of logistics in disaster relief operations (flooding) of RTA 3) The factors affecting the success of logistics for disaster relief operations (flooding) of RTA and, 4) the logistics model for disaster relief operations (flooding) of The Royal Thai Army, respectively.

4.1 The Overview of Military Relief Operations (Flooding) of RTA in Bangkok Area in 2011

4.1.1 Normal Situations

(Bangkok Fire and Rescue Department, 2012: 6-9)

Bangkok is located at the downstream basin of the Chao Phraya River close to the Gulf of Thailand. The altitude from the sea level ranges from 0+000 to +1.50 meters. The central areas in the east and south side are lower, ranging from +0.00 to +0.50 meters. Some areas are even lower than the sea level such as Ramkhamhaeng University. With the altitude of the land lower than the control level of the canals and the Chao Phraya River, it is difficult to drain the water with dependence on gravity flow. The water outflow depends mainly on the capacity of water pumping station and canals. However, the capacity of outflow through canals is also limited due to the problem of constructions intruding public canals. Therefore, Bangkok Administration has shifted the prevention and solution of flooding by to the polder system by construction flood preventive barrier around the area to prevent outside water from flowing in while installing water pumps inside the area to drain the flooding water caused by rain to the Chao Phraya River.

The top 3 most affected areas of Bangkok were the north side, the east side, and the west side. On the east side, most of the water flowed from Pathum Thani Province

through Rangsit Canal. Since there had been quite a large volume of flow from the upper area, the barriers at the bank of Raphiphat Canal and Rangsit were broken. The water then flooded into Bangkok, starting from Sai Mai District. Bangkok Administration built temporary barriers along Hok Wa Sai Lang Canal and flood levees according to the Royal Initiatives. The length of the area was about 8.20 kilometers and the height +3.00 meters from the sea level. The barriers could prevent the flood at a certain level. However, with the surface runoff too much more than the capacity of the barriers and unusually high tidal bore, the barriers could not resist the water. In the meantime, the runoff from Don Mueang flowed along Phahon Yothin Road, flooding the districts of Sai Mai, Bang Khen, Khlong Sam Wa, Lat Phrao, and Bueng Kum. On the west side, with a large volume of water from upper area and unusual tidal bore, the water from the Chao Phraya River overflowed Bangkok through Soi Charansanitwong 79/1 and 80 in which there were area owned by private businesses that did not Bangkok Administration to build the permanent barriers, and only the temporary ones constructed. Moreover, there was overbank from Bang Kruai District of Nonthaburi Province, through the southern rail line to soak the entire Bang Phlat District. Around Mahasawat Canal there was a huge volume of runoff from Pathum Thani and Nonthaburi. Most of the water came from the 14 broken water gates and the barriers along the Chao Phraya River in these provinces. More unfortunately, as these areas are lower than the Chao Phraya River, the bank overspill came flooding in the 2 provinces from the west side of the Chao Phraya River and some parts of Bangkok near Mahasawat Canal. In certain areas, the water was higher than the barrier by about 1-1.5 meters. In addition, there was also runoff from Salaya District of Nakhon Pathom Province, which was the main cause of extensive flooding in Thonburi side. The water overflowed the area through Phutthamonthon Sai 4 Road. Lastly, on the north side of Bangkok, the water flowed over the bank of Prapa Canal due to prolonged inundation and damaged bank of the canal. The runoff run over the bank and flowed into Prapa Canal, resulting in the whole districts of Ngamwongwan, Chaeng Watthana, and the areas along Prapa Canal. In most cases, the district of Don Mueang is not affected by flood. In 2011, however, the area was irregularly flooded. After the barriers of Raphiphat Yaek Tok Canal had failed to keep the area safe from the run off from higher area, the water flooded over Rangsit area. Bangkok Administration set up the preventive barriers made of sandbags, from Phahon Yothin Road under Rangsit Canal Bridge to Prapa Canal. However, some Pathum Thani people destroyed the sandbags

under Rangsit Canal Bridge and did not allow the authorities to fix the sandbag barrier. The earthen dyke to the south side of Mueang Ek Village of Pathum Thani Province was broken and collapsed, allowing the water to flow into the areas of Don Mueang, Lak Si, Sai Mai, Chatuchak, and Lat Phrao (Mr. Sanya Chinimit, Focus Group Discussion).

4.1.2 Urgent Disaster Area

Department of Disaster Prevention and Mitigation declared urgent disaster area in Bangkok from 12 October 2011 to 16 January 2012. The declared urgent disaster areas included 42 district of Bangkok i.e. Khlong Toei, Khlong San, Khlong Sam Wa, Khan Na Yao, Chatuchak, Don Mueang, Dusit, Taling Chan, Thawi Watthana, Thon Buri, Bangkok Noi, Bang Khen, Bang Kho Laem, Bang Khae, Bang Sue, Bang Phlat, Phra Nakhon, Phasi Charoen, Min Buri, Yan Nawa, Rat Burana, Lat Krabang, Lat Phrao, Wang Thonglang, Sathon, Sai Mai, Samphanthawong, Nong Chok, Nong Khaem, Lak Si, Din Daeng, Bangkok Yai, Bang Bon, Bueng Kum, Huai Khwang, Bang Khun Thian, Prawet, Bang Kapi, Saphan Sung, Chom Thong, Phayathai, and Suan Luang. The other 8 districts are safe from the flood, including Ratchathewi, Watthana, Bang Rak, Thung Khru, Bang Na, Pathumwan, Pom Prap Sattru Phai, and Phra Khanong (Mr. Montri Chanachaiwibunwat, focus group discussion).

4.1.3 Aids Provided to Flood Victims in 2011 by RTA

The researcher collected the data bout aids provided to flood victims by RTA by using an in-depth interview from top level supervisors of RTA who performed their duties during such period. The interviewees are 1) Gen Prayuth Chan-ocha, Commander in Chief, RTA and Commander of ADRC, whose interview was on 20 January 2015, and 2) LTG Phalawut Klapcharoen, Director of Civil Affairs and Head of Civil Affairs of ADRC, whose interview was on 11 February 2015. The first informant gave details about the policy and scope of work of RTA in the disaster mitigation operations while the second about the RTA disaster relief operations (flooding) in Bangkok in 2011.

The first informant stated that helping the flood victims is one of the important tasks of RTA because the army is ready and has the capacity in term of manpower, equipment, tools, and vehicles for helping the victims in a timely and effective

manner. RTA has always trusted and accepted by other government agencies and the public. The disaster relief implementations in Thailand are mainly in charge of Department of Disaster Prevention and Mitigation, Ministry of Interior, with supports from other agencies. Ministry of Defence is one of the ministries that provide manpower and equipment support for disaster mitigation operations of the country. For this matter, Ministry of Defence has established disaster relief centers at every level, starting from Ministry of Defence itself, Royal Thai Armed Forces Headquarters, and Armed Forces level. According to the Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011), responsibilities are assigned to army units at every part of the country to help the victims immediately upon the occurrence of an event. RTA has established the Army Disaster Relief Center (ADRC) and assigned 9 Support Service Departments and 6 Special Affairs Departments to function as the support units during the disaster operations. There are also disaster relief centers at the 4 Army Areas, functioning as the subordinate unit in the disaster mitigation operations. The civilian assistance companies responsible at the district level in normal situation are the operation units. There are also 4 companies under the Development Division functioning as the support units of the Army Area Disaster Relief Centers. Disaster Relief Centers at each level shall operate in accordance with the main responsible unit in disaster prevention and mitigation. For example, at the level of Army Area, Disaster Relief Centers shall coordinate with regional disaster prevention and mitigation office while at the division level shall coordinate with the provincial disaster prevention and mitigation office.

For the practice guideline of disaster mitigation operations by RTA, the first informant divided it into 3 steps; preparation, response, and reconstruction. Preparation refers to the process before occurrence of disasters. Major actions are such as preparations of manpower, equipment, tools, and communication kits to be readily available when a disaster occurs. The manpower assigned at the preparation step include the infantry company which can perform 3 different functions; battle, national security, and humanitarian assistance. The action plan is prepared in collaboration with civilian agencies. Training was also organized so that staffs develop important skills and operate in the same direction and that the aids are fast and effective. Monitoring centers are established at every level of military units

nationwide to watch out for the disaster and warn the citizens. The same monitoring centers have to also keep track of the overall situations of the country with the Civil Affairs Department of ADRC to link the data with relevant agencies. Secondly, in the response step when a disaster happens or is about to happen, the responsible units in each area shall address the situation and relieve the disaster quickly and systematically to minimize the hazard and damage to lives and properties of the people. The first things that need to be done are the communication channel and mobile medical units to attend to the injured, distribution of relief supply bags, necessary kits that keep the victims alive until the situation is improved. The other missions are upon request of civilian agencies. Lastly, the reconstruction step involves the rehabilitation after the disaster is over. Reconstruction is meant to relieve the victims at the primary stage in a systematic, thorough, quick, continuous, and effective manner. The operation includes sending maintenance staff to repair infrastructure and public facilities according to the capacity or as requested by provincial organizations. The primary goal of reconstruction is to recover the environment to normal situation as quickly as possible. Other tasks may include distribution of supplies, mental rehabilitation for the victims, especially children, and other support operations as requested by civilian agencies.

In addition, the first informant also mentioned the preparation of RTA for disaster operations in ASEAN region according to the ASEAN Agreement on Disaster Management and Emergency Response (ADDMER). He added that ADRC has prepared for humanitarian operations and other disaster mitigation operations in other countries affected by disaster. Training has been conducted with other countries to develop the skill and operate in the same direction. Experiences have been shared among the member countries about the disaster mitigation operations.

The second informant described the details about the RTA disaster relief operations (flooding) in Bangkok in 2011. He explained that the disaster mitigation operations by RTA are acted on behalf of ADRC and implemented under the framework defined by the Ministry of Defence's Disaster Relief Plan and Disaster Relief Center of Armed Forces. The organic units at every level of RTA establish a disaster relief center. Their responsibilities are divided from such as larger scale as a district to a smaller scale as a village. In every area, there must be a responsible unit

that strictly holds on to the policy and practice guideline of the Commander in Chief of RTA, which is to send the aids as soon as there is a disaster harming lives and properties of the people. In the flooding event of 2011, in the first stage, the situations went worse than what the civilian agencies could handle. The government therefore asked RTA to take responsibility, especially the integrated operation to address the flood in 5 provinces i.e. Nakhon Sawan, Phra Nakhon Si Ayutthaya, Lop Buri, Nonthaburi, and Pathumthani. However, the main responsible authority lay with the provincial governors. Later, when the flood moved downward to Bangkok Metropolitan, RTA coordinated with other armies continuously to prevent flooding in Bangkok. The army was assigned to be in charge of 43 districts out of 50 of Bangkok in order to help the flood victims. The operations were divided into 2 types: 1) to follow the order of the government, acted by the Flood Relief Operations Center, and 2) the management initiated by the army itself. The missions that the government, acted by Flood Relief Operations Center, assigned to RTA included construction of water barriers to help the affected areas of 5 provinces. These also included the protection of 5 industrial parks, repair of Bang Chomsi Water Gate, water barrier of Chainat – Ayutthaya Canal with the distance of 207 meters, construction of barriers in 4 critical areas, starting from Raphiphat Yaek Tok Canal, Rangsit area from Chulalongkorn Water Gate to Khlong 8 Canal, from Klong 8 Canal to Khlong Hok Wa Sai Lang Canal, and the areas of Lak Hok, Mueang Ek, with the total distance of 38.2 kilometers. Some other preventive measures were excavation of 3 shortcut canals of the Tha Chin River, the operation to dispose of water hyacinth and weeds near Sam Sen Water Treatment Center, as well as other canals and water gates. The Royal Palaces and other palaces were also protected. Big-bags (sandbags) were used to build high walls along Local Road to prevent the water from flooding Bangkok area, starting from the junction of Rangsit Canal, Chulalonglongkorn Water Gate, to the entrance of the Royal Thai Air Force Headquarters. The big-bags were also used to build a sandbag wall around Don Muang Airport and Vibhavadi Road to recover the airport. The second type of operations is the one initiated by RTA itself. The civilian assistance operations were divided 4 main groups: 1) water management, 2) public assistance, 3) flood victim supports, 4) operations integration to strengthen every sector. First of all, for water management, RTA built the water preventive barrier

around Bang Chan Industrial Park and Lat Krabang Industrial Park. Manpower and equipment were gathered to build the wall inside the industrial parks. The wall was reinforced with piling to prevent the slide of the moats. Security guards were set up for round-the-clock surveillance, especially looking for the leak, repair, canal digging, removal of water hyacinth and other objects blocking the watercourse. There was also the public relation and assistance for the communities around the industrial parks. Secondly, for the public assistance operations, ADRC combines the forces of 181 companies, with the total of 50,258 staffs to evacuate the people to safe areas, their hometown, or temporary shelters provided at government offices and charity organizations. There were 5 temporary shelters provided by RTA, with the capacity to accommodate 9,850 people. At the peak of the crisis, 7,000 people used these shelters. The RTA staffs and their family members stayed at 8 separate shelters, with the total capacity of 1,200 people. During the peak of the crisis, around 1,000 people used these shelters. Thirdly, in the flood victim support operation, RTA facilitated traffic by lending vehicles of the army, including trucks and boats, in the areas that other vehicles could not go. RTA provided the vehicles for people in the area with high level of water in Bangkok Metropolitan in 12 routes, and additional 218 routes for travelling to their communities. The total vehicles used were 435 trucks and 64 boats. The transportation mission was also supported by other private and public organizations. From the first day on 28 October 2011, there were more than 140,000 people / day using the service. The total count was 7,980,000 trips. In addition, the Royal Kitchen also provided food and drinking water. From 1-17 November 2011, the Kitchen provided 6,000 packs / day to monks and people in Bang Phlat District. Also, RTA in collaboration with government agencies and private businesses supplied fresh food to the flood victims. The army established mobile kitchens and kitchen personnel to make food for the people 2 meals a day, with the total of 24,000 boxes per meal. The mobile kitchen also distributed about 45,000 of food boxes per day. The total count was about 1,125,000 boxes. On 23 November 2011, RTA organized 10 field kitchens called “RTA Royal Kitchen” to cook food and distribute it to the victims who suffered from difficult commute and could not cook their own food, waiting for help from other aid agencies. Each field kitchen could make 3,000 boxes. The cook was in collaboration between RTA, private, and public organizations. The food

distribution also attracted the generous helps from general public. This reflected the love, unity, and cooperation from every party. Local administrations and community leaders were responsible for receiving the distributed food and other supplies. The announcement was made to that they were aware of the distribution. The distribution spots were allocated. The important thing to consider is the equal distribution and to avoid double receivers. In addition, RTA also took advantage of this channel to magnify the effect of operation by giving the receivers also the EM balls so that the people used them to treat the water in the affected areas. For medical service, medical staffs from hospitals nationwide under RTA were called in to support the operation of public hospitals, National Institute of Emergency Medicine, and 19 mobile medical units in addition to the medical units of RTA operating in Bangkok Metropolitan. The total patient was around 200,000 people. For the security of the area, RTA allocated manpower to patrol together with the police to take care of the properties of the people. Around 200 military policemen were assigned to patrol in many areas, especially in critical areas. RTA together with Bangkok Administration and Ministry of Education planned to build 71 wooden bridges to facilitate people in 19 districts of Bangkok. In order to soothe the victims, 46 sets of soothers were sent to the temporary shelters and communities. The jobs of soothers were to organize the activities to relieve their stress and explain the role and missions of RTA. The important equipment and tools sent to support the victims included 4,508 trucks, 2,765 motor boats, and many supplies. Fourthly, in the operations integration to strengthen every sector, RTA placed emphasis on strengthening government agencies and local leaders i.e. directors of districts, MPs, Members of Bangkok Metropolitan Council, Members of District Council, and community leaders. RTA functioned as the main coordinator. The operation was integrated. There was an establishment of mutual coordination points among the responsible units at the battalion level at District Offices and the center of the community. Other missions also include taking advantage of vehicle and tools for disaster prevention and mitigation, patrol and surveillance on the risky area, distribution of supplies and commodities, waste management to relieve polluted water problem, and water treatment using EM at the flooded area or canals when the flood is about to end. RTA prepared manpower, equipment, and tools for reconstruction. For environmental reconditioning, EM liquid

and EM balls were used at the flooded area and canals. To support the board designated by the government and mechanism of rehabilitating the victims, Ministry of Defence established a center for this support operation. The manpower for this mission include 41 disaster relief companies, 21 special engineering companies, 377 teams of military engineers, accompanied by 20 teams of mobile medical unit. In addition, a team of soothers also joined the mobile medical units. The supports in term of equipment included the provision of transport trucks and ordnance trucks, with the total of 1,145, aas well as other equipment. The manpower and equipment were ready to operate upon the direct order from the government. In addition, RTA also prepared the plan for management of 35 basins up the Chao Phraya River as well as canal and rivers in Bangkok Metropolitan.

4.2 The Conditions and Problems of Logistics in Disaster Relief Operations (Flooding) of The Royal Thai Army

The researcher employed mixed methodology between survey research and quality research as the approach for investigating the conditions and problems of logistics in disaster relief operations (flooding) of RTA. For the survey research, a questionnaire was used as a research tool. The questionnaire was distributed to samples which were logistics personnel at the Army Disaster Relief Center who worked during the Great Flood of 2011. The total of 83 questionnaire copies was returned. Out of the 83 copies, only 76 were complete and could be analyzed (79.16% of all the questionnaire copies). The results of the analysis are as showed in Table 4.1.

Table 4.1 General Information of the Questionnaire Informants (n=76)

Detail	**Quantity**	**Percent**
Gender		
Male	59	77.60
Female	17	22.40
Age (average = 47.71±5.56 years old)		

Table 4.1 (Continued)

Detail	Quantity	Percent
< 40 years old	11	14.48
40-49 years old	27	35.52
> 50 years old	38	50.00
Education		
Bachelor's degree	50	65.80
Master's degree	26	34.20
Work experience (average = 7.26±3.49 years)		
< 5 years	19	25.00
5-10 years	46	60.52
> 10 years	11	14.48

According to Table 4.1, most informants were male (77.60%), aged 47.71±5.56 by average. The majority of the informants were older than 50, followed by 40-49, and below 40, respectively. Most of them held a bachelor's degree (65.80%), had the average work experience of 7.26±3.49 years. The majority of the informants had the work experience of 5-10 years, followed by below 5 years, and above 10 years, respectively.

Regarding the conditions and problems of logistics in disaster relief operations (flooding) of RTA, the researcher investigated from management principles that can be used to increase the operation performance according to McKinsey 7-S Framework which consists of 7 interrelated factors; 1) structure, 2) strategy, 3) systems, 4) staff, 5) skill, 6) style, and 7) shared values/superordinate goals. The researcher interpreted the meaning from the average of such principle based on the following criteria:

1) Average 8.21-10.00 refers to the events or operations that reflect the reality at the level of the highest.

2) Average 6.41-8.20 refers to the events or operations that reflect the reality at the level of high.

3) Average 4.41-6.40 refers to the events or operations that reflect the reality at the level of medium.

4) Average 2.21-4.40 refers to the events or operations that reflect the reality at the level of low.

5) Average 1.00-2.20 refers to the events or operations that reflect the reality at the level of the lowest.

Table 4.2 The Conditions and Problems of Logistics in Disaster Relief Operations (Flooding) of RTA in Term of Structure (n = 76)

Structure	Average	STD	Interpretation	No.
1) The main focus is on the operation result and freedom to make a decision	7.33	1.59	high	1
2) Structure is reorganized and order of report is shortened to effectively support internal and external changes.	7.32	1.25	High	2
3) The internal communication of the organization is effective enough to make the staffs thoroughly aware of the news and information, as well as the trajectory of the organization.	7.30	1.64	High	3
4) The scope of work is clearly defined and easily understandable.	7.28	1.76	High	4
5) Responsibilities are divided based on expertise of human resources in every mission.	7.26	1.72	High	5

Table 4.2 (Continued)

Structure	Average	STD	Interpretation	No.
6) Operations are strictly conforming to the written regulations.	7.24	1.59	High	6
7) The structure is reorganized according to the situation of the disaster for the achievement of the objectives.	7.18	1.47	High	7

According to Table 4.2, the overall conditions and problems of logistics in disaster relief operations (flooding) of RTA in term of structure were at the level of high. The topic that received the highest average was "The main focus is on the operation result and freedom to make a decision" (average = 7.33$\pm$1.59, high), followed by "Structure is reorganized and order of report is shortened to effectively support internal and external changes" (average = 7.32$\pm$1.25, high). The other topics had the average at the level of high. The topic that had the lowest average is "The structure is reorganized according to the situation of the disaster for the achievement of the objectives" (average = 7.18$\pm$1.47, high). These results agree with the structural changes of ADRC during the first stage of the flood where the operations were rather slow and could not satisfy the situation in an effective manner.

Table 4.3 The Conditions and Problems of Logistics in Disaster Relief Operations (Flooding) of RTA in Term of Strategy (n = 76)

Strategy	Average	STD	Interpretation	No.
1) Action plans are always made to agree with the implementation of the strategic plan	7.47	1.39	high	1

Table 4.3 (Continued)

Strategy	Average	STD	Interpretation	No.
2) The policy, goal, trajectory, and strategic plan are set to agree with the problems and relevant to the context.	7.46	1.37	high	2
3) The strategic plan of the organization is developed and improved for the practical implementation.	7.46	1.45	high	3
4) The implementation results are monitored, supervised, controlled, and evaluated according to the strategic plan in order to measure the progress and use for solving problems.	7.37	1.59	high	4
5) The internal and external contexts of the organization are constantly analyzed to improve the strategic plan and implementation approach.	7.34	1.48	high	5
6) The policy and strategy of the organized is communicated to the staff throughout the organization.	7.33	1.46	high	6
7) The strategic plan is constantly reviewed.	7.22	1.52	high	7

According to Table 4.3, the overall conditions and problems of logistics in disaster relief operations (flooding) of RTA in term of strategy were at the level of high. The topic that received the highest average was "Action plans are always made to agree with the implementation of the strategic plan" (average = 7.47$\pm$1.39, high),

followed by "The policy, goal, trajectory, and strategic plan are set to agree with the problems and relevant to the context" (average = 7.46±1.37, high). The other topics had the average at the level of high. The topic that had the lowest average is "The strategic plan is constantly reviewed" (average = 7.22±1.52, high).

Table 4.4 The Conditions and Problems of Logistics in Disaster Relief Operations (Flooding) of RTA in Term of Systems (n = 76)

Systems	Average	STD	Interpretation	No.
1) Operation process of the organization agrees with the strategy of the organization in every dimension.	7.55	1.73	high	1
2) There is a system to inspect and review the operation of the personnel in the organization effectively.	7.50	1.49	high	2
3) The operation evaluation system is clear, open, transparent, and fair for all personnel.	7.45	1.55	high	3
4) The organization can integrate the operation systems effectively.	7.42	1.65	high	4
5) There is a system to measure, analyze, and manage modern knowledge suitable for new situations.	7.30	1.47	high	5
6) Modern IT systems that can effectively support the operations are introduced.	7.24	1.71	high	6

Table 4.4 (Continued)

Systems	Average	STD	Interpretation	No.
7) There is an inventory system that satisfies that fast-changing organization.	7.19	1.56	high	7

According to Table 4.4, the overall conditions and problems of logistics in disaster relief operations (flooding) of RTA in term of systems were at the level of high. The topic that received the highest average was "Operation process of the organization agrees with the strategy of the organization in every dimension" (average = 7.55±1.73, high), followed by "There is a system to inspect and review the operation of the personnel in the organization effectively" (average = 7.50±1.49, high). The other topics had the average at the level of high. The topic that had the lowest average is "There is an inventory system that satisfies that fast-changing organization" (average = 7.19±1.56, high). This is due to the limitations of law, policy, and relevant regulations about logistics in disaster relief operations (flooding) of RTA that lack flexibility in real practice in the flooded area. The advance money that Ministry of Defence receives is limited, both in term of the quantity and type of supports. Moreover, relevant regulations are also obsolete and cannot satisfy the demand of the actual situation in different areas.

Table 4.5 The Conditions and Problems of Logistics in Disaster Relief Operations (Flooding) of RTA in Term of Staff (n = 76)

Staff	Average	STD	Interpretation	No.
1) The policy and role of human resource management are clearly defined in writing.	7.51	1.59	high	1
2)There is a comprehensive personnel database for such	7.41	1.63	high	2

Table 4.5 (Continued)

Staff	Average	STD	Interpretation	No.
operations as manpower planning, recruitment, selection, putting staff to a position, and human resource development.				
3) Personnel learning system is created in many forms such as training, library, internet access, journals, and books sufficiently provided.	7.18	1.75	high	3
4) Staffs' knowledge and experience are developed and exchanged constantly.	7.16	1.67	high	4
5) The number of manpower is set for a task suitably based on their skills and knowledge.	7.11	1.96	high	5
6) There is an operation manual with complete, understandable, and practical details.	7.01	1.72	high	6

According to Table 4.5, the overall conditions and problems of logistics in disaster relief operations (flooding) of RTA in term of staff were at the level of high. The topic that received the highest average was "The policy and role of human resource management are clearly defined in writing" (average = 7.51 ± 1.59, high), followed by "There is a comprehensive personnel database for such operations as manpower planning, recruitment, selection, putting staff to a position, and human resource development" (average = 7.41 ± 1.63, high). The other topics had the average at the level of high. The topic that had the lowest average is "There is an operation manual with complete, understandable, and practical details". The results agreed with the qualitative research. In other words, RTA did not have a military doctrine or a

logistics manual for disaster mitigation operations which is modern and practical to the situation to be used as the operation guideline for staff to study and follow.

Table 4.6 The Conditions and Problems of Logistics in Disaster Relief Operations (Flooding) of RTA in Term of Skills (n = 76)

Skills	Average	STD	Interpretation	No.
1) Staffs can use information technology for operation effectively.	8.28	1.57	highest	1
2) The skill quality of staff is improved to be ready for changes.	7.39	1.47	high	2
3) Staffs know how to use the tools, the techniques, and method of operations.	7.36	1.53	high	3
4) Staffs have the teamwork skill, are complimented and awarded for good performance.	7.21	1.78	high	4
5) Staffs at different positions can replace the position of others.	7.12	1.83	high	5
6) Staffs have the knowledge, skills, and potentials that matched the assigned tasks.	7.09	1.93	high	6

According to Table 4.6, the overall conditions and problems of logistics in disaster relief operations (flooding) of RTA in term of skills were at the level of high. The topic that received the highest average was "Staffs can use information technology for operation effectively" (average = 8.28$\pm$1.57, highest), followed by "The skill quality of staff is improved to be ready for changes" (average = 7.39$\pm$1.53, high). The other topics had the average at the level of high. The topic that had the

lowest average is “Staffs have the knowledge, skills, and potentials that matched the assigned tasks” (average = 7.09±1.93, high). This is because of the conditions and problems of logistics in disaster relief operations (flooding) of RTA in term of staff still lack a military doctrine or a logistics manual for disaster mitigation operations which is modern and practical to the situation and relevant staffs also lack the skills for operation in huge scale and prolonged disasters.

Table 4.7 The Conditions and Problems of Logistics in Disaster Relief Operations (Flooding) of RTA in Term of Style (n = 76)

Style	Average	STD	Interpretation	No.
1) The supervisors perform their duties based on the regulations.	7.58	1.31	high	1
2) The supervisors give the opportunity for inferiors to share their opinions about the operations at the suitable time.	7.50	1.47	high	2
3) The supervisors are committed to directing the operation and motivating mutual vision in the organization.	7.47	1.39	high	3
4) The supervisors clearly communicate the policy, goal, and trajectory to the staffs.	7.34	1.47	high	4
5) The supervisors’ style of management is to use orders.	7.24	1.59	high	5
6) The supervisors set the policy, goal, structure, management, and approach of operation, as well as the vision that relates to the context in a concrete way.	7.17	1.68	high	6

According to Table 4.7, the overall conditions and problems of logistics in disaster relief operations (flooding) of RTA in term of style were at the level of high. The topic that received the highest average was "The supervisors perform their duties based on the regulations" (average = 7.58±1.31, highest), followed by "The supervisors give the opportunity for inferiors to share their opinions about the operations at the suitable time" (average = 7.50±1.47, high). The other topics had the average at the level of high. The topic that had the lowest average is "The supervisors set the policy, goal, structure, management, and approach of operation, as well as the vision that relates to the context in a concrete way" (average = 7.17±1.68, high). This is because the logistics for disaster relief operations of RTA is usually based on Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011) and the incident action plan (IAP). Therefore, the supervisors have rather low chance to set the policy, goal, structure, management, and approach of operations as well as the vision.

Table 4.8 The Conditions and Problems of Logistics in Disaster Relief Operations (Flooding) of RTA in Term of Shared values (n = 76)

Shared values	Average	STD	Interpretation	No.
1) The shared values are instructed to all levels of staffs.	8.42	2.45	highest	1
2) The shared values apply to the changing situation and all staffs in the organization understand the shared values.	7.22	1.48	high	2
3) The shared values are reflected in the forms of slogan to make it easier to remember and practice.	7.19	1.47	high	3
4) The organization culture affects the behaviors and encourages the staff to perform their jobs effectively.	7.14	1.83	high	4

According to Table 4.8, the overall conditions and problems of logistics in disaster relief operations (flooding) of RTA in term of shared values were at the level of high. The topic that received the highest average was "The shared values are instructed to all levels of staffs" (average = 8.42±2.45, highest), followed by "The shared values apply to the changing situation and all staffs in the organization understand the shared values" (average = 7.22±1.48, high). The other topics had the average at the level of high. The topic that had the lowest average is "The organization culture affects the behaviors and encourages the staff to perform their jobs effectively" (average = 7.14±1.48, high). The topics that had the highest average could be the consequence of the identity of soldier profession that emphasizes on their performance according to Soldier Discipline Act B.E. 2476 (1933). The topics that had the lowest average could be because the change made directly or indirectly by the supervisors during such period of time regularly.

For the qualitative research, the researcher relied on grounded theory methodology together with a case study. The study tools were documentary research and in-depth interview. The results helped fulfill the explanation of the conditions and problems of logistics in disaster relief operations (flooding) of RTA in the preparation and reconstruction process that they are similar to those in normal situations. The results agreed with RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army . RTA on behalf of Ministry of Defence only plays a role as supporter in the civil operations according to the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014). Therefore, the supports provided by RTA needs to first be requested from civilian agencies. That explains why the conditions of logistics in disaster relief operations (flooding) of RTA in the preparation and reconstruction process are similar to that in normal situations. On the other hand, logistics in disaster relief operations (flooding) of RTA in the event of the 2011 flood will initiate only when the severity level is at least 3, which is more than the capacity of civilian agencies to help the victims, and when Department of Disaster Prevention and Mitigation declares as the emergency disaster area. Otherwise, RTA will not be able to help the people and launch the logistics operations according to Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004) and its revised editions (Table 4.9).

Table 4.9 Summary of Logistics for Disaster Mitigation Operations (Flooding) of RTA in 2011

Step	Action Plan	Implementation term	Action/activity	Responsible agencies	Supports from RTA		Logistics type
					Military units	Job description	
Preparation	Flood prevention plan/ incident action plan	Short-term	1) Help civilians move their properties 2) Preparation to prevent the areas 3) Supports from government organizations and local administrative organizations	1) Agencies of Ministry of Interior 2) Local administrative organizations	1) Internal Security Operations Command 2) Armed Forces' Disaster Mitigation Center 3) Military units in the area	1) Provide equipment support according to the capacity of the agency 2) Prepare the assistance plan since the normal situation	Logistics in normal situations
		Long-term	1) Reforestation, building weirs to reduce the current speed, providing relevant knowledge, and	1) Relevant ministries e.g. Ministry of Agriculture and Cooperatives, 2) Government	1) Internal Security Operations Command 2) Armed Forces' Disaster	1) Follow RTA policy 2) Support government policy such as canal dredging	Logistics in normal situations

Table 4.9 (Continued)

Step	Action Plan	Implementation term	Action/activity	Responsible agencies	Supports from RTA		Logistics type
					Military units	Job description	
			prevention of deforestation 2) Supports from other government agencies	agencies in the area	Mitigation Center 3) Military units in the area 4) Units assigned by RTA		
Response	Flood prevention plan/ incident action plan	Short-term	1) Helping victims of emergency disaster 2) Supporting other agencies	1) Agencies of Ministry of Interior 2) Local administrative organizations 3) Government agencies in the area	1) Internal Security Operations Command 2) Armed Forces' Disaster Mitigation Center 3) Military units in the area	1) Support in term of equipment and manpower for urgent aid to the victims 2) Support in term of equipment and manpower as requested	Logistics in normal situation and disaster logistics

Table 4.9 (Continued)

Step	Action Plan	Implementation term	Action/activity	Responsible agencies	Supports from RTA		Logistics type
					Military units	Job description	
		Long-term		1) Agencies of Ministry of Interior 2) Local administrative organizations 3) Government agencies in the area	1) Internal Security Operations Command 2) Armed Forces' Disaster Mitigation Center 3) Military units in the area	Support in term of equipment and manpower as requested	Logistics in normal situations and disaster logistics
Reconstruction	Flood prevention plan/ incident action plan	Short-term	Provide manpower or construction support as commanded by superordinate unit	1) Agencies of Ministry of Interior 2) Local administrative organizations 3) Government agencies in the area	1) Internal Security Operations Command 2) Disaster Mitigation Center of Army Area or higher	Support other agencies as commanded by superordinate units such as short-time or urgent construction or repairs	Logistics in normal situations

Table 4.9 (Continued)

Step	Action Plan	Implementation term	Action/activity	Responsible agencies	Supports from RTA		Logistics type
					Military units	**Job description**	
		Long-term	Provide manpower or construction support as commanded by superordinate unit	1) Agencies of Ministry of Interior 2) Local administrative organizations 3) Government agencies in the area	1) Internal Security Operations Command 2) Army Disaster Relief Center 3) Units assigned by RTA	Support other agencies as commanded by superordinate units such as helping flood victims in the southern region	Logistics in normal situations

In addition, the researcher also found that logistics in disaster relief operations (flooding) of RTA in systematically related to the Strategic Response Plan B.E. 2557 -2561 (2014-2018). According to the Strategic Response Plan, Ministry of Defence plays a role as the support provider for the operations of Ministry of Interior. That explains why logistics operations of RTA in times of disaster are primarily based on Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011). LTG Supphakon Sanguanchatsonkrai emphasized the relationship and the approach of logistics in disaster relief operations (flooding) that it is the same as logistics operation in normal situations despite minor differences in detail according to relevant official regulations.

> The government made the Strategic Response Plan B.E. 2557-2561 (2014-2018) so that government agencies use as the framework for making strategies, approaches, measures, as well as action plans for emergency management. The focus is on the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014) for which Ministry of Interior is the host, and the Synergetic Manpower and Resources for National Defense Plan B.E. 2552 (2009) for which Ministry of Defence is the host. The Synergetic Manpower and Resources for National Defense Plan B.E. 2552 (2009) will be used only when the country is at war…logistics operations are still run as normal, but there are minor differences in details

As discussed above, it is noted that logistics in disaster relief operations (flooding) of RTA in 2011 is an essential part of Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011) which define the operation approaches clearly, systematically, consistently with the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014) (Figure 4.1).

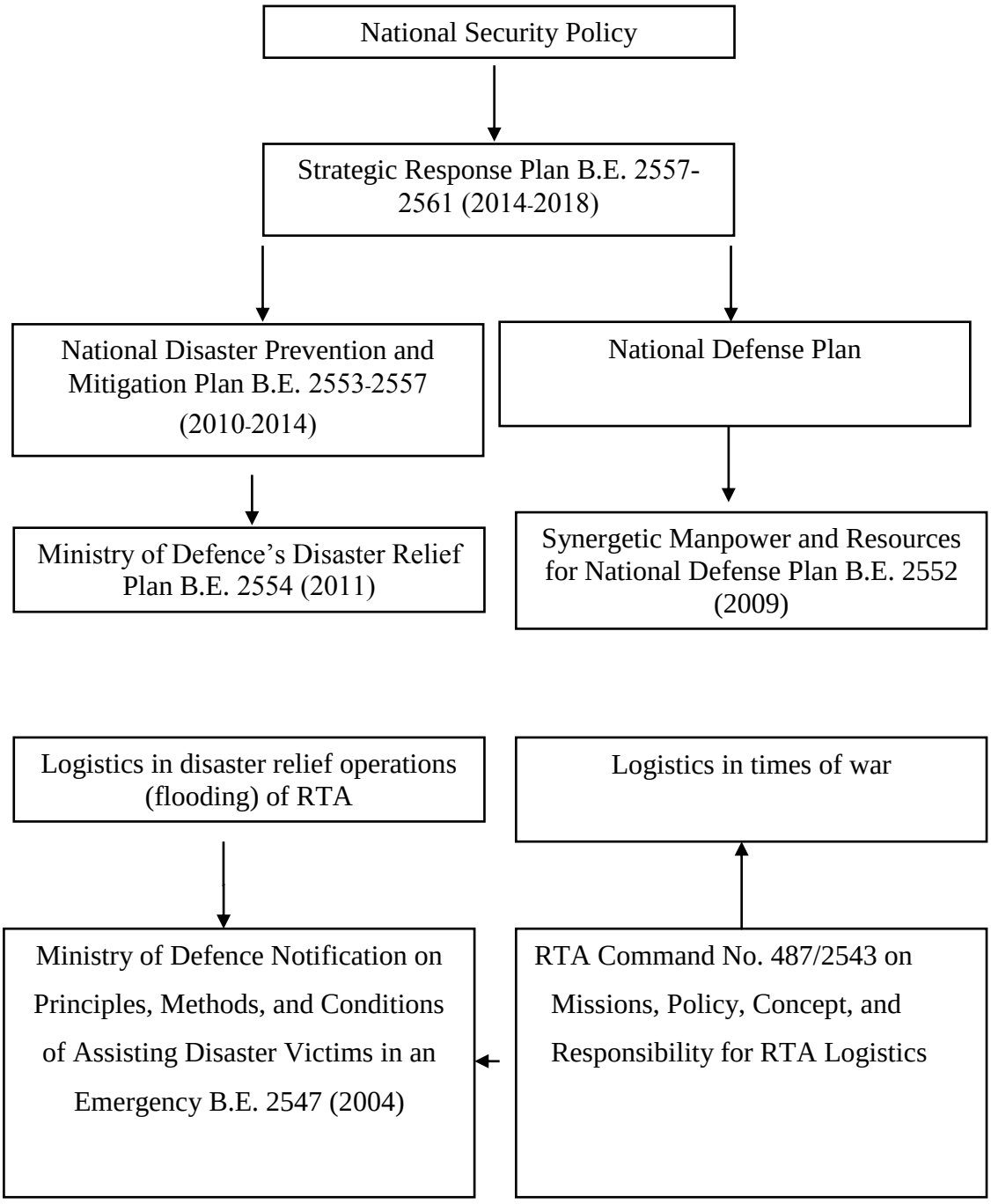

Figure 4.1 The Relationship between Logistics in Disaster Relief Operations (Flooding) of RTA and Strategic Response Plan B.E. 2557-2561 (2014-2018)

The data were collected by in-depth interview with 3 groups of informants (a total of 16 persons): 1) top level supervisors of RTA (6 persons), 2) heads of logistics

division of ADRC (5 persons), and 3) unit commanders or logistics officers (5 persons) assigned to be in charge of 42 districts of Bangkok declared in 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior. It was found that by overall each informant or group of informants provided the data in the same way. That is to say, logistics in disaster relief operations (flooding) of RTA in 2011 consisted of 2 parts: to follow the order of the government and 2) the management initiated by the army itself. The operations involved 2 main task: 1) support the evacuation of victims to safe areas, their hometown, or temporary shelters provided at government offices and charity organizations, and 2) facilitating traffic by lending vehicles of the army, including trucks and boats, in the areas that other vehicles could not go and the vehicles for people in the areas with high level of water in main routes of Bangkok Metropolitan and minor routes for travelling to their communities. In addition, the Royal Kitchen also provided food and drinking water. By working with government agencies and private organizations, RTA also supplied fresh food to the flood victims. The army established mobile kitchens and cooks to make food for the people. For medical service, medical staffs from hospitals nationwide under RTA were called in to support the operation of public hospitals, National Institute of Emergency Medicine, and 19 mobile medical units in addition to the medical units of RTA operating in Bangkok Metropolitan.

However, in October 2011, the flood crisis became intensified to level 4, the highest severity level as defined in National Disaster Prevention and Mitigation Plan B.E. 2553–2557 (2010–2014). The government assigned Ministry of Defence and Ministry of Interior to be the main agency to address the situation. Armed Forces were also allowed to request additional budget to support the victims as necessary. The severity of the flood crisis at the time made logistics in disaster relief operations (flooding) of RTA inflexible and unable to handle the flood effectively. Logistics Division of ADRC decided to restructure the organization for the logistics chain at the level of inventory of Army Support Service Department. The restructured organization consisted of 3 logistics headquarters. First of all, at 12.00 p.m. on 9 October 2011, a logistics center was established. Its function was to coordinate the logistics activities to support ADRC. The logistics center was under control by Transportation Department. Secondly, at 12.00 p.m. on 10 October 2011, a food and

facilities center was founded. Its functions included provision of food and facilities to support ADRC. The Quartermaster General Department was in charge of this center. Thirdly, at 08.00 a.m. on 13 October 2011, a medical coordination center was established to support ADRC. Medical Department of RTA was the responsible organization. In the meantime, the normal structure of management also ran as usual to help the flood victims (Figure 4.2).

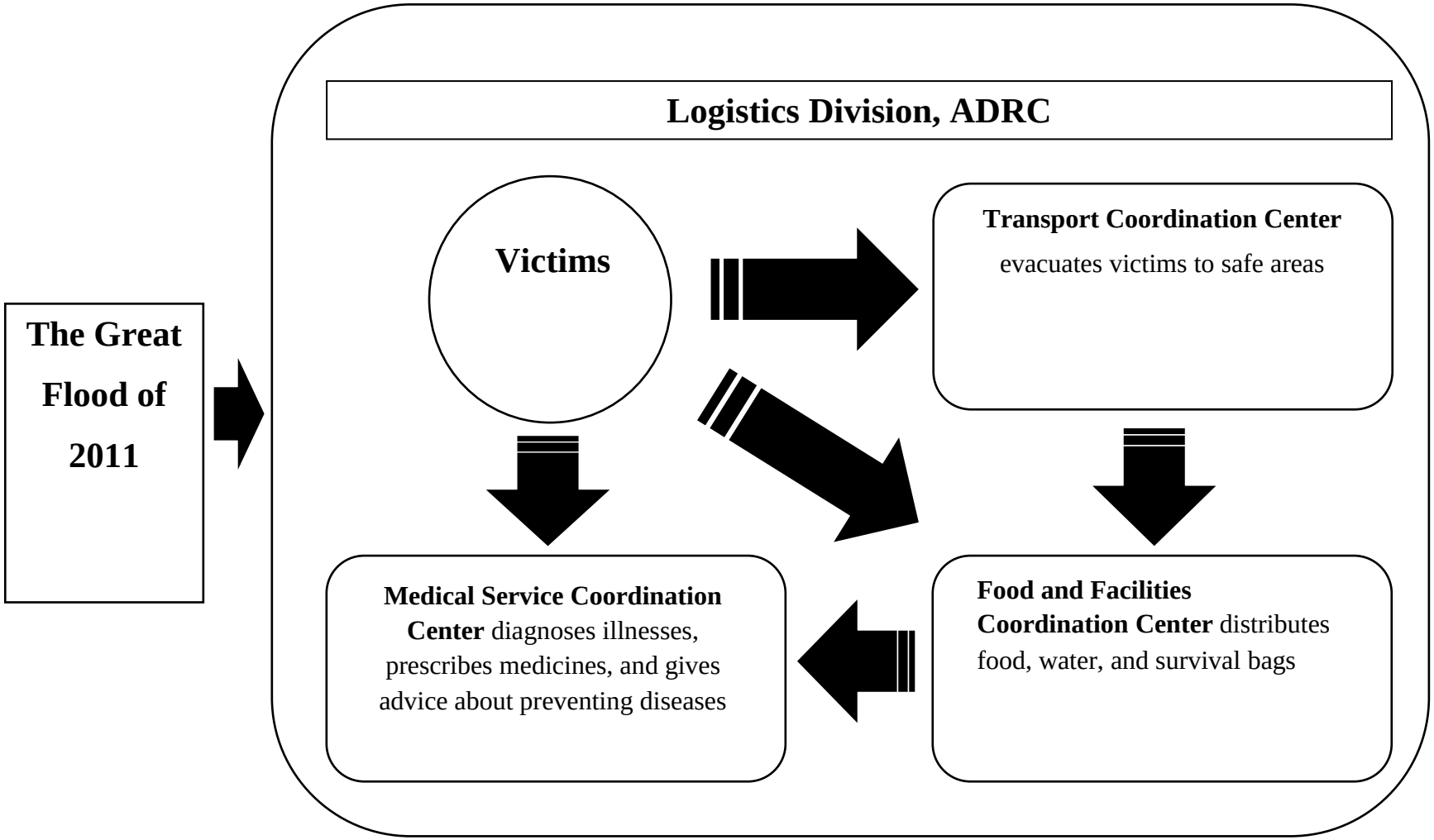

Figure 4.2 Logistics for Disaster Mitigation Operations (Flooding) of RTA in the Response Step in October 2011

According to Figure 4.2, after the flood hit Bangkok in October 2011 and Department of Disaster Prevention and Mitigation announced the emergency disaster area, logistics activities in disaster relief operations (flooding) of RTA started from evacuating people from the affected areas to safe areas and providing them with transportation vehicles such as large trucks, multi-purpose armored personnel carrier, plastic boat, and air boats. The subsequent operations were providing basic survival items such as supply bags, food, water, and medicines. However, the assistance may vary in different areas and different people, depending on their suffering and preparedness of the aid agency. Therefore, the aid process was not full and complete for every case. It may include only one or a few steps, and be different from Figure 4.3. The focus on logistics in disaster relief operations (flooding) of RTA in Figure 4.3 was on the reconstruction and rehabilitation or, to be more specific, transportation to move the victims back to their homes, cleaning of houses, roads, or important places, house repair, and landscape maintenance. These activities were conducted by the Disaster Relief Center of the assigned military units.

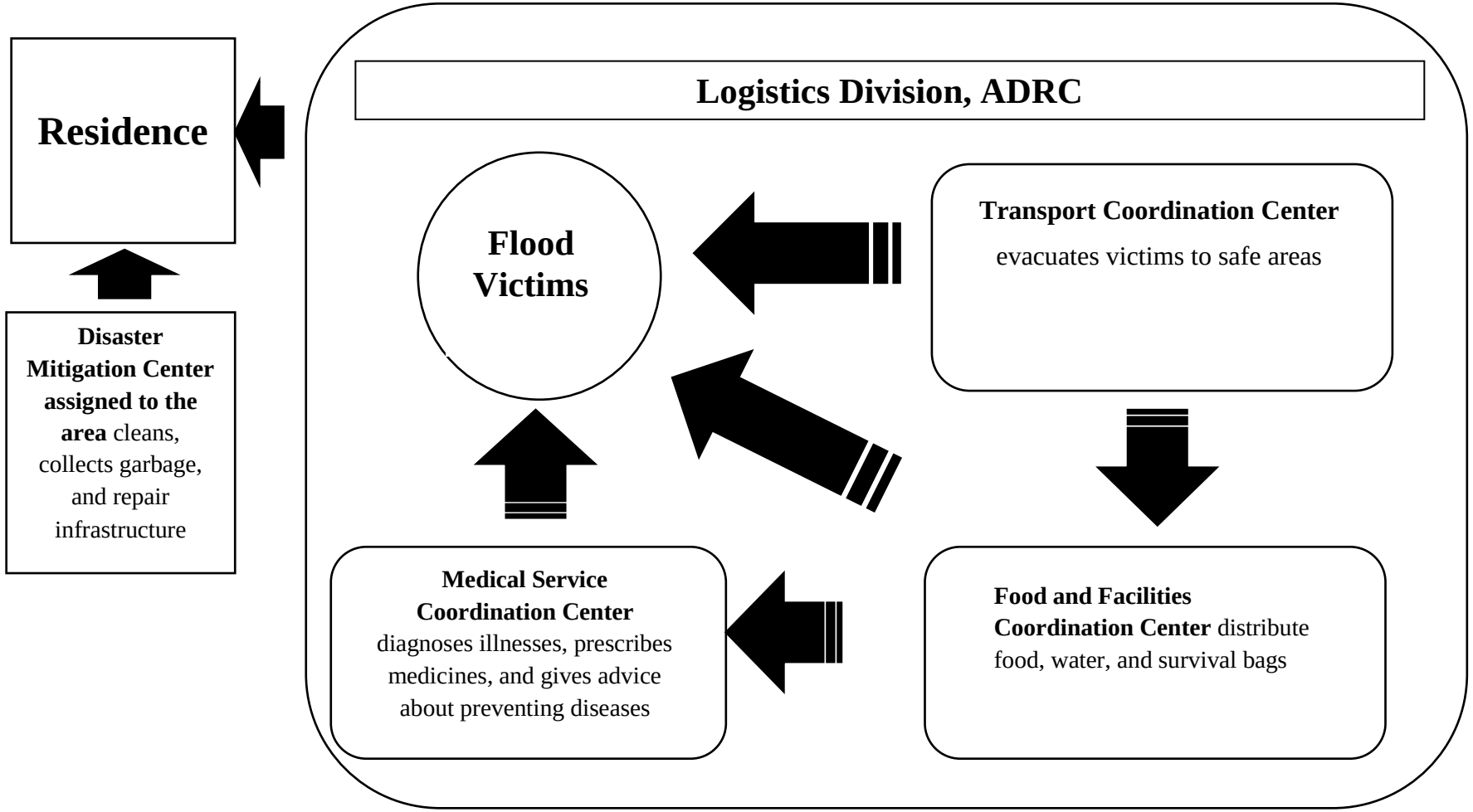

Figure 4.3 Logistics for Disaster Mitigation Operations (Flooding) of RTA in the Reconstruction Step in October 2011

In order to get the complete conditions of logistics in disaster relief operations (flooding) of RTA, the researcher collected additional data about logistics activities in disaster relief operations (flooding) of RTA in the actual area from the informants who were unit commander or officers of the logistics units assigned to be in charge of 5 district of Bangkok declared in 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior, e.g. Dusit, Phayathai, Nong Khaem, Thawi Watthana, and Phra Nakhon. The findings revealed that the logistics activities in disaster relief operations (flooding) of organic units subject to RTA went on as defined by ADRC. They also strictly agreed with the policy and order of the Commander in Chief, Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011), RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army , Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004) and its revised editions, and incident action plan (IAP) of each unit. The IAP comprised preparation, response, and reconstruction, respectively. The 6 activities in the IAP were evacuation, traffic facilitation, provision of food and water, cooperation with other government agencies and private business in food distribution, cooking and kitchen unit services, and medical services. (Table 4.10)

However, the researcher noted that such additional activities regarding logistics activities in disaster relief operations (flooding) of organic units subject to RTA may be different in detail. The difference could affect the effectiveness of public service in 3 ways. Firstly, every organic unit of RTA could not carry out logistics activities in disaster relief operations (flooding) from the process of preparation because it is the responsibility of Ministry of Interior. All it could do was to prepare manpower and equipment at normal location. Secondly, in the process of reconstruction, ADRC continued to do the logistics activities in disaster relief operations (flooding) by organic unit under RTA although it was the responsibility of civilian agencies. Finally, organic units subject to RTA did logistics activities in disaster relief operations (flooding) differently in the practice of response and reconstruction. This is because the practice was mainly based on preparedness and capacity of each unit.

Table 4.10 Logistics Activities in Disaster Relief Operations (Flooding) by Organic Unit Under RTA 2011

Activity	Operation			District	Remark
	Pre-paration	Res-pone	Recon-struction		
Evacuation	-	/	/	Dusit	RTA Logistics School
	-	/	/	Phayathai	2nd Cavalry Division (King's Guard)
	-	/	/	Nong Khaem	Veterinary Department, RTA
	-	/	/	Thawi Watthana	Veterinary Department, RTA
	-	/	/	Phra Nakhon	1 st Field Artillery Regiment (King's Guard)
Transportation support	-	/	/	Dusit	RTA Logistics School
	-	/	/	Phayathai	2nd Cavalry Division (King's Guard)
	-	/	/	Nong Khaem	Veterinary Department, RTA
	-	/	/	Thawi Watthana	Veterinary Department, RTA
	-	/	/	Phra Nakhon	1 st Field Artillery Regiment (King's Guard)
Food and water	-	/	/	Dusit	RTA Logistics School
	-	/	/	Phayathai	2nd Cavalry Division (King's Guard)
	-	/	/	Nong Khaem	Veterinary Department, RTA
	-	/	/	Thawi Watthana	Veterinary Department, RTA
	-	/	/	Phra Nakhon	1 st Field Artillery Regiment (King's Guard)

Table 4.10 (Continued)

Activity	Operation			District	Remark
	Pre-paration	Res-pone	Recon-struction		
Procurement and distribution of fresh food together with other agencies and private sector	-	/	/	Dusit	RTA Logistics School
	-	/	/	Phayathai	2nd Cavalry Division (King's Guard)
	-	/	/	Nong Khaem	Veterinary Department, RTA
	-	/	/	Thawi Watthana	Veterinary Department, RTA
	-	/	/	Phra Nakhon	1 st Field Artillery Regiment (King's Guard)
Mobile kitchen and kitchen personnel	-	/	/	Dusit	RTA Logistics School
	-	/	/	Phayathai	2nd Cavalry Division (King's Guard)
	-	/	/	Nong Khaem	Veterinary Department, RTA
	-	/	/	Thawi Watthana	Veterinary Department, RTA
	-	/	/	Phra Nakhon	1 st Field Artillery Regiment (King's Guard)
Medical service	-	/	/	Dusit	RTA Logistics School
	-	/	/	Phayathai	2nd Cavalry Division (King's Guard)
	-	/	/	Nong Khaem	Veterinary Department, RTA

Table 4.10 (Continued)

Activity	Operation			District	Remark
	Pre-paration	Res-pone	Recon-struction		
	-	/	/	Thawi Watthana	Veterinary Department, RTA
	-	/	/	Phra Nakhon	1 st Field Artillery Regiment (King's Guard)

After the investigation of the conditions of logistics in disaster relief operations (flooding) of RTA in 2011, the initial conclusion was that there were some problems of flaws such as in regulations. To be specific, the regulation should have been more flexible in practice, especially about the advance money for which Ministry of Defence was allocated. More often than not, the advance money that RTA received could not meet the actual situations. Another thing that needed improvement was the capacity of organic units subject to RTA and that of the manpower working in the field. It was found that logistics personnel in disaster relief operations (flooding) of RTA did not have proper knowledge in logistics. That is to say, they failed to perform their job in procurement according to Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004) and its revised editions. The reason for this failure was their familiarity with RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army and regulations of the Office of the Prime Minister on Procurement B.E. 2535 (1992) and its revised editions. In addition, there was a serious issue with errors due to coordination and communication failure of military agencies and other government agencies, private sector, or the public. Things went to different trajectory and lack uniformity. These disparities resulted in the delayed assistance to the victims. Therefore, to fulfill the completeness of data about problems and solutions to logistics in disaster relief operations (flooding) of RTA in 2011, the researcher decided to take the in-depth interview with 3 groups of informants. It was found that most informants were well aware of the problems and understand how important it was to solve logistics problems in disaster

relief operations (flooding) of RTA in the same direction. However, they expressed slightly different opinions about the importance of problems and minor details. To clarify, the top level supervisors of RTA placed the highest importance on the policy problems, followed by management. Regarding the most important problems according to the top level supervisors, laws, policies, and regulations about logistics in disaster relief operations (flooding) of RTA were not flexible in practice in times of disaster. Some of the regulations became obsolete and could not apply to the actual situation in different areas. The budget did not match the size of the assign task. In practice, the capacity of organic units subject to RTA and that of the manpower working in logistics in disaster relief operations (flooding) of RTA in each area were so limited. The biggest failure was the coordination and communication between military agencies and civilian agencies, private sector, and the public, which was not uniform and not steered to the same direction. As a consequence, the victim assistance was not effective since the first stage of the flood. However, the interview with heads of logistics division of ADRC and unit commanders or logistics officers (5 persons) assigned to be in charge of 42 districts of Bangkok declared in 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior pointed out to different answers. Most informants in this second and third groups said that the most important problem lay with management such as the structure of logistics systems in disaster relief operations (flooding) of RTA that had single and long level of supervision. Singularity and complicated level of supervision resulted in the inflexibility in practice. The equipment, tools, and manpower for logistics in disaster relief operations (flooding) of RTA were limited both in quantity and capacity. Procurement of relief items was delayed. Inventory control was not up-to-date and incomplete. The number of equipment warehouses was also limited. Categorization of inventory was also unsystematic. Repairs of equipment for disaster mitigation operations were behind the schedule. All in all, other relevant operations were discontinued and unsystematic.

The researcher summarized the problems and the solutions to logistics in disaster relief operations (flooding) of RTA in 2011 based on the framework of Mckinsey 7-S, the critical success factors in logistics in disaster relief operations (flooding) of RTA, and the implementation theories. The summary comprised 2 parts

(Table 4.11): 1) problems and the solutions to logistics in disaster relief operations (flooding) of RTA in term of policy (Table 4.12), and 2) problems and the solutions to logistics in disaster relief operations (flooding) of RTA in term of management (Table 4.13).

Table 4.11 Summary of Problems and the Solutions to Logistics in Disaster Relief Operations (Flooding) of RTA in 2011

Problems	**Policy**			**Management**		
	top level supervisors of RTA	unit commanders or logistics officers	unit commanders or logistics officers	top level supervisors of RTA	unit commanders or logistics officers	unit commanders or logistics officers
Laws, policies, and regulations were not flexible.	/	/	/	/	-	-
Budget is not enough.	/	/	/	/	/	/
Capacity of units/ manpower is limited.	/	/	/	/	/	/
Coordination and communication with other agencies are ineffective.	/	/	/	/	-	/
Structure of logistics system is not suitable for effective operation	-	/	-	/	/	/
Logistics operations are ineffective.	-	-	-	-	/	/

Table 4.12 Summary of Problems and the Solutions to Logistics in Disaster Relief Operations (Flooding) of RTA in 2011 in Term of Policy

Problems	Causes	Solutions	Remark
Laws, policies, and regulations were not flexible	1) Severity level of the flood 2) Responsibility assignment of military units as supporter	1) Revise the duty and responsibility of Ministry of Defence according to National Disaster Prevention and Mitigation Plan to be more flexible in practice.	Gen Prayuth Chan-ocha and LTG Supphakon Sa-nguanchatsonkrai
		2) Increase the advance money and details about disaster supports in Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency	Col Suchat Wongmak, Col Chanin Waramit, Col Chaimontri Phothong
		3) Revise RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army to be more appropriate.	LTG Thawi Chaemcharat, LTG Sayan Yangphithak, MG Chamnan Koetphon, Col Suksan Bunchit, Col Prasai Phutrakun
Budget is not enough.	1) Severity level of the flood and the huge number of victims 2) Limitations of budget sources	1) Increase the advance money for emergency disaster mitigation operations by RTA	Col Suchat Wongmak, Col Chanin Waramit
		2) Add the provision that allows the use of central budget or normal budget	Col Chanin Waramit, Col Chaimontri Phothong

Table 4.12 (Continued)

Problems	Causes	Solutions	Remark
Capacity of units/ manpower is limited.	1) Military units are not designed specifically for disaster relief.	1) Request equipment support for disaster relief in addition to current capacity of units.	LTG Supphakon Sa-nguanchatsonkrai, Col Suchat Wongmak
	2) Equipment for effective disaster relief is insufficient.		LTG Supphakon
	3) Military training/ education system focus mainly on national defense.	2) Request additional requipment support from other sectors.	Sa- nguanchatsonkrai
		3) Improve systematically and continuously manpower skills and capacity in disaster relief	Gen Prayuth Chan-ocha and LTG Supphakon Sa-nguanchatsonkrai
		4) Training together among armed forces and civilian agencies on disaster relief	LTG Supphakon Sa-nguanchatsonkrai, LTG Somchai Yangphithak
Coordination and communication with other agencies are ineffective.	1) Civilian agencies did not understand military operation approach.	1) Establish mutual understanding between military units and civilian agencies regarding coordination and communication.	LTG Phalawut Klapcharoen
	2) Differences in coordination process	2) Develop closer relationships between military and civilian agencies	LTG Phalawut Klapcharoen, Col Suphon Chanphong
	3) Limited communication channels	3) Improve the role of military units assigned to the areas.	
	4) Areas for military units are unclearly assigned.	4) Areas for military units are clearly assigned.	Gen Prayuth Chan-ocha, LTG Phalawut Klapcharoen

Table 4.13 Summary of Problems and the Solutions to Logistics in Disaster Relief Operations (Flooding) of RTA in 2011 in Term of Management

Problems	Causes	Solutions	Remark
Singularity and complicated level of supervision in the structure of logistics resulted in the inflexibility in practice	1) There are no specific criteria of logistics structure for flood disaster relief	1) Structure of logistics for flood disaster should be suitably defined.	LTG Supphakon Sa-nguanchatsonkrai, Col Suchat Wongmak
Procurement of relief items was delayed.	2) Relevant policies and regulations are obsolete. Operational staffs are not familiar with procurement regulations in times of disaster.	2) Relevant policies and regulations should be updated to match with the actual situation. 1) Staffs should be trained on practice approach. 2) Make simple operation manual.	Col Suchat Wongmak, Col Suphon Chanphong Col Phaisan Muendet
Inventory control was not up-to-date and incomplete.	The number of logistics personnel is low compared to the volume of equipment.	1) Allocate additional personnel 2) Improve personnel performance 3) Apply IT systems	LTG Thawi Chaemcharat
The number of equipment warehouses was also limited and scattered. Categorization of inventory was also unsystematic	Some of the available equipment was affected by the flood.	1) Distribute the equipment as soon as possible, even without going through the warehouse. 2) It is best to categorize the equipment for logistics more systematically. 3) Outsourcing when necessary	LTG Nanthaphon Chamratromran, Col Surasak Chindaprasan

Table 4.13 (Continued)

Problems	Causes	Solutions	Remark
Repairs of equipment for disaster mitigation operations were behind the schedule. Other relevant operations were discontinued and unsystematic, especially logistics, ordnance, and engineering equipment.	There was budget shortage for equipment repairs.	1) Always set the budget for repairs. 2) Outsourcing when necessary	Col Chaimontri Phothong, Col Suchat Wongmak

4.3 The Factors Affecting the Success of Logistics for Logistics for Disaster (Flooding) Relief Operations of The Royal Thai Army

The researcher employed the mixed methodology between survey research and qualitative research to investigate the factors affecting the success of logistics for disaster (flooding) relief operations of RTA similarly to that of the conditions and problems of logistics in disaster relief operations (flooding) of RTA. For the survey research, the factors affecting the success of logistics for disaster relief operations (flooding) of RTA were investigated through a questionnaire (Part 3 of the questionnaire), starting from the process of planning, combat support, as well as other activities in normal situations apart from war, in the national defense plan, or other projects defined in RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army and Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004) and its revised editions. Logistics for disaster operations can be divided into 4 groups; 1) operation planning e.g. policymaking, determining the demand, and locating the quarter of logistics, 2) procurement, 3) inventory management e.g. storage, distribution, maintenance, and disposition, and 4) services e.g. transport and medical services. To make the data complete and well-categorized, the researcher combined similar results to those of the conditions and problems of logistics in disaster relief operations (flooding) of RTA.

Table 4.14 Factors Affecting the Success of Logistics for Disaster Relief Operations (Flooding) of RTA in Term of Policymaking (n = 76)

Policymaking	Average	STD	Interpretation	No.
1) There have been meetings to make logistics plan for disaster mitigation operations.	7.36	1.44	high	1
2) The demand of victims or aid agencies is forecast regarding logistics in order to achieve the objectives.	7.34	1.48	high	2
3) There is a good system to procure equipment for logistics so that the operations are convenient and easily verified.	7.29	1.37	high	3
4) The logistics quarter and warehouses are chosen appropriately for the flood relief operations of RTA.	7.09	1.63	high	4

According to Table 4.14, the factors affecting the success of logistics for disaster relief operations (flooding) of RTA in term of policymaking were at the level of high. The topic that received the highest average was “There have been meetings to make logistics plan for disaster mitigation operations” (average = 7.36$\pm$1.44, high), followed by “The demand of victims or aid agencies is forecast regarding logistics in order to achieve the objectives” (average = 7.34$\pm$1.48, high). The other topics had the average at the level of high. The topic that had the lowest average is “The logistics quarter and warehouses are chosen appropriately for the flood relief operations of RTA” (average = 7.09$\pm$1.63, high). The results agreed with the qualitative research that the equipment was limited, scattered, unsystematic, and affected by the flood.

Table 4.15 Factors Affecting the Success of Logistics for Disaster Relief Operations (Flooding) of RTA in Term of Procurement (n = 76)

Procurement	Average	STD	Interpretation	No.
1) The procurement process in times of disaster should be different from normal situations.	7.14	1.48	high	1
2) The process of procuring the equipment for logistics is suitable for the situation.	7.03	1.52	high	2
3) The procurement is according to the regulations of the government.	7.03	1.82	high	3
4) The process of procuring the relief items for disaster mitigation operations is suitable for the situation.	6.96	1.69	high	4
5) There is a good system for handling the donated items from the public and private sectors.	6.82	1.65	high	5

According to Table 4.15, the factors affecting the success of logistics for disaster relief operations (flooding) of RTA in term of procurement had the average of 6.99$\pm$1.07 and were at the level of high. The topic that received the highest average was “The procurement process in times of disaster should be different from normal situations” (average = 7.14$\pm$1.48, high), followed by “The process of procuring the equipment for logistics is suitable for the situation” (average = 7.03$\pm$1.52, high). The other topics had the average at the level of high. The topic that had the lowest average is “There is a good system for handling the donated items from the public and private sectors” (average = 6.82$\pm$1.65, high). The results agreed with the limited ability and capacity of the manpower to handle with huge and prolonged disaster. Also, these results might be the reflection of lacking a doctrine or an operation manual.

Table 4.16 Factors Affecting the Success of Logistics for Disaster Relief Operations (Flooding) of RTA in Term of Inventory Management (n = 76)

Inventory Management	Average	STD	Interpretation	No.
1) Disposition of damaged equipment has the convenient process and well implemented.	7.17	1.48	high	1
2) The area for inventory management was optimized. The stock level was kept at the minimum to minimize the operation costs.	7.14	1.80	high	2
3) The process of equipment storage was correct according to academic principles.	6.97	1.60	high	3
4) Repairs of equipment used for disaster mitigation operations were timely.	6.93	1.78	high	4
5) Level of logistics units could respond to disaster mitigation operations effectively.	6.91	1.71	high	5

According to Table 4.16, the factors affecting the success of logistics for disaster relief operations (flooding) of RTA in term of inventory had the average of 7.03$\pm$1.49 and were at the level of high. The topic that received the highest average was “Disposition of damaged equipment has the convenient process and well implemented” (average = 7.14$\pm$1.80, high), followed by “The area for inventory management was optimized. The stock level was kept at the minimum to minimize the operation costs” (average = 7.03$\pm$1.52, high). The other topics had the average at the level of high. The topic that had the lowest average is “Level of logistics units could respond to disaster mitigation operations effectively” (average = 6.91$\pm$1.71,

high). These were the consequence of logistics being designed mainly for war, resulting in inflexibility to adjust to the actual disaster situation.

Table 4.17 Factors Affecting the Success of Logistics for Disaster Relief Operations (Flooding) of RTA in Term of Service (n = 76)

Service	Average	STD	Interpretation	No.
1) Public transportation was thoroughly provided in the assigned areas.	7.25	1.41	high	1
2) Temporary shelters were sufficiently provided.	7.20	1.65	high	2
3) Medical services provided to the flood victims were of professional standards.	7.14	1.48	high	3
4) Mobile kitchens provided services thoroughly to the victims.	7.05	1.54	high	4
5) Other services were provided, including house repairs and security guard.	7.03	1.60	high	5
6) Infrastructure provided to the victims was of good standard.	6.98	1.68	high	6

According to Table 4.17, the factors affecting the success of logistics for disaster relief operations (flooding) of RTA in term of service were at the level of high. The topic that received the highest average was “Public transportation was thoroughly provided in the assigned areas” (average = 7.25$\pm$1.41, high), followed by “Temporary shelters were sufficiently provided” (average = 7.20$\pm$1.65, high). The other topics had the average at the level of high. However, it was found that the last 3 topics received rather low average compared to others because of limited capacity and quantity of personnel with specialized skills compared to the demand of the victims in such time.

For the qualitative research, the researcher relied on grounded theory methodology together with a case study. The study tools were documentary research and in-depth interview similarly to the investigation of conditions and problems of logistics in disaster relief operations (flooding) of RTA. In order to connect the factors affecting the success of logistics for disaster relief operations (flooding) of RTA to practice according to the National Disaster Prevention and Mitigation Plan B.E. 2553 -2557 (2010-2014) and Army Disaster Relief Plan B.E. 2554 (2011), starting from preparation, response, and reconstruction and rehabilitation, the researcher has integrated the frameworks of logistics in times of disaster and implementation, particularly the parts affecting the implementation success. The results revealed that the factors affecting the success of logistics for disaster relief operations (flooding) of RTA were closely related to the conditions and problems of logistics in disaster relief operations (flooding) of RTA in the processes of preparation and reconstruction. The factors worked the same way, both in times of disaster and in normal situations. The implementations were based on Army Disaster Relief Plan B.E. 2554 (2011), RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army , Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004) and its revised editions. In addition, it was also found that the factors affecting the success of disaster logistics and those affecting the success of policy implementation, and factors affecting the success of logistics for disaster relief operations (flooding) of RTA had very close relationships and pointed toward the same direction with only minor differences in detail. Therefore, the researcher compiled the factors affecting the success or failure of logistics for disaster relief operations (flooding) from 3 groups of informants and the implementation results in the actual areas in 2011 by organic units subject to RTA. It was found that the factors affecting the success of disaster logistics and those affecting the success of logistics were related both in term of policy and management, starting from preparation, response, and reconstruction. However, the content coverage was lower than the factors affecting the success or failure of policy implementation (Table 4.18 and Table 4.19).

Therefore, the researcher decided to use 8 groups of factors affecting the success or failure in policy implementation (Supachai Yavaprabhas, 2012: 101-118) as the main framework for investigating the factors affecting the success of logistics for disaster relief operations (flooding) of RTA. It was found that in practice, there were flaws, problems, or insufficiencies about policy implementation which could be divided into 6 groups: 1) characteristics of the policy i.e. trial practice and quality of feedback, 2) objectives of the policy i.e. success indicator of the policy and accuracy of information, 3) sufficiency of resources i.e. budget, manpower quality and number, and management, 4) technical or theoretical possibility i.e. characteristics of the technology, 5) characteristics of the organization implementing the policy i.e. structure, supervision, and procedure of open communication, and 6) relationship between the mechanisms in the organizations i.e. the number of relevant organizations, the number of decision making points, and interference from higher organization (Table 4.20). Regarding the factors affecting the success or failure of logistics in disaster relief operations (flooding) of RTA in the preparation and reconstruction processes, no flaws, problems, or insufficiencies were found to significantly affect the policy implementation. That was because the role of logistics in disaster relief operations (flooding) of RTA was only as a supporter for Ministry of Interior, resulting in the practice approach being carried out according to Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011). In other words, the activities were carried out like logistics in normal situations as described in Table 4.19.

Table 4.18 Comparison between Factors Affecting the Success or Failure of Policy Implementation, Disaster Logistics, and Logistics of RTA

Factors Affecting the Success or Failure of Policy Implementation (Supachai Yavaprabhas, 2012: 101-118)	**Success Factors for Disaster Logistics (Pettit and Beresford, 2009)**	**Factors Affecting the Success or Failure of Logistics of RTA (Phaithoon Lueangtrakun, 2009 and Wade, 2005)**
1. Characteristics of the policy		
1.1 Type		Implementation planning
1.2 Relative benefit	Strategic planning/ continuous development	Implementation planning
1.3 Satisfying the needs	Strategic planning/ continuous development	Implementation planning
1.4 Trial practice		
1.5 Foresight	Continuous development	
1.6 Quality of feedback	Strategic planning/ data management	Implementation planning
2. Objectives of the policy		
2.1 Clarity of the objectives		Implementation planning
2.2 Agreement of the objectives		Implementation planning
2.3 Difficulties of realization of objectives	-	-
2.4 Policy success indicator	Strategic planning/ continuous development	Implementation planning
2.5 Accuracy of information	-	Implementation planning

Table 4.18 (Continued)

Factors Affecting the Success or Failure of Policy Implementation (Supachai Yavaprabhas, 2012: 101-118)	**Success Factors for Disaster Logistics (Pettit and Beresford, 2009)**	**Factors Affecting the Success or Failure of Logistics of RTA (Phaithoon Lueangtrakun, 2009 and Wade, 2005)**
3. Political possibility		
3.1 Negotiation between government and private sectors		-
3.2 Supports from relevant parties	Strategic planning	Implementation planning/ procurement/ service
3.3 Impacts of the policy on powerful benefit groups	-	-
3.4 Supports from the elites	-	Implementation planning
3.5 Supports from press and the public	-	-
3.6 Supports from voters	-	-
4. Technical or theoretical possibility		
4.1 Policy drafting	-	Implementation planning
4.2 Request to change behaviors	-	-

Table 4.18 (Continued)

Factors Affecting the Success or Failure of Policy Implementation (Supachai Yavaprabhas, 2012: 101-118)	**Success Factors for Disaster Logistics (Pettit and Beresford, 2009)**	**Factors Affecting the Success or Failure of Logistics of RTA (Phaithoon Lueangtrakun, 2009 and Wade, 2005)**
4.3 Reliable theory	Continuous development	Implementation planning/ procurement/ inventory management
4.4 Characteristics of technology	Strategic planning/ transportation planning Transportation capacity planning Data management/ utilization of technology Continuous development/ military strategy	Service
5. Sufficiency of resources		
5.1 Financial support	Strategic planning	Implementation planning / procurement
5.2	Strategic planning/ human resource management Continuous development	Implementation planning / service
5.3 Management factors	Strategic planning/ resource management Transportation planning, logistics strategy	Implementation planning / service

Table 4.18 (Continued)

Factors Affecting the Success or Failure of Policy Implementation (Supachai Yavaprabhas, 2012: 101-118)	**Success Factors for Disaster Logistics (Pettit and Beresford, 2009)**	**Factors Affecting the Success or Failure of Logistics of RTA (Phaithoon Lueangtrakun, 2009 and Wade, 2005)**
6. Characteristics of the organization implementing the policy	-	-
6.1 Type of organization	-	-
6.2 Structure and supervision	Strategic planning/ human resource management	Implementation planning
6.3 Ability of leaders	Strategic planning	-
6.4 Relationship with the organization making the policy	-	-
6.5 Level of open communication	Strategic planning	Implementation planning
7. Attitude of the policy implementers		
7.1 Attitude toward the objectives of the policy	Strategic planning	
7.2 Impact on the behavior of staff	-	-

Table 4.18 (Continued)

Factors Affecting the Success or Failure of Policy Implementation (Supachai Yavaprabhas, 2012: 101-118)	**Success Factors for Disaster Logistics (Pettit and Beresford, 2009)**	**Factors Affecting the Success or Failure of Logistics of RTA (Phaithoon Lueangtrakun, 2009 and Wade, 2005)**
7.3 Conflict with the value of the policy implementers	-	-
7.4 Impact on job, power, dignity, and benefit	-	-
8. Relationship of mechanisms in the organization or between the organizations implementing the policy		
8.1 The number of relevant organizations	policy planning	implementation planning
8.2 The number of decision making points	-	implementation planning
8.3 The existing relationship among the organizations	Continuous development/ relationship with suppliers	-
8.4 Interference from the superordinate units	-	-

Table 4.19 Groups of Factors Affecting the Success or Failure of Logistics for Disaster Relief Operations (Flooding) of RTA in Step of Operation

Groups of Factors Affecting the Success or Failure	**Steps of Operations**		
	Preparation	**Response**	**Reconstruction**
Characteristics of the policy	/	/	/
Objectives of the policy	/	/	/
Political possibility	/	/	/
Technical or theoretical possibility	/	/	/
Sufficiency of resources	/	/	/
Characteristics of the organization implementing the policy	/	/	/
Attitude of the policy implementers	/	/	/
Relationship of the mechanisms in the organization or between the organizations implementing the policy	/	/	/

Table 4.20 Comparison between Factors Affecting the Success or Failure of Logistics for Disaster Mitigation Operations (Flooding) of RTA in the Response Step: the Investigation of Flaws or Problems in Implementation

Factors Affecting the Success or Failure of Policy Implementation (Supachai Yavaprabhas, 2012: 101-118)	**Success Factors for Disaster Logistics (Pettit and Beresford, 2009)**	**Results**
1. Characteristics of the policy		
1.1 Type	-	/
1.2 Relative benefit	Strategic planning/ continuous development	/
1.3 Satisfying the needs	Strategic planning/ continuous development	/
1.4 Trial practice	-	X
1.5 Foresight	Continuous development	/
1.6 Quality of feedback	Strategic planning/ data management	X
2. Objectives of the policy		
2.1 Clarity of the objectives	-	/
2.2 Agreement of the objectives	-	/
2.3 Difficulties of realization of objectives	-	X
2.4 Policy success indicator	Strategic planning/ continuous development	
2.5 Accuracy of information	-	

Table 4.20 (Continued)

Factors Affecting the Success or Failure of Policy Implementation (Supachai Yavaprabhas, 2012: 101-118)	**Success Factors for Disaster Logistics (Pettit and Beresford, 2009)**	**Results**
3. Political possibility		
3.1 Negotiation between government and private sectors	-	/
3.2 Supports from relevant parties	Strategic planning	/
3.3 Impacts of the policy on powerful benefit groups	-	/
3.4 Supports from the elites	-	/
3.5 Supports from press and the public	-	/
3.6 Supports from voters	-	/
4. Technical or theoretical possibility		
4.1 Policy drafting	-	/
4.2 Request to change behaviors	-	/
4.3 Reliable theory	Continuous development	/

Table 4.20 (Continued)

Factors Affecting the Success or Failure of Policy Implementation (Supachai Yavaprabhas, 2012: 101-118)	**Success Factors for Disaster Logistics (Pettit and Beresford, 2009)**	**Results**
4.4 Characteristics of technology	Strategic planning/ transportation planning Transportation capacity planning Data management/ utilization of technology Continuous development/ military strategy	X
5. Sufficiency of resources		
5.1 Financial support	Strategic planning	X
5.2 Capacity and quality of staff	Strategic planning/ human resource management Continuous development	X
5.3 Management factors	Strategic planning/ resource management Transportation planning, logistics strategy	X
6. Characteristics of the organization implementing the policy		
6.1 Type of organization	-	/

Table 4.20 (Continued)

Factors Affecting the Success or Failure of Policy Implementation (Supachai Yavaprabhas, 2012: 101-118)	**Success Factors for Disaster Logistics (Pettit and Beresford, 2009)**	**Results**
6.2 Structure and supervision	Strategic planning/ human resource management	X
6.3 Ability of leaders	Strategic planning	/
6.4 Relationship with the organization making the policy	-	/
6.5 Level of open communication	Strategic planning	X
7. Attitude of the policy implementers		
7.1 Attitude toward the objectives of the policy	Strategic planning	/
7.2 Impact on the behavior of staff	-	/
7.3 Conflict with the value of the policy implementers	-	/
7.4 Impact on job, power, dignity, and benefit	-	/

Table 4.20 (Continued)

Factors Affecting the Success or Failure of Policy Implementation (Supachai Yavaprabhas, 2012: 101-118)	**Success Factors for Disaster Logistics (Pettit and Beresford, 2009)**	**Results**
8. Relationship of mechanisms in the organization or between the organizations implementing the policy		
8.1 The number of relevant organizations	policy planning	X
8.2 The number of decision making points	-	X
8.3 The existing relationship among the organizations	Continuous development/ relationship with suppliers	X
8.4 Interference from the superordinate units	-	X

Regarding the factors on characteristics of the policy, it was found that there were 2 insufficiencies or flaws affecting the success of policy implementation; the trial practice and quality of feedback. For the first issue, any policy that could be tested in a trial mode before being brought into practice would have more chance of success than those not tested. In the response step of logistics in disaster relief operations (flooding) of RTA, the important characteristics that directly affected the possibility to run in the trial mode were prolonged situation, a huge number of people involved, limitations of the areas, uncertainties of the actual demand and supply, and limited budget. Therefore, the practice of disaster relief could only be done in a situation simulated by RTA or by the Armed Forces, or collaborated practice with civilian agencies (Gen Prayuth Chan-ocha, LTG Supphakon Sa-nguanchatsonkrai, Col Suphon Chanphong, in-depth interview). In addition, there were also limitations in term of relevant laws and regulations which could not allow the practice in normal situation. For this matter, LTG Somchai Yangphithak highlighted the relationship with relevant laws and regulations, as well as the practice approach of logistics in disaster relief operations (flooding) of RTA. He mentioned that:

> Logistics in RTA cannot be simulated. There are rules for everything because it involves the budget of this country. That cannot be simulated. Correctness is the first priority. Honesty is a must. Whatever ones will do or think, ones can find the best option and think carefully. We cannot include every possible environmental factor in every task we do. When we make a decision, keep in mind the minimized budget. That is our decision. And the final one is timeliness.

The second issue is the quality of feedback. This is another problem due to the characteristics of logistics in disaster relief operations (flooding) of RTA in the response step, just like the issue of trial practice. The problem makes it difficult to control and evaluate the results effectively. After the logistics in disaster relief operations (flooding) of RTA in 2011, it was found that there were a number of reports on public assistance, for example, lack of transparency in inventory

management and over-withdrawal of advance money (Col Suchat Wongmak, Col Suphon Chanphong, in-depth interview).

Regarding the factors about objectives of the policy, it was found that there were 2 insufficiencies or flaws affecting the success of policy implementation; success indicators and accuracy of information. The first one was a consequence of the characteristics of logistics in disaster relief operations (flooding) of RTA in the response step. The second concerned the quality of feedback. To further explain, it is rather difficult to determine the success indicator quantitatively and qualitatively, be it the economic value affected by the number of survivors or subsequent damages. This is because the most important thing for logistics in disaster relief operations (flooding) of RTA is the process of relieving the suffering of the victims and minimizing the loss of lives (Gen Prayuth Chan-ocha, in-depth interview). That was why it is impossible to evaluate only in the dimension of economic value. However, it was found that, for logistics in disaster relief operations (flooding) of RTA in 2011, the success indicators were roughly defined by applying and referencing to those of logistics in normal situations. The success indicators in the cases included, for example, satisfaction of the victims with the RTA relief operation, the number of people receiving medical services, and the number of vehicle services provided by RTA during the flood. It was further discovered that the IT search regarding success indicators of logistics was rather limited because there were issues with confidentiality of official documents. Secondly, information accuracy was found to be the by-product of uncertainties of environmental factors outside of the organization. That is to say, the ever changing situation resulted in inconsistency of information among the superordinate and subordinate agencies. Such inconsistency caused the aids not go as planned by the superordinate agencies or requested by civilian agencies. Therefore, it would be more effective to establish a communication system to be used between military units and civilian agencies to settle this problem.

Regarding technical or theoretical possibility, it was found that there was an insufficiency or flaw affecting the success of policy implementation; the characteristics of technology. This problem was also caused by uncertainties of environmental factors outside of the organization. Therefore, RTA proposed a project to procure equipment for disaster relief, with the project term of 3 years from 2014–

2016. In such a project, there was a request to receive data from the satellites to monitor the disaster situation more systematically for more effective operations.

Regarding the factors about sufficiency of resources, it was found that there 3 insufficiencies or flaws affecting the success of policy implementation: budget, quality and quantity of manpower, and management. These were the factors that all the 3 groups of informants put the highest emphasis on. First of all, budgets were found to be closely related to the procurement process. There were 4 different sources of budget, and all of which had different regulations. 1) Normal budget of official agencies or annual government statement of expenditure was set by Regulations of the Office of the Prime Minister on Procurement B.E. 2535 (1992) and its revised editions. 2) The central budget of the government was allocated according to Regulations of the Office of the Prime Minister on Procurement B.E. 2535 (1992) its revised editions. Donated money and items were procured based on Regulations of the Office of the Prime Minister on Donations B.E. 2551 (2008). 4) Advance money shall be applicable to Ministry of Finance Regulations on Emergency Relief Fund B.E. 2546 (2003) and its revised editions. The last one was the source that RTA used for logistics activities for disaster relief operations (flooding) in 2011. For uniformity of procurement process of every agency, Ministry of Defence enacted Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004) and its revised editions. The in-depth interview result pointed to the same way. Simply put, Ministry of Defence should play a role as the supporter according to the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014) and use Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011) as the operation framework (Gen Prayuth Chan-ocha, in-depth interview). That explained by some parts of the logistics in disaster mitigation operations were similar to that in normal situations, with only minor differences in regulations of relevant agencies. As a matter of fact from the actual operation of RTA in 2011, Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004) and its revised editions had many limitations that resulted in ineffective disaster mitigation operations. For example, it was the cause of failure to procure sandbags to build flood preventive wall, find chemicals to produce clean water for the victims, or cook food to the victims. Thus, it is advised to widen the limit of advance money and add more

details in assisting the victims in times of disaster (LTG Supphakon Sa-nguanchatsonkrai, Col Suchat Wongmak, Col Chanin Waramit, Col Chaimontri Phothong, in-depth interview). Recently, Ministry of Defence enacted Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2556 (2013) with details showed in Table 4-21. The second issue concerned the number and quality of manpower. It was found that there was an issue with allocating personnel for Logistics Division of ADRC to be present around the lock. The best it could do was to solve the urgent problems at hand. For example, there was a shortage of manpower reserve to spare for the restructuring of the organization during the flood of 2011. Also, personnel did not have the skills on large scale and prolonged disaster mitigation operations, resulting in losses of manpower. Furthermore, it was also found that RTA did not have military doctrine or operation manual for logistics which was up-to-date and flexible to the situation for personnel to study and hold on to. At the moment, the preparation of military doctrine and relevant operation manual is underway. The Army Training Command is responsible for the preparation of such documents and training of public assistance companies. In fact, the top supervisors of RTA placed high importance on improvement of manpower to be ready for all types of situations and development of IT system for a serious management of logistics since 2012 (LTG Supphakon Sa-nguanchatsonkrai, in-depth interview). Additional knowledge in civil studies was also encouraged. On this matter, Gen Prayuth Chan-ocha mentioned the desirable qualities of logistics personnel who are the essential mechanisms for logistics for disaster mitigation operations.

> Good logistics personnel of the Army should be knowledgeable and able to perform the mission in every dimension, not just delivery of equipment, ammunition, or weaponry. This is because the major problem of RTA is the budget and logistics activities demand a lot of budget. It is important for RTA to always keep in mind how to make the army ready for incidents and how to make the available resources sufficient. The smart and experience logistics personnel who understand the policy of the supervisors will result in continuous and effective operations.

Thirdly, regarding management, it was found that the army lacked necessary equipment for disaster relief and the available equipment was too old, damaged, and not in operational conditions. These problems were caused by limited budgets for maintenance and repairs of equipment and procurement. The initial attempt to address the issue was the urgent request for budget for procuring equipment (Table 4.22 and Table 4.23). On this matter, LTG Somchai Yangphitak discussed the troublesome management due to limited budget in an interesting way.

> The most important factor is budget. The equipment in RTA at the moment, especially the important one, is rather old. It is very difficult to make RTA ready while the existing equipment is old and the procurement is limited, including maintenance budget. The equipment is divided into 3 groups: 1) less than 10 years old, 2) 10-20 years old, and 3) more than 20 years old. The idea to take care of these groups of equipment should be consistent with preparedness of RTA. However, to set a budget in each fiscal year needs to take into account many things and it cannot weigh too much on a certain subject.

Table 4.21 A Comparison of Advance Money and Detail of Disaster Relief According to Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims

Topic	Ministry of Defence Notification Old edition	Ministry of Defence Notification New edition	Remark
Year of reference from Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims	2014 2013	2013 2013	
Limit of advance money of RTA	10 million baht	12 million baht	
Number of disaster reliefs	6	11	
allowance/ housing rent/ compensation	/	/	Based on relevant regulations

Table 4.21 (Continued)

Topic	Ministry of Defence Notification Old edition	Ministry of Defence Notification New edition	Remark
Cost of Type 3 equipment	/	/	consumption criteria
minor repair cost for vehicles, tools	/	/	pay per actual use/save
Equipment cost for victims assistance e.g. house repair	/	/	pay per actual use/ not more than 20,000 baht/ house
material cost for operation e.g. sandbag, gravel, and soil	-	/	pay per actual use/save
food for victims	-	/	not more than 3 meals/ day 30 baht/ meal
food for staff	-	/	not more than 3 meals/ day 30 baht/ meal Staff do not get additional pay
survival bag/family	500 baht	550 baht	
medical cost	not more than 50,000 baht/ person	pay per actual use	
drinking water	-	200 baht/ person	
chemicals for producing drinking water	-	/	pay per actual use

Table 4.22 Status of RTA Equipment that Could be Used for Flood Relief in 2011 (data as of 9 November 2011)

Type of Equipment	Quantity	Remark
Vehicle	7,362	
- For ordnance	4,310	
- For transport	1,920	
- For engineering	1,132	Development Division 1-4
Boat	412	
- According to the ratio of munitions, transport and engineering equipment	412	
- Receive additionally from RTA	187	Special equipment
- Donated and supported by other agencies	50	
Aircraft	14	
- Blackhawk	4	
- MI 17 V5	2	
- Chinook	1	
- Helicopter Model 212	3	
- Embraer	2	
- Jetstream	1	
- Helicopter Model 1900	1	
Others	9	
- Water pumps	134	
- Rear motors	195	
- Bridges	32	

Table 4.22 (Continued)

Type of Equipment	Quantity	Remark
- Water quality kits	31 sets	mobile water treatment/ digger set
- Veterinary tractors	42	
- Low bed semi-trailer	76	
- Mobile communication vehicle	8	
- Multifunction personnel carrier	3	

Table 4.23 The Guideline for Determining the Demand of Equipment for Public Assistance by RTA, Sorted by Characteristics of Work and Responsibility (data as of 8 October 2013)

Unit	Equipment	Urgency No. 1	Urgency No. 2	Urgency No. 3	Total
Task Force Company/ Operation Team 202 Company	Life vest	40	40	70	150
	Portable stretcher	2	1	-	3
	Motored pontoon boat	1	1	1	3
	Flashlight 5 million candle power	1	1	1	3
	Megaphone	1	1	-	2
	Long spinal board for carrying the injured	2	1	1	4
Development Division 1-4	Water pump (pull type) size > 8”	2	1	1	4

Table 4.23 (Continued)

Unit	Equipment	Urgency No. 1	Urgency No. 2	Urgency No. 3	Total
	Toilet /shower trailer	1	1	-	2
	Motored aluminum boat	1	1	2	4
	Lantern	2	1	1	4
	Drinking water maker set	1	1	-	2
	Forklift size 2,000 pound	1	-	-	1
	backhoe size 1.5 m^3	4	9	11	24
	tipper truck size 20 tons	4	9	11	24
Support Service Department					
- Signal Department	Civilian FM Radio Set	1	-	-	1
- Quartermaster General Department	Motored aluminum Boat	4	4	4	12
Veterinary Service Department	Motored aluminum Boat	3	3	3	9
Medical Department	Motored aluminum Boat	4	4	4	12
Transportation Department	Passenger Truck size 2 ½ tons	16	16	19	51
Task Force Unit of RTA	Large backhoe truck	2	2	1	5
	Personnel carrier	2	2	1	5
	Power generator truck with lighter	1	1	-	2

Table 4.23 (Continued)

Unit	Equipment	Urgency No. 1	Urgency No. 2	Urgency No. 3	Total
	Truck with crane	2	1	1	4
	Water pump (pull type) size > 12”	2	1	1	4
	Motored inflatable boat	4	4	4	12
	backhoe size 1.5 m^3	2	2	4	8
	Passenger truck size 20 tons	2	2	4	8
Scientist Team, Chemical Department	Mobile industrial chemical detector	2	1	1	4
	Large decontamination tent	1	-	-	1
Disaster Assessment Team, RTA	Small Ground-Mobile Satellite Station 1 System	1	-	-	1

Currently, RTA has launched a project to procure equipment for disaster relief, with the project term of 3 years from 2014-2016. The project aimed to procure support equipment for disaster relief units of RTA, including Disaster Relief Unit of Engineering Department and Disaster Relief Unit of Development Division 1-4. In the future, this will become Disaster Relief Company with more disaster relief equipment such as firefighting trucks, rescue truck, lighting equipment, air compressor, flat bottomed boat, inflatable vehicle, truck with crane, water truck, and other necessary equipment. In addition, it was found that procurement of equipment was delayed, inventory of donated items was not up-to-date and not complete, warehouses for storing relief item were limited and scattered, and it was not able to correctly categorize the items, repairs of equipment for disaster relief were untimely, and other relevant operations were discontinued and unsystematic.

Regarding the factors on characteristics of the organization implementing the policy, it was found that there were 2 insufficiencies or flaws affecting the success of policy implementation: 1) structure and level of supervision and 2) procedure of open communication. It was found that in normal situation logistics structure of RTA has long supervision level and did not work with the past flooding disaster in 2011. . Logistics Division of ADRC decided to restructure the organization for the logistics chain at the level of inventory of Army Support Service Department. These 3 newly established coordination centers needed to learn by doing. It is worth noting that RTA has never done such restructuring of organization in disaster case before. The three coordination centers were divided according to type of logistics; transport, food and facility support, and medical services, which were delayed in the first stage. Col Suchat Wongmak discussed about the adaptation at the time that:

> Logistics Division of ADRC has never done restructuring during disaster before. We only have restructured army logistics center or army logistics headquarters in times of war. However, the flood was too critical to handle with the normal structure. For this situation, we established 3 coordination centers; 1) transport coordination center responsible by Transportation Department, 2) Food and Facility Coordination Center responsible by Quartermaster General Department, and 3) Medical Coordination Department responsible by Medical Department

Regarding the procedure of open communication, it was found that the implementation coordination and communication between military organizations and civilian agencies, private sector, and public sector was not uniform, resulting in ineffective disaster relief operation in the first stage of the flood.

Regarding the relationships of the mechanisms in the organizations or between the organizations implementing the policy, it was found that there were 3 insufficiencies or flaws affecting the success of policy implementation: 1) the number of relevant organizations, 2) the number of decision making points, and 3) interference from higher organization. First of all, regarding the number of relevant

organizations, it was found that there were a lot of personnel involved in logistics in disaster relief operations (flooding) of RTA, for example, those from Department of Disaster Prevention and Mitigation, Ministry of Interior, regional official agencies, and local official agencies. Each organization had different ways of coordination. It was also found that they did not understand correctly the provisions in the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014) in the part of requesting logistics supports in disaster relief operations (flooding) of RTA, resulting in the problems of coordination and communication. Furthermore, there was an issue with the shortage of coordination between military units in the affected areas. To clarify, the medical team assigned in response to the incident did not match the sufferings of people in the affected areas, especially in the first stage of operation due to the lack of close coordination with Medical Department and a lot of changes in shift of officers. As a consequence, the operations did not go as the incident action plan (MG Buntoem Saengdit, in-depth interview). Secondly, the number of decision making points was a by-product of the matter with structure and supervision of the organizations implementing the policy. That is to say, complicated level of supervision resulted in a lot of decision making points and made it impossible to effectively respond to the situation. Thirdly, there was interference from higher organization to focus on certain areas for certain reasons. The interference forced the military units assigned to area to operate somewhere else outside of their responsible area. This resulted in ineffective logistics for disaster relief operations (flooding) (Col Suchat Wongmak, in-depth interview).

4.4 The Logistics Model for Disaster Relief Operations (Flooding) of The Royal Thai Army

For the qualitative research, the researcher relied on grounded theory methodology together with a case study to explore the approach to develop the logistics model for disaster relief operations (flooding) of RTA. The main tool was focus group discussion, which was held twice. The first focus group discussion was held to gather information from 7 logistics experts of RTA (Table 3.3) on 13 August 2015 at 10.00 a.m. at a meeting room of RTA Logistics School, Bangkok. The second

one was conducted with 7 relevant personnel from other sectors (Table 3.4) on 10 September 2015 at 10.00 a.m. at a meeting room of RTA Logistics School, Bangkok. The purpose of focus group discussion was to evaluate the logistics model for disaster relief operations (flooding) of RTA in 4 dimensions: overview, suitability, completeness, and practicality.

The study results from documentary research, quantitative research, in-depth interview, and focus group discussion pointed toward the same direction, implying that Ministry of Defence should play a role as the supporter according to the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014) by using Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011) as the main framework for implementation. For uniformity of disaster mitigation operation among many organic units of RTA, the Commander in Chief (Gen Prayuth Chan-ocha) commanded that all organic units of RTA abide by Disaster Relief Plan B.E. 2554 (2011), which was based on RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army . Therefore, logistics in disaster relief operations (flooding) of RTA in the preparation, response, and reconstruction process were similar to those in normal situations (Table 4-9) with some minor differences in details of relevant regulations. The differences largely depended on the source of budget for emergency disaster mitigation. LTG Thawi Chaemcharat also confirmed that logistics was the same in normal situations and in times of disaster.

> We try to use the same logistics system in normal situations and in times of war, or even disaster as much as possible because that will make it easier for personnel to get familiar with the practice. When the staffs are not confused, the system can satisfy many missions in a timely manner. The supervisors will know immediately the stock of Support Service Department or whether it will be enough for the mission at the time. The supervision becomes uniform in every unit of RTA. There will be no scenario where each unit works different ways. This will encourage the support unit to lend a hand more easily

MG Chamnan Koetphon also shared his opinion that confirmed the similarity between logistics in normal situations, in times of war and disaster. He also discussed the suitability of RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army. All the focus group discussion participants agreed to the Command by overall (Table 4.24 and Table 4.25). However, they also thought that some details of such Command should be revised to be more flexible to the disaster mitigation operation of RTA in the future. The revision should be able to apply to the structural changes and the entire logistics system of RTA starting from the fiscal year of 2015. That is to say, the 21 regional military units will be additionally transformed from Military District to Military Circle and the policy to use a battalion level unit of RTA shall be applicable to the mission and area as the Commander in Chief (Gen Prayuth Chan-ocha) assigned Military District to control the companies running the non-war operations such as humanitarian assistance (when the army gives an order). As of now, the plan is in the process of trial operation in the pilot area of Army Area 3 and is expected to realize the trial results by the end of 2016. However, top level supervisors of RTA have agreed to the guideline for allocating logistics personnel for disaster relief operations of RTA to be based on that of Support Service Department. On this matter, Col Suksan Bunchit mentioned about allocation of logistics personnel for disaster relief operations of RTA, saying that:

> The allocation logistics personnel for disaster relief operations of RTA should follow the method of Support Service Department because the mission-based logistics is suitable for fast movement when it is necessary to get close to the battlefield. When logistics is fast, timely, and effective, the mission is more likely to be successful. Logistics Division of ADRC should be the same as in 2011, namely like that of Support Service Department because the mission area is inner area. It is comparable to warehouse-level maintenance. This will help save the budget by not having to resend logistics personnel and allow the operators to use the existing logistic chain and facilities.

Table 4.24 Summary of Suitability of RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army for Disaster Relief Operations (Flooding) in 2011

Main Topic	Subtopic	Support/Additional Details
Logistics policy	1) Logistics policy according to logistics principles	1) LTG Thawi Chaemchamrat 2) MG Chamnan Koetphon 3) Col Suksan Bunchit 4) Col Athicha Wongsuwan 5) Col Sawangchit Kanchanakomon 6) Col Prasai Phurakun 7) Col Phaisan Muendet
	2) Logistics based on available equipment and manpower acquired from procurement	1) LTG Thawi Chaemchamrat 2) MG Chamnan Koetphon 3) Col Suksan Bunchit 4) Col Athicha Wongsuwan 5) Col Sawangchit Kanchanakomon 6) Col Prasai Phurakun: Should have more donations 7) Col Phaisan Muendet: Should have more donations
Logistics principles	1) Centralized support	1) LTG Thawi Chaemchamrat 2) MG Chamnan Koetphon 3) Col Suksan Bunchit 4) Col Athicha Wongsuwan 5) Col Sawangchit Kanchanakomon 6) Col Prasai Phurakun 7) Col Phaisan Muendet
	2) Back-forth support	1) LTG Thawi Chaemchamrat 2) MG Chamnan Koetphon 3) Col Suksan Bunchit

Table 4.24 (Continued)

Main Topic	Subtopic	Support/Additional Details
		4) Col Athicha Wongsuwan
		5) Col Sawangchit Kanchanakomon
		6) Col Prasai Phurakun
		7) Col Phaisan Muendet
Logistics principles (continued)	3) Reliability	1) LTG Thawi Chaemchamrat
		2) MG Chamnan Koetphon
		3) Col Suksan Bunchit
		4) Col Athicha Wongsuwan
		5) Col Sawangchit Kanchanakomon
		6) Col Prasai Phurakun
		7) Col Phaisan Muendet
	4) Simplicity	1) LTG Thawi Chaemchamrat
		2) MG Chamnan Koetphon
		3) Col Suksan Bunchit
		4) Col Athicha Wongsuwan
		5) Col Sawangchit Kanchanakomon
		6) Col Prasai Phurakun
		7) Col Phaisan Muendet
	5) Timeliness	1) LTG Thawi Chaemchamrat
		2) MG Chamnan Koetphon
		3) Col Suksan Bunchit
		4) Col Athicha Wongsuwan
		5) Col Sawangchit Kanchanakomon
		6) Col Prasai Phurakun
		7) Col Phaisan Muendet
	6) Proportionality	1) LTG Thawi Chaemchamrat
		2) MG Chamnan Koetphon
		3) Col Suksan Bunchit

Table 4.24 (Continued)

Main Topic	Subtopic	Support/Additional Details
		4) Col Athicha Wongsuwan
		5) Col Sawangchit Kanchanakomon
		6) Col Prasai Phurakun
		7) Col Phaisan Muendet
Logistics principles (continued)	7) Power	1) LTG Thawi Chaemchamrat: Power should be decentralized to the operation unit as much as possible, report to the superordinate unit at the first chance after operation
		2) MG Chamnan Koetphon
		3) Col Suksan Bunchit
		4) Col Athicha Wongsuwan
		5) Col Sawangchit Kanchanakomon
		6) Col Prasai Phurakun
		7) Col Phaisan Muendet: Should assign units in the area to procure relief items according to relevant official regulations
	8) Safety	1) LTG Thawi Chaemchamrat
		2) MG Chamnan Koetphon
		3) Col Suksan Bunchit
		4) Col Athicha Wongsuwan
		5) Col Sawangchit Kanchanakomon
		6) Col Prasai Phurakun
		7) Col Phaisan Muendet
	9) Frugality	1) LTG Thawi Chaemchamrat: Lives of victims should be the top priority.
		2) MG Chamnan Koetphon
		3) Col Suksan Bunchit

Table 4.24 (Continued)

Main Topic	Subtopic	Support/Additional Details
		4) Col Athicha Wongsuwan
		5) Col Sawangchit Kanchanakomon
		6) Col Prasai Phurakun
		7) Col Phaisan Muendet
Concepts about logistics	1) Use the same logistics system in normal situations and in times of war, or disaster as much as possible	1) LTG Thawi Chaemchamrat
		2) MG Chamnan Koetphon
		3) Col Suksan Bunchit
		4) Col Athicha Wongsuwan
		5) Col Sawangchit Kanchanakomon
		6) Col Prasai Phurakun
		7) Col Phaisan Muendet
	2) Follow the same standard, with minor differences	1) LTG Thawi Chaemchamrat
		2) MG Chamnan Koetphon
		3) Col Suksan Bunchit
		4) Col Athicha Wongsuwan
		5) Col Sawangchit Kanchanakomon
		6) Col Prasai Phurakun
		7) Col Phaisan Muendet
	3) Assign logistics tasks to Army Area to be the support unit in the area as much as possible. Distribute equipment, services, and facilities to regional logistics centers	All the participants agreed that ADRC should be the main support unit from in the overview.

Table 4.24 (Continued)

Main Topic	Subtopic	Support/Additional Details
Concepts about logistics (continued)	4) Prepare the equipment in the operational conditions all the time by normal procurement regulations and military industrial affairs of Ministry of Defence	All participants agreed that procurement should be based on procurement process of Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2556 (2013)
	5) Prepare spare warfare equipment and logistics personnel	All participants agreed that it is important to implement according to the Army Disaster Mitigation Plan B.E. 2556 (2013)
	6) Prepare services, constructions, infrastructure, and facilities to fully satisfy the need of agencies	1) LTG Thawi Chaemchamrat 2) MG Chamnan Koetphon 3) Col Suksan Bunchit 4) Col Athicha Wongsuwan 5) Col Sawangchit Kanchanakomon 6) Col Prasai Phurakun 7) Col Phaisan Muendet
	7) Logistics personnel shall be sufficient and proportional to battle units. Increase the available logistics personnel or establish new units as necessary.	1) LTG Thawi Chaemchamrat 2) MG Chamnan Koetphon 3) Col Suksan Bunchit 4) Col Athicha Wongsuwan 5) Col Sawangchit Kanchanakomon 6) Col Prasai Phurakun 7) Col Phaisan Muendet

Table 4.24 (Continued)

Main Topic	Subtopic	Support/Additional Details
Concepts about logistics (continued)	8) Improve and keep updated the logistics system	1) LTG Thawi Chaemchamrat 2) MG Chamnan Koetphon 3) Col Suksan Bunchit 4) Col Athicha Wongsuwan 5) Col Sawangchit Kanchanakomon 6) Col Prasai Phurakun 7) Col Phaisan Muendet
Logistics responsibility	1) General	1) LTG Thawi Chaemchamrat 2) MG Chamnan Koetphon 3) Col Suksan Bunchit 4) Col Athicha Wongsuwan 5) Col Sawangchit Kanchanakomon 6) Col Prasai Phurakun 7) Col Phaisan Muendet
	2) Units at different levels	All participants agreed that it should be changed to go in line with the transformation from Military District to Military Circle.

Table 4.25 Summary of Suitability of RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army for Disaster Relief Operations (Flooding) in 2011

Main Topic	Subtopic	Suitability	Remark
Logistics policy	1) Logistics policy according to logistics principles	/	

Table 4.25 (Continued)

Main Topic	Subtopic	Suitability	Remark
	2) Logistics based on available equipment and manpower acquired from procurement	/	Should have more donations
Logistics principles	1) Centralized support	/	
	2) Back-forth support	/	
	3) Reliability	/	
	4) Simplicity	/	
	5) Timeliness	/	
	6) Proportionality	/	
	7) Power	/	1) Power should be decentralized to the operation unit as much as possible, report to the superordinate unit at the first chance after operation. 2) Should assign units in the area to procure relief items according to relevant official regulations

Table 4.25 (Continued)

Main Topic	Subtopic	Suitability	Remark
	8) Safety	/	
	9) Frugality	/	Lives of victims should be the top priority.
Concepts about logistics	1) Use the same logistics system in normal situations and in times of war, or disaster as much as possible	/	
	2) Follow the same standard, with minor differences	/	
	3) Assign logistics tasks to Army Area to be the support unit in the area as much as possible. Distribute equipment, services, and facilities to regional logistics centers	X	All the participants agreed that ADRC should be the main support unit from in the overview.
	4) Prepare the equipment in the operational conditions all the	X	All participants agreed that procurement should be based on

Table 4.25 (Continued)

Main Topic	Subtopic	Suitability	Remark
Concepts about logistics (continued)	time by normal procurement regulations and military industrial affairs of Ministry of Defence		procurement process of Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2556 (2013)
	5) Prepare spare warfare equipment and logistics personnel	X	All participants agreed that it is important to implement according to the Army Disaster Mitigation Plan B.E. 2556 (2013)
	6) Prepare services, constructions, infrastructure, and facilities to fully satisfy the need of agencies	/	
	7) Logistics personnel shall be sufficient and	/	

Table 4.25 (Continued)

Main Topic	Subtopic	Suitability	Remark
	proportional to battle units. Increase the available logistics personnel or establish new units as necessary.		
	8) Improve and keep updated the logistics system	/	
Logistics responsibility	1) General	/	
	2) Units at different levels	X	All participants agreed that it should be changed to go in line with the transformation from Military District to Military Circle.

The researcher developed and synthesized the logistics model for disaster relief operations (flooding) of The Royal Thai Army (Figure 4.4) by integrating the conditions and problems of logistics in disaster relief operations (flooding) of RTA and the factors affecting the success of logistics for disaster relief operations (flooding) of RTA under the framework for implementing according to Army Disaster Mitigation Plan B.E. 2556 (2013) and National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014). It was found that, regarding the factors affecting the success of logistics for disaster relief operations (flooding) of RTA, there were 6 flaws, problems, or insufficiencies affecting policy implementation: 1) characteristics

of the policy i.e. trial practice and quality of feedback, 2) objectives of the policy i.e. success indicator of the policy and accuracy of information, 3) sufficiency of resources i.e. budget, manpower quality and number, and management, 4) technical or theoretical possibility i.e. characteristics of the technology, 5) characteristics of the organization implementing the policy i.e. structure, supervision, and procedure of open communication, and 6) relationship between the mechanisms in the organization or between the organizations implementing the policy i.e. the number of relevant organizations the number of decision making points, and interference from higher organization. Regarding the factors affecting the success or failure of logistics in disaster relief operations (flooding) of RTA in the preparation and reconstruction processes, no flaws, problems, or insufficiencies were found to significantly affect the policy implementation. That was because the role of logistics in disaster relief operations (flooding) of RTA was only as a supporter for Ministry of Interior.

To make the logistics model for disaster relief operations (flooding) of The Royal Thai Army complete in 4 dimensions: overview, suitability, completeness, and practicality, the researcher asked the first group of informant to evaluate the model. The evaluation showed that, in the overview, the logistics model for disaster relief operations (flooding) of The Royal Thai Army developed in this research was suitable, complete, and practical. In addition, the informants also suggested some useful advice as described in Table 4.26.

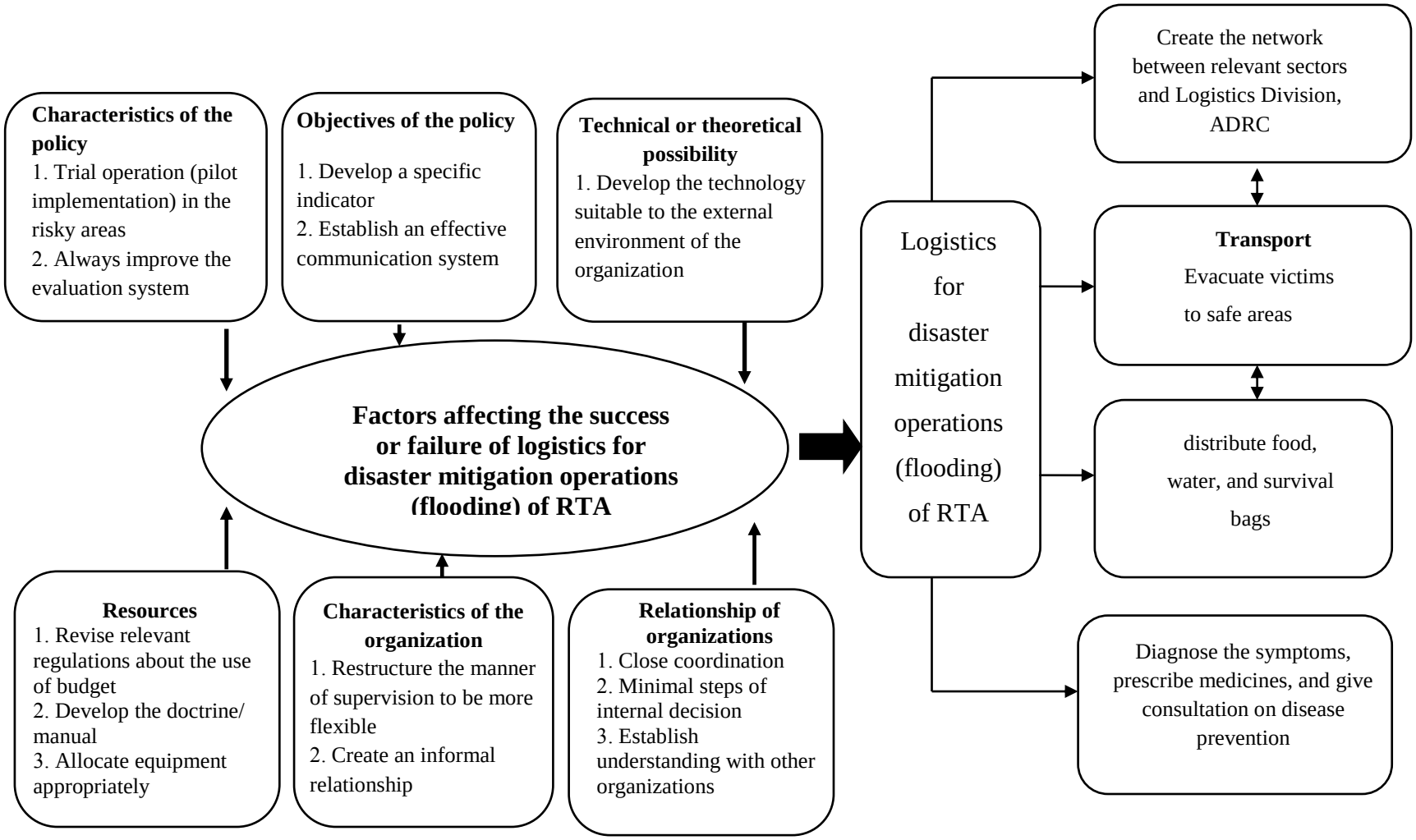

Figure 4.4 The Logistics Model for Disaster Mitigation Operations (Flooding) of RTA

Table 4.26 Evaluation Result of the Logistics Model for Disaster Relief Operations (Flooding) of The Royal Thai Army by Logistics Experts

Focus Group Discussion Participants	Model Evaluation				Remark
	Overview	Suitability	Completeness	Practicality	
LTG Thawi Chaemchamrat	/	/	/	/	Other services should be added if commanded so, such as security guard.
MG Chamnan Koetphon	/	/	/	/	
Col Suksan Bunchit	/	/	/	/	
Col Athicha Wongsuwan	/	/	/	/	
Col Sawangchit Kanchanakomon	/	/	/	/	
Col Prasai Phutrakun	/	/	/	/	
Col Phaisan Muendet	/	/	/	/	

In order to make the logistics model for disaster relief operations (flooding) of The Royal Thai Army as complete as possible and enable the public sector, private sector, and civil society in implementing according to Disaster Prevention and Mitigation Act B.E. 2550 (2007) to use it for more concrete results, the researcher asked the second group of the informants to evaluate the model again. The results showed that, in the overview, the participants agreed that the logistics model for disaster relief operations (flooding) of The Royal Thai Army developed in this research was suitable, complete, and practical. In addition, the informants also suggested some useful advice as described in Table 4.27.

Table 4.27 Evaluation Result of the Logistics Model for Disaster Relief Operations (Flooding) of The Royal Thai Army by Relevant Parties from Other Sectors

Focus Group Discussion Participants	Model Evaluation				Remark
	Overview	Suitability	Completeness	Practicality	
LTG Thawi Chaemchamrat	/	/	/	/	
Mr. Darong Traiwongphaisan	/	/	/	/	Outsourcing system from private sector should be applied as a trial.
Mr. Montri Chanachaiwibunwat	/	/	/	/	Relevant sectors should be integrated effectively.
Mr. Sanya Chinimit	/	/	/	/	Network should be developed.
LTG Amnat Bali	/	/	/	/	Disaster mitigation principles should be closely observed.
Mrs. Parina Prayukwong	/	/	/	/	The role of public sector and civil society should be promoted more formally.
Mr. Wirot Laohaphan	/	/	/	/	

Furthermore, there was an issue that the participants were interested in and discussed widely, namely the creation of allies to tackle disaster. The allies shall consist of all relevant sectors where there is also official empowerment for the public or civil society for the concrete action in the disaster relief movement. On this matter, Mrs. Parina Prayukwong shared her opinion on the importance of the public in an interesting way. She said,

> When a disaster is too large for the old systems to settle, be it the systems of the government, private sector, public sector, or local organizations, there will be chaos. The helping hand to address the disaster will lie with the role of the people to unitedly lend hands

This opinion went the same way as the approach of helping the flood victims by RTA when the integrated action plan group was trying to empower all relevant parties, especially the people or the civil society. In such a case, the army functioned as the main coordinator with Bangkok Administration while other government agencies, leader of the affected community, and other sectors worked together in a systematic manner. For example, they collaborated in the mission of building a coordinating center between battalion-level responsible unit in the community or at the center of the community, not to mention the use of vehicle, tools for disaster prevention and mitigation, patrol and security guard, distribution of relief items, food and supplies, waste management to reduce water pollution, water treatment using EM ball in the flooded area and drainage canals, and establishment of donation centers (LTG Phalawut Klapcharoen, in-depth interview; Mr. Sanya Chinimit, LTG Amnat Bali, and Mr. Wirot Laohaphan, focus group discussion).

CHAPTER 5

CONCLUSION, DISCUSSION, AND SUGGESTIONS

In the research titled "Development of Logistics Model for Disaster relief operations (flooding) of The Royal Thai Army", the researcher employed mixed methodology between survey research and quality research. The objectives of the research are 1) to investigate the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army, 2) to examine the factors affecting the success of logistics for disaster relief operations (flooding) of The Royal Thai Army, and 3) to develop the military logistics model for disaster relief operations (flooding) of The Royal Thai Army. The researcher decided to use survey research to investigate the first and second objectives. To be specific, the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army were investigated based on the McKinsey 7-S Framework. The factors affecting the success of logistics for disaster relief operations (flooding) of RTA were examined through the results of logistics by RTA, as well as other activities in normal situations apart from war, in the national defense plan, or other projects defined in RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army. For the second and third objectives, the researcher relied on grounded theory methodology together with a case study as the guideline for developing the military logistics model for disaster relief operations (flooding) of The Royal Thai Army. The research tools included documentary research, in-depth interview, and focus group discussion. The development of military logistics model for disaster relief operations (flooding) of The Royal Thai Army was based on the integration between the conditions and problems of military logistics for disaster relief operations (flooding) of The Royal Thai Army and the factors affecting the success of logistics for disaster relief operations (flooding) of The Royal Thai Army. The preliminary results of the survey research were discussed and used as the guideline for logistics for disaster relief

operations (flooding) of The Royal Thai Army. Most importantly, military logistics model for disaster relief operations (flooding) of The Royal Thai Army in 2011 was developed under the framework of implementation according to Army Disaster Relief Plan B.E. 2556 (2013) and the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014).

5.1 Research Results

5.1.1 The victim assistance of RTA in Bangkok area declared as urgent disaster area in 2011 was conducted on behalf of ADRC. The structure of ADRC was subject to the Disaster Relief Center Headquarters of Ministry of Defence, and Disaster Relief Center of the Armed Forces. The organic units at every level in RTA established its disaster relief center. Responsible zones were allocated for each military unit according to the Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011). The responsible zones covered every district and village nationwide. Apart from the command of higher units, the organic units of RTA in every level shall strictly hold on to the policy and approach of assisting the victims of the Commander in Chief (Gen Prayuth Chan-ocha). The priority of the command was to urgently help the victims of the disaster that may harm their lives and properties in the first stage (before October). When the flood become worse than the extent that civilian agencies could handle according to the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014) (severity level higher than 3), the Government assigned RTA to be in charge of resolving the situations in 5 provinces i.e. Nakhon Sawan, Phra Nakhon Si Ayutthaya, Lop Buri, Nonthaburi, and Pathum Thani. The key responsibility was still with the governor of each province. However, when the situation expanded to Bangkok Metropolitan, the Government assigned Ministry of Defence to take the main charge to resolve the flood together with Ministry of Interior. On this occasion, RTA coordinated with other armed forces continuously and closely in the solution and prevention of flooding in Bangkok area. RTA was responsible for helping the flood victims in 43 out of the entire 50 districts in Bangkok in 2011. To complete the assignment, RTA operated in 2 manners: 1) to follow the order of the government, acted by the Flood Relief Operations Center, and

2) the management initiated by the army itself. The public assistance job was divided into 4 missions: 1) water management, 2) public assistance, 3) victim support, and 4) integrated planning to empower every sector on water management. The tasks relevant to logistics for disaster relief operations (flooding) of RTA (Table 5.1) were public assistance and victim support. Public assistance included evacuating the people to safe areas, their hometown, or temporary shelters provided at government offices and charity organizations. In the flood victim support operation, RTA facilitated traffic by lending vehicles of the army, including trucks and boats, in the areas that other vehicles could not go. RTA provided the vehicles for people in the area with high level of water in Bangkok Metropolitan in main routes and additional routes leading to their communities. Also, it also covered provision of food and drinking water, royal kitchen service, and collaboration with government agencies and private businesses to supply fresh food to the affected area. In addition, the army established mobile kitchens and kitchen personnel to make food for the people. For medical service, medical staffs from hospitals nationwide under RTA were called in to support the operation of public hospitals, National Institute of Emergency Medicine, and 19 mobile medical units in addition to the medical units of RTA operating in Bangkok Metropolitan.

5.1.2 Logistics for disaster relief operations (flooding) of RTA in every step i.e. preparation, response, and reconstruction, in 2011 was systematically related to the Strategic Response Plan B.E. 2557-2561 (2014-2018). Strategic Response Plan required Ministry of Defence to support disaster relief operations of Ministry of Interior. As a result, logistics for disaster relief operations (flooding) of RTA was according to Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011), which is in turn based on RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army (Table 5.2). That having been said, when the situation become more severe than level 3 as specified in the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014), it is worse than what the civilian agencies could help the victims. Also, the fact that Department of Disaster Prevention and Mitigation declared the emergency disaster area, logistics for disaster relief operations (flooding) of RTA would become more flexible as they would be based on Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004).

Table 5.1 Logistics Activities for Disaster Relief Operations (Flooding) of RTA in 2011 (Sorted by Types of Mission)

Activity	Step			District	Type of Mission
	Preparation	Response	Reconstruction		
Victim evacuation	-	/	/	Dusit	Public assistance
	-	/	/	Phayathai	
	-	/	/	Nong Khaem	
	-	/	/	Thawi Watthana	
	-	/	/	Phra Nakhon	
Traffic facilitation	-	/	/	Dusit	Victim support
	-	/	/	Phayathai	
	-	/	/	Nong Khaem	
	-	/	/	Thawi Watthana	
	-	/	/	Phra Nakhon	
Provision of food and water	-	/	/	Dusit	Victim support
	-	/	/	Phayathai	
	-	/	/	Nong Khaem	
	-	/	/	Thawi Watthana	
	-	/	/	Phra Nakhon	
Collaboration with government agencies and private business to supply fresh food	-	/	/	Dusit	Victim support
	-	-	-	Phayathai	
	-	/	/	Nong Khaem	
	-	/	/	Thawi Watthana	
	-	-	-	Phra Nakhon	
Kitchen personnel and mobile kitchen	-	/	/	Dusit	Victim support
	-	-	-	Phayathai	
	-	-	-	Nong Khaem	

Table 5.1 (Continued)

Activity	Step			District	Type of Mission
	Preparation	Response	Reconstruction		
	-	-	-	Thawi Watthana	
	-	-	-	Phra Nakhon	
Medical service	-	-	-	Dusit	Victim support
	/	/	/	Phayathai	
	/	/	/	Nong Khaem	
	/	/	/	Thawi Watthana	
	/	/	/	Phra Nakhon	

Table 5.2 Conditions of Logistics for Disaster Relief Operations (Flooding) of RTA in 2011

Step	Action Plan/ Regulation	Implementation Term	Action/Activity	Responsible Agencies	Supports from RTA		Logistics Type
					Military Units	Job Description	
Preparation	Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011)	Short-term	1) Help civilians move their properties 2) Preparation to prevent the areas 3) Support government organizations and local administrative organizations	1) Agencies of Ministry of Interior 2) Local administrative organizations	1) Internal Security Operations Command 2) Armed Forces' Disaster Mitigation Center 3) Military units in the area	1) Provide equipment support according to the capacity of the agency 2) Prepare the assistance plan since the normal situations	Logistics in normal situations
		Long-term	1) Reforestation, building weirs to reduce the current speed, providing relevant knowledge, and prevention of deforestation	1) Relevant ministries e.g. Ministry of Agriculture and Cooperatives, 2) Government agencies in the area	1) Internal Security Operations Command 2) Armed Forces' Disaster Mitigation Center 3) Military units in the area 4) Units assigned by RTA	1) Follow RTA policy 2) Support government policy such as canal dredging	Logistics in normal situations

Table 5.2 (Continued)

Step	Action Plan/ Regulation	Implementation Term	Action/Activity	Responsible Agencies	Supports from RTA		Logistics Type
					Military Units	Job Description	
			2) Support other government agencies				
Response	Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011) and Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004)	Short-term	1) Helping victims of emergency disaster 2) Supporting other agencies	1) Agencies of Ministry of Interior 2) Local administrative organizations 3) Government agencies in the area	1) Internal Security Operations Command 2) Armed Forces' Disaster Mitigation Center 3) Military units in the area	1) Support in term of equipment and manpower for urgent aid to the victims 2) Support in term of equipment and manpower as requested	Logistics in normal situation and disaster logistics
		Long-term	1) prolonged and continuous assistance to the victims	1) Agencies of Ministry of Interior 2) Local administrative organizations 3) Government agencies in the area	1) Internal Security Operations Command 2) Armed Forces' Disaster Mitigation Center 3) Military units in the area	Support in term of equipment and manpower as requested	Logistics in normal situations and disaster logistics

Table 5.2 (Continued)

Step	Action Plan/ Regulation	Implementation Term	Action/Activity	Responsible Agencies	Supports from RTA		Logistics Type
					Military Units	Job Description	
Reconstruction	Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011)	Short-term	Provide manpower or construction support as commanded by higher unit	1) Agencies of Ministry of Interior 2) Local administrative organizations 3) Government agencies in the area	1) Internal Security Operations Command 2) Disaster Mitigation Center of Army Area or higher	Support other agencies as commanded by higher units such as short-time or urgent construction or repairs	Logistics in normal situations
		Long-term	Provide manpower or construction support as commanded by higher unit	1) Agencies of Ministry of Interior 2) Local administrative organizations 3) Government agencies in the area	1) Internal Security Operations Command 2) Army Disaster Relief Center 3) Units assigned by RTA	Support other agencies as commanded by higher units such as helping flood victims in the southern region	Logistics in normal situations

5.1.3 Some problems or flaws regarding logistics for disaster relief operations (flooding) of RTA in 2011 were found. First of all, relevant laws, policies, and regulations were not flexible and practical in the affected area. To be specific, the advance money that Ministry of Defence was allowed to have was limited. RTA, in particular, was allocated the advance money much lower than the demand compared to the huge number of victims, not to mention out-of-date regulations that could not be applied to different areas. Moreover, there was an issue with the ability of organic units of RTA and capacity of the manpower operating in the area. It was found that logistics personnel for military relief operations (flooding) of RTA did not have proper knowledge in the process of logistics. That is to say, they failed to operate according to Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004) and its revised editions because of familiarity with RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army and regulations of the Office of the Prime Minister on Procurement B.E. 2535 (1992) and its revised editions. In addition, there was another troublesome matter, the conflicting collaboration due to communication or coordination failure between military units and other agencies, private sector, or the civil society. The collaboration did not go to the same trajectory and was not uniform, resulting in the delay in victim assistance. Most of the informants were aware of and placed much importance on the problems and solutions to logistics for disaster relief operations (flooding) of RTA in the same direction. However, they expressed slightly different opinions about the importance of problems and minor details. To clarify, the top level supervisors of RTA placed the highest importance on the policy problems, followed by management. Regarding the most important problems according to the top level supervisors, laws, policies, and regulations about logistics in disaster relief operations (flooding) of RTA were not flexible in practice in times of disaster. Some of the regulations became obsolete and could not apply to the actual situation in different areas. Some of the regulations became obsolete and could not apply to the actual situation in different areas. The budget did not match the size of the assign task. In practice, the capacity of organic units subject to RTA and that of the manpower working in logistics in disaster relief operations (flooding) of RTA in each area were so limited. The biggest failure was the

coordination and communication between military agencies and civilian agencies, private sector, and the civil society, which was not uniform and not steered to the same direction. As a consequence, the victim assistance was not effective since the first stage of the flood. However, the interview with heads of logistics division of ADRC and unit commanders or logistics officers (5 persons) assigned to be in charge of 42 districts of Bangkok declared in 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior pointed out to different answers. Most informants in this second and third groups said that the most important problem lay with management such as the structure of logistics systems in disaster relief operations (flooding) of RTA that had single and long level of supervision. Singularity and complicated level of supervision resulted in the inflexibility in practice. The equipment, tools, and manpower for logistics in disaster relief operations (flooding) of RTA were limited both in quantity and capacity. Procurement of relief items was delayed. Inventory control was not up-to-date and incomplete. The number of equipment warehouses was also limited. Categorization of inventory was also unsystematic. Repairs of equipment for disaster relief operations were behind the schedule. All in all, other relevant operations were discontinued and unsystematic.

Table 5.3 Problems and the Solutions to Logistics in Disaster Relief Operations (Flooding) of RTA in 2011 in Term of Policy

Problems	Causes	Solutions	Remark
Laws, policies, and regulations were not flexible	1) Severity level of the flood 2) Responsibility assignment of military units as supporter 3) Limited ability of civil personnel	1) Revise the duty and responsibility of Ministry of Defence according to National Disaster Prevention and Mitigation Plan to be more flexible in practice.	Gen Prayuth Chan-ocha and LTG Supphakon Sa-nguanchatsonkrai
		2) Increase the advance money and details	Col Suchat Wongmak, Col Chanin Waramit,

Table 5.3 (Continued)

Problems	Causes	Solutions	Remark
		about disaster supports in Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency	Col Chaimontri Phothong
		3) Revise RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army to be more appropriate.	LTG Thawi Chaemcharat, LTG Sayan Yangphithak, MG Chamnan Koetphon, Col Suksan Bunchit, Col Prasai Phutrakun
Budget is not enough.	1) Severity level of the flood and the huge number of victims 2) Limitations of budget sources	1) Increase the advance money for emergency disaster relief operations by RTA	Col Suchat Wongmak, Col Chanin Waramit
		2) Add the provision that allows the use of central budget or normal budget	Col Chanin Waramit, Col Chaimontri Phothong
Capacity of units/ manpower is limited.	1) Military units are not designed specifically for disaster relief. 2) Equipment for effective disaster relief is insufficient.	1) Request equipment support for disaster relief in addition to current capacity of units.	LTG Supphakon Sa-nguanchatsonkrai, Col Suchat Wongmak
	3) Military training/ education system focus mainly on national defense.	2) Request additional equipment support from other sectors.	LTG Supphakon Sa-nguanchatsonkrai

Table 5.3 (Continued)

Problems	Causes	Solutions	Remark
		3) Improve systematically and continuously manpower skills and capacity in disaster relief	Gen Prayuth Chan-ocha and LTG Supphakon Sa-nguanchatsonkrai
		4) Training together among armed forces and civilian agencies on disaster relief	LTG Supphakon Sa-nguanchatsonkrai, LTG Somchai Yangphithak
Coordination and communication with other agencies are ineffective.	1) Civilian agencies did not understand military operation approach.	1) Establish mutual understanding between military units and civilian agencies regarding coordination and communication.	LTG Phalawut Klapcharoen
	2) Differences in coordination process	2) Develop closer relationships between military and civilian agencies	LTG Phalawut Klapcharoen, Col Suphon Chanphong
	3. Limited communication channels	3) Improve the role of military units assigned to the areas.	
	4) Areas for military units are unclearly assigned.	4) Areas for military units are clearly assigned.	Gen Prayuth Chan-ocha, LTG Phalawut Klapcharoen
Singularity and complicated level of supervision in the structure of logistics resulted in the inflexibility in practice	1) There are no specific criteria of logistics structure for flood disaster relief	1) Structure of logistics for flood disaster should be suitably defined.	LTG Supphakon Sa-nguanchatsonkrai, Col Suchat Wongmak

Table 5.3 (Continued)

Problems	Causes	Solutions	Remark
Procurement of relief items was delayed. Inventory control was not up-to-date and incomplete.	2) Relevant policies and regulations are obsolete. Operational staffs are not familiar with procurement regulations in times of disaster.	2) Relevant policies and regulations should be updated to match with the actual situation. 1) Staffs should be trained on practice approach. 2) Make simple operation manual.	Col Suchat Wongmak, Col Suphon Chanphong Col Phaisan Muendet
The number of equipment warehouses was also limited and scattered. Categorization of inventory was also unsystematic	The number of logistics personnel is low compared to the volume of equipment.	1) Allocate additional personnel 2) Improve personnel performance 3) Apply IT systems	LTG Thawi Chaemcharat
	Some of the available equipment was affected by the flood.	1) Distribute the equipment as soon as possible, even without going through the warehouse. 2) It is best to categorize the equipment for logistics more systematically. 3) Outsourcing when necessary	LTG Nanthaphon Chamratromran, Col Surasak Chindaprasan
Repairs of equipment for disaster relief operations were behind the schedule. Other relevant operations were discontinued and unsystematic, especially logistics, ordnance, and engineering equipment.	There was budget shortage for equipment repairs.	1) Always set the budget for repairs. 2) Outsourcing when necessary	Col Chaimontri Phothong, Col Suchat Wongmak

5.1.4 The factors affecting the success of logistics in disaster relief operations (flooding) of RTA had a substantial relationship with conditions and problems of logistics for disaster relief operations (flooding) of RTA in the steps of preparation and reconstruction. The finding was similar to logistics in normal situation and in times of disaster. That being said, the implementation was based on the Army Disaster Relief Plan B.E. 2556 (2013), RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai Army and Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2547 (2004) and its revised editions. In addition, it was found that the factors affecting the success of disaster logistics, the factors affecting the success of policy implementation, and the factors affecting the success of logistics for disaster relief operations (flooding) of RTA had the agreeing relationship where there were minor differences in detail. Therefore, the researcher decided to consider the factors affecting the success or failure of logistics for disaster relief operations (flooding) from the 3 groups of informants, and the results of operation in the affected areas in 2011 of RTA organic units. It was found that the factors affecting the success of disaster logistics and the factors affecting the success of logistics had a relationship in terms of policy and management, from the steps of preparation, response, and reconstruction. However, the content coverage was lower than the factors affecting the success or failure of policy implementation. The results in this research pointed out that, regarding the factors affecting the success or failure of logistics for disaster relief operations (flooding) of RTA in the response step, there were 6 flaws, problems, or insufficiencies affecting policy implementation: 1) characteristics of the policy i.e. trial practice and quality of feedback, 2) objectives of the policy i.e. success indicator of the policy and accuracy of information, 3) sufficiency of resources i.e. budget, manpower quality and number, and management, 4) technical or theoretical possibility i.e. characteristics of the technology, 5) characteristics of the organization implementing the policy i.e. structure, supervision, and procedure of open communication, and 6) relationship between the mechanisms in the organization or between the organizations implementing the policy i.e. the number of relevant organizations the number of decision making points, and interference from higher organization. Regarding the factors affecting the success or

failure of logistics in disaster relief operations (flooding) of RTA in the preparation and reconstruction steps, no flaws, problems, or insufficiencies were found to significantly affect the policy implementation. That was because the role of logistics in disaster relief operations (flooding) of RTA was only as a supporter for Ministry of Interior. Therefore, the logistics approach for disaster relief operations (flooding) of RTA was according to Ministry of Defence's Disaster Relief Plan B.E. 2554 (2011), which was similar to logistics in normal situations.

5.1.5 The researcher developed and synthesized the logistics model for disaster relief operations (flooding) of RTA (Figure 5-1) by integrating the conditions and problems of logistics for disaster relief operations (flooding) of RTA and the factors affecting the success of logistics for disaster relief operations (flooding) of RTA under the framework for implementing according to Army Disaster Mitigation Plan B.E. 2556 (2013) and National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014). It was found that, regarding the factors affecting the success of logistics for disaster relief operations (flooding) of RTA, there were 6 flaws, problems, or insufficiencies affecting policy implementation: 1) characteristics of the policy, 2) objectives of the policy, 3) sufficiency of resources, 4) technical or theoretical possibility, 5) characteristics of the organization implementing the policy, and 6) relationship between the mechanisms in the organization or between the organizations implementing the policy. Regarding the factors affecting the success or failure of logistics in disaster relief operations (flooding) of RTA in the preparation and reconstruction steps; no flaws, problems, or insufficiencies were found to significantly affect the policy implementation. That was because the role of logistics in disaster relief operations (flooding) of RTA was only as a supporter for Ministry of Interior. In addition, to make the logistics model for disaster relief operations (flooding) of The Royal Thai Army complete in 4 dimensions: overview, suitability, completeness, and practicality, the researcher asked both groups of informants to evaluate the model. The evaluation results showed that, in the overview, the logistics model for disaster relief operations (flooding) of The Royal Thai Army developed in this research was suitable, complete, and practical.

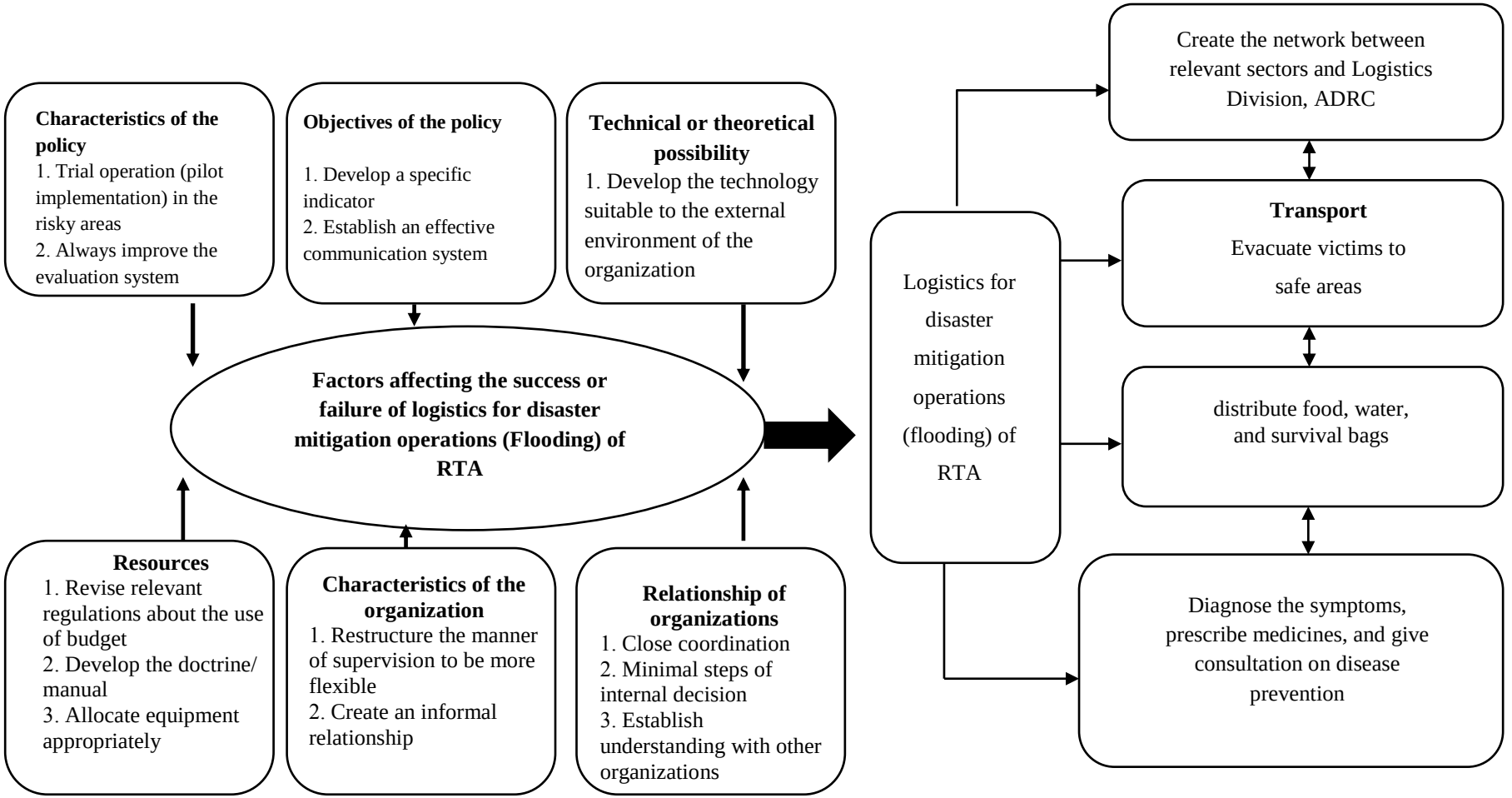

Figure 5.1 The Logistics Model for Disaster Mitigation Operations (Flooding) of RTA

5.2 Discussion

5.2.1 The results of the research "A Development of Logistics Model for Disaster Relief Operations (Flooding) of RTA" are objective evidences that help prove the integration of knowledge between military logistics and disaster logistics despite their completely different objectives. To demonstrate, the objective of military logistics is to provide essential supports so that the battle units get victorious, by sending equipment, supplies, and services in a sufficient and timely manner, with the preparedness of the battle units to maintain sovereignty as the main goal (Army Logistics Doctrine, 2009: 1). On the other hand, disaster logistics is aimed to relief sufferings of the victims. The scope of disaster logistics usually covers at least 2 areas: 1) logistics in response to the disaster within limited time and uncertain demand and supply, limited budget, and high expectation toward satisfactory supplies, public health, accommodation, relief, and transportation, and 2) a close relationship with the disaster, starting from preparation, response, and reconstruction (Kovacs and Spen, 2011; Thomas and Kopczak, 2005: 2). The basic principles of disaster relief consist of 4 elements: 1) humanity e.g. helping the victims without conditions and discrimination, 2) neutrality e.g. helping the victims regardless of conflicts, 3) impartiality e.g. helping and relieving based on necessity, and 4) liberty e.g. helping and relieving without political, economic, military, or other interests (LTG Amnat Bali and Mrs. Parina Prayukwong, focus group discussion). However, military logistics for disaster relief operations of RTA is different from other countries. In Thailand, it is a military operation was conducted in consideration of the Ministry of Defence as stipulated in Section 8 of Ministry of Defence Reorganization Act B.E. 2551 (2008) and its amended version which states that "(3) protect and maintain national interests and the democracy with the King as head of the state, develop the nation for national security, and support the government's mission to develop the country, prevent and mitigate the problems caused by disasters". However, there might be some differences from the army in some country such as the United States where there are prohibitions of using military forces to enforce internal laws. Therefore, the USA needs to use the national guard under the commanded of the governor of each state to address the emergency disaster (Phorn Phisek, 2015: 86; LTG Phalawut Klapcharoen, in-depth interview).

5.2.2 Problems and solutions problems and solutions to logistics in disaster relief operations (flooding) of RTA in 2011 both in term of policy and management were the consequences of modern security environment which is different from the past. Therefore, the role of RTA to address new types of threats need to change accordingly. To clarify the traditional threats or full-spectrum war becomes less likely while the new threats have become more critical (Prayuth Chan-ocha, 2008b: 13; Ministry of Defence, 2013). RTA has categorized military operations by the characteristics of threats into 2 groups: 1) traditional operations such as border defense, warfare, and the like, and 2) non-traditional or asymmetrical operations such as protection of the monarch, maintaining internal peace and order, and disaster relief (The Army Training Command of RTA. Center for Doctrine and Strategy Development, 2012: 1-13-1-15; Ministry of Defence, 2013: 13). After additional research, it was found that law, manual, regulation, structure of organization, doctrine, training process, personnel management, as well as military logistics or the continuance of RTA battle have been designed to support traditional military operations. The findings agreed with the research results by Prayuth Chan-ocha (2008b: 14-15) which identified 3 problems of RTA to confront new threats. According to Chan-ocha, first of all, there is no clear structuring of organization to address the new threats because the structure and management style of the army at present aims for the traditional threats. Secondly, while the main mission of the army is national defense, its mission regarding the new threats is only a support or assistance unit, thus lacking the full power to act. Finally, Thai Army does not have a clear doctrine for Military Operations Other Than War (MOOTW) as the framework for organization, mission, equipment, and systematic management for the new threats. The findings by Surayut Rattanacharu (2010: Abstract) identified the shortage of manpower in Disaster Relief Company due to limited budget. Prasarnchoke Thuvanuti (2003: Abstract) mentioned that personnel deficiency was due to the policy of downsizing the army. This was a clear indication that Thai Army is being changed to become multi-function and smaller according to the master plan. Therefore, Ministry of Defence needs to consider more about the new threats. In addition, when considering the problems and solution to logistics for disaster relief operations of RTA in 2011 in term of policy, it was found that it was not prepared for prolonged

flooding and the relief operations involved only solving the problems at hand (day-by-day basis). The findings agreed with Wutthisan Luangjinda (2012: Abstract) who identified the problems at policy level for disaster relief (flooding) in Bangkok of RTA in 2011. According to Luangjinda, the problems lay with the law and structure of the organization because Ministry of Defence functioned as a supporter according to National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014). Without any area announced emergency disaster area by Department of Disaster Prevention and Mitigation, Ministry of Interior, military units could only be prepared at their bases. Another problem at the level of operators in the flood relief operations in Bangkok of RTA in 2011 was that military equipment is not designed specifically for disaster relief, not to mention that they are out-of-date, thus resulting in in effective result. The statement went in line with the study by Chonphum Saengduean (2005, Abstract) and the information from an in-depth interview with LTG Supphakon Sa-nguanchatsonkrai and LTG Somchai Yangphithak. Furthermore, it was found that there were misunderstandings and miscommunications between civilian agencies and military units, especially the means of helping the victims by the army, style of command and supervision. The statement agreed with Tabbara (2008 : Abstract) who mentioned clarity of role, responsibility, and coordination in response and reconstructions steps, and Nithinan Chaiwatthanaphan, Kharawadi Phiphatphongsathon, and Piyachat Sunyakhanit (2007: Abstract) who said that coordination in disaster relief operations need to be understood among relevant parties. However, it was noted another factor that made military logistics for disaster relief operations (flooding) of RTA in 2011 more effective and systematic than those of civilian agencies was the army incident action plan. Thawida Kamonwet (2013) indicated that military incident action plan was effective because it defined all the actions, was based on clear regulations, and was brought into training in a regular basis.

5.2.3 The factors affecting the success or failure of logistics for disaster relief operations (flooding) of RTA in 2011 was found to be complicated in term of determining a specific success indicator (Van Wassenhove, 2006; Pettit and Beresford, 2009; Christopher and Tatham, 2011: 2-3). When conducting further research on the factors affecting the success in logistics for disaster relief operations (flooding) of RTA by gather more field data, it was found that each group of factors

are closely related, both directly and indirectly. This is because there is a link of logistics knowledge in 4 areas: 1) military logistics, 2) business logistics, 3) disaster logistics, and 4) the factors affecting the success or failure of policy implementation. Military logistics consists of 4 groups of factors: e.g. policymaking, determining the demand, and locating the quarter of logistics, 2) procurement, 3) inventory management e.g. storage, distribution, maintenance, and disposition, and 4) services e.g. transport and medical services (Phaithoon Lueangtrakun, 2009: 58). Business logistics is under the concept of creating value added in the activities related to market demand and cost reduction in the manufacturing process of products or service as much as possible, alternatively called product or service production optimization (McGinnis, 1992; Parapob, Suthikarnnarunai and Buranaprapa, 2009). Disaster logistics aims for the success of logistics in time of disaster. The activities involve 1) strategic planning, 2) resource management, 3) transport planning, 4) transport capacity planning, 5) information management, 6) utilization of technology, 7) human resource management, 8) continuous development, 9) relationship with suppliers, and 10) logistics strategies (Pettit and Beresford, 2009). The factors affecting the success or failure of policy implementation (Supachai Yavaprabhas, 2012: 101-118) include 1) characteristics of the policy, 2) objectives of the policy, 3) political possibility, 4) technical or theoretical possibility, 5) sufficiency of resources, 6) characteristics of the organization implementing the policy, 7) attitude of implementers, and 8) relationship between the mechanisms in the organization or between the organization implementing the policy. After an in-depth analysis, in the overview, the above knowledge has the connection pointing to the same trajectory, with only minor differences in details or aspects. According to the result, It was found that, regarding the factors affecting the success of logistics for disaster relief operations (flooding) of RTA, there were 6 flaws, problems, or insufficiencies affecting policy implementation: 1) characteristics of the policy i.e. trial practice and quality of feedback, 2) objectives of the policy i.e. success indicator of the policy and accuracy of information, 3) sufficiency of resources i.e. budget, manpower quality and number, and management, 4) technical or theoretical possibility i.e. characteristics of the technology, 5) characteristics of the organization implementing the policy i.e. structure, supervision, and procedure of open communication, and 6) relationship

between the mechanisms in the organization or between the organizations implementing the policy i.e. the number of relevant organizations the number of decision making points, and interference from higher organization. Regarding the factors affecting the success or failure of logistics in disaster relief operations (flooding) of RTA in the preparation and reconstruction processes, no flaws, problems, or insufficiencies were found to significantly affect the policy implementation. That was because the role of logistics in disaster relief operations (flooding) of RTA was only as a supporter for Ministry of Interior. However, the researcher found that the reconstruction step of logistics for disaster relief operations (flooding) of RTA, ADRC still continued with the military logistics for disaster relief operations (flooding) of RTA organic units just like the disaster logistics in spite of the fact that it was the responsibility of civilian agencies. This was because it was requested by the government to continue doing so since civilian agencies did not have the capacity to operate as effectively as military units.

5.2.4 The logistics model for disaster relief operations (flooding) of RTA was in agreement and connection with other policy implementation models. For example, it was found that resource was the main factor affecting the success or failure of policy implementation just like the model of Van Meter and Van Horn (1975), Sabatier (1986), and Voradej Chandarasorn (1984). However, this research revealed that some characteristics of logistics personnel greatly affected military logistics for disaster relief operations (flooding), especially leadership of top level supervisors of RTA in response to the disaster. Another factor was the organization culture of RTA, where the subordinate staffs have to strictly follow orders of the superordinate according to Soldier Discipline Act B.E. 2476 (1933) (Gen Prayuth Chan-ocha, LTG Phalawut Klapcharoen, and LTG Thawi Chaemcharat, in-depth interview). In addition, there were differences of the groups of factors affecting the success or failure of policy implementation sorted by different period of time and relevant laws. That is to say, the factors affecting the success or failure of logistics for disaster relief operations (flooding) of RTA in each step were similar. They consisted of 8 factors: characteristics of the policy, objectives of the policy, political possibility, technical or theoretical possibility, sufficiency of resources, characteristics of the organization implementing the policy, attitude of the implementers, and relationship between the

mechanisms in the organization or between the organizations implementing the policy (Table 4.19). However, by considering relevant laws about disaster prevention and mitigation in Thailand, the factors affecting the success or failure of logistics for disaster relief operations (flooding) of RTA concerned only in the response step, consisting of 6 factors: objectives of the policy, sufficiency of resources, technical or theoretical possibility, and relationship between the mechanisms in the organization or between the organizations implementing the policy

5.2.5 The logistics model for disaster relief operations (flooding) of RTA (Figure 5.1) developed and synthesized in this research was a result of integrating the data from preparation, response, and reconstruction steps. There could be certain detail differences regarding relevant official regulations. The mission of military logistics consists of 4 elements: logistics, maintenance, transportation, and medical services. The elements went in line with the policy, regulation, order, approach, or plan on disaster relief of the higher unit in every level. However, the logistics model for disaster relief operations (flooding) of RTA was developed based on grounded theory methodology together with a case study. Some parts of the content may be inevitably incomplete or filled with bias of the researcher. Therefore, should this model be used for analyzing military logistics for disaster relief operations in practice, it is important to take into consideration the limitations in the analysis such as characteristics of the disaster, area, and preparedness of the local units.

5.2.6 The results of the research "A Development of Logistics Model for Disaster Relief Operations (Flooding) of RTA" are objective evidences that clearly portrayed the status of public administration in Thailand. To clarify, it is the transition from new public management (NPM) which emphasizes the effectiveness of governance under marketing mechanism and defines the role of the public as customers (Osborne, 2006) to the new public service (NPS) which focuses on the citizen of democratic system and the role of different sectors of the society, especially the public or civil society, and highlight the role of the government as servant rather than controller of the public (R. B. Denhardt and J. V. Denhardt, 2000; Vigoda, 2002; Stoker, 2006). Simply put, the logistics model for disaster relief operations (flooding) of RTA developed in this research was a result of the integrated collaboration of many sectors and the army though creating the allied network to handle disaster and

empowerment to the public or civil society as the main driver for disaster relief in such time. The army at the time only functioned as the main coordinator with Bangkok Administration, other government agencies, leaders of affected communities, and other sectors to help the victims systematically. For example, they collaborated in the mission of building a coordinating center between battalion-level responsible unit in the community or at the center of the community, not to mention the use of vehicle, tools for disaster prevention and mitigation, patrol and security guard, distribution of relief items, food and supplies, waste management to reduce water pollution, and establishment of donation centers. The achievement was a result of close coordination between military units and other agencies, reducing the process of decision making, and formally establishing good understanding among the organizations and sectors under the policy implementation theories. In addition, the model also led to the solution to problems of logistics for disaster relief operations (flooding) of RTA, both in term of management and policy systematically. Eventually, it has brought the effective assistance to the flood victims.

5.3 Suggestions

5.3.1 Policy Suggestions

1) The government should amplify the role of Ministry of Defence to help the disaster victims in emergency cases from the step of preparation because it could help minimize the risks for the victims since the beginning. It would be better to allow the use of the Ministry of Defence Notification on Principles, Methods, and Conditions of Assisting Disaster Victims in an Emergency B.E. 2556 (2013) as necessary.

2) The Royal Thai Army should seriously develop a military doctrine on military operations other than war (MOOTW) as a systematic preparation for organization, mission, equipment, and personnel management in response to the new threats. In particular, logistics doctrine for disaster relief operations could be a good guideline for RTA agencies to practice effectively.

3) The Royal Thai Army should revise RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of The Royal Thai

Army to be more appropriate to the structure and mission of logistics unit from 2015 on. To clarify, That is to say, the 21 regional military units will be additionally transformed from Military District to Military Circle and the policy to use a battalion level unit of RTA shall be applicable to the mission and area assigned for Military District to control the companies running the non-war operations such as humanitarian assistance when the army gives an order.

4) The Royal Thai Army should launch a PR campaign to make logistics for disaster relief operations become understood by civilian agencies, private sector, and civil society. There should be a communication network collaborated with Ministry of Interior for helping the victims from the preparation step.

5) The Royal Thai Army should define the guideline for manpower management regarding disaster logistics, from the process of selection, human resource management, assessment, and retirement.

6) The Royal Thai Army should closely monitor disaster logistics activities because in the past operations in 2011, there were a lot of reports on transparency issue in the process.

5.3.2 Research Suggestions

1) There should be additional investigation on the integrated approach between military logistics, business logistics, and disaster logistics to alleviate the effectiveness of disaster relief operations of RTA.

2) There should be additional examination on the development of specific success indicators of military logistics for disaster relief operations of RTA

3) There should be further research on military logistics for disaster relief operations of RTA according to the mission of military logistics or relevant support service departments.

4) There should be more research on the role, duty, development of collaboration, and the systematic approach to coordinate with other sectors such as donors, civil society, government, and logistics providers relevant to logistics for disaster relief operations (flooding) of RTA.

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APPENDICES

APPENDIX A

QUESTIONNAIRE

Development of Military Logistics Model for Disaster Relief Operations (Flooding) of the Royal Thai Army

Instruction

1. This questionnaire aims to investigate the conditions and problems of logistics for disaster relief operations (flooding) of the Royal Thai Army in 2011 and the factors affecting the success of logistics for disaster relief operations (flooding) of the Royal Thai Army.

2. The informants of this questionnaire are staffs of Logistics Division, ADRC, working during the Great Flood of 2011.

3. The questionnaire is divided into 4 parts:

Part 1: Personal information of the informants

Part 2: Conditions and problems of logistics for disaster relief operations (flooding) of the Royal Thai Army (43 items)

Part 3: Factors affecting the success of logistics for disaster relief operations (flooding) of the Royal Thai Army (20 items)

Part 4: Recommendations

4. How to answer the questions:

Part 1 Please fill the check symbol (✓) in the parenthesis in front of the true statement

Part 2 Please fill the check symbol (✓) into the scale that best matches the actual situation. In order that all informants answer the questionnaire in the same way, the researcher gives an example of rating scale as a guideline.

Rating scale	
1 2 3 4 5 6 7 8 9 10	
---------- Disagree ----------	---------- Agree ----------
the least	the most

5. Definition of terms in this questionnaire

Management refers to the principles that can be used for effectiveness of operation according to McKinsey 7-S Framework. The framework is generally accepted as the criteria that can evaluate the strength and opportunity for improving the operation process and results very effectively. The framework consists of structure, strategy, systems, staff, skill, style, and shared values.

Logistics (military logistics) refers to planning, support service, and military operations other than war of RTA in normal situations, or the activities held according to the national defense plan or defined by other structures that allow the mission assigned by higher units to be accomplished effectively according to RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of the Royal Thai Army. Military logistics operations can be divided into 4 groups; 1) operation planning e.g. policymaking, determining the demand, and locating the quarter of logistics, 2) procurement, 3) inventory management e.g. storage, distribution, maintenance, and disposition, and 4) services e.g. transport and medical services.

6. You are an important person for this research. Please respond to this questionnaire truthfully. The researcher certifies that the information shall reflect the actual condition which will be used only for research purpose.

Part 1 Personal Information of the Informants

Please mark ✓ on the rating scale that best describe you

1. Sex

( ) 1. Male ( ) 2. Female

2. Age_____years old

3. Education

( ) 1. Lower than a bachelor's degree

( ) 2. Bachelor's degree

( ) 3. Higher than a bachelor's degree

4. Current position_____

5. Organization_____

Part 2 Conditions and Problems of Logistics for Disaster Relief Operations (flooding) of The Royal Thai Army

Please mark ✓ on the rating scale that best describe you

Conditions and Problems of Logistics for Disaster Relief Operations (Flooding) of The Royal Thai Army	**Rating**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Disagree					**Agree**				
Structure										
1. Structure is reorganized and order of report is shortened to effectively support internal and external changes.										
2. Tasks are assigned based on skills and knowledge of staff.										
3. Scope of work is clearly defined and easily understandable.										
4. Job descriptions are clearly defined in writing.										
5. Tasks are result-oriented and staffs are given freedom to make a decision.										
6. Structure is reorganized according to the characteristics of the disaster, aiming for the achievement of objectives.										
7. Internal communication is effective. Staffs are aware of news and target of the organizations.										
8. Internal and external environments of the organization are constantly analyzed to revise the strategic plan and practice.										
9. The strategic plan is periodically reviewed.										

Conditions and Problems of Logistics for Disaster Relief Operations (Flooding) of The Royal Thai Army	**Rating**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Disagree					**Agree**				
10. The policy, goals, direction, and strategic plan are set to directly address the problem and meet the context.										
11. The action plan is made according to the strategic plan.										
12. The policy and strategy of the organization are communicated to all staffs.										
13. The strategic plan is improved to make it more practical.										
14. The implementation results are monitored, supervised, controlled, and evaluated to measure the progress and solve the problems.										
Systems										
15. Modern information technology is applied to support the operation effectively.										
16. Working process of the organization agrees with the strategy of the organization in every dimension.										
17. Performance of staffs are inspected and reviewed effectively.										
18. Modern knowledge is measured, analyzed, and managed according to the actual situation.										
19. The inventory system can satisfy the environment of the organization which is changing rapidly.										
20. The organization can integrate its systems effectively.										

Conditions and Problems of Logistics for Disaster Relief Operations (Flooding) of The Royal Thai Army	**Rating**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Disagree					**Agree**				
21. Performance evaluation system is clear, transparent, and fair to all staffs.										
Staff										
22. The policy and role of human resource management are clearly defined in writing.										
23. There is a comprehensive personnel database for such operations as manpower planning, recruitment, selection, putting staff to a position, and human resource development										
24. Personnel learning system is created in many forms such as training, library, internet access, journals, and books sufficiently provided.										
25. Staffs' knowledge and experience are developed and exchanged constantly.										
26. The number of manpower is set for a task suitably based on their skills and knowledge.										
27. There is an operation manual with complete, understandable, and practical details.										
Skills										
28. Staffs have the teamwork skill, are complimented and awarded for good performance.										
29. The skill quality of staff is improved to be ready for changes.										
30. Staffs know how to use the tools, the techniques, and method of operations.										

Conditions and Problems of Logistics for Disaster Relief Operations (Flooding) of The Royal Thai Army	**Rating**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Disagree					**Agree**				
31. Staffs can use information technology for operation effectively.										
32. Staffs have the knowledge, skills, and potentials that matched the assigned tasks.										
33. Staffs at different positions can replace the position of others.										
Style										
34. The supervisors set the policy, goal, structure, management, and approach of operation, as well as the vision that relates to the context in a concrete way.										
35. The supervisors clearly communicate the policy, goal, and trajectory to the staffs.										
36. The supervisors are committed to directing the operation and motivating mutual vision in the organization.										
37. The supervisors perform their duties based on the regulations.										
38. The supervisors' style of management is to use orders.										
39. The supervisors give the opportunity for inferiors to share their opinions about the operations at the suitable time.										

Conditions and Problems of Logistics for Disaster Relief Operations (Flooding) of The Royal Thai Army	**Rating**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Disagree					**Agree**				
Shared values										
40. The organization culture affects the behaviors and encourages the staff to perform their jobs effectively.										
41. The shared values are reflected in the forms of slogan to make it easier to remember and practice.										
42. The shared values apply to the changing situation and all staffs in the organization understand the shared values.										
43. The shared values are instructed to all levels of staffs.										

Part 3 Factors Affecting the Success of Logistics for Disaster Relief Operations (flooding) of The Royal Thai Army

Please mark ✓ on the rating scale that best describe you.

Factors Affecting the Success of Logistics for Disaster Relief Operations (Flooding) of The Royal Thai Army	**Rating**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Disagree					**Agree**				
Policy making										
1. The demand of victims or aid agencies is forecast regarding logistics in order to achieve the objectives.										

Factors Affecting the Success of Logistics for Disaster Relief Operations (Flooding) of The Royal Thai Army	**Rating**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Disagree					**Agree**				
2. There is a good system to procure equipment for logistics so that the operations are convenient and easily verified.										
3. The logistics quarter and warehouses are chosen appropriately for the flood relief operations of RTA. 4. There have been meetings to make logistics plan for disaster mitigation operations.										
Procurement										
5. The process of procuring the equipment for logistics is suitable for the situation.										
6. The procurement is according to the regulations of the government.										
7. There is a good system for handling the donated items from the public and private sectors. 8. The procurement process in times of disaster should be different from normal situations. 9. The process of procuring the equipment for logistics is suitable for the situation.										
Inventory management										
10. The process of equipment storage was correct according to academic principles.										
11. The area for inventory management was optimized. The stock level was kept at the minimum to minimize the operation costs.										
12. Repairs of equipment used for disaster mitigation operations were timely.										

Factors Affecting the Success of Logistics for Disaster Relief Operations (Flooding) of The Royal Thai Army	**Rating**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Disagree					**Agree**				
13. Level of logistics units could respond to disaster mitigation operations effectively.										
14. Disposition of damaged equipment has the convenient process and well implemented.										
Service										
15. Public transportation was thoroughly provided in the assigned areas.										
16. Medical services provided to the flood victims were of professional standards.										
17. Mobile kitchens provided services thoroughly to the victims.										
18. Other services were provided, including house repairs and security guard.										
19. Temporary shelters were sufficiently provided.										
20. Infrastructure provided to the victims was of good standard.										

Part 4 Recommendations

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Thank you for your kind cooperation

APPENDIX B

INTERVIEW FORM

Development of Military Logistics Model for Disaster Relief Operations (Flooding) of the Royal Thai Army

Instruction

1. This interview form aims to discover the guideline of logistics for disaster relief operations (flooding) of the Royal Thai Army.
2. The informants are divided into 3 groups:
   2.1 Top level supervisors of the Royal Thai Army
   2.2 Heads of logistics division of ADRC
   2.3 Unit commanders or logistics officers assigned to be in charge of 42 districts of Bangkok declared in 2011 as disaster areas by the Department of Disaster Prevention and Mitigation, the Ministry of the Interior
3. The interview form is divided into 5 parts:
   Part 1: General information of the informants
   Part 2: Preparation step of logistics for disaster relief operations (flooding) of RTA
   Part 3: Response step of logistics for disaster relief operations (flooding) of RTA
   Part 4: Reconstruction step of logistics for disaster relief operations (flooding) of RTA
   Part 5: Recommendations
4. Definition of terms in this interview form

Logistics (military logistics) refers to planning, support service, and military operations other than war of RTA in normal situations, or the activities held according to the national defense plan or defined by other structures that allow the

mission assigned by higher units to be accomplished effectively according to RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of the Royal Thai Army. Military logistics operations can be divided into 4 groups; 1) operation planning e.g. policymaking, determining the demand, and locating the quarter of logistics, 2) procurement, 3) inventory management e.g. storage, distribution, maintenance, and disposition, and 4) services e.g. transport and medical services.

5. You are an important person for this research. Please respond to this interview form truthfully. The researcher certifies that the information shall reflect the actual condition which will be used only for research purpose.

Part 1 General Information of the Informants

1. Name-Surname of the respondent.....
2. Date/time/place.....
3. Age.....
4. Education.....
5. Current position.....
6. Duration of disaster relief operation of RTA.....

Part 2 Preparation Step of Logistics for Disaster Relief Operations (Flooding) of RTA

1. Do you know the system of military logistics of RTA?
2. Do you think the system of military logistics in normal situations should be the same as disaster logistics? Please explain.
3. What are the mission, policy, plan, objective, and job description of your unit in logistics for disaster relief operations of RTA?
4. What is your opinion about how the mission, policy, concept, and responsibility of logistics for disaster relief operations of RTA are determined? How should they be developed?
5. Do you think the responsibilities of Logistics Division of ADRC in supporting logistics for military units are suitable? How? (in terms of operation planning, procurement, inventory management, and service)

6. What is your opinion about the approach of logistics for disaster relief operations of RTA?

Part 3 Response Step of Logistics for Disaster Relief Operations (Flooding) of RTA

1. How does your manage the mission of logistics for disaster relief operations of RTA?

2. What is the concept of your unit regarding the mission of logistics for disaster relief operations of RTA?

3. What is the responsibility assigned to your unit regarding the mission of logistics for disaster relief operations of RTA?

4. Does your unit establish the measures regarding the mission of logistics for disaster relief operations of RTA so that your unit can link the operations and supports to other organizations, both inside and outside RTA? How?

5. Regarding logistics for disaster relief operations of RTA in the past, did the mission or your unit face any obstacle in helping the people? How? (in terms of operation planning, procurement, inventory management, and service)

6. What is your opinion about the approach of logistics for disaster relief operations of RTA?

Part 4 Reconstruction Step of Logistics for Disaster Relief Operations (Flooding) of RTA

1. Does your unit evaluate the results of logistics for disaster relief operations of RTA? How?

2. What is your method for preparation and implementation of for disaster relief operations of RTA to enable your unit to solve the problems, improve, and develop logistics for disaster relief operations of RTA to be fully effective? (in terms of operation planning, procurement, inventory management, and service)

3. Do you have any ideas or recommendations that may be useful for developing a logistics model for disaster relief operations of RTA? Please explain.

Part 5 Recommendations

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Thank you for your kind cooperation

APPENDIX C

FOCUS GROUP DISCUSSION FORM

Development of Military Logistics Model for Disaster Relief Operations (Flooding) of The Royal Thai Army

1. What is your opinion about the conditions and problems of logistics for disaster relief operations (flooding) of the Royal Thai Army in 2011?

2. What is your opinion about the factors affecting the success of logistics for disaster relief operations (flooding) of the Royal Thai Army in 2011?

3. What is your opinion about logistics for disaster relief operations (flooding) of the Royal Thai Army according to RTA Command No. 487/2543 on Missions, Policy, Concept, and Responsibility of Logistics of the Royal Thai Army?

4. What is your opinion about the solutions to the problems of military logistics for disaster relief operations (flooding) of the Royal Thai Army in 2011?

5. What is your opinion about logistics model for disaster relief operations (flooding) of the Royal Thai Army in 2011?

6. What is your opinion about the application of logistics model for disaster relief operations (flooding) of the Royal Thai Army in 2011 under the framework of policy implementation of the Army Disaster Relief Plan B.E. 2556 (2013) and the National Disaster Prevention and Mitigation Plan B.E. 2553-2557 (2010-2014) in 3 steps: preparation, response, and reconstruction?

BIOGRAPHY

NAME	Major Weerawat Punquejana
ACADEMIC BACKGROUND	Doctor of Veterinary Medicine Chulalongkorn University Bangkok, Thailand, 2006.
	Master of Public Administration Program (Human Capital Management) National Institute of Development Administration Bangkok, Thailand, 2008.
PRESENT POSITION	Head, Commander Office of Veterinary and Remount Department, The Royal Thai Army Fort Thong-T-Ka-Yu, Nakornprathom, Thailand
EXPERIENCE	2014-2015, Aide de Camp to Deputy Chief of Veterinary Service, Veterinary and Remount Department, The Royal Thai Army Fort Thong-T-Ka-Yu, Nakornprathom, Thailand
	2013, Aide de Camp to Deputy Commanding General,Veterinary Army School, Veterinary and Remount Department, The Royal Thai Army Nakorn Nayok, Thailand
	2007-2012, Staff Officer Research and Development Section, Technical Support Division, Veterinary and Remount Department, The Royal Thai Army Fort Thong-T-Ka-Yu, Nakornprathom, Thailand