A Model of Public Policy for Flood Management of Hatyai City, Songkhla Province, Thailand

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A Thesis Submitted in Fulfillment of the Requirements for the Degree of Doctor of Philosophy in Environmental Management

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บทคัดย่อ

การศึกษาเรื่องนี้มีวัตถุประสงค์เพื่อพัฒนาตัวแบบ (Model) นโยบายสาธารณะในการจัดการอุทกภัยมิติเชิงนโยบายและการมีส่วนร่วมในอำเภอหาดใหญ่ จังหวัดสงขลา โดยถอดตัวแบบจากกรณีศึกษา HatYai ACCCRN (Asian Cities Climate Change Resilience Networks) และเพื่อนำเสนอแนวทางจัดการกับปัญหาภัยพิบัติอย่างยั่งยืนในพื้นที่ดังกล่าว

การศึกษาในครั้งนี้ประยุกต์ใช้ระเบียบวิธีวิจัยเชิงปริมาณและระเบียบวิธีวิจัยเชิงคุณภาพ เป็นการใช้แบบสำรวจในการเก็บรวบรวมข้อมูลจำนวน 400 ตัวอย่าง โดยใช้กลุ่มตัวอย่างจากชุมชนนำร่อง 3 ชุมชน ในเขตเทศบาลนครหาดใหญ่ และเขตเทศบาลพะตงได้แก่ ชุมชนหาดใหญ่ในชุมชนประธานคีรีวัฒน์ และชุมชนต้นลุงซึ่งเป็นชุมชนที่มีปัญหาเด่นชัดและมีความเสี่ยงที่จะได้รับผลกระทบจากภัยพิบัติ ในขณะที่การศึกษานี้มีการรวบรวมข้อมูลด้วยวิธีการวิจัยเชิงคุณภาพด้วยการใช้การสัมภาษณ์เชิงลึกกับผู้ที่มีส่วนเกี่ยวข้องกับกำหนดนโยบายสาธารณะด้านการจัดการอุทกภัย จำนวน 4 ราย และการจัดทำสนทนากลุ่ม (Focus Group) จำนวน 9 ราย ซึ่งเป็นผู้แทนจาก 5 กลุ่ม ได้แก่ กลุ่มที่ 1 หน่วยงานภาครัฐและการเมือง กลุ่มที่ 2 ภาคเอกชน กลุ่มที่ 3 สถาบันการศึกษาในพื้นที่ กลุ่มที่ 4 สื่อมวลชนจากสื่อต่างๆ และกลุ่มที่ 5 ภาคประชาชนสังคมและผู้มีส่วนได้ส่วนเสีย ทั้งนี้เพื่อนำผลการวิจัยเชิงคุณภาพมาสนับสนุนผลการวิจัยเชิงปริมาณและอธิบายตัวแบบการจัดการนโยบายสาธารณะในการจัดการอุทกภัยมิติเชิงนโยบายและการมีส่วนร่วมในอำเภอหาดใหญ่ จังหวัดสงขลา

ผลการวิจัยเชิงปริมาณแสดงให้เห็นว่าประชาชนกลุ่มตัวอย่างมีระดับการรับรู้ข้อมูลเกี่ยวกับโครงการ ACCCRN โดยภาพรวมอยู่ในระดับมากและเห็นว่าโครงการ ACCCRN มีประสิทธิภาพดีเนื่องจากก่อให้เกิดการรับรู้ของสาธารณชนในวงกว้าง จากการทดสอบเปรียบเทียบข้อมูลทางสถิติพบว่าปัจจัยส่วนบุคคลหลายประการมีความสัมพันธ์กับปัญหาภายในชุมชนในพื้นที่ประสบภัยน้ำท่วมในมิติต่าง ๆ อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 และผลการวิเคราะห์ความสัมพันธ์ระหว่างปัญหาภายในชุมชนในพื้นที่ประสบภัยน้ำท่วมการทดสอบสถิติโดยใช้ค่าไคสแควร์ (Chi-Square) พบว่า ลักษณะน้ำท่วมที่พักอาศัยระยะเวลาที่น้ำท่วมที่พักอาศัยการพัฒนาระบบการแจ้งเตือนภัย และ

การมีส่วนร่วมกิจกรรม ACCCRN มีความสัมพันธ์กับการรับรู้ข้อมูลเกี่ยวกับโครงการ ACCCRN อีกด้วย

ผลการศึกษาเชิงคุณภาพแสดงให้เห็นว่าปัจจัยและองค์ประกอบที่ส่งผลต่อกระบวนการในการก่อเกิดนโยบาย (Policy) เพื่อนำมาพัฒนาเป็นตัวแบบนโยบายสาธารณะได้โดยการกำหนดพันธกิจ (Mission) ของนโยบายการป้องกันปัญหาอุทกภัยใน อำเภอหาดใหญ่ จังหวัดสงขลาได้โดย (1) การบูรณาการแผนงานสู่ภาคีในระดับลุ่มน้ำทะเลสาบสงขลา มุ่งสู่กลไกการจัดการน้ำระดับชาติ (2) ระบบการบริหารจัดการทรัพยากรน้ำเพื่อการรับมือและ/หรือการปรับตัวกับการเปลี่ยนแปลงสภาพภูมิอากาศในลุ่มน้ำคลองอู่ตะเภา (3) พัฒนาคุณภาพชีวิตของกลุ่มเสี่ยง/เปราะบางที่ได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศในด้านทรัพยากรน้ำ (4) พัฒนาเมืองให้น่าอยู่ให้สอดคล้องกับแนวทางการพัฒนาเชิงอนุรักษ์ฟื้นฟูทรัพยากรธรรมชาติและสิ่งแวดล้อม และ (5) สร้างกลไกสนับสนุนการขับเคลื่อนการบริหารจัดการในการรับมือ/ปรับตัวกับการเปลี่ยนแปลงสภาพภูมิอากาศ ทั้งในระดับพื้นที่และระดับลุ่มน้ำทะเลสาบสงขลา

นอกจากนี้ตัวแบบการจัดการอุทกภัยอย่างมีประสิทธิภาพของอำเภอหาดใหญ่ จังหวัดสงขลา ควรมีองค์ประกอบที่สำคัญ 2 ประการ ประการแรกเป็นปัจจัยหลักที่สำคัญ ประกอบด้วย (1) การมีจุดศูนย์กลางในการสั่งการ (Focal Point) ซึ่งจะเป็นหน่วยงานหลักในการดำเนินการโดยมีความพร้อมทั้งอำนาจสั่งการและทรัพยากร (2) การเชื่อมโยงระหว่างหน่วยนโยบายและหน่วยปฏิบัติงาน ประการที่สอง คือ การจัดการองค์กรให้มีลักษณะเอื้ออำนวยต่อการจัดการเชิงรุกแบบบูรณาการที่เปิดพื้นที่และเชื่อมโยงทุกภาคส่วนให้มีส่วนร่วมในทุกระยะของการจัดการอุทกภัยโดยใช้ชุมชนเป็นศูนย์กลางที่ประกอบด้วยปัจจัยองค์ประกอบทั้ง 8 ด้าน ได้แก่ ด้านสังคม ด้านองค์กร ด้านการจัดการ ด้านการมีส่วนร่วมด้านการจัดการความสัมพันธ์ทางการเมือง ด้านความเป็นอันหนึ่งอันเดียวกับนโยบาย ด้านสภาพแวดล้อมปัจจัยอื่นๆ และด้านการประสานงานและความร่วมมือ

ซึ่งรูปแบบดังกล่าวจำเป็นต้องมีปัจจัยที่นำไปสู่ความสำเร็จ (Key Success Factor: KSF) 3 ปัจจัย ได้แก่ 1) ความสมดุลระหว่างผลประโยชน์ส่วนตนกับผลประโยชน์ส่วนรวม (Self-interest vs Public interest) 2) การมีส่วนร่วมของภาคเอกชน (Private Participation) และ 3) การข้ามพ้นขอบเขต (Beyond Boundary) อันเป็นหลักการและแนวคิดที่สำคัญของการนำไปเป็นองค์กรความรู้เพื่อการต่อยอดและประยุกต์ใช้ให้สอดคล้องกับบริบทในพื้นที่อื่นๆ ในอนาคตต่อไป

Thesis Title A Model of Public Policy for Flood Management of Hatyai City

Author Mr. Somporn Siriporananon

Major Program Environmental Management

Academic Year 2016

ABSTRACT

Climate change is currently occurring around the world both in local and global levels and tends to increase the occurrence and severity of natural disasters, especially flooding which is the most severe natural disaster. This researchaimed to develop a model of public participatory policy for flood management in Hatyai District, Songkhla Province by applying the case study of Hatyai ACCCRN (Asian Cities Climate Change Resilience Networks) and to present an appropriate approach for sustainable flood management in that area.

This research applied both quantitative and qualitative methods. The theoretical concepts from literature review influenced the formation of the research conceptual framework. In this present research, the data were drawn from two major sources. The questionnaire was used to elicit perceptions about the ACCCRN programme from 400 samples, who had been affected by the flood in target areas. The in-depth interviews with 4 public policy makers for flood management and the focus group discussion also used to collect data from 9 representatives of relavants stakeholder groups including; government, private sector, academic medias and community . The results from case study and in-depth interview methods were used to support the quantitative findings.

The quantitative findings indicated that the target samples had high level of perceptions about the ACCCRN programme. They recoginzed the efficiency of the programme as it could create positive awareness to the public such as good policy for mation, planning, coordination, and delegation.There was an advisory commitee to provide the knowledge on how to manage the natural diaster.The coordination among the authorities and relevant organizations was promoted. The flood management particpation was enhanced. The hypothesis testing revealed that the relationship between some personal factors and the community problems in affected areas was statistically significant at the 0.05 level. The Chi-Square test also indicated that characteristics of flooding, duration of flooding, warning system development, and particpation in ACCCRN programme had a relationship with the levels of programme perceptions.

The results from qualitaive study suggested that the factors affecting the policy formulation could be used to establish the following missions of flood prevention policy of Hatyai District, Songkhla Province: (1) to integrate the action plan with other associates in Songkhla Lake Basin and gear towards water management mechanisms at the national level; (2) to develop water resource management system in order to cope with/ adapt to climate change situation in U-Tapao Canal Basin; (3) to improve the quality of life of vulnerable groups, affected by climate change in terms of water resource; (4) to develop Hatyai into a healthy city according to the development approach of natural resource and environmental conservation; and (5) to create the mechanisms supporting and driving climate change management in Hatyai and Songkhla Lake Basin.

In addition, it was found that the efficient disaster management model for Hatyai District, Songkhla Province, consisted of two major components: the first one was the main factors including; (1) Focal point that was the main agency taking care of overall operations and possessed both administrative powers and resources, (2) Cooperation between policy agencies and operational team, (3) Collaboration between the central government and the local government with consistent and compliant local, provincial, and national development plans, and (4) Willingness of all relevant parties; the second factor was the proactive organization management, which integrated and allowed all sectors to participate in every phase of community-based disaster management. The results suggested that proactive organization management consisted of the following 8 dimensions, which were social involvement, systematic organization, management procedures, participatory, political relationship management, public policy unity, result-orientation, and networking. Furthermore, it was found that the key success factors for sustainable flood management policy implementation included the policy that matched the context of each area, the effective communication suitable for the target groups and the public, the cooperation among relevant agencies, and the information and knowledge development for the right decision making.

This study integrated and linked knowledge from relevant parties together. The impacts and adaptation measures for all sectors were taken into account in order to drive the developed model into the public policy for sustainable disaster management. The effective model should consist of 3 key success factors, including; 1) Balance between personal gain and public interest, 2) Private Participation, and 3) Going beyond boundary. This is considered an important principle, concept, and knowledge, which can be further studied and applied to different contexts in the future.

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Last but not least, hope this dissertation will be useful and good contribution to readers for useful of the community, society and the country level.

Somporn Siriporananon

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Somporn S, Parichart V. 2016. An Integrated Sustainable Development Model for Effective Disaster Management Policy of Khlong-U-Taphao Basin in Thailand. GMSARN International Journal. Vol.20 No.2 June 2016. Pp 77-86

Somporn S, Parichart V. 2016. Key success factors of disaster management policy: A case study of the Asian cities climate change resilience network in Hat Yai City, Thailand. Kasetsart Journal of Social Sciences. Vol.39 No.1 Jan-Apr 2018.

List of Conference paper

Somporn S, Parichart V. 2014. Disaster management process of Hatyai city: A case study of Hatyai Asian Cities Climate Change Resilence Network, Songkla Provinces. The1st International Congress on Ecotourism Management Krabi, Thailand, February 12^{th} -13^{th}, 2014.

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PAPER I

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PAPER II

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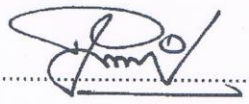
Signed: 

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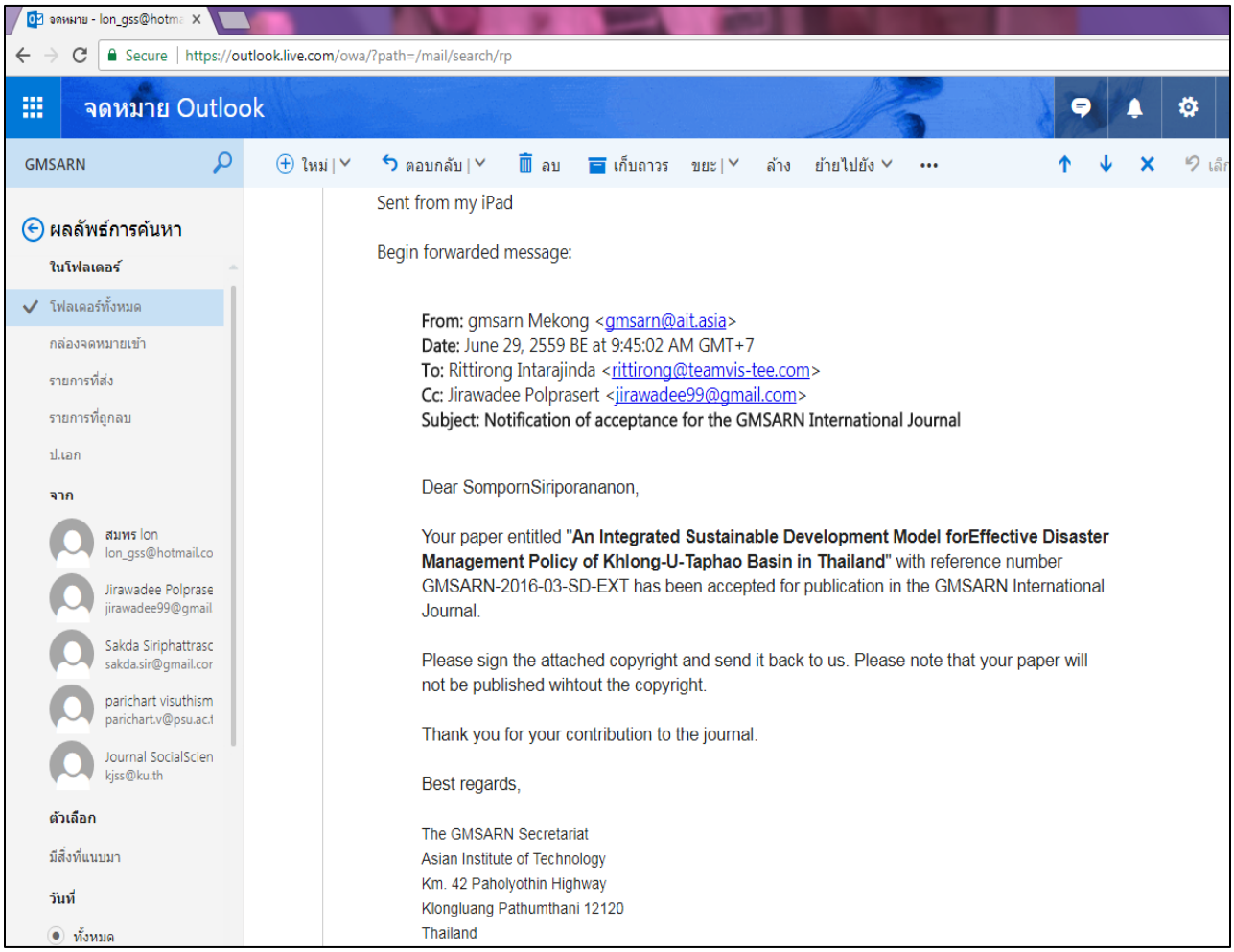
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PAPER III

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Dear Somporn Siriporananon,

We are pleased to inform you that, based on your submitted paper entitled, Key success factors of disaster management policy: A case study of the Asian cities climate change resilience network in Hat Yai City, Thailand by, Parichart Visuthismajarn and Somporn Siriporananon for publication and is to be published in Kasetsart Journal of Social Sciences, Jan-Apr 2018, Volume 39 Number 1.

Yours Sincerely,

(Asst. Prof. Dr. Shiepsumon Rungsayatorn)
Editor-in-Chief
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Somporn Siriporananon

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Chapter I

Overview and hypotheses

1. Overview of climate change and disaster management.

Climate change is the potential world problem which can cause serious impacts on economic social and environment. However, human activities have accumulated the heat into Earth's atmosphere causing climate change. In general, many systems and groups may face risk from mentioned factors and fragile to different grievances depending on the capacity to adapt with the change in the future which is different from area or society with different local physical and economic conditions. Thus, the solution of climate change has involved in conducting of many sequence, one of which is the disaster management. One of the most important problems in disaster management is the lack of unity in the management system, which is without a good cooperation among the government sector, people and the stakeholders which are the associates in the cooperation and which in fact they should work together to propel the policy effectively and efficiently. The researcher realized the significance of the stakeholders at the community level that are at the front line of the problems and understand the problems very well, and push the community to participate in the policy implementation which emphasizes the involvement of people in planning, organizing, and decision making, and supporting or opposing the policy.

The area of Hat Yai District, Songkhla Province, is approximately 764 square meter or 478,093.92 Rai. Hat Yai is one of the area have been predicted to receive the impact from climate change because of Southwest and Northeast wind especially the heavy rain in the area causing big flood such as the flood disaster in the year 2000 , with estimated cost of damage more than 1,000 million Baht. Subsequently, the canals were built by the royal project to halt future flood, but the rainfall has increased in rainy season causing flood every year. The data and monitoring situation of the El Niño / La Niña phenomenon by the Meteorological Department has predicted that during the winter of Thailand in 2020-2021 it will be very cold in many areas especially in the north and northeast and the quantity of rain will also increase especially in the

South. Also in 2100 the averaged temperature will rise by 1-2 degrees Celsius resulting in a further increase in the amount of rain.

Hence, this research has two objectives which aimed to 1) study the causes and solutions of disaster management in a public participatory and sustainable manner in HatYai district, Songkhla province and, 2) develop a model of public participatory policy for flood management in Hatyai District, Songkhla Province by applying the case study of Hatyai ACCCRN (Asian Cities Climate Change Resilience Networks) and to present an appropriate approach for sustainable flood management in that area. The first objective has led a guide to the public participatory disaster management model after knowing the cause and solution of disaster management in Hatyai district, Songkhla province. For sustainable manner, an integrated approach was introduced by the hypothesis from the first objective and led to the second paper entitle "An Integrated Sustainable Development Model for Effective Disaster Management Policy of Khlong-U-Taphao Basin in Thailand.". The study showed that disaster management in the context of city area was not appropriate. Therefore the basin context should be developed for disaster management model. Hence the area based approach model of Hatyai city such as Klong-U-Tapho basin are identified.

The second objective was to develop a model of public participatory policy for flood management in Hatyai district, Songkhla province by using the case study of Hatyai ACCCRN (Asian Cities Climate Change Resilience Networks). An appropriate approach for sustainable flood management of Hatyai city has been identified including; 1) to integrate the action plan with other associates in Songkhla Lake Basin (SLB) and gear towards to the water management mechanism at national level, 2) to develop water resource management system in order to cope with/ adapt to climate change situation in U-Tapao Canal Basin, 3) to improve the quality of life of vulnerable groups, affected by climate change in terms of water resource, 4) to develop Hatyai into a healthy city according to the development approach of natural resource and environmental conservation, and 5) to create the mechanism supporting and driving climate change management in Hatyai city by using area based approach of the SLB.

In addition, the 3rd paper entitle "Key success factors of disaster management policy: a case study of the Asian cities climate change resilience network in Hatyai City, Thailand

was published. It was found that the efficient disaster management model for Hatyai district, Songkhla province, consisting of two major components: the first one is the main factor including; 1) focal point that was the main agency taking care of overall operations and possessed both administrative powers and resources, 2) cooperation between policy agencies and operational team, 3) Collaboration between the central government and the local government with consistent and compliant local, provincial, and national development plans, and (4) willingness of all relevant parties. The second factor is the proactive organization management, which integrated and allowed all sectors to participate in every phase of community-based disaster management. The result showed that the proactive organization management should consist of the following eight dimensions including; social involvement, systematic organization, management procedure, participatory, political relationship management, public policy unity, result-orientation, and networking. Furthermore, it was found that the effective model should consist of three key success factors, including; 1) balance between personal gain and public interest, 2) private participation, and 3) going beyond boundary. For sustainable flood management policy manner should include the policy that match the context of area based, the effective communication suitable for each target group and the public, the cooperation among relevant agencies, and the information and knowledge development for the right decision making should be taken into account.

Chapter II

Public Participatory Disaster Management Model: A Case Study Of The ASIAN Cities Climate Change Resilience Network In Hat Yai, Songkhla Province, Thailand.

2.1 Abstract

This research is a public participatory policy study which aims at proposing a model for sustainable disaster management in Hat Yai district, Songkhla province, in Thailand. The research methods were divided into three steps: the first step was the data collection from relevant documents, in-depth interviews, and focus groups with stakeholders and key informants; the second step was the process of developing a model of public policy for disaster management; and the third step was data collection from seminars and group discussion with the public and at conferences. The results revealed eight dimensions in developing a public policy model with regard with the study. They included social involvement, organization establishment, management procedures, the participatory dimension, political relationship management, the unity of public policy, the result-oriented dimension, and networking and coordination. Furthermore, the key success factors for the sustainable disaster management of policy implementation included policy that suited the context of the area, effective communication with the target groups and the public, cooperation with the concerned agencies, and the development of an information and knowledge database for proper decision making.

2.2 Introduction

Climate change is currently occurring around the world both at local and global levels and tends to increase the occurrence and severity of natural disasters. It has been reported that water plays a major role in 70% of the disasters worldwide (Brooks, 2003), especially flooding, which is the most severe natural disaster. In Thailand, there are various forms of natural disasters. Each of them causes immense damage to life and property and also contributes to

climate change, which in turn leads to an annual rise in temperature. In 2057, the temperature will potentially be higher than 35 degrees Celsius for more than 100 days in almost all regions of Thailand. More importantly, the risk of flooding and drought in the monsoon season will increase (Amnart Chidthaisong*et al*., 2010). Climate change policy has been addressed in the National Master Plan on Climate Change Impact but the political fluctuation has made the government unable to establish practical policy for the relevant ministries, departments, and agencies to be implemented in a timely manner. Moreover, the research related to urban disaster policy has received relatively little attention and there is still a lack of continuity in actual implementation. Thus, it is essential to develop preparedness plans for disaster, including policy establishment, communication, the decision-making of local authorities, and disaster surveillance in communities. In the previous policy, there was little communication during the process of policy formulation. However, some local administrative organizations have placed importance on natural disaster issues and have taken action to reduce the impact of climate change for several years (Department of Disaster Prevention and Mitigation, 2008).In terms of the policy formulation in Thailand, it was found that each governmental agency has its own policy. Local administrative organizations adopt decentralization policies but they unfortunately do not take an active part in disaster management. Therefore, this present research discusses the development of a model of public policy on disaster management in Hat Yai District, Songkla Province, Thailand. Nowadays, Hat Yai is a tourist destination with rapid urban expansion, which is the cause of frequent flooding. However, its lack of collaboration has resulted in limited disaster assistance that cannot be thoroughly distributed. In addition, Hat Yai still has no effective mechanism for long-term recovery management related to the area development, which is crucial to sustainable disaster management.

As a consequence, the present study aimed to develop a model of public participatory policy for disaster management in Hat Yai District, Songkla Province and to present an appropriate approach for sustainable disaster management in that area. This study has linked and integrated knowledge from relevant parties. The impacts and adaptation measures for all sectors were taken into account in order to formulate the developed model into the public policy for a sustainable disaster management solution.This is considered an important principle and concept

of knowledge organization, which can be further studied and applied in accordance with different contexts in the future.

2.3 Literature review

Definition and Theoretical Concept of Flood Management

Yala's Disaster Prevention and Mitigation Office defined a flood as a natural hazard occurring from an overflow of sea water and river water onto land. Floods can submerge people's houses and cause great loss of life and property damage. Natural floods can be summarized into 5 categories (Department of Environmental Quality Promotion, n.d., cited in Tewarit Maneechai, 2007), which are:(i) river floods caused by high tides; (ii) flash floods due to prolonged heavy rains in high headwater areas, tropical cyclones, monsoon troughs, strong monsoons, and thunderstorms; (iii) storm surges, which are caused by tropical cyclones; (iv) drainage flooding which arises from tropical cyclones, monsoon troughs, strong monsoons, and thunderstorms; and (v)tsunamis, which are caused by earthquakes, volcanic eruptions, and landslides.

Considering the past flooding, Pallop Kritayanawach (2012) studied the report of Centre for Research on the Epidemiology of Disasters (CRED) and found that flooding in 2010 alone caused damage to many countries and affected as many as 178 million people. Flood disasters have constantly occurred in various countries around the world and caused great loss of life and severe damage to houses, property, and the economic status of each country during the past century. The International Strategy for Disaster Reduction (ISDR) reported that more than 7,486 hydro-meteorological events occurred in the last century. According to the EM-DAT disasters database, the flood disasters that generated the greatest loss of life during the previous century mostly occurred in Asia, followed by America and Africa. China was found to have the highest number of flood disaster victims in the world.

Major flood events in Hat Yai

Thanit Chalermyanont et al. (2013) studied flood conditions and damage in the area of the U-Tapao Canal Basin, in which Hat Yai is the major economic city with serious flood problems and where the most economic damage was caused. Hat Yai City has been found to have consistently grown and expanded in every aspect, resulting in relatively higher flood damage. According to the past records, Hat Yai has regualry experienced flooding for more than 20 times. The major floods that caused severe damage included the flood events in 1988, 2000, and 2010. The details are as follows.

1) The flood of 1988: On November 22, 1988, Hat Yai municipality and neighboring areas were severely damaged by a flood. The water level in U-Tapao Canal rapidly rose, and Hat Yai's municipal area had been under high flooding for almost a week. The water depth in some roads was recorded at 1.5 meters. All means of transportation, including planes, trains, automobiles, and even phone connections, were cut off. In some areas, the water was 2 meters deep. About 90% of Hat Yai municipality was submerged under water. The damage to the business and tourism sectors there was estimated at 1,000 million baht.

2) The flood of 2000: On November 22, 2000, Hat Yai's municipal area was hit by a flood, which was caused by the following 3 factors: heavy rains in specific areas and small communities, water flooding the lowlands around the municipal area, and a river flood overflowing the banks of U-Tapao Canal. This flood left 32 people dead, 9 missing, and 32 injured. The total damage was estimated at 18,162 million baht.

3) The flood of 2010: On November 1-2, 2010, there was a great flood in Hat Yai District and surrounding areas. Almost all of those areas were inundated by water. The approximate depth of the water was recorded at 1.50-3.0 meters. The roads were totally impassable and the electricity was cut off. Additionally, phone connections were difficult to make. The damage was estimated to be higher than the previous flood events in 1988 and 2000.

Regarding the causes of the floods in Hat Yai, it was found that many areas in the Songkla Lake Basin were affected by flooding, including Hat Yai municipality in the U-Tapao Canal Sub-Basin and the eastern part of Hat Yai- Phatthalung Road (Songkhla Lake Basin Development Master Plan, 2005 cited in Thanit Chalermyanont*et al.,*2013). Hat Yai- Phatthalung Road was reported to have obstructed flood flows during the major flood events in 1988 and

2000, which consequently caused tremendous economic damage. The main causes of flooding in Hat Yai can be summarized as follows.

1) Construction of roads obstructing flood flows: The roads that had been constructed to connect each district in Songkla and Phattalung provinces were the major cause of flooding, as they obstructed flood flows. Moreover, the drainage pipes under the roads were too small and inadequately provided.

2) Rainfall amounts: High amounts of rainfall could be another cause of flooding during some years. According to a study analyzing the flood management plan and environmental impact of the Royal Irrigation Department (Royal Irrigation Department, 2002 cited in Thanit Chalermyanont*et al.*,2013), it was found that when the rainfall amounts in urban areas exceed 40 millimeters per hour, it can cause flood problems in some areas. In case there was heavy rainfall over large catchment areas, the flood problems would be severer. This is because the water runoff would flow downstream to Songkla Lake through several urban areas, including Hat Yai municipality.

3) Songkla Lake overflow: Normally, the water level in Songkla Lake ranged from 0.25 meters above mean sea level to +0.25 meters above mean sea level, which had no effect on the drainage of U-Tapao Canal or other canals. However, if a large amount of water runoff from the sub-basins rapidly went to Songkla Lake when the water level in the lake reached +2.00 meters above mean sea level due to rising sea level in the Gulf of Thailand, the water from U-Tapao and other canals would not be able to flow to Songkla Lake but would overflow the banks and inundate the communities on both sides of the canals.

4) Land filling or polder system implementation: Land filling , which was performed in order to construct buildings or roads in flood drainage areas , could reduce the drainage profiles, making the water level increase.

5) Land use changes: The forest areas in the basin were decreasing and changed to farmland, such as rubber planting, which affected the flow rate of water. Most of the rainwater would flow along the ground and overflow the watersheds below the catchment area.

Concepts of flood management

Sirichai Mongkolkiatsri (2012, Online) collected information regarding flood management in the Netherlands,which is a country that has established legal measures specifically for flood prevention. The Netherlands has larger low-lying coastal areas compared to other countries in the European Union. This factor has made the Netherlands frequently experience flood problems for a long time. The worst flooding in the Netherlands was the storm surge disaster in 1953, which caused the most severe flooding crisis in Dutch history. The strong storm that moved through the northwest immensely affected the north coast of Rotterdam. The high tide resulting from this storm caused a deadly flood that killed 1,836 people, left over 100,000 temporarily homeless, and destroyed 4,500 houses. At that time the sea dykes and dams were already prepared to deal with the high tide, but they were not numerous enough to disproportionate the high tide and handle the storm surge , which was higher than expected. In addition, the communication technology in those days was not effective enough. The telephone was not widely used and the disaster warning was announced only through radio and telegraph. Therefore, the people were not able to cope with or escape from the disaster in time. After this catastrophe, the Dutch government reviewed the damage from the flood and analyzed the flooding tendency, which they thought might reach crisis levels in the future if no prevention plan or flood management measure were put in place (Sirichai Mongkolkiatsri, 2012: Online).

Concerning the flood management in the Netherlands, twenty days after the flood of 1953, the Dutch government and the Delta commission met and cooperatively discussed solutions for long-term flood prevention. The key characteristics of the Delta Works project (Belang van de Deltawerken) can be summarized as follows.

1) The Delta Works project could contribute to the maintenance of freshwater and seawater balance for agricultural purposes, which would prevent freshwater from entering the seawater because it might cause ecological changes, such as the death of sea creatures.

2) The Delta Works project could increase the potential for eliminating pollution and excessive waste from freshwater by using different sluice gate mechanisms. The project constructions could also enhance the transportation between the islands and the peninsula

and the connection among the islands, such as the construction of Zeeland Bridge and the Watershed tunnel.

3) The Delta Works project could support international water transportation. In 1976, Belgium and the Netherlands signed an international collaboration agreement on the transport of goods between the ports of Rotterdam and Antwerp in order to facilitate private maritime operations and trade cooperation between the two countries. This project could develop natural areas into tourist attractions and also draw tourists to the delta, which was considered another way to generate income for the country. Apart from Delta Works, the Dutch government also developed specific laws to promote and support the mechanisms of the project and established guidelines for long-term flood prevention as well (Sirichai Mongkolkiatsri, 2012: Online).

Considering the implementation of new technology for flood prevention, Khamnai Aphipratyasakul (2011) studied the flood management in the Netherlands and found that a manual for "Water Management in the Netherlands" was developed and published in February, 2011 by the Dutch government. This manual provided readers with information about the water management concept, design guidelines, construction, good governance, including the history of water management, freshwater element management systems, national water management, beyond-design basis safety for water management, water shortage management, salinity management, water quality, the future development of project management, the impacts of global warming on flooding, water management laws, disaster warning systems, information on flood prevention projects nationwide, soil characteristics, the responsibilities of the National Water Commission, construction plans for a flood prevention system, the flow of river water, and a national water management system, which was considered a good public information system.

As for flood management in Thailand, Pallop Kritayanawach (2012), who collected information related to flood management at national, governmental, municipal, and urban levels, stated that a holistic approach to resolving the flooding crisis problem should be urgently established. Integrated Flood Management (IFM) should be developed in order to enhance the efficiency of all relevant work systems, which include geographic and hydrographic information systems, flood prevention infrastructure and drainage systems (dams, earthen dykes,

rivers, canals, swamps, water pumps, and others), a flood height model and warning system, a weather and flood forecasting system, a flood response planning and integrated emergency management system, a disaster communication system, an emergency evacuation assistance system, food and beverage management, a health service and public health system, a restoration and rehabilitation system, as well as an urban planning system and building innovation, which could effectively prevent flooding in the future. It was also suggested that the great flood suffering that might occur in the future could be mitigated only by certain preparedness, effective solution planning, and systematic flood measures of the government, public and private agencies, as well as the cooperation of the general public.

Asian Cities Climate Change Resilience Network (ACCCRN)

The ACCCRN project is supported by the Rockefeller Foundation and the Thailand Environment Institute with the perception that the impact of climate change in urban communities with large living areas and high population density can inevitably cause severe damage to life and property. This project is committed to strengthening the capacity of 10 Asian cities in Thailand, Vietnam, Indonesia, and India to preparing for, withstanding, and recovering from the impacts of climate change. A coordinating network has been formed to enhance the collaboration between local parties on strategy and measure development in order to prepare for and deal with the consequent impact which may affect the cities, population at risk, and vulnerable groups in need of priority assistance. The main objective of this project is to promote knowledge and understanding of climate change and to enhance the capacity needed for climate change resilience in the city.

The work processes and evaluations of the project are divided into four phases as follows.

- Phase 1 City Selection.
- Phase 2 City Engagement and Capacity Development: Developing strategies, measures, action plans, project proposals, and pilot projects suitable for the risks and conditions of the city in order to prepare for and cope with the emerging impact.
- Phase 3 Project Implementation: Implementing projects according to the proposal developed in Phase 2.

- Phase 4 Project Replication: Promoting knowledge sharing between the member cities, countries, and relevant parties and creating a collaborative network to operate such work.

In Thailand, out of 10 candidate cities, Hat Yai and Chiang Rai have been selected as the pilot cities. As for Hat Yai, the main agency responsible for this project is the Hat Yai Municipality Office, which needs to work with other public organizations, local administrative organizations, as well as the academic, private, and civil society sectors in the area, namely Prince of Songkla University, the Chamber of Songkla, the Southern Meteorological Center (East Coast), the Office of Water Resources Sector 8, Songkla's Office of Disaster Prevention and Mitigation, the Songkla Irrigation Project, the Kho Hong Municipality Office, the KlongHae Municipality Office, the Kuan Lang Municipality Office, Patong Municipality Office, Songkhla Community Foundation, Chumchonthai Foundation, and Songkhla Lake Basin Development Committee.

2.4 Research methodology

This study applied a qualitative research method, focusing on understanding, interpreting, and analyzing the data in order to draw conclusions and seek truth from interviews and observations in order to find the relationships between the issues of interest and the contextual environment. In-depth interviews, participatory and non-participatory observations, secondary data reviews, data recording, and content analysis were also employed to collect the data for this research.

Sample

This present study used purposive sampling, which is a sampling method with neither a strict structure nor complicated procedure, to draw the samples. The main purpose of using this method was not to determine the representative samples but to select the most appropriate samples and to ensure that the researchers thoroughly examined and explored the studied issues in various aspects. The data resources that could provide information related to the research questions and could respond to the research objectives were selected for the study. The

sample size was not previously fixed. The research focused on data quality rather than quantity. Hence, purposive random sampling method was applied to obtain the sample group, not for representing the population, but for involving the most appropriate sample. The following inclusive criteria were used: (i) being participation in the flooding projects, (ii) having relevant experiences from their organizations, and (iii) having contribution to the disaster management to the society continuously for not less than 3 years. The researchers contacted related organizations to request the name lists and selected the key informants whose characteristics matched the set target population and criteria. Finally, the 10 key informants were selected from the representatives of relevant organizations in Hat Yai District, Songkhla Province. The details are shown in Table 1.

Table 1 Key informants from relevant organizations

Sector/Group	Types	Number
Public sector	Division of department	1
	Academy	1
	Local government	1
Private sector	Stake holder	2
	Social entrepreneur	1
Non-Profit organization	NGOs	2

Data Collection

The data collection for this research can be divided into the following 3 steps.

Step 1 Exploratory research: Collecting data from academic journals and literature, including documents published by the public and private sectors, textbooks, articles, research studies, as well as international and domestic reports relevant to successful flood management and prevention, especially in the Netherlands. The obtained data was used as fundamental information for designing the research framework. This was the main process of gathering all of the information related to the objectives of this study.

Step 2 In-depth interview: Using a semi-structured questionnaire with the key informants or experts, who provided profound information on related issues and were regarded as important primary sources. The quality research employing in-depth interviews allowed the informants to profoundly express their thoughts, opinions, and experiences. Moreover, the semi-structured questionnaire was used to collect significant information missing from the literature review and was used to examine the consistency of the data gained from the document studies as well. In-depth interviews are among the most appropriate techniques for exploratory research. The study made an appointment before meeting and introducing themselves to the key informants and experts recommended by the research advisor.

Step 3 Additional data collection: Conducting participatory and non-participatory observations to gain complete information. Lessons-learned sessions were held in order to learn from experienced professionals and stakeholders in all sectors, including individuals, groups, organizations, and agencies previously affected by flood disaster. Data codification, synthesis, and analysis fitting the context of each community were also carried out. A public forum was also held to discuss and criticize the proposed policies with experts and relevant stakeholders in 3 pilot communities (Prathan Kiriwat Community, Ton lung Community, and Hat YaiNai Community), which had received the most impact from the disaster. The obtained data were analyzed and then used to revise and develop better proposed policies.

Instrumentation and validity

In Step 1 of the data collection, the research instrument was record form, which was used to record the data essential for developing the conceptual framework and semi-structured questionnaire, which was accordingly used to collect the data in Step 2 and 3. Moreover, during the process of data collection, the researchers had constantly examined the collected data using the content analysis method. If any data were found to be unclear or incomplete, additional data were further collected. Then, the accuracy and consistency of the data, which were gained from the in-depth interviews, the secondary data review, and observations, were verified using the data triangulation technique in order to ensure that the obtained data were reliable, unbiased, and consistent before they were analyzed according to the research framework.

Data Analyses and duration of the Study

This present study employed the analytic induction method (Denzin & Lincoln, 2011), which involves inferring general conclusions from particular instances, and the constant comparison technique, which is a process in which any newly-collected data are compared with previous data that were collected in one or more earlier studies in order to find similarities and differences contributing to the research conclusion.

The researchers collected the data from the key informants and experts in relevant organizations by using in-depth interviews from August 2013 to August 2014.

2.5 Results

The literature review and in-depth interviews were carried out to study the factors affecting the policy formulation through the three process variables, which were policy statement, organization competence, and policy accomplishment (Gunn, 1976). In order to develop a public policy model, the theoretical concept of Gerston (2010), focusing on policy integration and implementation, was applied to targeting success for ultimate results. In addition, the policy-making process and integrated theory on policy implementation (Waradech, 2008) were used to establish missions of flood prevention policies in Hat Yai District, Songkla Province, as follows.

1. To integrate an action plan with other associates in Songkla Lake Basin and geared towards water management mechanisms at the national level.

2. To develop a water resource management system in order to cope with/adapt to the climate change situation in U-Tapao Canal Basin.

3. To improve the quality of life of vulnerable groups affected by climate change in terms of water resources.

4. To develop Hat Yai into a healthy city according to the development approach to environmental and natural resource conservation and restoration.

5.To create mechanisms supporting and driving climate change management in Hat Yai and in Songkla Lake Basin.

In addition, it was found that the key components of efficient disaster management in Hat Yai District, Songkla Province, consisted of the following.

1. The important factors: (i) Focal point was the main agency that took care of overall operations and possessed both administrative powers and resources; (ii) Cooperation between policy and operational agencies; (iii) Collaboration between the central government and the local government with consistent and compliant local, provincial, and national development plans; and (iv) Willingness of all relevant parties.

2. Proactive organization management, which integrated and allowed all sectors to participate in every phase of community-based disaster management. The details are illustrated in Figure 1

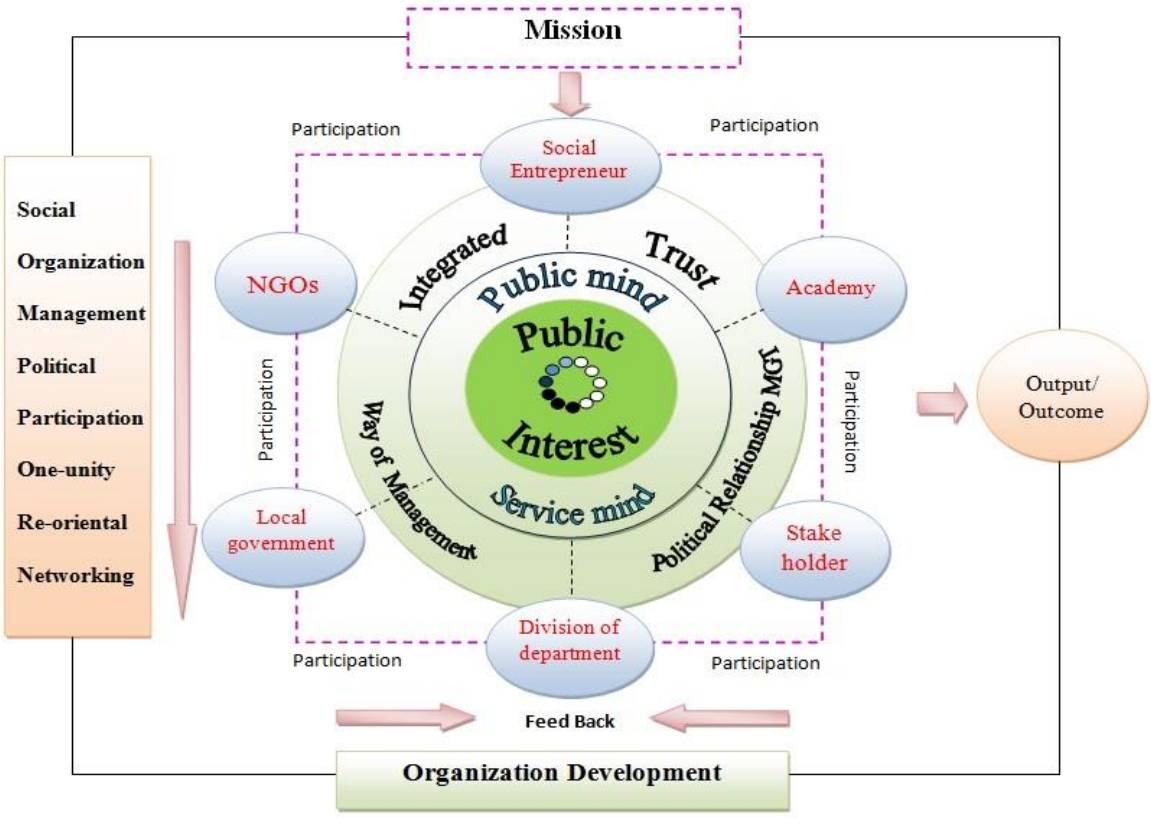

Figure 1 Model of the relationship between the organizations and related factors.

According to Figure 1, the model consisted of 8 key dimensions. The details of each dimension are summarized as follows.

Dimension 1: S = Society

This dimension included the societies and social capital connecting people to social networks based on trust, belief, and public mind. It included 2 main elements, social capital and human capital. Social capital was used to drive individuals and the network of social groups to collaboratively work under mutual trust. Social capital currently played an important role in the society because it involved a positive attitude, a good service mind, and creativity contributing to public interest. It could be built according to new technologies and various developments. Sustainable social capital could be developed through the collaboration of relevant organizations, brainstorming of experts and associates, pushing onto the national agenda (Grindle, 1980), and appointing an operating committee to establish organizational visions and missions, focusing on concrete benefits for society. An effective disaster management policy required clear goals and missions. The local administration was a key factor in identifying a development framework to promote the cooperation of all sectors and developing regular social capital evaluation and monitoring. The focal point was clearly set.

Dimension 2: O = Organization

This dimension involved the organizations or associates with systematic management and methodical planning and control under organizational structure, which focused on administration management, decentralization, achievement-oriented management, efficiency, and accountability. The organizational structure and executive committee were clearly determined in order to take responsibility and make an immediate decision according to the severity of each disaster. A one-stop service for problem-solving and integration among organizations for the optimization of natural resources should be implemented (Daniel, 1989) because the previous system lacked unity and clarity in giving orders and instructions. A local responsible organization should be clearly set according to the context of each community. All relevant parties should directly participate in analyzing problems, identifying directions and primary goals, conducting regular disaster management activities, and continually implementing organization development. The organizational dimension can be divided into the following 6 groups.

1. Social entrepreneur: Private business entrepreneurs and Chamber of Commerce
2. Academy: Researchers and academic institutions that have conducted research, learned case studies, and reviewed and synthesized existing knowledge to ensure that

effective disaster management was properly carried out with a knowledge-based system and could be expanded and achieve sustainability.

3. Stakeholder: The stakeholders of the public policy can be categorized into 2 groups as follows.

    3.1 Key stakeholders were those that directly received either positive or negative effects from the disasters, those that either supported or opposed the public policy, and those that took part in policy formulation, including the people living in the 3 pilot communities (PrathanKiriwat Community, Ton lung Community, and Hat YaiNai Community) and the organizations relevant to local policy formulation such as the local administrative organization.

    3.2 Secondary stakeholders were those affected by the operations and involvement of other stakeholders. They perceived the situation and took part in decision-making, which was another factor contributing to policy achievement and leading to the mutual acceptance of all relevant parties. The secondary stakeholders included the communities surrounding the pilot communities and the groups of people in disaster-prone areas.

4. Division and department: Governmental agencies such as the Office of Water Resources Sector 8, the Office of Public Works and Town & Country Planning, the Provincial Waterworks Authority, the Regional Irrigation Office 16, and the Southern Meteorological Center (East Coast).
5. Local government: The members of the Municipal Council, Hat Yai Municipality Office, and Office of Disaster Prevention and Mitigation.
6. NGOs: Non-governmental organizations with a work philosophy aiming at the public interest, community foundations, and private development organizations.

Dimension 3: M = Management

In this context, the management dimension refers to disaster management in the organizations that adopted public policy by way of management. The missions and assignments were determined and communicated to public and private agencies and communities, which were considered as disaster management organizations according to the principles of disaster management application, which used community-based organizations to achieve sustainability. The evaluation was divided into the following 3 stages.

Stage 1: The capacity to reduce the severity of the disaster.

Stage 2: The capacity of the communities to recover and resist loss during and after the disaster.

Stage 3: The capacity to reduce disaster losses, resist natural disasters, and cause the least damage to the life and property of the people in the communities, which was thought to reduce dependence on external factors. In other words, the communities needed to forecast disasters in advance and find preventive solutions in order to reduce the damage that might occur. Surveillance and evaluation measures needed to be implemented at all levels, including both operational and management staff (Levin, 1981). The knowledge and experience of the people in the communities should be used as a mechanism for handling disaster management at individual, family, and community levels so that all relevant parties have the capability to cope with disasters and provide basic assistance using evacuation routes or maps of the disaster mentor. Each community prepared for disaster management differently according to the context of each area. The disaster management should be comprehensively implemented and emphasize the participation of the people in decision-making and each working procedure in order to optimize disaster risk reduction.

Dimension 4: P = Participation

Participation was a part of the management of target group and policy-related parties. It could drive the organizations or networks forward and create a sense of shared pride in disaster reduction, leading to good collaboration as well as smooth and effective operations (Kerr, 1976). A gathering of individuals resulted in strong power, driving activities to achieve the common goals of the networks. Participatory working was essential at the family, community, local, and international levels. It created a sense of ownership and strongly affected stakeholders' compliance and commitment (Little, 2002). Therefore, it should be applied to develop high-quality participatory disaster management.

Dimension 5: P = Political relationship management

Political relationship management enabled the local authorities to work effectively and independently, develop an action plan without having conflict with the central goals and objectives, allocate the budget according to financial plan, and receive support from the central and local governments.

Dimension 6: O = One-Unity

When every part of each organization, including the management team, the operational staff, and the people in the communities, were united into one-unity, all of them would think and act in the same direction, coordinate with each other, focus on participation, support each other, and believe in and realize their own duties. The local people, who thoroughly understand the context of their community regardless of religion, ethnic group, class, or age, should take part in the problem-solving process, which could create and sustain good relationships among all parties.

Dimension 7: R = Result orientation

Result orientation focused on efficiency and effectiveness evaluation according to the organizational missions and objectives, provided resources, clear and transparent success indicators, the community's involvement in policy formulation, operational monitoring and tracking, and participation in decision-making on disaster management and performance report (Canadian International Development Agency; CIDA, 1999).

Dimension 8: N = Networking

This dimension involved network building with nearby communities or other relevant organizations in order to gain operational support, create social activities, and communicate useful information. A strong network and good relationships would lead to sustainable relations between the relevant organizations and communities.

Among all 8 dimensions, networking was considered the heart of successful public policy implementation.

2.6 Discussion and conclusions

From the proposed model illustrating eight dimensions of disaster management according to public policy principles and concepts of integration and participation, the key success indicators of public participatory policy for disaster management include the following 4 factors.

1. The policy and context of each area
2. Communication with target groups and the general public
3. Cooperation with the government sector
4. Development of information and knowledge management for decision-making

The processes of disaster management policy formulation and the activities enhancing the community's potential to contribute to sustainable disaster management are shown in Figure 2

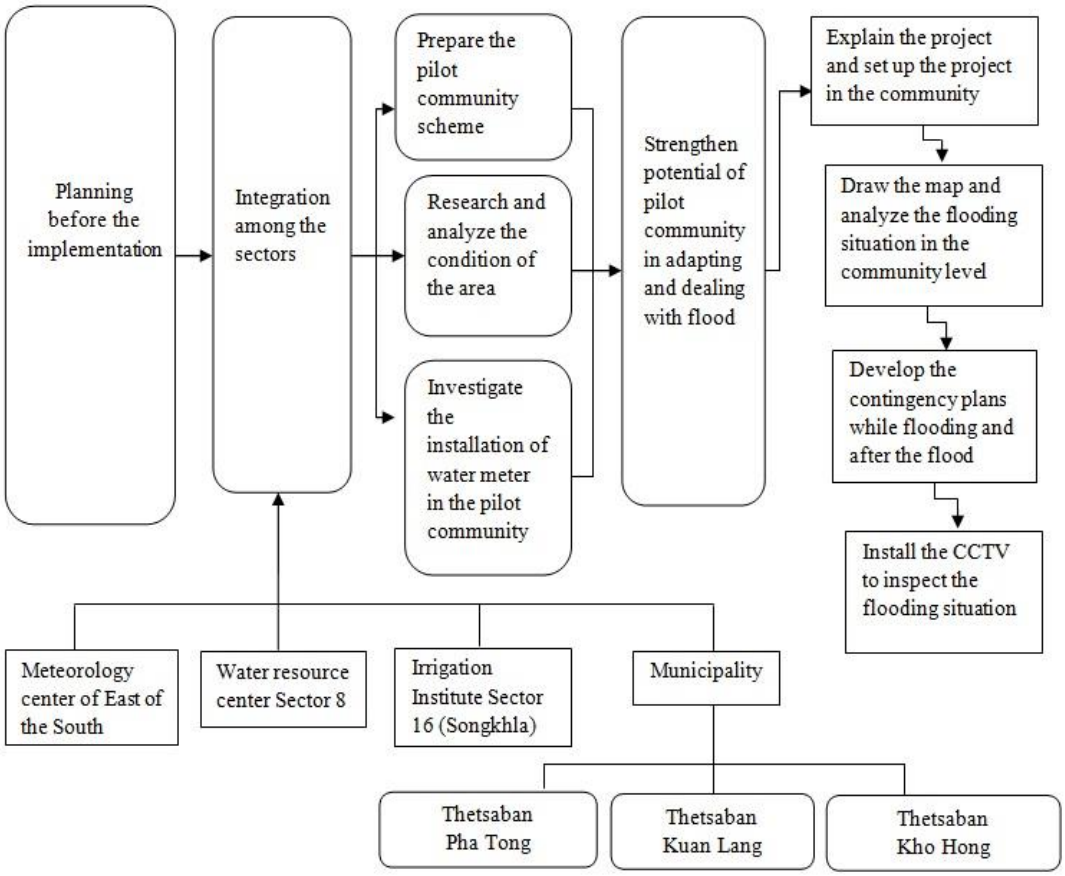

Figure 2 Processes of Public Policy Formulation for Sustainable Disaster Management.

The main elements of sustainable disaster management can be summarized as follows.

1. Integration among associates and networks with common goals and commitments to resolve disaster management problems, public consciousness, belief in the use of local resources, and sharing knowledge between the government and public sectors.

2. Self-reliance that can be adapted according to the context of each area without dependence on governmental operations.

3. Comprehensive disaster management covering preparedness, prevention, response, resilience, use of technology to rapidly communicate information, and collaboration with academic agencies to carry out human resource management congruent with central resources and policies.

4. Good administrative management that clearly identifies the duties, roles, and responsibilities of leaders and personnel and also possess adequate resources, volunteers, training courses, and support policies.

5. Lessons learned, research, and communications needed for future development.

The context of the target areas and the needs of stakeholders should be analyzed and applied to policy formulation in order to reduce losses, enhance safety with reference to the life and property of the people, and resolve disaster problems with a public participation mechanism. This participation should be carried out in the form of collaborative integration, focusing on achieving balanced development in terms of the environment, the economy, and technology (Reissman, 2008). In addition, the proposed model has been complied with the concept of policy formation stipulated by Gerston (2010) and (Gunn, 1976). As a consequence, the reliability of the model seems to be high and fitted with this context.

The stakeholders should participate in decision-making regarding the direction of development. The relevant organizations should also build good relationships with each other. Additionally, a participation and integration system would enable each organization to clearly understand its roles and also reduce conflicts and disparity in organizational roles, leading to efficient and consistent collaboration. Good policy formulation and a good planning framework will ultimately contribute to sustainable development.

The findings of this study can be used to design and develop community-based disaster management in order to reduce losses after a disaster according to the local context and the community's way of life. As a consequence, the benefits of the study, but not limited to, include:

1. Existing social capital can be used to enhance the community's self-reliance when facing natural disaster;

2. The developed disaster management model is congruent with the community's needs and the current state of society;

3. Accessible media channels, learning sources, and technologies are provided;

4. Strong leadership has been developed, especially in local organizations;

5. Budget and financial support is provided to facilitate flexible and quick management, and

6. The communities and stakeholders feel satisfied, have belief and faith, and continually collaborate in disaster management model development

Chapter III

An Integrated Sustainable Development Model for Effective Disaster Management Policy of Khlong-U-Taphao Basin in Thailand.

3.1 Abstract

This research aimed to examine the success factors for the implementation of public disaster management policy in Khlong U-Taphao Basin and to develop the sustainable development model. The qualitative methods employed were in-depth interview, focus group discussion with those involved in policy implementation, and literature review. The results suggested that the sustainable development model for effective disaster management in Khlong U-Taphao Basin, Songkla Province, consisted of 2 main components, which included 1) 4 success factors for policy implementation and 2) 8 factors for proactive and integrated disaster management with community-based approach. In addition, it was found that the sustainable success of policy implementation also related to the following 3 factors: 1) a balance between personal gain and public interest, 2) participation of private sector, and 3) overcoming obstacles to effective policy implementation. The sustainable development model for effective disaster management in Khlong U-Taphao Basin resulted from this study could be applied to other areas with appropriate context in the future.

3.2 Introduction

Khlong U-Taphao Basin is the 7th sub-basin of the 21st basin (Songkla Lake Basin), which is the biggest one among 5 basins in Songkla Province. It is located between7 degrees 14 minutes North Latitude and 100 degrees 28 minutes East Longitude. It has an approximate area of 2,840 square kilometers, covering parts of 7 districts, 35 sub-districts, and 252 villages, which include Sadao District, Na Mom District, Hatyai District, Khlong Hoy Khong District, Bang Klam District, Rattabhumi District, and Kuan Niang District. There are 7 municipalities in this area, which are Hatyai, Ban Phru, Sadao, Padang Besar, Pang La, Patong, and Prik. Khlong U-Taphao is the main source of water and also the

largest canal in Songkla Province (Rak U-Taphao, 2015)

Khlong U-Taphao Basin area is about 130 kilometers long. Its total water catchment area is 2,200 square kilometers. The water catchment area above HatyaiCity, which is the key economic zone, is 2,000 square kilometers. Khlong U-Taphao has an ability to drain 35 million cubic meters of water per day but the water drainage capacity can be 50 million cubic meters per day, in case of inundation. The average temperature is 26.6 to 29.6 degrees Celsius. The highest temperature usually appears in April and the lowest temperature is in February. The average rainfall is recorded at1,916.4 millimeters. The highest rainfall occurs in November.

Khlong U-Taphao is the main canal,which originated from the watershed forest in Sadao District on the border with Malaysia. Sadao reservoir with storage capacity of 56.741 million cubic meters is the significant reservoir in Khlong U-TaphaoBasin area. It functions as kaem ling (water storage canal) in the rainy season and distributes the water out in the dry season. The watershed forest in this area is the source of many rivers, canals, and streams formingKhlong U-Taphao. It is full of natural resources and woodlands that have nurtured Songkla Province from the past to present day.

The economic structure of the provinces in Khlong U-TaphaoBasin consists of agricultural, industrial, and service sectors. The key agricultural sector is associated with rubber, wet season rice, fish, and giant tiger prawn. Theindustrial sector continues to expand its manufacturing capabilities, for examples, rubber processing products have been sold to tire manufacturers in Japan, the United States, and China, rubber gloves have been exported to the United States market, andprocessed rubber wood has been increasingly exported to China and Hong Kong. Regarding the seafood industry, its growth rate is likely to slow down because the operators are faced with trade barriers and high competition in international markets. As for the tourist industry, it is continuously growing due to the attractiveness of festivals such as New Year festival, Chinese New Year festival, Hari Raya festival, and Songkran festival. The private and governmental organizations also support the tourism industry by holding various promotional activities to attract more Malaysian and Singaporean tourists. Apart from this, the private organizations mainly invest in canned seafood manufacturing, cold storage, rubber gloves factories, and rubber processing plants.

Khlong U-Taphao Basin area has a significant impact on the environmental, economic, and social development of Thailand. However, the climate change has currently caused harmful natural phenomena such as greenhouse effect, global temperature rise, and change of sea level, consequently

resulting in weather fluctuation and natural disasters. All of those phenomena caused by climate change are considered as global threats that all relevant agencies including the World Metrological Organization (WMO) have paid attention on. The disasters can be divided into various categories, including man-made disasters such as nuclear bomb, natural disasters such as flood, storm, and drought, geophysical disasters such as earthquake, volcanic eruption, tsunami, and biological disasters such as contagious epidemics (Environmental Research and Training Center, 2013). Recently, these disasters have frequently occurred and caused enormous damage around the world.

According to Songkhla Lake Basin Development Master Plan 2005 (Thanit Chalerm yanont et al., 2013), there are many watershed areas in Songkla Lake Basin such as Hatyai municipality in Khlong U-Taphao Sub-Basin and the eastern part of Hatyai - Phatthalung Road. This Hatyai - Phatthalung Road is found to obstruct flood flows during the major flood events in 1988 and 2000, which subsequently caused tremendous economic damage. The main causes of flooding at Hatyai City in Khlong U-Taphao Basin can be summarized as follows.

1) Construction of roads obstructing flood flows: The roads, which have been constructed to connect each district in Songkla and Phattalung provinces, are the major cause of flooding as they obstruct flood flows. Moreover, the drainage pipes under the roads are too small and inadequately provided.

2) Rainfall amounts: High amounts of rainfall can be another cause of flooding in some years (Thanit Chalermyanont et al., 2013). It is found that when the rainfall amounts in urban areas exceed 40 millimeters per hour, it can cause flood problems in some areas. In case there was heavy rainfall over large water catchment areas, the flood problems will be severer. This was because the water runoff will flow downstream to Songkla Lake through several urban areas, including Hatyai municipality.

3) Songkla Lake overflow: Normally, the water level in Songkla Lake ranges from -0.25 meters above mean sea level to +0.25 meters above mean sea level, which had no effect on the drainage of Khlong U-Taphao and other canals. However, if a large amount of water runoff from sub-basins rapidly flows to Songkla Lake when the water level in the lake reaches +2.00 meters above mean sea level due to rising sea level in the Gulf of Thailand, the water from Khlong U-Taphao and other

canals will not be able to flow to Songkla Lake. Instead, it will overflow the banks and inundate the communities on both side of the canals.

4) Land filling or polder system implementation: Land filling which is performed in order to construct buildings or roads in flood drainage areas can reduce the drainage profiles, making the water level increase.

5) Land use changes: Forest area in the basin is decreasing and changed to farmland such as rubber plantation, which affects the flow rate of water. Most of the rainwater will flow along the ground and overflow the watersheds below the catchment area.

Hatyai is the major economic city with serious flood problems, causing the most economic damage. Hatyai City is found to have consistently grown and expanded in every aspect, resulting in relatively higher flood damage. According to the past records, Hatyai has consistently experienced flooding for more than 20 times. The major floods that caused severe damage includethe flood events in 1988, 2000, and 2010. The details are described below.

Hatyai City in Songkla Province is one of the cities withthe most serious flood problemsthat cause great economic damagein Thailand (Suphat Vongvisessomjai, 2011). In 2000, there was a big flood in Songkla Province, covering the area of 330 square kilometers out of the total area of 2,400 square kilometers in Khlong U-Taphao Basin. The total damage to the government, private and individual sector was estimated at more than 17,000 million baht. More recently in 2010, there was a great flood in Khlong U-Taphao Basin, which affected about 80% of Hatyai City and 30,000 households.The total damage was estimated at more than 10,000 million baht.

Due to the flood situations originated from Khlong U-Taphao Basin, that have constantly occurred in Hatyai City, the concept of participatory disaster management is established. The Rockefeller Foundation held the project called Asian Cities Climate Change Resilience Network (ACCCR) to develop the capacity and readiness for handlingthe impacts of climate change in disaster vulnerable areas. The collaborative network and cooperation between various local parties has been formed to developeffective strategies and measures to deal with the consequent impacts of climate change, which may affect the cities, population at risk, and vulnerable groups in need of priority assistance. The participatory role of the local leaders as well as governmental, private, and social sectors are also defined so that they can better understand the problems and actual recommendations for disaster preparedness such as preventive planning, disaster warning, defensive system development, flood

response planning and procedures, flood operations, emergency evacuation system, disaster communication system, food and beverage management, post-disaster management, and restoration and rehabilitation system.

The policy implementation of this project is hierarchically carried out, which is considered the government management style. The public policies for disaster management in Thailand are generally communicated with only "Top-Down Concept", which resulting in limitations of knowledge sharing among relevant sectors. The local parties, who are directly affected, should be especially alert and become self-reliant in the future. One of the essential factors for long-term sustainability of disaster management is creating a collaborative network between public, private, and social sectors through various kinds of activities. This can make the society becomes constantly alert and aware of disaster problems and potential solutions.

The above limitations make the researchers interested to systematically study this problem and create know-how from a case study that can be applied to the other areas with similar contexts, which will be beneficial to people in general. The lessons from Hatyai ACCCRN, the project received Thailand Public Service Award 2012 in an *excellent integrated service* category from the Office of the Public Sector Development Commission (Office of the Public Sector Development Commission, 2012), which are discussed in this study include cooperation among all relevant parties, collaborative network between social, public, private, educational, and media sectors, cooperative commitment to solve the problems, disaster awareness, and network development for comprehensive knowledge sharing. This project is a good case study to investigate disaster management public policy

The results can be used as the guideline for Hatyai City and Khlong U-Taphao Basin to handle upcoming disasters and the fundamental model for disaster management in other contexts. The different fields of knowledge should be integrated to achieve successful disaster management in all dimensions, including environmental, economic, and social aspects.

3.3 Research objectives

To examine the success factors of sustainable development model for effective disaster management policy implementation in Khlong U-Taphao Basin, Thailand, by applying a case study of Hatyai ACCCRN (Asian Cities Climate Change Resilience Network) in order to further knowledge on sustainable public policy management.

3.4 Literature review

Concept of public policy

Some researchers previously defined public policy as an important tool for the government to run the country (Dye, 2012; Anderson, 1994) and a guideline for governmental activities. In other words, public policy is practically an option built by the government to solve, mitigate, and prevent the problems according governmental obligations. The goals of public policy need to truly serve the needs of people and lead the country to better development. In addition, public policy needs to have organized, structured, and systematic operations and also legal, consistent, and progressive activities, which contributes to practical implementation
(Sombat Thamrongthanyawong, 2007). The conditions of good public policy include (Chanidtha Choosuk, 2010) the ability of policymakers, the understanding and ability of those who adopt the policy, effective management system, and attitudes of those who are relevant to the policy (Prachum Rodprasert, 1996).Public policy is either a broad guideline for decision-making of administrators and agencies or a general statement suggesting appropriate administrative decision-making (Siriwan Serirat, 1996).

Public policy process consists of 5 steps (Todsaphorn Sirisamphan, 2011), which are 1) Public policy formation: this step needs to answers the question why each public policy is needed. Normally, the formation begins with the public problems in community, 2) Public policy alternative development and decision making: the problematic situation is analyzed to find out and decide the possible policy options, 3) Public policy implementation: this is the key step to turn policy into action, to define the performance indicators of policy implementation, and to control the operation according to determined plan and policy, 4) Public policy evaluation: the achievement level of each project and operation need to be evaluated so that the policy can be modifiedin accordance with changing situations, 5) Public policy maintenance, succession, and termination: a successful public policy needs to have a mechanism to maintain its continuity. If a public policy is not well-received, it has to be terminated or replaced with an alternative policy. This is considered the reverse process of the policy formation.

According to Mazmaniana and Sabatier (1989), there are 5 main conditions of policy implementation, which are 1) causal relationship and valid reason, 2) policy clarity, 3) political determination, 4) organizational support, 5) external situation that has no opposition to policy. If only one

condition is missing, the policy implementation may have problems and obstacles, which finally leads to failure.

Anderson (1994) suggests that public policy evaluation is an activity that aims to examine the achievement and result of a policy. The actual performance will be compared with the expected outcome in every step of operation. Dunn (2004) focuses on whether there is any social change after policy implementation or not. Social problem-solving and social response, which are a part of policy analysis, are taken into account. The consequence of policy implementation is paid attention to during policy evaluation. James and Blaine (2010) state that human societies have choices and the best choice is evaluated and selected by self-perception. In addition, House and Howe (2000) suggest that policy evaluation is an activity to build understanding and acceptance. It does not force or manipulate people to believe. It simply focuses on utilization of evaluation result and acceptance after implementation.

Public policy implementation process is carried out after policy formation and procedure analysis. The concept of public policy implementation can be divided into 3 categories (Pulz and Treib, 2007 cited in RuengwitKetsuwan, 2008), which are 1) Top-Down Concept, 2) Bottom-Up Concept, 3) Hybrid Concept. Each concept is different from each other. Woradech Jantarasorn (2008) also suggests 12 factors of policy implementation. Therefore, policy implementation requires understanding of problems and circumstances in order to prevent failure and achieve the objectives in the most effective and efficient way.

Concept of public policy engagement

Most public policies are under the concept of linear policy process. The policies are defined from the central government. The people and other sectors are policy environment. This is a limitation of traditional public policy model in which people rarely have chance to take part. Considering citizen engagement in planning, investing, taking action, receiving benefit, it is found that the citizens cannot actually participate in those processes because they and other sectors are in the environment of policy. The model that only focuses on governmental affairs cannot truly respond to the needs of people.

The concept of citizen and stakeholder engagement in public policy is emerged later. Pratchya Wesarach (1985) defines citizen engagement in community development as an action that people get involved in community development activities or use their own resources to develop their

community. Thaweethong Hongwiwat (1984) gives themeaning of community engagement policy as a process that the government encourages, leads, supports, and allows all forms of citizens,including individual, group, club, associate, foundation, and voluntary organizations, to take part in a governmental operation. The definition of citizen engagement also includes an ability of the citizens or community to control resource management for the economic and social benefits of the community members.

Citizen engagement is considered universal principles that international countries place an importance on and also a main issue that the government has to allow the citizens and stakeholders to perceive, consider, and make a decision together according to good governance principles. It helps enhance transparency and making-decision quality of the government as well as mutual acceptance of all relevant parties. The International Association for Public Participation divided the citizen engagement development into 5 levels (Department of Industrial Works, 2015), which are 1) providing information is the lowest and most significant level of citizen engagement because it is the initial stage that the citizens are given chances to participate in the government's operations, 2) listening to opinions is a process that the citizens are allowed to give information and share their opinions useful for the governmental decision-making, 3) engaging is a step that encourages the citizens to take part in governmental activities and suggest practical solutions so that the citizens can be ensured that their opinions and suggestions are taken into consideration for governmental management, 4) cooperating is a process that the civil sector's representatives participate in every step of governmental operations and decision-making, 5) empowering is a stage that the government allow the citizens to play dominant role and make a full decision.

Concept of disaster management

UN International Strategy for Disaster Reduction (UNISDR) (cited in Choowong U-balee, 2008) defines disaster as a serious disruption of the functioning of a community resulting in economic and environmental losses which exceeds the ability of the affected community to cope using its own resources. Disaster is a series of risk situation resulting from combination of hazard, precarious condition, and inappropriately managed risk.

Asian Disaster Preparedness Center states that the impacts of disaster can cause loss of human lives and properties that leads to economic, social, and other relevant damages. Disaster can be divided into 3 categories according to its causes, which are 1) natural disaster such as flood, landslide,

and earthquake 2) man-made disaster such as terrorist attack, traffic accident, transport accident, and fire 3) technological disaster such as communication problem and nuclear leak. Moreover, disaster can be defined as an adverse event that happens to people including natural and man-made hazards, causing loss of life and great damage to public and private properties such as fire, flood, hurricane, tsunami, and others (*National Disaster Prevention and Mitigation Committee, 2007)*.

The crucial problem of disaster management is the lack of a unified management.There is a lack of collaboration between government organizations, civil society, and stakeholders who work in partnership with each other to drive effective and efficient policy such as local agencies, government and private sectors, and relevant organizations. The importance of civil society stakeholders and their understanding is taken into account. The civil society is encouraged to participate in every step of policy development including policy planning, managing, presenting or opposing.

Disaster problems, including man-made and natural hazards, continue to occur repeatedly. The systematic and effective disaster management can help people to handle and prepare for all phases of disaster.Proven and Milward (2003) suggest that the government needs to create collaborative network in 3 levels, which are community level, organization level, and network level. Each level has its own evaluation criteria, which are different from each other, although the three of them are relatively connected. These 3 levels are called “social network”, which refers to an integration of local citizens in the form of an organization to work together with governmental agencies in order to reduce risk and find ways to prevent disaster. Disaster management, preparedness, prevention, and solution can reduce negative impacts on public and private properties and make the related parties ready for systematic disaster response and emergency practices, leading to minimum loss and damage.

Concept of Sustainable Development (SD)

The World Commission on Environment defined Sustainable development as "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs" in the Bruntland Report, Our Common Future. This report suggested the state of global affairs in terms of environmental degradation, international economic inequality and poverty, and the inability of current national and international institutions to deal effectively with the challenges of securing equity for future generations. Global organizations has taken

the philosophy of sustainable development into account and has organized the conferences to find out common practices. However, the meaning of sustainable development in the environment and sustainability report is broad and covers a wide range of issues.

The Office of the Royal Society states that sustainable development consists of 3 concepts, which include:

1. Human needs: Sustainable development is associated with human needs which can be either basic needs for living or needs for better living.
2. Environmental limitation: Environ mental system has limited resources and waste treatment capacity.
3. Intergenerational and intragenera- tional equity: Sustainability cannot be stable without development policy that focuses on social and cultural factors so intergenerational and intragenerational equity needs to be taken into account.

The development can be steadily and smoothly conducted, if it cause no undesirable results. However, destruction of natural resources and environment tends to occur whenever the needs of current generations are served. The concept of sustainable development is created to solve this problem. It aims to achieve macro macro-level conservation. In other words, if the sustainable development causes an environmental impact on one area, it has to enhance environmental quality in other areas as a compensation in order to maintain overall quality of the environment.

Sustainability consists of economic, social, environmental pillars, which are interrelated and connected. These 3 pillars need to be taken into account when setting up a new develop- ment project. Sustainable development is far beyond environmental conservation. It can change economic and social structure to reduce environmental and resource consumption in a balance manner, which contributes to peaceful and harmonious living between people and nature.

3.5 Research methodology

To achieve the objectives of this research, the methodology was divided into 2 steps. In the first step, the concepts of policy, public policy, citizen engagement, and disaster management were collected and studied. The second steps included data collection, literature review, and fundamental knowledge development for the operations of ACCCRN. The public policy analysis and qualitative

methods were used for content analyses. The focus group discussion with private network and ACCCRN team, in-depth interview based on a case study learned from ACCRN policies and participatory working process,participa- tory observations were applied to collect data.

Qualitative Research Processes

The case study method, in-depth interview, and focus group discussion with relevant communities were employed. The details of qualitative research methods are as follows.

Population and Sample

The target population of this research was 5 groups of people who are related to disaster management policy in Khlong U-Taphao, Thailand, which were 1) members of governmental and political agencies 2) members of private organizations 3) members of educational institutions and educators in relevant areas 4) journalists from various media 5) representatives of civil society and stakeholders.

The purposive sampling method was used to select 10 informants from each of the group. The total 50 informants were selected to provide information about disaster management in Thailand.

Research Tools

The research tools in this present study included a series of unstructured questions for in-depth interview, which were developed from literature review and collected secondary data to use a guideline to collect information from the informants. The researchers also used field note sheet to record detailed information about circumstances, places, persons, incidents, and speeches based on empirical observa- tions without adding interpretation. Theoretical note was also used to add opinion, emphasize meaning, and set temporary assumption.

Data Collection

This qualitative research employ- yed in-depth interview to collect data from those who workedin management level of public and private organizations associated with disaster management policy formation in Thailand. The primary and secondary data was collected to create the development model for disaster management policy. Then the model wss used to conduct focus group

discussion with the communities affected by the policy. The researchers also usedthe participatory observation methodto collect dataduring focus group discussion. The content validity was confirmed by the experts.

Data Reliability and Validity Test

A variety of methods were used to test the reliability and validity of data in this research. The researchers took time to mingle with the local population in target areas for years before starting the data collection. Therefore, the researchers were very familiar with the participants and the community. The data triangulation method was applied to verify the data reliability and data sources such as times, places, and informants who providedthe secondary data and gave information during in-depth interviews and focus group discussions.

Qualitative data analyses

The researchers applied the grounded theory approach, developed by Strauss and Corbin (1990), to thedata analyses of this qualitative study. This theory is generally used to create new theory and has been widely used for qualitative data analyses in present day. The public policy analysis framework was also applied to develop the sustainable development model for effective disaster management policy in Khlong U-Taphao Basin, Thailand.

After data collection, the comple- teness of data was examined by content analysis method. The grounded theory approachwas applied to insightfully analyze, verify, and interpret the data according to the objectives.

3.6 Results

The literature review, focus group discussion, and in-depth interview were carried out to study the factors affecting policy implementation achievement and policy formation through 3 process variables, which were policy statement, organization, and competency. To achieve the objectives of developing public policy model, the integrated theoretical concept suggested by Gerston (2010) regarding public policy implementation was applied to determine the success target contributing to the ultimate results. Policy making process and integrated policy implementation theory (Woradech

Jantarasorn, 2008) were also used to develop public policy model. The missions of flood prevention policy in Khlong U-Taphao Basin, Songkla Province were listed below.

1. To integrate the action plan with other associates in Khlong U-Taphao Basin and Songkla Lake Basin and gear towards water management mechanisms at the national level.
2. To develop water resource management system in order to cope with/ adapt to climate change situation in Khlong U-Taphao Basin.
3. To improve the quality of life of vulnerable and risky groups affected by climate change in terms of water resource.
4. To enhance urban development according to the eco-development approach of natural resource and environmental conservation.
5. To develop a supportive mechanism driving climate change management in Khlong U-Taphao Basin and Songkla Lake Basin.

In addition, it was found that the key components of efficient disaster management in Hatyai City or Khlong U-Taphao Basin consisted of the following:

1. Main factors: 1) Focal point that was the main agency taking care of overall operations and possessing both administrative powers and resources.The provincial governor, the director of the local administrative organization, and the district chief had shared-authorization to give command and take action. There was the committee to monitor and assess the water situation. The Regional Administrative Zone 12 was responsible for the monitor focal point, which was set to monitor the water level. 2) Cooperation between policy agencies and operational team. There were many organizations and practitioners that worked together to develop flood response plan at provincial, district, and sub-district levels. The ACCCRN project was applied to develop flood management plan for the vulnerable communities in Khlong U-Taphao Basin and to carry out water survey, water map development for flood warning, water measurement, and water practitioners networking. The action plan, manual, and communication system, including CCTV, Line application, and operational practices were also provided. 3) Collaboration between the central government and the local government with consistent and compliant local, provincial, and national development plans.The ACCCRN project focused on the

basin development plan and working group consisting of experts from related organizations. 4) Willingness of all relevant parties.

2. Proactive organization management, which integrated and allowed all sectors to participate in every phase of community-based disaster management. The vulnerable communities were the center for establishing "social network" at community, organization, and network levels. The proactive organization management consisted of the following 8 dimensions.

2.1 Society: This dimension includedthe societies and social capital connecting people in social networks based on the basis of trust, belief, and public mind. It included 2 main elements, which were social capital and human capital. Social capital was used to drive collaboration between individuals and social networks under mutual trust. The ACCCRN project enabled the social capital consisting of relevant organizations, networks, and communities in the vulnerable areas to determine effective disaster management policy in order to enhance cooperation among all sectors and to develop the achievement indicators and monitoring and evaluation approach. The individuals with public and service mind from relevant organizations, communities, and network were involved in this process.

2.2 Organization: This dimension involved the organizations or associates with systematic management and methodical planning and controlling under organizational structure, which focused on administration management. The ACCCRN intended to decentralize authority to the local people, especially in the vulnerable communities through working group establishment and operational planning. The achievement-oriented management, efficiency, and accountability were emphasized. The organizational structure and roles of provincial and local executive committee had to be clearly determined in order to give authorized command and make an immediate decision according to the severity of each disaster. The one-stop problem solving and integration among related organizations on the optimization of natural resources should be implemented.

2.3 Management: This dimension referred to disaster management in the organizations that adopted the public policy by way of management. Considering the ACCCRN project, the missions and assignments were determined and communicated to the public and private agencies and communities, which were considered as disaster management organizations, according to the principles of disaster management application and community-based sustainability. The evaluation was divided into the following 3 stages.

Stage 1: The capacity to reduce the severity of the disaster

Stage 2: The capacity of the communities to recover and resist loss during and after the disaster

Stage 3: The capacity to reduce disaster losses, resist natural disasters, and cause the least damage to life and property of the people in the communities, which was considered reducing dependence on external factors. In other words, the communities in risky areas of Hatyai City and Khlong U-Taphao Basin needed to have disaster forecast and assessment system, develop warning system through CCTV, smart phones, banners and flags, SMS, car parade, and press conference, and find preventive solutions to reduce the damage which might occur. The surveillance and evaluation measures needed to be implemented at all levels, including both operational staffs and management team. The knowledge and experiences of people in the communities should be used as a mechanism for disaster preparedness in individual, family, and community levels. The disaster response practice and basic assistance should be trained together with the use of water map, evacuation route, disaster alert network, and the disaster mentor's map in order to cope with the disaster. Each community prepared for disaster management differently according to the context of each area. The disaster management should be comprehensively implemented and focus on the citizen engagement in decision-making andall working procedures in order to optimize disaster risk reduction.

2.4 Participation: This was a part of the operational management of target group and policy-related parties. It could drive the organizations and networks forward and create a sense of shared pride in disaster reduction, leading to good collaboration and coordination as well as smooth and effective operations. The ACCCRN project encouraged a gathering of individuals and networks in form of area-based organizations, private sector organizations, and professional groups. Water map development, data survey, and public forum were used to builda sense of ownership and participation, resulting in a shared public consciousness.

2.5 Political relationship manag- ement: This dimension enabled the local authorities to work in an effective and independent manner, develop an action plan without having conflict with the central goals and objectives, allocate the budget according to financial plan, and gain constant supports from the central and local governments. The ACCCRN project helped give operational support, reduce gaps and obstacles, and enhance the achievement of political organizations, contributing to the maximum public interest.

2.6 One-Unity: When all parts ofa community, including organizational executives, operational staffs, andlocal people, were united into one-unity, all of them would think and act in the same direction, coordinate with each other, focus on collaboration, support each other, believe and realize in their own duties. The community's members, who thoroughly understood the context of their community should take part in problem-solving process, regardless of religion, ethnic group, class, and age, in order todevelop and sustain good relationship among all parties. The ACCCRN project applied both formal and informal operations to build unity and also focused on disaster monitoring and warning system, innovative technology, and knowledge management.

2.7 Result orientation: This was a success factor that focused on engagement of the experts and relevant organizations in problem-solving. The members of ACCCRN working team were proficient, knowledgeable, and full of abilities. They had public mind and always worked hard for public interest.

2.8 Networking: This dimension involved establishing a network with nearby communities and other relevant organizations in order to gain operational support and create social activities. The ACCCRN project applied integration approach to build 5 basin networks in the Songkla – Satun area. The useful information was communicated through Line Application. The strong network and good relationship would lead to sustainable relationship between the relevant organizations and communities.

Among all 8 dimensions, network- ing was considered the heart of successful public policy implementation in Khlong U-Taphao Basin.

The results also suggested that there were another 3 main factors affecting the achievement of disaster management public policy development in Khlong U-Taphao Basin, which included private sector participation, going beyond boundary, and a balance between personal and public interest. The details were as follows.

1. Private Sector Participation

Private sector participation especially required the following social consciousness: 1) Public mind caused by individual factors including upbringing, organizational value focusing on helping each other, and previously being one of stakeholders affected by the past disasters, 2) Social responsibility resulted from leadership and participation in public organizations that carried out CSR-process such as Provincial Chamber of Commerce, Rotary Club, and other related associations and foundations.

2. Going beyond Boundary

This factor enabled the relevant organizations to work together in form of integrated operations in order to go beyond the individual and organizational objectives and achieve united cooperation. It could result from the following:

1) Organizational Structure: The Community of Practice (COP) was built to horizontally work with flexibility and to collaborate with external organizations. Regardless of their affiliation, all COP members aimed to achieve common goals with expertise, potential, balanced qualifications, leadership, and team working skills. They also applied problem-based approach to make a key decision in every board meeting.

2) Creative Thinking: It was used to find a solution for unsolved problem, carry out activities, and develop warning system. Communication and information technology was also applied to develop innovative, workable, and appropriate systems such as CCTV and disaster warning application that was accidentally discovered.

3. Balance between Personal and Public Interest

A balance between personal and public interest could be developed by the following factors.

1. Team Selection: All team members had public mind, expertise, and high organizational skills. They thought about public interest before personal gain and believed that the reduction of disaster impact could benefit many people in the community.

2. Public Policy Participation: All relevant parties, from operational level to management level, took part in disaster management policy development according to the bottom up concept in order to build collaboration, solve the problems based on the decentralization approach, and explore potential channels to drive the public policy such as roadmap development, Community Assembly meeting, and Hatyai People Assembly meeting.

The results from this present research clearly showed the key factors of sustainable development model for effective disaster management policy of Khlong U-Taphao Basin in Thailand. The details could be summarized in Figure 3

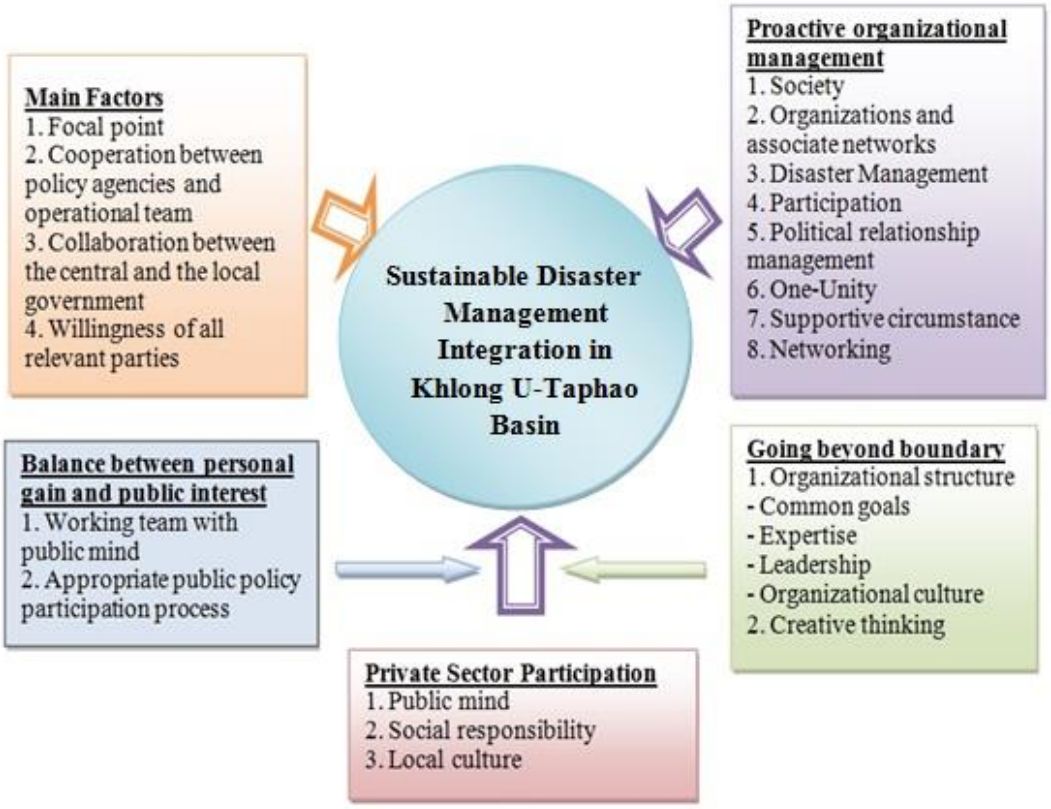

Figure 3: The relationship model of factors affecting effective and sustainable disaster management policy implementation in Khlong U-Taphao Basin

3.7 Conclusion and recommendation

Khlong U-Taphao Basin area is full of physical and biological diversity and can cause economic and social impact on the southern part of Thailand. To solve the major flood problems in Khlong U-Taphao Basin, integrated disaster management methods, comprehensive engagement of all sectors are required. The governmental, local, and educational organizations as well as affected people and public policy stakeholders should collaborate on environmental and natural resource management and find effective solutions suitable for the local context of each community by using knowledge sharing and community engagement approach. In addition, social action should be taken to empower the citizens and communities in Khlong U-Taphao Basin, contributing to self-reliance among related communities and sustainable public policy management in Khlong U-Taphao Basin area.

In this research, the current climate change causing natural phenomena and the Asian Cities Climate Change Resilience Network are taken into account in order to promote the ability and readiness of the cities in Asia in coping with the impact of climate change. The coordinating network should be formed to enhance collaboration between local parties on strategy and measure development in order to prepare for and deal with the consequent impact which may affect the cities, population at risk, and vulnerable groups in need of priority assistance. Hatyai City was selected to be a pilot city in the Hatyai ACCCRN project, which aimed to find the appropriate public participatory policy development model for disaster management in Hatyai city, Songkla Province. The recommendations for this project regarding public policy promotion are as follows.

1. Community Level: The communities in risky and vulnerable areas should develop climate change response plan, disaster preparedness, mutual capacity enhancement, and social cooperating networks to cope with the disaster and support the existing measures.

2. Landscape Ecology Level: The disaster management model of Khlong U-Taphao Basin can be further applied in other basin areas throughout Thailand in order to enhance effective flood management and prevention suitable for environmental context, way of life, social capital, and other supportive factors.

3. Policy Level: The cooperating networks should be formed at national level in order to handle climate change problems, develop mutual agreements and practices, and drive practical continuity.

Public policy promotion should take account of the local network mechanism in each area such as community and network organization. Local knowledge should be used to develop public participatory policy together with related factors. Private networks should be built to conduct CSR activities, CSR-after-process, CSR-in-process, and CSR-as-process and collaborate in formal and informal operations. The key stakeholders, including universities, hospitals, merchants, and street vendors, should have equal chance to cooperate with each other, contributing to sustainable disaster management in the future.

Chapter IV

Key success factors of disaster management policy: A case study of the Asian cities climate change resilience network in Hat Yai City, Thailand.

4.1 Abstract

The objective of this research are to study the key success factors of public policy in the disaster management and involvement of Hat Yai citizens, Songkhla province, based on the case study of Hat Yai ACCCRN (Asian Cities Climate Change Resilience Network) and to purpose guidelines for sustainable disaster management in the area. The methodologies applied in this research were both quantitative and qualitative approaches. In the quantitative approach, the researcher used a questionnaire survey of 400 samples from three representative communities in Hat Yai city. The qualitative approach used the focus group technique with the stakeholders of policy implementation. The result of the survey regarding the problems within the community affected by the flood was that most of the respondents that answered the questionnaires had faced with a flood in the community. Moreover, these respondents had participated in the policy and were aware of information about ACCCRN from different media, as well as participated in activities of disaster management and had meetings with the organizations or personnel involved with disaster management. Moreover, the results showed a relationship between the individual factors and the information awareness of ACCCRN at the 95% confidence. Additionally, the results using the qualitative method showed that the model of disaster management in Hat Yai, Songkhla province, as well as the three key success factors of disaster management policy revealed the following: (1) there is a balance between self-interest and the public interest; (2) requiring private participation; (3) there were obstacles in bringing this policy into the implementation process and in being effectively implemented. The benefits from this research are enormous in terms of successfully implementing disaster management policy and this policy can be applied to other contexts in Thailand as well.

4.2 Introduction

The changes in the environment nowadays has caused many impacts on the environment, for instance, the greenhouse effect, the increases in the world temperature, and the increasing sea level to take a few example, which have resulted in the fluctuation in the climate and have finally become disasters finally. These happenings resulted from the climate changes, which is a severe phenomenon around the world. Even the World Metrological Organization (WMO) is seriously concerned about these problems happening in the world. Regarding the types of disasters, they can be categorized into a few types: disasters from human beings, such as accidents with nuclear power; natural disasters or hydro-meteorological disasters such as floods, draught, or geophysical disasters such as earthquakes, volcanos, and Tsunamis; and biological disasters such as serious plagues, etc. (Environmental Research and Training, 2013). Recently, these effects and disasters have happened rather frequently and even more seriously damaged.

Regarding Hat Yai City, floods are a major disaster there, and it was one of the most severely affected cities by flooding in Thailand. Based on the Report of Suphat Wongwisetsomjai (2011) on the topic, "The Disaster from Flood in the South of Thailand, Bangkok and The Chao Phya River," especially regarding the severe flooding in 1988 on 21 November, Hat Yai city was affected by flooding of a 1.43 meter high water level. The affected area covered 20 square kilometers, and the estimated financially loss was more than 1,000 million baht. Later in 2000, during 21-24 November, there was a severe flood there that covered 3,300 square kilometers, and from Klong U-Tapao canel 2,400 square meters, the estimated financial and economic loss from the government sector, public sector, and the citizens was more than 17,000 million baht. Recently, on 1-4 November 2010, there was a flood in the Klong U-Tapao area which affected Hat Yai city as the flood covered 80% of the city area; 30,000 families were affected and the economic loss was more than 10,000 million baht.

From these flooding experiences, preparation for protection against the disaster is mostly still a "workaround" to the disaster and such disasters cannot be solved effectively. The reasons for this are mainly because each government sector is responsible only for its own assigned area, and therefore, there is no proper planning or budget allocation for the other affected areas. This has led to some projects that could not be implemented continuously, and the

leaders from the management section do not thoroughly understand the situation or the behavior of people in the areas, and therefore there is a gap between the government sector and the private sector. The flood in 2010 was the starting point of the disaster cooperation management, especially with the support of the Rockefeller Foundation, which pioneered "The Asian Cities Climate Change Resilience Network" or the ACCCRN project. The ACCRN's main objective is in order for the disaster areas to develop their potential and readiness in coping with the effects of the climate change by working as a network and cooperation among associates at the local level in strategic and tactic planning in order to prepare for and cope with the effects that happened in the city and the communities at risk that would be affected first. The ACCRN also identifies the roles of the local government, management, the government and public sector, and the people to get involved and aware of the problems. It is enhancing the people in coping with the disaster, starting from preparing prior to the flood such as planning, warning, protection system, steps in coping with the flood, implementation, moving of people and assets, the distribution of living supplies through the planning of repairing of habitats and mental healing. The command process was implemented according to legislation management, which was given the Thailand Public Service Award 2012 from the project coping with the flood in Hat Yai by integrating the government sector, civil society, and the community.

However, the integration policy employed a top-down approach, which had some limitations in terms of a lack of sharing knowledge among the sectors involved, especially on the part of the local people who were directly affected by the flood. The significant factor that contributed to the sustainable disaster management was network creation—the cooperation among the government sector, private sector and the people which was enforced through the media and activities in order to create awareness of the problems and to prevent and cope with disaster continuously.

According to these limitations, the researchers were interested in studying this problem systematically and creating a body of knowledge for the specific case which can be applied in other affected areas that have similar problems. The research studied the case of Hat Yai ACCCRN, which is a good model for studying the public policy in disaster management. It would be beneficial widely by being a guideline for the city to cope with disaster and serves as a model for disaster management for other areas which integrates every dimension of the external

environment, both economic and social dimensions. This network works in cooperation to solve the flooding problem and be active in learning together. The effects from the disaster on the community were assessed in order for them to be able to cope with and adapt themselves to the disaster. The foundation of this study is combined the public policy with social processes to create "community power," which is seen as being tangible in terms of a sustainable secure economic system. In other aspects, the involvement of the community is emphasized; learning and knowing about the problems with the community, creating guidelines for environmental public policy, to make the policy sustainable.

4.3 The objectives of the study

1) To survey the opinions and involvement in disaster management, as well as to know the level of understanding and awareness of ACCCRN of the affected citizen in Hat Yai city.

2) To study the key success factors of disaster management policy in Hat Yai by applying the Hat Yai ACCCRN case study.

4.4 Literature review

The Concept of Public Policy and Policy Implementation

Public policy needs to have a true objective in responding to people in order to better develop the country. This requires systematical planning, rules, and legislation and activities that are legally aligned and implemented continuously until becoming a guideline for applicable practicing. (Sombat Thamrongwong, 2007). The conditions for well-developed policy (Somporn, 1993 cited by Chanitta Chusuk, 2010) consist of the competency of the policy developer, the understanding and ability of the leader that implements the policy for effective management, and the attitudes of the stakeholders (Prachum Rodprasert, 1996). Additionally, public policy is a term for a broad guideline for the management in decision making or general guidelines for proper decision making of management (Siriwan Seireerat, 1996).

The study of Daniel A. Mazmaniana and Paul A. Sabatier (Daniel and Paul, 1989) indicated that there were five conditions in implementing policy: (1) the precise

relationship between cause and result; (2) the clarity of the policy; (3) the real intention of government; (4) the support from organizations; and (5) external environments that do not have conflicts with the policy. If these five conditions are not present in the policy implementation process, conflicts and obstacles can happen and it will finally be unsuccessful.

The policy evaluation according to the concept of Anderson E. James (Anderson, 1994) stated that policy evaluation is the activity of how to achieve objectives and results from the implementation, while a comparison between expectations and results is conducted constantly. On the other hand, the concept of Dunn N. William (Dunn, 2004) emphasized whether there was any change in the society in which the policy had been implemented, focusing on the problems solved and the responsiveness of the society that are part of the policy analysis. Therefore, policy evaluation stresses the results from the policy implementation. James R. Sanders and Blaine R. Worthen (James and Blaine, 2010) expressed the idea that human society had choices, and the best choices for humans require self-learning in choosing any activities that are evaluated as the best ones. Moreover, Ernest R. House and Kenneth R. Hown (House and Howe, 2000) discussed the idea that the policy evaluation as the activity which created the understanding and accepting of policy; which was not something that forced people to believe but emphasized the results after the policy was implemented and accepted its results. In short, public policy then means the guidelines for implementing it with distinct objectives in solving specific problems. Implementing an policy is to follow the guidelines in order to achieve the objectives and there requires the constant evaluation of the activity, which is not necessary done by the government sector. Hence, policy is dynamic, not static.

The process of policy implementation occurs after the analysis and identifying the policy process. There are three concepts in policy implementation (Pulz & Treib, 2007, cited by Reungwit Ketsuwan, 2008): (1) the top-down approach, (2) the bottom-up approach, and (3) the hybrid approach. Each concept has a different focus. According to Woradeh Chantasorn's (2008) study of the factors in policy implementation, there are twelve factors: the nature of the policy, the resources, the target group, the organizations which implement the policy, the management team, roles and job description (communication), the public relations, personnel, cooperation, planning and controlling, the evaluation process, and environmental factors.

Therefore, in order to be able successfully implement the policy, understanding the situations and problems are required to avoid failure. Additionally, implementation is the practice that achieves the objective effectively and efficiently.

The concept of disaster management

The UN International Strategy for Disaster Reduction (ISDR referred by Chuwong Ubalee, 2008) defines the term "disaster" as the situation of environment in the community is severely affected which causes the loss in lives, assets, economic and social environment, and it is beyond the ability of the affected area to be able to handle, cope or manage the disaster by itself with its limited resources. The disaster is a kind of risk which includes the damage and unexpected situation that is unable to reduce the negative effects of the risk.

The Asian Disaster Preparedness Center (ADPC) defines disaster as the loss of human lives and assets which result in the destruction of the economy, society, and others. A disaster can be categorized by the causes of the disaster: (1) natural disasters such as flood, buildings collapsing, earthquakes, etc.; (2) disasters from human beings such as terrorism, traffic, transportation, conflagration, etc.; and (3) disasters from technology such as communication problems, nuclear power, etc. Moreover, disaster also means harm to the public, no matter whether the harm is from nature, such as natural disasters, or from people, which causes the loss in lives and assets of the government and the people, such as conflagrations, windstorms, floods, Tsunamis, etc. (Department of Disaster Prevention and Mitigation, 2007).

The disasters nowadays are increasing in their severity, no matter whether the disasters are from human beings, with or without intention, or natural disasters which are expectable or unexpectedly. Systematic disaster management helps people cope with the disaster better-before, during, and after the disaster. Provan and Milward (2003) stated that the cooperation of the government sector needs to work in cooperation and network at in three levels: the community, the organization, and the network levels. Each level has its own evaluation process since the evaluation of one level might not be suitable for the other levels. These three levels will be linked to form "social networks," which means the integration of the community as the organizations and to work together with the government sector in order to reduce risks and prevent or cope with disasters. In disaster management, planning and process identifying in

preventing or coping with the obstacles in advance would reduce the loss and danger to people and the government. This planning and implementing could as well be practiced in a normal situation in order to prevent confusion when the disaster happens, and to reduce the rates of loss and harm to the least level.

The key success factors in policy implementation

The key success factor (KSF) is an important factor which needs to be acquired or created in order to achieve the vision. Organizations possess solid key success factors in connecting the implementation of every level in the same direction, for the staff and managers realize what to do to achieve the objectives. Without key success factors, the visions and objectives would not be able to be achieved. Key success factor provides the concepts, guidelines or methods for organizations to achieve their vision (Jiraphat Chantaprai, 2007).

Key success factors include:

1. The balance between self-interest and public interest according to the concept of Michael McDonald (Pleonta Tanrangsan, 2009). The balance is the equality that is not inclined to any side. In an organization which composed of people from different sectors, different background which could cause the misunderstanding and conflicts and results in self-interest attitudes other than working for the best interest of the public. Finally, the organization may not be able to achieve its vision or objective. Therefore, the balance between self-interest and public interest is the first key success factor for every organization.

2. Private participation; most people believe that developing the country is the responsibility of the government sector, which is rather wrong. It is obvious that there are still many problems that the government cannot solve alone without the cooperation of every sector, especially during this current era (King Prajadhipok's Institute, Thailand Political Base, the citizen section, 2012). However, the concepts of public implementation and social responsibility have to work together with the belief that business and society have a close relationship with each other - that they rely on each other and cannot be separated from each other. Hence, the private sector should participate in the society to create better business for society since business is operated under the expectations of society, and therefore business should adapt itself according the changes in society (Rapiphan Wondprasert, 2009).

3. The beyond boundary; the beyond boundary in the angle of the management in organization. The working of people from many different fields or backgrounds, which are professionalized in different areas, the different talents and competencies, but they are able to work together by combining the different knowledge and behavior to become unity and results in the beyond boundary. The beyond boundary can be achieved through denying, reducing anger, and compromising, which lead them to the same direction and achieve the objective eventually (Paithoon Srirod, 2009). The variety and novel ideas can be used to apply the concept of beyond boundary and implement with care and correct, that can result in future innovation.

Hat Yai ACCCRN (Hat Yai Asian Cities Climate Change Resilience Network)

ACCCRN is a network project in Asia which works to cope with climate change pioneered by the Rockefeller Foundation. It realizes that the effects from the climate change in urban areas which are the large community, high human congestion would definitely result in the severe loss of human lives and assets. ACCCRN aims for the big countries in Asia, such as Thailand, Vietnam, Indonesia, and India, to have the potential to cope with the disasters caused by climate change. Today the Network focuses on helping individuals and organizations build climate change resilience for poor and vulnerable people by fostering partnerships and collaboration. Together, the Network will build a larger coalition to drive the capacity and action needed for climate change resilience in the region.

Thailand, as one of the four countries which are working as a network to cope with climate change and started the first project in May 2009, selecting two cities as the pilot cities. The Thailand Environment Institute (TEI) and the Asian Disaster Preparedness Center (ADPC) are the key institutions involved in selecting the pilot cities in Thailand, and considered the size of the cities and the expected disaster from climate change, and fair public governing-oriented. At the beginning step, there were five cities nominated to be the two pilot cities: (1) Chiang Rai city, Chiang Rai, (2) Udonthani city, Udonthani, (3) Hat Yai city, Songkhla, (4) Phuket city, Phuket, and (5) Samusakorn city, Samutsakorn.

The implementation process begins with studying the effects from climate change both directly and indirectly, and the city system to prepare and cope with the disaster. The city system is complicated because it is connected with other systems that contribute to the

growth and development of the city, such as ecology system in physical and basic structure, the social system, the economic and financial systems, and assistance to the risky areas that are very sensitive. In short, the key disaster of Hat Yai city is floods.

Then the structure in pushing ACCCRN of Hat Yai city consists of a support mechanism, which is the central working team. It has the provincial board of directors serving as close consultants; the public sector such as the Songkhla Chamber of Commerce as the president; representatives from Hat Yai city municipality as the secretary and the working staff from the government sector such as the Department of Disaster Prevention and Mitigation, the Southern Metrological Center (East Coast), the Water Resources Regional Office 8, the Regional Irrigation Office 16, Prince of Songkhla University, local representatives such as Pa Tong municipality, Ko Hong municipality, Klong Hae municipality; the community sector such as the Songkhla Community Foundation, and media which are pioneered by the Rockefeller Foundation (RF) and co-associates such as the ARUP through the TEI. This structure is designed to coordinate all of the efforts from organizations and stakeholders involved in the government, public and community. Additionally, the structure is designed to be implemented in the long run in strategic and localized areas.

4.5 Methodology

In order to achieve the objectives of this research, there were two steps in the methodology; (1) collection of information on the topics of policy, public policy, public participation, and disaster management (2) analyze and summarize into the knowledge base of the network (ACCCRN). The public policy analysis utilized both quantitative analysis and qualitative analysis. For the quantitative analysis, a questionnaire was used to survey the people's opinions, information on their participation in disaster management, their knowledge and understanding of ACCCRN, and their awareness of the effects from climate change by using representative groups from three communities in Hat Yai - Pratankiriwat, the Ton Lung community in the Patong municipality, and the Hat Yai Nai community. These were selected from the criteria of distinctly effected from the disaster, habitat congestion. and distribution of habitats.

Another methodology used was qualitative analysis, which employed focus groups from the public sector and the ACCCRN committee. The case study provided the lessons learned from the participatory policy of ACCCRN, and this topic was used during the focus group. Moreover, participatory observation was used to check the content validity by professional advisors. The qualitative analysis studied the successful cases in order to avoid the weakness of qualitative analysis of not being able to answer some sensitive questions or non-structured questions. The qualitative analysis supported the results from the quantitative analysis, which was to inspect the validity of the results and the researcher's bias.

The steps in the quantitative analysis

For the result of this quantitative analysis to be able to be used in explaining the general situation, the researcher used a questionnaire as the tool.

(1) Population and sample size: the three communities representing the population were Pratankiriwat, the Ton Lung community, and the Hat Yai Nai community, and the population of these three communities was 7,839 people and 3,709 families (March 2013). The sample size selected was based on the module of Taro Yamane, which has which was 380 samples, but the researcher used 400 samples in order to create enough samples for collecting information from the three communities.

(2) Design: the question type used in the questionnaire was unstructured or open-ended questions, and the researcher had the questions approved by the advisor for validity. There were four types of questions: the process of creating public participation in disaster management in Hat Yai based on ACCCRN; bringing the guidelines of disaster management into practice; and problems and obstacles from the implementation.

(3) The content validity test: the test was carried out by distributing 30 questions to the target population and Cronbach's alpha was used to test the validity. If the alpha value was below 0.60, which was not valid, the researcher redesigned the questionnaire and ran the test again until the content validity was proved. Then the questionnaires were distributed to the three communities of the population and the sample size was selected. Finally, the alpha coefficient was used in order to obtain the confidence value, which was 7.35, and the questionnaire which was being edited and content validity proved would be kept for future use.

(4) The analysis: the researcher used the data from the questionnaires, which included descriptive variables such as frequency distribution and the analysis in order to arrive at a summary and suggestions. In statistical analysis, there must be at least two variables and the researcher used the chi square technique to study the relationship among the variables in the research.

The steps in the qualitative analysis

In the qualitative analysis, case study and in-depth interviews, as well as focus groups, were used to acquire the qualitative information.

(1) Key informants selected: the key informants were persons that were qualified to provide the information needed for the research, and therefore the selection criteria were based on the purposive sampling method, on whose objectives the research was focused and prioritized. Therefore, the key informants selected were the representatives of five groups: political and governmental sectors, the public sector, the education sector, the media and communication sector, and communities and stakeholders.

(2) Tools designed: the questions raised during the in-depth and focus groups were based on the knowledge and information from the literature review and developed from the primary data received. Then unstructured questions were formed for the in-depth interview and focus groups.

(3) Data collection: the data were collected from the in-depth interview with the persons that were in charge of disaster management policy in both the government and public sectors. Then the primary and secondary data were collected and collaborated into the model of disaster management. This model then was used in the focus groups with the representatives from stakeholders. The participatory observations were also used as guideline in the focus groups and the content validity of the questions was proved by professionals in the field.

(4) Data validity: data triangulation was used to inspect the validity of the data. The data triangulation was the method used to prove the validity of the data based on the information of time, venue, and people involved in the in-depth interviews and focus groups.

(5) Qualitative analysis: the content analysis of the qualitative analysis was used to check its validity. Then the results from both quantitative and qualitative analysis were proved again to inspect the validity.

4.6 Results

The results from the quantitative analysis

The analysis sector of this research was comprised of members of ACCCRN in Hat Yai and information was collected from the three communities, which were Pratankiriwat, the Ton Lung community, and Hat Yai Nai. The sample size was 8,393 people, 3,706 families, and the results are analyzed as follows.

The demographic information of the population was 68% was female; the education background was a bachelor and under-bachelor degree, which accounted for 50% and 40% consecutively. The professions were employees (23.5%), civil governors (34.8), entrepreneurs (20.5%), general people (78.8%), and health service volunteers (12.5%) and the municipality staff (.8%) The income ranges were 0-10,000 baht (38.2%) and 10,001-20,000 baht (40%). The accommodations were a one-story house (42.2%), a two-story house (31.5%), and a rented house (16.8%). The number of people in a family was summarized as three people (23%), four people (42.2%), and five people (18.8%). The age range of the people in the family was 59-30 (45%). The children accounted for 44.2%., the elder group 31.5%, the sick people 8.8%, and the disabled were at 1%.

The problems and number of people affected by the disaster were analyzed as follows: 57.8% of the respondents were affected in their entire living area, 29% respondents were affected partly in their living space, and 12% of the respondents were affected partly in their living and agricultural areas. The duration of the disaster or flood was 1-3 days.

The relationship between the demographic data and awareness of the ACCCRN project which used X^2 and the differential value was 0.05. Males had the better awareness of the ACCCRN project than females, and the respondents that had a higher education level had a better awareness level of the project. Governors and civil governors had a better awareness level than other professions. The social status of the Tambon municipality had better awareness than other

social status. The higher-income respondents had better awareness. The types of accommodations and number of family members also had a relationship with the project awareness as well; that is, the people that lived in a one-story house and had four members in the family had better awareness.

Regarding warning system development, the reliability of the warning system was 21.8% (red, yellow, and green flags), and warning with plans for coping with disaster was 10.2%. Regarding the participation in the ACCCRN project, 91.8% of the respondents never participated in the project, and 8.2% had participated in the project before. The awareness of the ACCCRN project coming from the media such as radio, newspapers, magazines, etc. was at 64%, participation in activities to learn about and understand the disaster management project was at 46.2%, browsing information at the ACCCRN website was at 37.2%, and participation in the meetings with the project's representatives was at 24.5%.

The qualitative analysis results

Climate change resilience nowadays is causing many natural disasters in the world population. The Asian Cities Climate Change Resilience Network, or ACCCRN, is a project which assists and supports many big cities in Asia to plan and prepare for, and cope with, the disasters caused by climate change. ACCCRN works with teamwork including associates and members from many sectors of the country to plan, prepare and cope with the disasters. Hat Yai ACCCRN was selected as one of the model projects of ACCCRN in Thailand in order to apply guidelines and the public participatory method in managing disasters.

The results from the literature review, in-depth interviews, and focus groups showed that the model of effective disaster management in Hat Yai should consist of two factors:

1. The key factors in effective implementation should include (1) a focus point is the major center which has power and resources; (2) a connection between the policy section and the implementation section; (3) a connection among the central government and the provincial and municipality governments regarding the strategic plans of provincial and municipality levels; (4) the sincerity of every sector involved, which would bring this model into practice effectively and efficiently.

2. The proactive management style in the organization which integrates every sector involved at every step of disaster management by using community-based disaster management, which consists of eight dimensions: (1) the social dimension, which connects every person that is in the social networks of the areas and creates relationships based on trust, reliability, and social-orientation; (2) the organization dimension, which includes systematic organizational management; planning, implementing, and controlling; and community empowerment to emphasize effective and efficient management; (3) the management dimension defines jobs and responsibilities clearly for every sector involved in the concept of community-based disaster management in order to create the sustainability of the system; (4) the participatory dimension is one of the target and stakeholder management which this participatory management style enables the organization and the network to participate or take part in the disaster management; (5) political relationship management empowers the local government to have freedom in planning and decision making, whose objectives do not conflict with the objectives of the central government and has the support financially of the central government; (6) one-unity dimension in every sector results in one direction of the implementation process; everyone works toward the same goals, and finally for the best of the public as a whole; (7) the re-oriental dimension means other factors that support the project implementation effectively and efficiently, such as the support and assistance of professionals in the field; (8) networking is the cooperation among nearby organizations or communities to support and help the community cope with disasters. Well-developed networks result in sustainable relationships among organizations and communities.

According to the model of disaster management policy development, the eight dimensions above are the key factors in designing public participation policy in disaster management. Apart from the eight dimensions above, there are three additional factors in public participation policy in disaster management of Hat Yai based on the study of ACCCRN, which are private participation, beyond boundary, and the balance of self-interest vs. the public interest, and the relationships of these three dimensions are shown below.

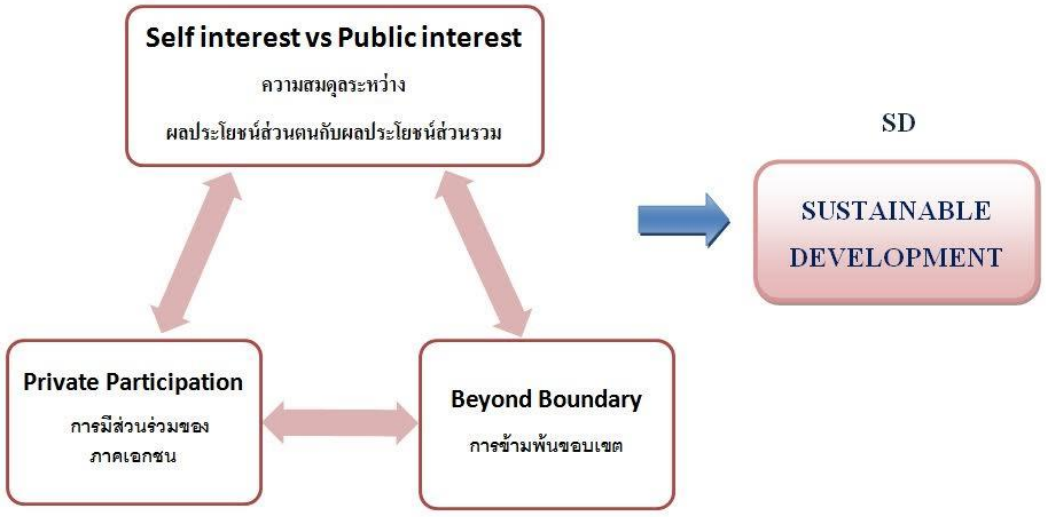

Figure 4 : Model of the Relationship of Factors Contribution to the Success of Public Participatory Policy in Disaster Management in Hat Yai

Private participation

The factors that contributed to the private participation were:

1. Public mind is from the individual and many other factors from the individual such as socialization, the values of many public sectors most of which are Chinese and have the value of public mind; helping other people; the awareness of the stakeholders. Moreover, memberships from the public sectors were educated in the institution or in the faculties which pointed out the structures in policy management or some had the experience from working with some networks and some wanted to use their knowledge in helping the society.

2. Social responsibility comes from leadership and public participation. Many of the public sectors participated in the disaster management project with ACCCRN because this project is part of their CSR projects (CSR-as-process), such as the Songkhla Chamber of Commerce, Rotary, other foundations, etc. They implement the project as if they are representatives of the public and they are able to see the whole picture of the problem and have visions concerning solutions and developments in solving the problems. Social responsibility allows them to realize their knowledge and capabilities in the implementation of the project (CSR-after-process).

3. The cultures of Hat Yai originating from the participation of the community. The Chinese ancestors planned the city and everything regarding future generations includes, building a railway station, buildings, and schools or hospitals. They cooperated with the government in developing the city to be prosperous, as it is called CSR-as-process. The rich donated land, money and other resources for the good of the public, such as building schools, universities, hospitals, etc. The first Chinese generation had a strong and distinct leadership style, and public mind in helping people, while the following generations still had a public mind but it was more focused at the individual level or was narrowly focused on only their groups or communities.

Still, there are some obstacles in public participation regarding disaster management, which are:

1. Value in a capitalistic society focuses more on self-interest than the public's interest. This suggestion was acquired from the qualitative research.

2. The public sector still does not have the knowledge about disaster, how a disaster happens, or knowledge about their hometown, what the history and background is, how the city map was developed, and therefore they do not have a deep relationship of their hometown. Some even wondered why the problem of flooding could not be solved and why the government did not provide any assistance. When the disaster happened, they did not have basic knowledge to solve the problems.

3. The methods for participation in the disaster management project were not clear. The government sector still could not fill the gaps with some public sectors, especially the new generation, which is knowledgeable and professional in many areas. The memberships or committees could not to utilize the valuable resources of these people.

4. Some private sectors viewed the problems as the responsibility of the government alone and they did not have control or power in managing the disaster.

5. The private sectors had negative attitudes toward the performance and ability of the government in dealing with and solving problems, and therefore they do not participate in any activities of the government.

6. The private sector in Hat Yai was during the transference period from the first initiated generation to the new generation and they definitely have different perceptions,

attitudes, and opinions, especially the Chinese. That is, for the first two generation the economic situation was very poor and therefore the leader became outstanding instantly for example, Chee Kim Yong Kun Niphat when he was able to settle down, well-established from his hard working, he started to build the city map, Niphat Utit 1-3, Hat Yai was very fast developed during that time. The second generation continued to build many facilities in Hat Yai until the third generation until today everything in life is ready and the leader of this third generation has taken power for a long time, so that the fourth or fifth generation could not participate in the city development. This is a part of the Chinese culture of respecting the elder generation and it has resulted in the separation of the fourth and fifth generations to other places, they were not as unity as the previous generations were, therefore, the government could insert its power in the private sector by setting Chamber of Commerce, Industrial Association, and the bank club or foundation to control the power of the Chinese. Nowadays the Chinese are united only within their own communities and do not want outsiders. In terms of city development, they are still very strong but it is not the same as the past. Now the government takes this power from the Chinese or the private sector. In the past, people were suffering, but they were more united and helped one another for surviving together. Now, the private sector is still willing and ready to help the society but is only waiting for the leader to give the command of what to do. This is also one aspect of the Chinese culture: respect for the elders in terms of making important decisions.

7. Hat Yai is the passing city. According to the geographic condition of Hat Yai, it is suitable for people from other cities to pass by or settle down, and therefore, in Hat Yai, there are many people with diverse races, cultures, and language. This results in a lack of hometown loving awareness.

Beyond boundary

The factors contributing to the integration of professionals in different sectors to work toward the same goal or direction are:

The organizing style is based on the community of practice or COP, which works on a linear, flat and flexible style which can easily connect with other communities or sectors. Some of the sub-factors follow:

(1) There are common objectives; that is, every working committee shares the same objectives, no matter which institutions they are from—the private sector, academic personnel in the university, civil governors, or municipality. Finally they work together towards the same goal or objective, which is disaster management.

(2) The competency and knowledge of the working committee has very high potential, with complete and balanced components. The ACCCRN project began with selecting the target city, which was Hat Yai; the committee could be chosen freely, which was suitable for the conditions. The committee was composed of the government sector, the private sector, the academic sector, and the local government. The criteria for selecting committees should be based on the public mind and the suitability to the work. The connections and relationships could be created after they have been working together for a long time.

(3) The leadership style is very important. During the beginning of the project, the Vice President of the Songkhla Chamber of Commerce was chosen to be the president of the committee. Also, the committee consists of professionals from many organizations or institutions; Water Resource specializes in water supply management, the metrological center specializes in weather forecasting, and the local government is responsible for the management within its own area. Therefore, the president of the private sector would listen to every party, invite the participation of every sector, and use the consent from the meetings to make decisions and assign jobs and responsibilities clearly to make every party feel comfortable when working together. Additionally, the relationship between the committee and the municipal government has been doing well, since they need to rely on each other regarding many matters such as the budget from the government and the empowerment between the two parties. This relationship has been built on trust and respect in order to achieve the same goals or objectives.

(4) The corporate culture of ACCCRN stresses teamwork. In making major decisions, there must be committee meetings and 4 to 5 members are selected to share their opinions or directions toward the problems or issues in the meetings; the decisions are not made by one person. Teamwork means that everyone works together no matter which institutions or organizations they are from, or what strengths or weakness they have; everyone has the same goals and works toward the same goals or objectives. All of the people respect one another and never consider the weakness of other memberships as obstacles to teamwork because they believe

in thinking “out of the box” - that everyone has his or her own ideas and opinions. This also requires the integration of opinions and actions.

Moreover, the implementation of the project has run purely without the insertion of political power; every decision and plan is from knowledge and professional of the membership.

Creative thinking

Creativity is being used to find the answers to the questions or problems that have not been solved. Since the Thailand Environment Institution (TEI) has been the consulting organization for the project, Share Learning Development (SLD) has been used to expand the same or existing ideas to acquire new ideas. SLD combines the attitudes, values, and opinions of all the members in the same direction and obtains solutions for specific problems. Based on SLD, the members come up with visions, missions, and strategic and operational plans. At the beginning every member came to the committee to work only for their own institution or organization, but the SLD made them change their own attitudes and work for the public as a whole, seeing the effects of disaster as an important issue to solve together. Therefore, SLD resulted in creative thinking; for example, they could develop a disaster warning system which utilized technological and communication innovation, the CCTV, Serenity were something they had never had before, they were new and original innovations and workable supplies. They are appropriate for the issues of disaster management. This flexible and creative atmosphere in the ACCCRN committee makes everyone a leader in the areas in which he or she is a professional. In short, SLD results in creativity.

The obstacles to the integration of beyond boundary are:

1. ACCCRN is not a corporate entity. The working committee works flexibly and is not very structured. If there is no budget granted from the central government, the ACCCRN project cannot stand on its own feet. Because it is not a corporate entity, getting a budget from the central government is not easy.

2. The disaster management in the water basin is not a formal structure for integrating different institutions and working in align with the landscape ecology, and therefore the work of ACCCRN cannot push laws allowing the ACCCRN committee to be legitimate.

3. The potential of the personnel has to be continuous, which means the new generations of personnel or committees should come from different professional backgrounds.

Self-interest vs. Public-interest

1. The factors that contribute to the balance of self-interest and public interest consist of the knowledge and capability of every working committee, and the factors that create challenge and creativity for the committee; in this way, the committee would tend to put the public interest as a priority.

1.1 The selection of committees: a criterion used is the public mind; everyone is excellent and has potential to work for the organizations or institutions and places the public interest as a priority. The committee believes that if the effects from the disaster could be resolved or reduced, it would benefit the whole community, which would also benefit self-interest.

1.2 Based on the public's participation in disaster management, the policy issuer designs the policy to benefit the public or community and in this way the individuals in the committee would also benefit from the least effect of disaster and this would continue to the next generations.

2. The Obstacles

2.1 The value of supportive in Thai civil system affects the benefits of the public, which is there is no separation between self-interest and the public's interest, and there is a lack of relationships with the community as a whole. The government policy would be difficult to pursue and implement because of the lack of the support from the public sector.

2.2 The lack of a public mind and public spirit on the part of the leaders of organizations or institutions results in the lack of a service mind, which sees self-interest as being more important than the public interest and this affects the effectiveness and connection within and without organizations.

4.7 Conclusion

The climate change today has resulted in the many natural phenomena. The network project of the Asian Cities Climate Change Resilience Network, ACCCRN, is to support and activate the potential cities in Asia which are ready and prepared for the effects of disaster, and to work as a network and cooperate among many associates locally in developing strategies and policies in coping and managing the effects from disasters and helping the affected communities. Hat Yai ACCCRN was selected to be the pilot city for disaster management in the form of participatory public policy, and aims to be model policy for other affected areas.

Three suggestions are offered:

1. Community level: the communities in the risky or sensitive areas should have plans for coping and managing disasters within and among the communities, and to run the plans as a network for managing disasters.

2. Specific area level: the local government should have plans and budget allocation plans which cover active and passive tactics, such as in the Klong Utapao area, for example. A mayor network should be set up in order to cope with the climate change by integrating the personnel in that specific area, such as in Klong Utapao for example.

3. Policy level or country level: the management style for disaster management should be based on political relationships, and the community and government sector should work in the same direction, with the support of both policy and budget from the central government.

The projection of public policy should consider the mechanism within the local area such as the community, networks, and knowledge centers. It should work in cooperation and in concrete ways. The key success factors suggested from the focus groups in terms of public participatory policy are as follows:

1. Open opportunities for the private sector to participate in every level of management, especially for the new generations, who can be invited to the groups or networks according to their interests and innovative and creative suggestions can be welcomed from them.

2. Creating a private sector network which can organize the CSR projects; the CSR-after-process and CSR-in-process and CSR-as-process by searching for new private sectors

which have a public mind, leadership, budget, knowledge, and time to be able to take part in the policy more, formally and informally. Having a distinctive leader is very important, and the Chamber of Commerce should play a major role in implementing the policy.

3. Creating a knowledge package for the convenience of the community in applying and using in coping with the disasters.

4. Creating the loving in one's hometown, developing an education system which initiates the courses that create relationship and feeling connected with one's hometown such as adding this topic in Hat Yai study course in the schools or universities, for the next generations to have the loving and relationship of Hat Yai and its cultures, history, background, structure, city map and strategies seriously.

5. Encouraging the new generations to participate in and be responsible for the network of ACCCRN and to be the successions of this project.

6. Allowing or inviting the key stakeholders to participate in the project, and not only the private sectors alone; they can be groups of universities, hospitals, merchants, where every sector is equal in participation.

7. Using this model from the study of the ACCCRN project with the private sector in order to let them have visions, guidelines, knowledge, and understanding and feeling of taking part in the disaster management project.

Chapter V

Conclusion and future direction.

5.1 Conclusion

5.1.1 Disaster management process of Hatyai city revealed that eight dimensions in developing a public policy model from the study. They included social involvement, organization establishment, management procedures, the participatory dimension, political relationship management, the unity of public policy, the result-oriented dimension, and networking and coordination (Chapter I).

5.1.2 Public participatory disaster management model, finding of this study could be used to design and develop community based disaster management in order to reduce the losse after the disaster according to the local context and the community's way of life.This based on a case study of The ASIAN cities climate change resilience network in Hatyai city, Songkhla province, Thailand (Chapter II).

5.1.3 An integrated sustainable development model for effective disaster management policy for a success manner. Integrated approach should take into account as a model for effective disaster management. The area based should design as a basin context as a model of Khlong U-Taphao Basin (Chapter III).

5.1.4 Key success factors of disaster management policy, hence three key success factors of disaster management policy revealed the following: 1) there is a balance between self-interest and the public interest; 2) requiring private participation; 3) there were obstacles in bringing this policy into the implementation process and in being effectively implemented. The benefits from this research are enormous in terms of successfully implementing disaster management policy and this policy can be applied to other contexts in Thailand as well (Chapter IV)

5.2 Further direction

Despite this study integrated and linked knowledge from relevant parties together. The impacts and adaptation measures for all sectors were taken into account in order to drive the developed model into the public policy for sustainable disaster management It is still not clear that what the sustainable manner is. Therefore, further study to investigate the mechanism of sustainable should be performed. Furthermore, it was considered that the effective model consisted of three key success factors, including; 1) balance between personal gain and public interest, 2) private participation, and 3) going beyond boundary. This is considered an important principle, concept, and knowledge, which should be further studied and applied for different context in the future.

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APPENDICS

Paper I

Somporn S, Parichart V .Public Participatory Disaster Management Model: A Case Study Of The ASIAN Cities Climate Change Resilience Network In Hat Yai, Songkhla Province, Thailand. The Association of Researchers.


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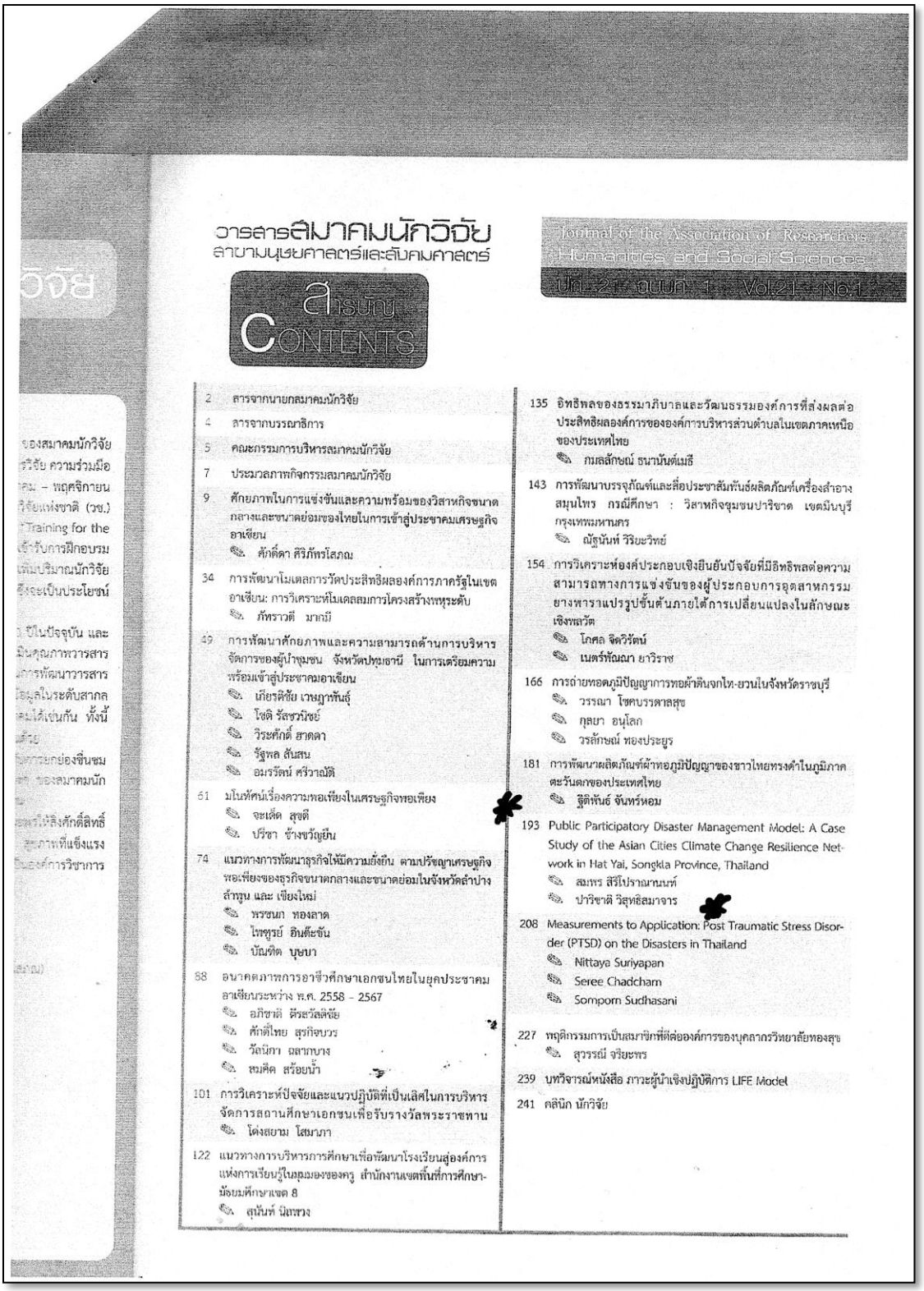

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Public Participatory Disaster Management Model: A Case Study of the Asian Cities Climate Change Resilience Network in Hat Yai, Songkla Province, Thailand

รูปแบบนโยบายสาธารณะกับการจัดการภัยพิบัติ กรณีศึกษา: โครงการ เครือข่ายเมืองในเอเชียเพื่อรับมือกับการเปลี่ยนแปลงสภาพภูมิอากาศ อ.หาดใหญ่ จ.สงขลา

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บทคัดย่อ

งานวิจัยในครั้งนี้เป็นการศึกษาเชิงนโยบายสาธารณะที่เกี่ยวข้องกับการมีส่วนร่วมของชุมชนโดยมุ่งเน้นการนำเสนอตัวแบบสำหรับการจัดการภัยพิบัติอย่างยั่งยืนสำหรับอำเภอหาดใหญ่ จังหวัดสงขลาของประเทศไทย กระบวนการวิจัยได้แบ่งออกเป็น 3 ขั้นตอน โดยขั้นตอนแรกเป็นการเก็บรวบรวมข้อมูลจากข้อมูลที่เป็นเอกสารวิชาการต่างๆ ที่เกี่ยวข้อง การสัมภาษณ์เชิงลึกกับผู้ให้ข้อมูลหลัก (Key informants) และการจัดทำการสนทนากลุ่มกับผู้ที่มีส่วนได้เสีย (Stakeholders) ขั้นตอนที่สองเป็นกระบวนการพัฒนาตัวแบบนโยบายสาธารณะในการจัดการกับปัญหาภัยพิบัติ และขั้นตอนที่สามเป็นการรวบรวมข้อมูลความคิดเห็นที่มีต่อตัวแบบจากการนำเสนอในงานสัมมนาวิชาการที่เกี่ยวข้อง ผลการศึกษาแสดงให้เห็นว่า ปัจจัยที่เป็นตัวกำหนดความสำเร็จของตัวแบบนโยบายสาธารณะประกอบด้วยมิติที่สำคัญ 8 ประการ ประกอบด้วย มิติด้านสังคม การจัดองค์กร กระบวนการจัดการ มิติการมีส่วนร่วม การจัดการความสัมพันธ์ทางการเมือง ด้านความเป็นอันหนึ่งอันเดียวกับนโยบาย ด้านการมุ่งผลสัมฤทธิ์ และด้านการประสานงานและความร่วมมือ นอกจากนี้ ปัจจัยที่จะทำให้การนำนโยบายไปสู่การปฏิบัติให้ประสบผลสำเร็จประกอบด้วย ความเหมาะสมของพื้นที่ การสื่อสารอย่างมีประสิทธิภาพสู่กลุ่มเป้าหมายและสาธารณะ ความร่วมมือกับหน่วยงานต่างๆ ที่เกี่ยวข้อง และการพัฒนาสารสนเทศและฐานข้อมูลองค์ความรู้ที่เหมาะสมต่อการตัดสินใจเชิงนโยบาย

คำสำคัญ: การจัดการภัยพิบัติ นโยบายสาธารณะ อำเภอหาดใหญ่ การมีส่วนร่วมร่วมของชุมชน

ABSTRACT

This research is a public participatory policy study which aims at proposing a model for sustainable disaster management in Hat Yai district, Songkhla province, in Thailand. The research methods were divided into three steps: the first step was the data collection from relevant documents, in-depth interviews, and focus groups with stakeholders and key informants; the second step was the process of

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Paper II

Somporn S, Parichart V. An Integrated Sustainable Development Model for Effective Disaster Management Policy of Khlong-U-Taphao Basin in Thailand. GMSARN International Journal.

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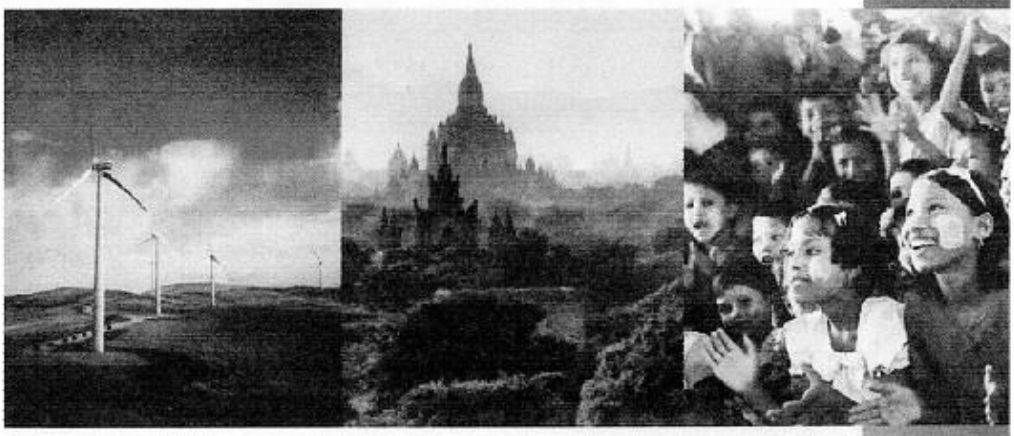

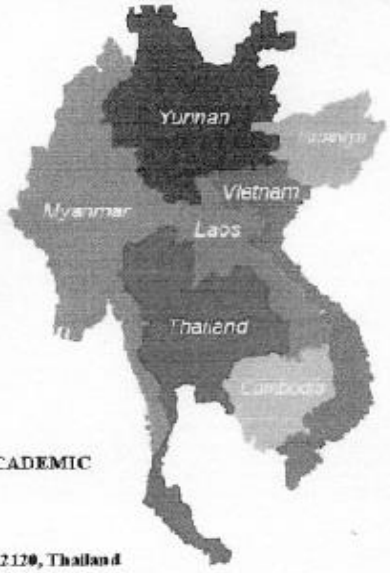

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CONTENTS

S. Siriporananon and P. Visuthismajarn / GMSARN International Journal 10 (2016) 77 - 86

An Integrated Sustainable Development ModelforEffective Disaster Management Policy of Khlong-U-Taphao Basin in Thailand

Somporn Siriporananon and Parichart Visuthismajarn

Abstract*— *This research aimed to examine the success factors for the implementation of public disaster management policy in Khlong U-TaphaoBasin and to develop the sustainable development model. The qualitative methods employed were in-depth interview, focus group discussion with those involved in policy implementation, and literature review. The results suggested that the sustainable development model for effective disaster management in Khlong U-TaphaoBasin, Songkla Province, consisted of 2 main components, which included 1) 4 success factors for policy implementation and 2) 8 factors for proactive and integrated disaster management with community-based approach. In addition, it was found that the sustainable success of policy implementation also related to the following 3 factors: 1) a balance between personal gain and public interest, 2) participation of private sector, and 3) overcoming obstacles to effective policy implementation. The sustainable development model for effective disaster management in Khlong U-TaphaoBasinresulted from this study could be applied to other areas with appropriate context in the future.

***Keywords*— Public Policy Management, Disaster Management, Success Factors, Sustainable Development.**

1. INTRODUCTION

Khlong U-TaphaoBasin is the 7th sub-basin of the 21st basin (Songkla Lake Basin), which is the biggest one among 5 basins in Songkla Province. It is located between7 degrees 14 minutes North Latitude and 100 degrees 28 minutes East Longitude. It has an approximate area of 2,840 square kilometers, covering parts of 7 districts, 35 sub-districts, and 252 villages, which include Sadao District, Na Mom District, Hatyai District, Khlong Hoy Khong District, Bang Klam District, Rattabhumi District, and KuanNiang District. There are 7 municipalities in this area, which are Hatyai, Ban Phru, Sadao, Padang Besar, Pang La, Patong, and Prik. Khlong U-Taphao is the main source of water and also the largest canal in Songkla Province (Rak U-Taphao, 2015).

Khlong U-TaphaoBasinarea is about 130 kilometers long. Its total water catchment area is 2,200 square kilometers. The water catchment area above HatyaiCity, which is the key economic zone, is 2,000 square kilometers. Khlong U-Taphao has an ability to drain 35 million cubic meters of water per day but the water drainage capacity can be 50 million cubic meters per day, in case of inundation. The average temperature is 26.6 to 29.6 degrees Celsius. The highest temperature usually appears in April and the lowest temperature is in February. The average rainfall is recorded at1,916.4 millimeters. The highest rainfall occurs in November.

Khlong U-Taphao is the main canal,which originated from the watershed forest in Sadao District on the border with Malaysia. Sadao reservoir with storage capacity of 56.741 million cubic meters is the significant reservoir in Khlong U-TaphaoBasin area. It functions as kaem ling (water storage canal) in the rainy season anddistributes the water out in the dry season. The watershed forest in this area is the source of many rivers, canals, and streams formingKhlong U-Taphao. It is full of natural resources and woodlands that have nurtured Songkla Province from the past to present day.

The economic structure of the provinces in Khlong U-TaphaoBasin consists of agricultural, industrial, and service sectors. The key agricultural sector is associated with rubber, wet season rice, fish, and giant tiger prawn. Theindustrial sector continues to expand its manufacturing capabilities, for examples, rubber processing products have been sold to tire manufacturers in Japan, the United States, and China, rubber gloves have been exported to the United States market, andprocessed rubber wood has been increasingly exported to China and Hong Kong. Regarding the seafood industry, its growth rate is likely to slow down because the operators are faced with trade barriers and high competition in international markets. As for the tourist industry, it is continuously growing due to the attractiveness of festivals such as New Year festival, Chinese New Year festival, Hari Raya festival, and Songkran festival. The private and governmental organizations also support the tourism industry by holding various promotional activities to attract more Malaysian and Singaporean tourists. Apart from this, the private organizations mainly invest in canned seafood manufacturing, cold storage, rubber gloves factories, and rubber processing plants.

Khlong U-Taphao Basin area has a significant impact on the environmental, economic, and social development of Thailand. However, the climate change has currently caused harmful natural phenomena such as greenhouse effect, global temperature rise, and change of sea level, consequently resulting in weather fluctuation and natural disasters. All of those phenomena caused by climate change are considered as global threats that all relevant agencies including the World Metrological Organization

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Paper III

Somporn S., Parichart V. Key success factors of disaster management policy: A case study of the Asian cities climate change resilience network in Hat Yai City, Thailand. Kasetsart Journal of Social Sciences.

The Kasetsart Journal of Social Sciences
Kasetsart University Research and Development Institute,
Kasetsart University, Bangkok 10900, Thailand.
Tel. 662 5795548, Fax. 662 9405977
E-mail: kjss@ku.th

October 4, 2016

Dear Somporn Siriporananon,

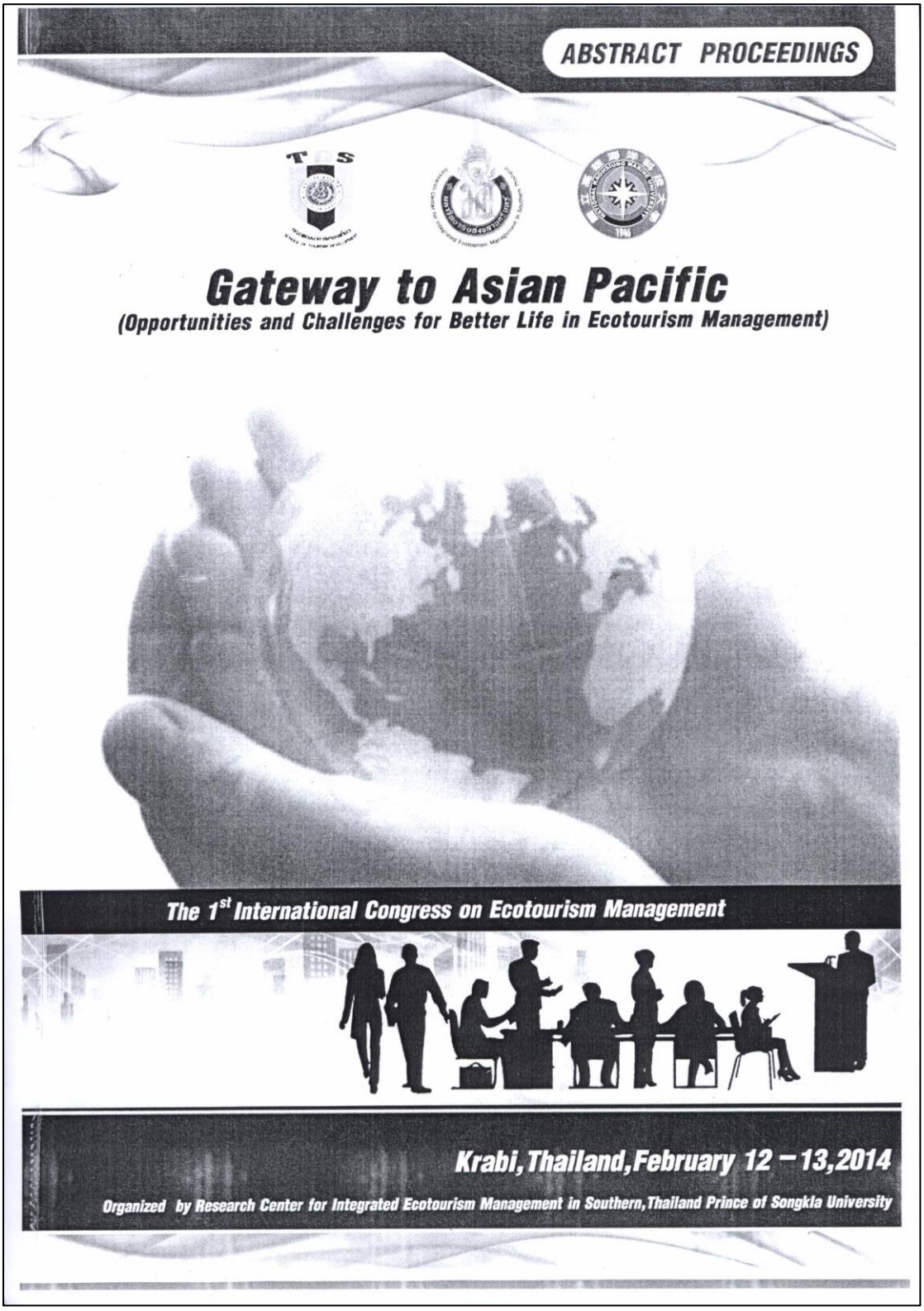
We are pleased to inform you that, based on your submitted paper entitled, Key success factors of disaster management policy: A case study of the Asian cities climate change resilience network in Hat Yai City, Thailand by, Parichart Visuthismajarn and Somporn Siriporananon for publication and is to be published in Kasetsart Journal of Social Sciences, Jan-Apr 2018, Volume 39 Number 1.

Yours Sincerely,

(Asst. Prof. Dr. Shiepsumon Rungsayatorn)
Editor-in-Chief
Kasetsart Journal of Social Sciences

Conference Paper

Somporn S., Parichart V., Disaster management process of Hatyai city: A case study of Hatyai Asian Cities Climate Change Resilence Network, Songkla Provinces. The1st International Congress on Ecotourism Management Krabi, Thailand, February 12th -13th, 2014.


ABSTRACT PROCEEDINGS
Gateway to Asian Pacific
(Opportunities and Challenges for Better Life in Ecotourism Management)
The 1st International Congress on Ecotourism Management
Krabi, Thailand, February 12 – 13, 2014
Organized by Research Center for Integrated Ecotourism Management in Southern, Thailand Prince of Songkla University

Time	**Room 1** **Commentator: Asst.Prof.Dr.Wen-Ling Hong (NKMU, Taiwan)**	**Room 2** **Commentator: Assoc.Prof.Dr.Weerapon Thongma (Maejo, Thailand)**
Session I	***Chairperson: Asst. Prof. Dr.Umaporn Muneenam (PSU, Thailand)***	***Chairperson: Assoc. Prof. Dr. Wang, Jr Ping (NKMU, Taiwan)***
1.00 - 1.20 PM	Role of Monks for Historical Tourism Management of Songkhla Lake Basin. *Somjit Intamano*	Disaster management process of Hatyai city: A case study of Hatyai Asian Cities Climate Change Resilence Network, Songkla Provinces. *Somporn Siriporananon*
1.20 - 1.40 PM	Ecotourism: What is it and how is it important? *Piyanut Pornprasit*	Tourism Management for Green Destination at Manang District, Satun Province *Apinat Promsup*
1.40 - 2.00 PM	Ecotourism activity in Songkhla Lake Basin benefiting for local community: A case study of Laankhoi village, Phatthalung province *Prachyakorn Chaiyakot*	The Management of Beaches Tourism in Municipality of Songkhla. *Apisara Tantasuttikul*
2.00 - 2.20 PM	The ecotourism ontology model of lower southern of Thailand for information searching system. *Tippawan Pinthongpan*	The study of context based in Pattani for the tourism route. *Suwit Suwannno*
2.20 - 2.40 PM	Perceptions, expectations, and factors affecting tourist satisfaction the learning tourism routes at Samui island, SuratThani Province, Thailand. *Parichat Singsaktrakul*	The study of potential for Samui beach environment, the project of education-tourism route at KoSamui, Suratthani province. *Parichart Visuthismajarn*
2.40 - 3.00 PM	Culture and Lifestyle for Ko Samui Community based Ecotourism Management: Taling Ngam Community at Ko Samui District, Surat thani Province. *Thanet Thaweeburus*	Earth System Education and Ecotourism Management. *Warangkana Jutidamrongphan*
3.00 - 3.30 PM	Refreshment break	

O-13

Disaster management process of Hatyai city: A case study of Hatyai Asian cities climate change resilience network, Songkla Provinces

Somporn Siriporananon[1*], *Parichart Visuthismajarn*[1, 2], *Supamas Wijarn*[1]

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Abstract

The research aims 1) to study lesson learnt from disaster management process of Hatyai city under the Hatyai Asian Cities Climate Change Resilience Network (ACCCRN) project, and 2) to develop a guideline for community preparedness and adaptation plan of the city. The participants consisted of four networks include: government, politics, academic and the mass media, using a specific sampling. Establishment of public policy for disaster management are divided into four phrases (1) Implementation of the plan, strategy and vision to build an understanding to civil society when civil society has started understanding. (2) Preparing a news release to the public information system, and (3) Selection of three pilot communities within the vulnerability population to apply the guideline for disaster management plan and the learning center. (4) Application of hand-made map and CCTV cameras for improving the warning system together with the use of media as website www.hatyaicityclimate.org. The results showed that the establishment of such cooperation could be an effective tool. Resilience population could be moved in time to the safe area. This can reduce the damage to life and property. A guideline for community preparedness and adaptation plan of the city should be implemented. Under the ACCCRN project in the future. Public policy for disaster management should be developed through the participatory of stakeholders for sustainable city in the future.

Keywords: disaster management, environment, Hatyai city, public policy

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VITAE

Name Somporn Siriporananon

Student ID 5510930015

Educational Attainment

degree	Name of Institution	Year of Graduation
Master of Public Administration Management for Administrators	National Institute of Development Administration	2004
Bachelor of Arts Promgram in Community Development.	Songkhla Rajabhat University	2001

Position and Work Location: Managing Director

1. Songkhla Express Co., Ltd.: Dealer of prepaid card and all types of communication equipment.
2. Green Solution and Sevice Co., Ltd. : Consultant and distributor of wastewater treatment equipment.
3. Pannasiri Project Home Place Punnawan: Real Estate / Housing Development

Important social position: Present

1. Chairman of the board Chamber of Commerce, Songkhla, Administration Year 2013 - 2014 and Executive Year 2015
2. Chairman of the board Southern Cities Climate Change Foundation Resilience Networks Foundation (SCCCRN)
3. Chairman, Subcommittee on Strategy, Hat Yai City Hat Yai Public Auditorium
4. Chairman of the Board Pracha Rakam Samakkee Songkhla (Social Enterprise) Limited
5. President Songkhla Provincial Administration Organization Year 2560 – 2563

6. President of the Orphanage of the Juvenile and Young People's Court, Songkhla Province, 2017
7. Vice Chairman of the Board of Directors of Hat Yai Public
8. Vice President of Leng Yai Songkhla Association
9. Vice Chairman, Joint Public and Private Committee for Development and Resolving Economic Problems, Songkhla Province, 2016.
10. Treasurer Director Songkhla Community Foundation
11. Director, 15 network partners Management "Songkhla Vision"
12. Director, Foundation for Education, Wittayanusorn School
13. Advisory Director The Rajaprajanugroh Foundation in Songkhla
14. Advisor to the Prince Songkla Hospital Foundation Foundation, 2018
15. Research Advisor, Economic Development Model Songkhla Province for Sustainability
16. Honorary Advisor Master of Economics Program Faculty of Economics Prince Songkla University Hat Yai Campus
17. Board of Directors Prince of Songkla University, 2016
18. Faculty of Economics Master of Economics Applied Economics Prince of Songkla University Academic year 2013
19. Board of Trade Promotion and Development The Council of Thailand Chamber of Commerce Agenda 2015-2016
20. Board of Directors of Thai Chamber of Commerce 2015 – 2016
21. Board of Business Promotion, Songkhla Rajabhat University
22. Board of Boromarajonani College of Nursing Songkhla Academic Year 2013-2016
23. District 12 Energy Regulatory Commission (Songkhla)
24. The Development of the Sufficiency Economy Philosophy Board
25. The expert committee considers the environmental impact assessment report. Industry And supporting utilities In Songkhla Special Economic Zone
26. Subcommittee to set up a framework for the establishment of Songkhla Special Economic Development Zone. (Under the board Songkhla province)

27. Subcommittee on the development of safe and creative media in Songkhla.
28. Subcommittee on Public and Private Sector (Lieutenant), Southern Chamber of Commerce
29. Subcommittee on Promotion and Development of Quality of Life of the Disabled in Songkhla
30. Subcommittee on Education Strategy and Development Plan of Songkhla Province
31. Judge joined the Juvenile and Young People's Court in Songkhla.
32. Private Sector Leader of the Foundation for Economic Development, Foundations, and the State of Songkhla, 2016.
33. Board of Tourism Promotion, Sadao District, 2016
34. Working Group on Problem Solving of Transportation and Traffic in Songkhla Province in 2016
35. Consultant Public Inspector Songkhla economy For the fiscal year 2016, the Board of Directors of the Songkhla Economic Stimulation Promotion Project, 2559, will be pleased to host the fun-filled shopping festival under the name Hat Yai Hard Sale 2016.
36. Hat Yai Tourism Promotion Board, 2016-2017
37. The Commission for the Management of Vocational Education for Employment in 2016
38. The working group facilitates the people to travel in advance. Prostrate burial His Majesty King Bhumibol Adulyadej of Songkhla Province, 2013.

List of Publication and Proceeding

Siriporananon S, Visuthisamajarn P .2014. Disaster management process of Hatyai city: A case study of Hatyai Asian Cities Climate Change Resilence Network, Songkla Provinces. The1st International Congress on Ecotourism Management Krabi, Thailand, February 12th -13th ,2014.

Siriporananon S, Visuthisamajarn P. 2015 .Public Participatory Disaster Management Model: A Case Study Of The ASIAN Cities Climate Change Resilience Network In Hat Yai, Songkhla Province, Thailand. The Association of Researchers. Vol.21 No.1 Jan-Apr 2016. Pp 193-207.

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Siriporananon S, Visuthisamajarn P. 2016. Key success factors of disaster management policy: A case study of the Asian cities climate change resilience network in Hat Yai City, Thailand. Kasetsart Journal of Social Sciences. Vol.39 No.1 Jan-Apr 2018.