



Community resilience for the survival in flooded areas Nakhon Sawan province

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Abstract

This research aims to study the context and background of the communities in flooded areas and the community resilience of the survival in flooded areas in Nakhon Sawan. Data were collected from higher experienced government and NGO staff, community leaders, farmers, community people, and qualitative data analysis was based on content analysis. The research found that Nakhon Sawan's physical geography has been and still is affected by flooding several months annually. Nowadays, the flood situation is severe because of climate change, monsoon and storms, water management in the dams all over the country, socio-cultural changes such as road and building construction, and rice paddy increase, all which affect the economy and quality of life in the community. Community resilience for the survival in flooded areas in Nakhon Sawan consisted of community management which is established through a community disaster, the economic system which increases production, land allocation for community inhabitant and water drainage, risk area management and the Monkey Cheek Project, early warning system and emergency response system through volunteer team forming system, and community rehabilitation through appropriate occupation and habitation. However, to survive and exist in the flooded areas, people have to adapt their lifestyles, thinking system, practical system and networking of learning to empower communities.

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Introduction

The existence of agricultural communities amidst the currents of social, cultural and economic change have been greatly impacted, affecting lifestyle. People have had to adapt in different ways according to the community's context. Moreover, the reliance on money has been a cause of humans losing values. Also, severe natural disasters, such as climate

change, drought, floods, have had an impact on agricultural production, food security, energy, health and quality of life. (Thailand Greenhouse Gas Management Organization (Public Organization) [TGO], 2015)

As Thailand is located in the tropical zone, there is a large climate fluctuation, which causes a lot of natural disasters. Thailand has suffered from many natural disasters in the past 25 years, which have caused the loss of lives and damage to property and assets. Moreover, the impacts of floods in terms of the community, society and country are as follow: 1) In economic context, the decline in agricultural production impacting food supply and agricultural product exporting, and on housing. 2) In social context, it has affected people's life in terms of living and the link in economic and social conditions

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at both household and national level. 3) In health context, the food resource is destroyed both directly and indirectly, the agricultural area is damaged and cultivated fruit crops that were blooming on low land are flooded. 4) In transport context, transportation is cut off during the flooding because roads and bridges were destroyed, which affects goods' delivery and the infrastructure system. 5) Environmental damage such as with riverside communities and the collapse of banks. Also, places such as temples, schools, town hall, houses are left with large quantities of waste which affect physical and mental health. (Rattana, Krachangyudh & Rattanakaisang, 2015; Vetzama, 2011)

According to a study by Piyachan (2011) the concept of community organization and social network is a tool to manage community resources in terms of adaptive management. Moreover, Wisartsakul (2012) presented the humanitarian concept to reduce conflicts which might arise from the situation by creating a new system and structure such as food, travel, housing, and shelter during disaster situations. And, the Department of Disaster Prevention and Mitigation (DDPM, 2008) developed a manual on community-based disaster risk management (CBDRM) that addressed community risk mitigation actions, empowering people in the community to be a strong community through systematically analyzing, planning and adjusting.

Therefore, the community must be resilient so that it can survive in a vulnerable and risk-prone area. In Nakhon Sawan province, the physical geography itself has a vulnerability to the flood situation from the past to the present. Moreover, social and cultural changes affect communities. Those affect the quality of life and agricultural areas. Thus, the community has to learn to adapt to survive for the existence of the community. Therefore, how is the community resilient for survival in flooded areas Nakhon Sawan province? The research objectives are to study the context and community background in Nakhon Sawan province and to study the community resilience for survival in flooded areas in Nakhon Sawan province.

Literature Review

The concept of adaptation for the community's resilient is the principle of community development to accommodate the adaptation that occurs in both sudden and crisis situations using integration in the aspects of living in economic and social context, resources management, social and political context, risk management, early warning system, emergency response and rehabilitation (United States Agency for International Development [USAID], 2007) to reduce the risks by increasing community's potential and society and community empowerment (Wattanasiritham, 2011). Human resource development for self-reliance leads to a strong community by strengthening community learning that is related to life, and the learning process will create ownership to community; people have a lot of public awareness and are able to form groups and networks through social processes in the community's context community (Phayomyam, 2013).

Methodology

The Research Methodology was a Qualitative Research

1. A field preparation process was through documentary analysis to select the study area such as recurrently flooded area documents from Land Development Department, documents on flood risk area from the Royal Irrigation Department, and community self-management to survive in the flooded area from the Department of Community Development, and included conducting field visits to explore real situations and interview the community leaders to gather basic information related to the existing community issues. Then, all information was analyzed to create criteria for selecting a research study area. The researcher selected specific research study areas as a case study, namely, Maklua community, Maklua sub-district, a rural community of mostly agricultural areas and supporting flooding in accordance with government policies, and Wat Khao community, Muang district, an urban community of mostly residential areas on the river. Both communities have remained standing through the power of community, learning to fight and adapt to be able to live properly.

2. Community relationship establishing through cooperation letter and identifying key informants by interviewing community leaders and observing, including participating in community activities to gain trust.

Data Collection

The data collection was divided into 2 parts: 1) community context and community background analysis on the flood situation and important events that affected the community's life 2) The study of persistence for the existence of the community and conditions that affected the change of community through in-depth interviews, focus group discussion, documentary analysis, community exploration, informal interviews and observation of 20 selected key informants, namely, community leaders, community seniors, chairman of Nakhon Sawan rice conservation group, community committees, external academic people, NGOs, the president of the sub-district administrative organization, a speaker from sufficiency economic community learning center and community disaster center, farmers and agricultural officer.

Data Analysis

Data quality validation through data triangulation method by the researcher in terms of observation and interview of key informants in the same issue in different situations, such as time and location differences, to see if the information obtained from those situations is the same. The process was conducted along with data collection, even though during the final data analysis, there was a revisiting of data for validation.

Data analysis is described phenomena from the past into sequences to see the resilience of the community from the change by using the context of the community as a scene of phenomena based on the external conditions. The researcher also applied theories and related researches into the phenomena's interpretation by presenting the content analysis' results through descriptive writing.

Results

The Context and Community Background in Nakhon Sawan Province

The community context of Nakhon Sawan province; Nakhon Sawan is located in the Chao Phraya River basin as the gateway to the north. The main rivers are the Ping, Wang, Yom, and Nan River which converge into the Chao Phraya River. There are many small rivers and canals, with the mentioned geographical area of Nakhon Sawan having a flood situation every year.

“Normally, water flows from Bang Mun Nak to Phikun, Ban Mang and Ban Nong Yai., and the water is increasing every year, and some years, the water comes earlier, before the season, therefore there is a flood...”

In addition, there are many conditions causing flooding; low effectiveness of natural drainage and man-made drainage systems, water management including dam construction, not maximized, including the overall drainage not being effective, the expansion of agricultural areas, residential development and infrastructure, the expansion of the community into the flood area and the use of land for economic and agricultural purposes, and an increase in the number of new residents.

The flooding situation Nakhon Sawan province more than 50 years ago is divided into 3 eras; 1) The era of living together with nature in peace because water is life of the community. 2) The era of seeing problems and solution because the government, businessmen, and villagers have a role to manage the problem. and 3) The era of normal coexistence enjoyed by community power because of learning and adapting for the survival of the community. Nakhon Sawan has experienced 4 massive floods; in 1978, 1995, 2000 and 2011, especially in 2011, when flooding was the heaviest

in decades. The largest flooded area in Nakhon Sawan was 1,881,551 rai, which is shown in figure 1 (Land Development office Nakhon Sawan, 2013).

“... Flooding was really huge in 1995. Over a period of 4–5 years, there is a heavy flood ...”

“...2011 the bad flood year, we made a dam, took care of water pumping but could not manage the water as there was too much water. Many families had to make a new beginning...”

The Community Resilience for Survival in Flooded Area in Nakhon Sawan Province

Community of Ban Maklua, Maklua sub-district, Muang district, in Nakhon Sawan; the geographical feature in the west is the Ping river, on the east side is the Nan river and the Yom river. The community of Ban Maklua, consists of 12 villages with 2,560 households, with a population of 9,000 and the total area is 12,000 rai, all according to the villagers interviewed.

The topographical condition of the area is a plain in the east and the south, with village 1 to village 8 being partially flooded and moo 9 to moo 12 being flooded with high levels for around 3–4 months, starting from the end of July to November. Agricultural production and housing have been damaged. Agricultural production is heavily damaged. Experience and lessons have been learned from the flood problem in Ban Maklua sub-district since 2011.

Community resistance: self-managed communities to be resilient in recurrently flooded areas by coordinating with the Institute of Community Development (Public Organization) through the Federation Council of Ban Maklua organization to establish a sub-district disaster management center.

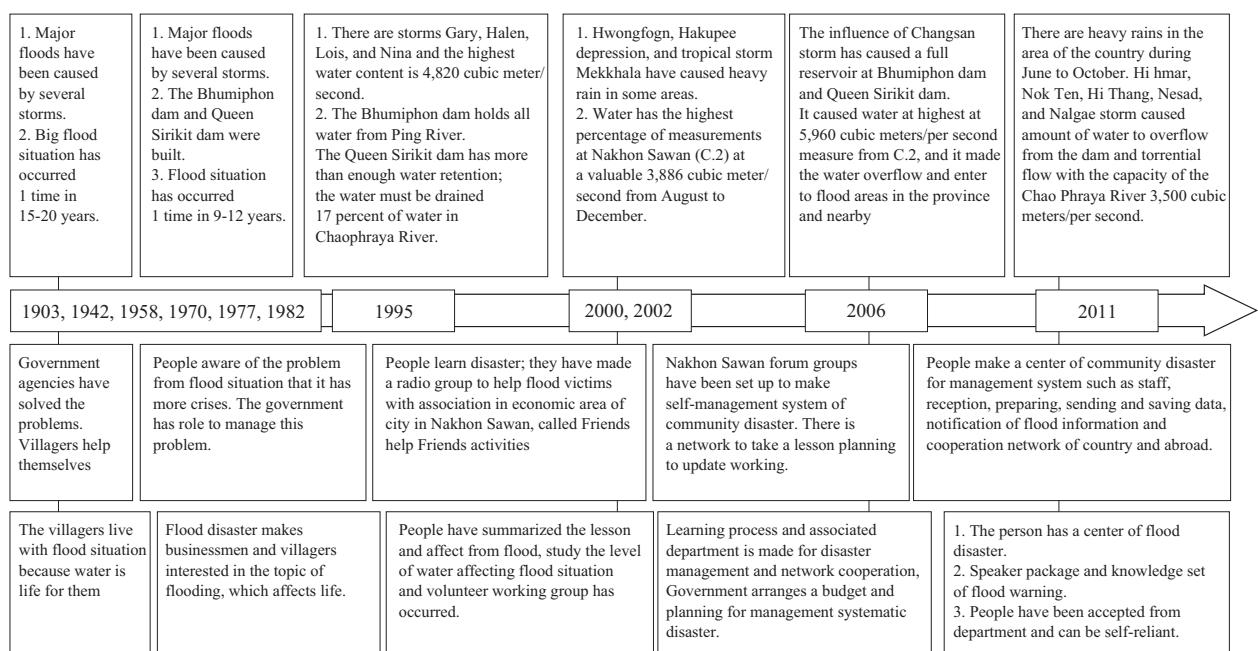


Figure 1 Timeline of flood situation in Nakhon Sawan province

1. The working group was 24 representatives from each village. At the beginning, the budget was 40,000 baht as a revolving fund for community rehabilitation after flood disaster. Community in-depth information collection in a set of 12 villages was used as a tool for planning the sub-district disaster management plan, community water plan, community map, and GIS management system for disaster preparedness in the time of early disaster, during disaster and after disaster.

2. Community survey of the number of boats and volunteers to assist with new boat building and maintenance. Setting up a boat volunteer team with 10 boats to explore the water routes to contact outsiders and deliver relief supplies in the flooded area.

3. Community evacuation system. The community planned with the Water Resources Bureau and members of the house of representatives in the area to establish a community evacuation center by dredging the canal to place the soil onto highland for use as an evacuation area for humans, agricultural vehicles and equipment including being the main contact point to link with outsiders.

4. The early warning system was to monitor information, early alarm or weather forecast from various media. Also, the use of local wisdom through water observation in terms of color and level in the river including community information exchanges through discussion. The early warning system also included community evacuation plans through moving out to decrease injury and loss that will occur. Effective weather forecasting was one way to reduce the impacts.

5. Community rehabilitation system; there was a change in production processes to suit natural conditions, such as reducing the area of garden trees, more planting of short-life crops, support of revolving funds and providing production supplies such as seeds and seed fund setting up. There was also an adjustment of planting area for pilot farming such as corn farming, systematic farming, and organic farming. Consequently, such support helped farmers to generate more income, increase food resources in the community and also linked to the activity of the learning network according to the farmers who were interviewed.

Community of Wat Khao, Muang district, Nakhon Sawan province located in the Wat Woranat Banphot area. The area is lowland area near the Chao Phraya River. This community has 60 years' history, and the population is 120 households. Community volunteer groups for public health, village funds, community funds, welfare fund, disaster funds, were formed. The community was often affected by flood. Community Resilience began with community learning and local wisdom management in 2002, with construction of sandbag water blocking wall. Then in 2010, Nakhon Sawan municipality made flood defenses and set up a temporary water pump to drain water to the Chao Phraya River. In 2011, the community planned for flood management as follows;

1. Disaster management center through learning flood situation and community capacity led to flood prevention planning before, during and after the flood. The volunteer teams consisted of 3 people per village, from 12 villages and in total was 36 people, divided into a construction team to take care of water drain and water pump, information team responsible of information systems/notification, health team to

prepare for the evacuated area and manage people's assets, kitchen team to take care of cooking for the affected community, security team, donation team, public relations team and management and accounting team.

2. Community long-term management; sub-district water management and water route exploring to ensure a suitable route to enter the community. Wat Khao community brought land from community members of around 80 square meters to set up a community water pump and requested support and subsidy to buy a water pump, and built a water pump center including the building of a 2 meter high water blocking wall to prevent floods. At present, the community has full capacity to drain water out of the community to reduce the risk of flood and increase quality of life through the support. The budget was subsidized by the World Bank and covers 385 households.

Community work process was the mechanism for the community to resolve their problems themselves, by using holistic development and problem resolving.

1. Before the flood period, the forming of teams for the potential of individuals and communities to manage and handle different areas (construction team, health team, kitchen team, information and media team, and finance and accounting team). The workflow started with the collection of flooding data from information and the media team through the community warning system by notification and voice announcements. A prevention plan on water blocking wall was set up. Shelter area preparation was coordinated with Wat Khao community and involved erecting a tent for accommodation, including preparing for kitchen and relief and donation supplies. A public toilet was prepared, and a community guard was used to assist the community.

2. The flood period. People in the community made sandbags to build water blocking walls. The material was supported by Nakhon Sawan Municipality and Jira Prawat Camp. The health volunteer team organized health promotion activities to reduce stress of villagers. House visits were provided for information and news. Water level, exploring and checking was done frequently to ensure having sufficient information to alert everyone early for safety and assets preparedness. The construction team inspected the electrical system of the community including the water pump. Community security guard was responsible to take care of all community security.

3. During the flood, community funds were donated as was food. A community kitchen was established to serve all villagers. The 4 working teams functioned in their role and responsibility.

4. Rehabilitation after water decrease. House care (especially one-story house), community environment and community's occupation were taken care of by the community through allocating money from disaster funds to help affected people in the community, such as by buying equipment for repairing houses. The construction team helped with repairing the houses.

Discussion

Living in flooded areas in the past was a good thing because it was an abundant area for food and cultivation, but nowadays with social and cultural change, and with more

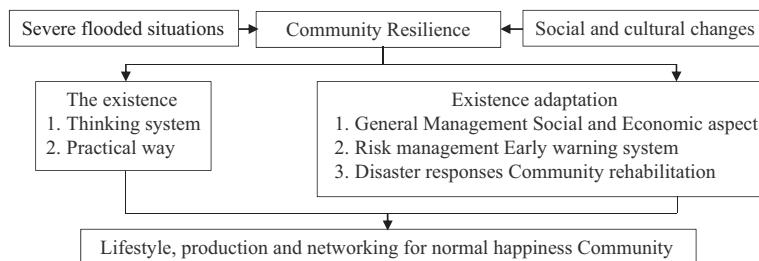


Figure 2 Community resilience for survival in flooded area in Nakhon Sawan province

severe flooding, agricultural practices and communities have to adapt to survive in order to have a better quality of life and resilient community.

The way of life is based on 4 factors, through local knowledge and appropriate community technology in accordance with the adaptation of community's participation. Haitook, Wongcharoen, Charoernrit, and Saengkaew. (2015). said that learning, transferring and exchanging experiences and understanding each other's culture make life easier and in harmony with living area. In addition, the community has also adapted its way of production through diversification in agricultural production, replacing plant types to suit the area, and adjust the timing of agricultural activities, invested in water resource development for agriculture, generated income from non-agricultural activities, and formed a cooperation network in terms of partnerships, knowledge and skills to reduce the risks. Also, lifestyle changes were the learning to change and adjust the style of house or residence to be appropriate with present lifestyle.

The changes in production and occupation. The change of in-season rice, off-season rice to avoid flooding season, and the farming method including an increase in the area of rice paddy, farmers having to form a barrier in the field to prevent flooding. The farmers can show self-reliance by digging for groundwater so that they will have enough water for farming.

The resilience of the two communities was aligned to the United States Agency for International Development (USAID, 2007). Community management was based on the principles of organizational structure. A plan was formulated to respond to the community threat. To strengthen the economic and social security of the community, resource and environment management was carried out in the community through facilitating agricultural production as the basis of community production. There was also an early warning system that allowed people to be ready to deal with an immediate incident. Also, there was a revival of the occupation, housing and mental health so that they can live normally. The resilience of the community was formed from the relations of people in the community through helping one another, which created the thinking system based on hope and trust, power for living. The relationship was built based on brothers-sisters treat approach through knowledge exchanges to create the change and new things for living. It was considered as social processes on the basis of community context for the existence of a normal happiness community

Conclusion and Recommendation

In this research, the researcher made recommendations for the government policy towards development planning which is appropriate for vulnerable areas using community-based analysis as follows; 1) Community mobilization through community-based disaster management in community context. 2) Increasing people's knowledge for harmonized living with nature by integrating and adopting the philosophy of sufficiency economy into their lives so that the community can adapt and survive in the time of natural disasters, and 3) Natural changes have an impact on the life of the community. Therefore, the community has to adapt the way of life to be appropriate for all circumstances.

The recommendations for the community are: resources and community development, which focus on and emphasize internal empowerment in the community playing an important role to drive the community in the future. Therefore, people in the community should be made aware of their potential and capacity through the process of learning, grouping and networking for sustainable self-reliance, reflecting the true values, and reduce risks by arranging water storage for use during the drought season.

Conflict of Interest

There is no conflict of interest.

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