

Adaptive Capacity of Local Governmental Agencies on Water Shortages Affecting the Local Tourism Industry: A Case Study of Koh Chang Island, Thailand

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Abstract: *This research aims to study the capacity of Thai local governmental agencies in addressing water shortage causing vulnerabilities to the local tourism industry on Koh Chang Island. The objectives of the study includes assessing the economic and social vulnerability of local tourism industries having been affected by water shortage caused by climate change and to study the capacity of the local governmental agencies in dealing with the problems. The research design and data collection techniques employed in this research included documentary research, interview, and field surveys. A series of studies were conducted to disclose certain critical issues of vulnerability caused by water shortage in the study area and to study the current ways that the local governmental agencies deal with the problems. The study of Yohe and Tol (2002) regarding determinants of adaptive capacity was applied as data collection framework to create the interview guides and other tools used in this study. Twenty-four respondents in this study comprising local governmental agencies, local community leaders, and local tourism operators. The finding could be concluded that water shortage in Koh Chang Island would come from climate change, but the most important thing is the lack of knowledge on water management under the climate change of the local governmental agencies. Therefore, capacity building of local governmental agencies on climate change and properly water management should be performed in order to reduce water shortage affecting on tourism industries.*

Keywords: *adaptive capacity; local governmental agencies; water shortage; local tourism industry;*

1. Introduction

Water is one of natural resources needed by human life for their well being and related goods and services. Therefore changing in climate which is likely affecting water resources would be a critical issue for many countries, especially in developing countries that rely on agricultural and industrial based economy. Apparently years, climate change has affected a wide range of countries appearing in various forms such as changing in rainfall patterns, increasing of temperature and including extreme climatic events. The impacts of these occurrences are likely to both directly and indirectly affect on water resources. Hence, the challenges of reducing vulnerability on water resources caused by climate change are issues that have been very attentive.

Developing countries, located in areas at risk of being influenced by climate change, such as small island states, are among the most vulnerable to climate change impacts. According to United Nations Framework Convention on Climate Change, these countries will become critical if no appropriate action is taken. Whilst many islands are threatened by rising sea levels, which increases severe and extreme weather events, they suffer in terms of loss of life and damage to property and infrastructure that can subsequently hinder their economies (UNFCCC, 2005).

The challenge for not only small island states but also other developing countries is to build up and enhance their capacity to adapt to climate change. Consequently, building adaptive capacity to respond and reduce the impact of climate change is taken into account as a necessary strategy for ensuring economies and quality of life of their people.

In Thailand, it has been well accepted that the tourism industry has become an important service sector generating significant income to the country. Thai's government has promoted various tourist destinations attracting tourists from all over the world. However, the country's tourism industry would negatively impact by climate change, especially on the islands which are particularly vulnerable to climate change.

Koh Chang Island is one of the most beautiful natural tourism destinations in the Gulf of Thailand. It is located in the Eastern region of Thailand and has a total land area of 650 square kilometers. In 2002, a number of related policies have been set in place to promote Koh Chang Island to become one of the attractive tourist places in Eastern Thailand (NESDB, 2003). While the island's tourism-economic growth is increasing rapidly, it has been found that the island has a number of limitations in developing a large water supply adequate to the needs of tourists whose numbers are continuously increasing. Moreover, the island has also been vulnerable to the effects of climate change regarding water shortages. To secure economic and social well being, the capacity building for adapting to and combating climate change is urgently necessary for local governmental agencies to take consideration. This study thus is aimed to assess the capacity of the local governmental agencies in dealing with climate change affecting tourism industry in Koh Chang Island.

2. Related issue to the research work

2.1 *Impact of Climate Change and the vulnerability of tourism sectors*

Vulnerability to climate change is closely related to poverty, as the poor are least able to respond to impacts of the changes. Certainly, developing countries, which are relatively low financial capability and rely heavily on technology from developed countries, they are likely to be threatened hardest by climate change, and their capacity to respond to such change is lowest (Santiago Olmos, 2001). Whilst economic development of the countries rely on income generated from various sectors, in particular the tourism industry. Therefore, the impact of climate change would affect the economic development of the country. The 4th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) in 2007 made clear that climate change is now a serious risk which could lead to an obstacle to the accomplishment of the Millennium Development Goals, particular poverty eradication. As tourism is a major income of many countries and depends on the environment and natural resources therefore changing in climate could have directly effect by decreasing a number of tourists. United Nations Conference on Environment and Development (UNCED) (1992) recorded that tourism in many countries are seen as the important sector that is vulnerable to climate change. The impacts of climate change on tourism and reinforce national capacities to deal with this consequent impact are needed (UNDP, 2001). In addition, IPCC also indicated that there is a need for societies and economic sectors such as tourism industry to adapt to climate change in order to reduce associated risks and take advantage of new opportunities in an economically, socially and environmentally sustainable manner (UN-WTO, 2008).

2.2 *Capacity building, a central concept enhancing implementation of national plans*

In 1991, the United Nations Development Programme (UNDP) and the International Institute for Hydraulic and Environmental Engineering defined capacity building as the creation of an enabling environment with appropriate policy and legal framework, institutional development, community participation, human resource development, and straining of managerial systems. Capacity building is a long-term and continuing process which all stakeholders such as local authorities must participate in. In 1992, capacity building has become a central concept as adopted at the United Nations Conference on Environment and Development which held in Rio de Janeiro, Brazil. It is necessary for countries to develop their capacity to enhance their abilities to implement the national policy. A primary goal of capacity building is to increase the ability of people to assess and address the critical questions related to policy choices and processes of implementation among development alternatives, based on an understanding of environment potentials and limits and the consideration of needs perceived by the people of the country concerned (UNCED, 1992). Additionally, Agenda 21 engages countries to identify priorities and determine the meaning of capacity building for national plans or national policy implementation. Based on the need of sustainable development in Agenda 21, skills, knowledge, and technical knowhow at the individual and institutional levels are required to establish strategic planning and priorities on the environment and development of countries (UN, 1997).

James (1998) stated that capacity building means maintain the integrity of the environmental circumstances and ability of the community and institutions. While Reis, et. al (1998) viewed that it is associated with the skills, knowledge and attitudes of personnel necessary to perform their tasks. Furthermore, Sobeck and Agius (2007) elaborated this point stating that capacity building is a process or activity to raise the ability of individuals and strengthen performance, within an environment, in order to achieve the intended objective and policy implementation. However, all of foregoing definitions have been extensively summarized by Stephen and Triraganon (2009) in the International Union for Conservation of Nature's capacity strengthening program. They noted that capacity is the overall ability of the individual or

group to achieve their responsibilities. They also viewed that capacity depends not only on the capabilities of the people, but also on the overall size of the task, the resources and the framework.

2.3 Climate Change Adaptation, a strategy reducing vulnerability in developing countries

As the IPCC's Report Summary for Policymakers (2007) concluded that developing countries are much more vulnerable to climate change as they generally possess less wealth, access to technology, equitable distribution of power, and well-functioning social systems. Accordingly, adaptation is considered as a necessary strategy for these countries because it has the potential to considerably reduce adverse impacts of climate change and enhance beneficial effects (IPCC, 2007). The meaning of adaptation defined by the UNFCCC in 2001, it is a process through which societies make themselves enhanced capable to cope with an uncertain future. Adapting to climate change involves taking the right measures to reduce the negative effects of climate change by making the appropriate adjustments and changes. Adaptation is needed in developing countries because global warming and intensity of extreme events, such as tropical cyclones, floods, droughts and heavy rainfall pattern changes are expected to rise rapidly. Therefore it is urgent for developing countries to reduce their vulnerability to the destructive impacts and increase their capacity to adapt together with implement national adaptation plans. Vulnerability of developing countries in the future depends not only on climate change but also on the type of development. Thus adaptation should be carried out in the framework of national and global sustainable development efforts. Moreover, many developing countries' governments have given adaptation action a high, even urgent, priority. (UNFCCC, 2007)

2.4 Local government engagement in climate change adaptation

There have been some links between climate change and the ability of local governments needing to achieve adaptation. Honadle and Howitt (1986) proposed a specific framework and structures of local organizations addressing problems occurring and stating certain accountabilities to conduct capacity building at the local level. Generally, local governments are frequently managing capacity building according to their size. Size is rarely defined rigorously, though those with smaller population are more suitable to develop. In addition, an advantage of smaller size makes for more accurate and efficient study and development. A small size of local government constitutes a threshold of capacity. It can be concluded that a framework of the capacity of local government consists of, the ability to predict change, build informal policies, develop programs, manage resources, evaluate current activities to guide future actions, mitigate the risks, and provide incentives for all stakeholders. In Thailand, the rural local self-governing body known as the Tambon Administrative Organization (TAO) made clear that the local government and their ability to manage resources are closely related to strengthening sustainable natural resource management and tourism development in their communities, consequently their priority for adaptation is to enhance understanding of them, as well as developing the capacity to adapt to climate change influencing the development of sustainable tourism. Therefore, building the capacity of local governments to adapt to climate change is essential to be implemented in tourism areas.

2.5 Koh Chang Local Governmental Agencies' organizational structure and their responsibilities

"Koh Chang" is a district of Trat province, Thailand (Royal Gazette 124, 2007). There consists of two sub-districts namely Koh Chang and Koh Chang Tai. The district is managed by two local governmental organizations that are the Municipality of Koh Chang and the Sub-district Administrative Organization of Koh Chang Tai.

The Municipality of Koh Chang and the Sub-district Administrative Organization of Koh Chang Tai are a form of Thailand's local administration. They have responsibilities and authorities under the Municipality Act, and Tambol Council-Tambol Administrative Act. Although the municipality and the Sub-district are under a different Act, however, responsibilities among them can be summarized as follows (Municipality Act., 2003 and Tambol Council and Tambol Administration Organization Act., 1999)

- (1) to maintain the public order;
- (2) to provide and maintain land and water;
- (3) to provide and clean waterway, public streets or sidewalks and other public areas including removal of solid waste and garbage;
- (4) to preserve and maintain natural resources and environment;
- (5) to prevent and suppress disease;
- (6) to provide extinguisher;

- (7) to provide education and training for people;
- (8) to encourage industrial family; to make available infrastructure;
- (9) to promote development of women, children, youth, elderly, and disabled;
- (10) to administer local arts, local tradition, local knowledge, and local culture;
- (11) to perform other duties as provided by law shall be the duty of the municipality or the Sub-district Administrative Organization

3. Research methodology

3.1 The study areas and respondents

The study areas were 4 villages within 2 Sub-districts of Koh Chang namely Klong Nonsri, Klong Praw, Bang Bao, and Salak Petch. Respondents of this study were selected by the specific sampling method. They were persons having responsibilities or playing roles dealing with tourism development and working at the Municipality of Koh Chang and the Sub-district Administrative Organization of Koh Chang Tai (SAO Koh Chang Tai), including 4 village-heads. The study selected 24 respondents to represent local governmental agencies' capacities to adapt to climate change that caused a shortage of water in the island. This involved Chief Executives and members of these two local organizations, village leaders from four selected villages (Ban Klong Nonsri, Ban Klong Praw, Ban Bang Bao, and Ban Salakpetch), Koh Chang District Chief Officer and Assistant District Chief Officer, including representatives of tourism operators. These respondents were chosen by specific sampling method and were people who had experience and were involved with water management and its problems.

3.2 Tools

The tools used in this research were the interview guide. A series of dialogues were held with the respondents in two subdistricts (Koh Chang Subdistrict, and Koh Chang Tai Subdistrict). They were conducted to discuss about their capacity to alleviate the problems caused by climate change, and possible future action to be taken regarding five main categories adopted from Yohe and Tol (2002) comprising the range of available technological options for adaptation; the available resources and distribution; the structure of critical institutions and the criteria for decision making; the stock of human capital and the system access to risk-spreading processes.

3.3 Data collection and Analysis

The data collection techniques included documentary research, interview, and field surveys. A series of studies were conducted to disclose certain critical issues of vulnerability caused by water shortages in the study area, to investigate the current ways the Local Governmental agencies deal with the problems, and to enhance the capacity of them by suggesting policies and strategies to alleviate the problems. Yohe and Tol (2002) collected data on determinants adaptive capacity as adaptation framework to create the interview guides and other instruments used in this study.

The process of data analysis was designed and based on the concept of Creswell (1998) proposal. It is the processes of using analysis, synthesis and indirect interpretation of all data collected. In the process, the data that was rich in content and involved multiple sources of information including field survey, respondents's interviews, documentary analysis, was translated into a textual database. The particular situation of the impact of climate change on water and its shortage together with the capacity of the local governmental agencies in responding to those impacts were identified, categorized, described, and considered in-depth. Meanwhile, it would be logical to analyze, synthesize, and criticize based on present capacity of local governmental agencies.

4. Findings and discussion

4.1 Economic and social vulnerability of local tourism industries affected by water shortage

From the interviewing in the field, it can be stated that tourism industries in Koh Chang have been vulnerable to the effects of climate change especially regarding water shortages. The findings found that climate change could impact on the tourism sectors through economic and social aspects. The issue of water resources drying up has caused vulnerability to tourism industry, especially during the high-season. Rising costs of operation due to purchasing water

during dry seasons also cause impact on the growth of the tourism industry. Under the continued growth of tourism demand, water and its scarcity as well as unsustainable supply, could made water-related vulnerability for the tourism industry. Moreover, this also seriously affects the home-stay business of local communities by increasing operational cost. The negative impact was not only the economy but also the well-being of people in the community. The indirect effect of climate change also decreases water quality that is being used by the community and tourism industry. The study found that ground water resource has been facing with saltwater intrusion due to the sea level rising. Additionally, whenever water from waterfalls and canals was not available throughout the year, the conflict between tourism operators and villagers could occurred. This makes difficulty among local communities, tourism operators, and other stakeholders. Ultimately, the challenge of climate change will hinder the development of sustainable tourism on this island.

4.2 Capacity of local governmental agencies in adapting to water shortage

Capacity of local governmental agencies is discussed regarding factors affecting their local adaptive capacity mentioned in Section 3.2. Without taking into account the budgetary and financial capabilities, local governmental agencies have accessed to general technological options for climate change adaptation. However, they may not recognize which technology is the most appropriate for relevant climate infrastructure impacts that they have little available expertise on the issue. Local governmental agencies focused mostly on short-term adaptation plans. These can be seen from their strategic implementations that intended to increase their ability to supply water, normally extracting from natural ground water resources, to meet the needs of higher water demand. Currently, LGAs have no conservational technology for proper water management in the island.

Considering the ability of water distribution to the communities, local governmental agencies have the potential to alleviate water shortage for local people, but not for the tourism industry. Such action has been done under three criteria which are (1) types of water users, (2) the purpose of water use, and (3) the availability of water resources. The types of water users and the purpose of water are based on such criterias. The LGAs have different decision to help villagers and tourism operators. For example, the villagers have been prioritized to provide water while tourism operators have considered to use water for their businesses and they should be able to solve such problems by themselves. This decision making of local governmental agencies has unavioded affected tourism operators in the island, especially small size businesses such as home-stays and small resorts. As a result, the problem of increasing operational costs would be increased due to cost of water demand. This seems to be treated on sustianble growth of tourism industry in this island. Regarding the investment on human capital of the organizations, the study found that the LGAs have small number of human resource development. Most of the budget was not used to enhance their human resources competencies. While the vast majority was spent on infrastructure. It was only about 5-6% of the total annual budget in 2011 has been spent in human resource development. The capacity of local governmental agencies on human resource management was inefficient due to high turnover and conflicts within the organization. As a result of high turn over rate, the problem took place in these organizations were discontinuity of work because of no job description provided. Tasks that require expertise and experience directly related to the area of work cannot be done professionally in a time period. These lead to water shortage that quite realted to the issue of climate change.

5. Conclusion

It could be councluded that water shortage in Koh Chang Island would come from climate change, but the most important thing is the lack of knowledge on water management under the climage change of the local governmental agencies. Therefore, capacity building of local governmental agencies on climate change and properly water management are needed in order to reduce water shortage affecting not only on tourism industries, but also the villagers. It could be recommended to further in depth study on this issue and others realated.

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