

## Legal Measures to Develop Khun Ta Le Lagoon to be a Wetland

### มาตรการทางกฎหมายในการพัฒนา พื้นที่บึงขุนทะเลให้เป็นพื้นที่ชุ่มน้ำ

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#### Abstract

People have relied on wetlands for a number of purposes including a source of livelihood, social, cultural and traditional functions, and means of transportation, recreation as well as a potential source of income among locals. However, recently wetland areas in Thailand have suffered from degradation due to several such factors as deforestation for land use, shallow water source, drainage of waste water into water sources and invasion of alien species of crops and animals, thus resulting in rapidly decreased capacity of water conservation. Effective preventions or relief of degraded wetlands so far have failed primarily because the boundary lines of most wetland areas are not precisely drawn; the governments have failed to enforce or implement the law relating to wetland reservation; and the magnitude of wetlands as well as understanding of wetlands relating to its benefits of abundance, impacts of degradation on ecology, society and economy tend to be underestimated. Thus, the objective of this study is to investigate legal measures as guideline or conceptual framework to restore or conserve Khun Ta Le lagoon in order to reduce degradation and enhance ecological restoration for sustainable use of the source. The author proposed a definition of natural resource and environment conservation areas. The proposed definition designates wetlands or other areas with similar purposes as the conservation areas. In addition, by this extended definition, non-profit groups of individuals or organizations whose activities are oriented to protection, promotion, and conservation of environment are permitted to apply for a license of environment private organization or environment community organizations. Furthermore, essential roles and responsibilities are developed so that these proposed organizations can participate in adopting policies, laws, regulations, plans and evaluate as well as monitor activities implemented by the government agencies. The ultimate objectives of this proposal is to promote and preserve natural resources and environment particularly in wetlands and other conserved areas under the environment laws.

**Keywords:** Wetlands; Legal Measures for Wetland Development

## บทคัดย่อ

ประชาชนส่วนใหญ่มีวิถีชีวิตเกี่ยวข้องกับพื้นที่ชุ่มน้ำทั้งทางด้านการดำรงชีวิต ทางสังคม วัฒนธรรม ประเพณี การสัญจรทางน้ำ การพักผ่อนหย่อนใจ รวมทั้งเป็นแหล่งรายได้สำคัญ สำหรับชุมชนท้องถิ่นในชนบท ปัจจุบันพื้นที่ชุ่มน้ำของประเทศไทยมีสภาพเสื่อมโทรมและขีดความสามารถในการรองรับน้ำลดลงอย่างรวดเร็ว เนื่องจากสาเหตุต่าง ๆ เช่น การบุกรุกพื้นที่เพื่อการใช้ประโยชน์ การตื้นเขินของแหล่งน้ำ การปล่อยน้ำเสียลงในแหล่งน้ำ การแพร่ระบาดของพันธุ์พืช และพันธุ์สัตว์ต่างถิ่น การป้องกันและการบรรเทาปัญหาความเสื่อมโทรมของพื้นที่ชุ่มน้ำไม่สามารถดำเนินได้อย่างมีประสิทธิภาพ เนื่องด้วยไม่มีการกำหนดและแสดงแนวเขตพื้นที่ชุ่มน้ำที่ชัดเจน ภาครัฐขาดการติดตามตรวจสอบและบังคับใช้กฎหมายในการควบคุมดูแลรักษา การขาดความตระหนักและความเข้าใจในความสำคัญของพื้นที่ชุ่มน้ำ ผลประโยชน์จากความสมบูรณ์และความเสียหายจากความเสื่อมโทรมของพื้นที่ชุ่มน้ำที่มีต่อสังคมแวดล้อมทั้งด้านนิเวศ สังคม เศรษฐกิจ ดังนั้น ผู้เขียนจึงต้องการศึกษาเรื่องนี้ ด้วยเห็นถึงความจำเป็นที่ต้องมีมาตรการทางกฎหมายในการวางหลักเกณฑ์และกรอบแนวทางในการอนุรักษ์พื้นที่ชุ่มน้ำที่บึงขุนทะเลซึ่งเป็นพื้นที่ที่เป็นแหล่งน้ำขนาดใหญ่ให้เป็นพื้นที่ชุ่มน้ำระดับจังหวัด อันเป็นแนวทางที่จะลดปัญหาความเสื่อมโทรมและฟื้นฟูระบบนิเวศ รวมทั้งการใช้ประโยชน์จากแหล่งน้ำในพื้นที่บึงขุนทะเลได้อย่างยั่งยืน โดยการกำหนดนิยามของพื้นที่อนุรักษ์ทรัพยากรธรรมชาติ และสิ่งแวดล้อมให้ครอบคลุมพื้นที่ชุ่มน้ำหรือพื้นที่อนุรักษ์อย่างอื่นให้ชัดเจนพร้อมกับการกำหนดให้คณะบุคคลที่มีกิจกรรมเกี่ยวข้องโดยตรงกับการคุ้มครองสิ่งแวดล้อม ส่งเสริมและรักษาสีเขียวสิ่งแวดล้อม หรือ สงวน อนุรักษ์ จัดการหรือใช้ประโยชน์จากทรัพยากรธรรมชาติ และได้มีวัตถุประสงค์มุ่งค่าหากำไรจากการร่วมประกอบกิจกรรมดังกล่าว มีสิทธิของจดทะเบียนเป็นองค์กรเอกชนด้านสิ่งแวดล้อมหรือองค์กรชุมชนด้านสิ่งแวดล้อมต่อกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม ทั้งนี้ต้องกำหนดสิทธิและหน้าที่ในการมีส่วนร่วมเสนอแนะนโยบาย กฎหมาย แผน หรือติดตามตรวจสอบการดำเนินงานของหน่วยงานของรัฐเพื่อส่งเสริมและรักษาทรัพยากรธรรมชาติและสิ่งแวดล้อมในเขตพื้นที่อนุรักษ์พื้นที่ชุ่มน้ำหรือเขตพื้นที่อนุรักษ์อื่น ๆ ตามกฎหมายสิ่งแวดล้อม

**คำสำคัญ:** พื้นที่ชุ่มน้ำ มาตรการทางกฎหมายเพื่อพัฒนา

## 1) Rationale and Background

Thailand is abundant with numerous wetlands, on which Thai people have rested from generation to generation. Benefits and interests from the wetland use vary from place to place; particularly, wetlands provide long-lasting, accessible, and public resource for both communities and individuals. However, the alarming numbers of wetlands in Thailand have been invaded, harmed and degraded. This may be due to rapid population growth, accelerated development of economy and society, thus increasing use of wetland areas. In addition, the exploitation of wetlands seems inefficient and inappropriate. To illustrate, wetland is used for containing water of discharged water for agricultural purposes, containing salted water for marine culturing, land filling for industry, urbanization, land development for housing and community, infrastructure development, road construction, tourism industries and other human activities. Despite relative advantages of wetlands, rarely are impacts on environment and over ecological systems concerned. Particularly,

in spite of such crucial roles of wetlands, the society including organizations under the private and government sectors as well as public sectors in all of the regions in both urban and rural areas lack knowledge and accurate understanding of the ecological diversity of wetlands, thereby lacking concerns about its significance. In addition, there remains a discrepancy in the solutions to those issues particularly in relation to law enforcement, which fails to be effectively implemented and permit sustainable development.

The current study aimed to investigate legal measures and introduce them in order to enhance knowledge and understanding of the public, community and stakeholders related to Kun Ta Le wetland of wetland ecology. Eventually, it is expected that a development scheme to designate Khun Ta Le lagoon to be a national Ramsar. In this study, a definition of natural resource and environment conservation areas was broadened in order to assign wetlands or other areas with similar purposes as the conservation areas. By this given

definition, non-profit organizations or individual groups involved with activities directed to protection, promotion, and conservation of environment are validated for license application to be environment private organizations or environment community organizations. The author also adopted essential roles and responsibilities so that these organizations can take their part in drawing policies, laws, regulations, plans and in activities evaluation and monitoring the performance of the government agencies. Another objective of this proposal is the promotion and preservation of natural resources and environment of wetlands and other conserved areas using the environment laws.

Khun Ta Le is a large freshwater lagoon located in Surat Thani province, covering 1,270 rai, less than three Tambon in Surat Tani Mueang district, namely Tambon Ma kharm Tea, Tambol Khun Ta Le and Tambon Wat Pradoo. Its ecology falls into the open system. This swamp reserve water from Cha-kai canal, Ta-kraud Tarea canal, Ta-kruad canal and from Banmai canal on the south; meanwhile, water is drained out of the swamp into Ma kham Tia canal and Ta-kub canal, which flows into Ta Pee river located north to the swamp. The lagoon is affected by tides of sea water, particularly in summer, when sea water occasionally influx, resulting in the exchange of substance. Khun Ta Le swamp has played crucial roles in relation to ecosystem and the mainstay of economy of Surat Thani province. To illustrate, the lagoon has served as the habitat of a wide range of species of water birds such as teals; in addition, it is an abundant source of freshwater fish in addition to its spectacular scenery. With respect to livelihood, the local residents depend on the lagoon and canal branches as cultivation areas, consumption and farming as well as fishery. However, due to its association to other systems in the lagoon, certain adverse effect harms the livelihood of the people concerned. Currently, Khun Ta Le lagoon becomes shallow and deteriorates due to several factors. For instance, the surface of the swamp is covered of aquatic weed such as reed, shrub and algae, which grow rapidly both on the surface and along the swamp edge.

To address this threat, the local authority took prompt actions. On June 18, 2014, Mr. Wongsiri Promchana, vice governor of Surat Thani province, called for a meeting of Kun Ta Le lagoon development committee, to raise opinions, suggestions and solutions to developing the lagoon. In addition, Prince of Songkla University was employed to conduct a feasibility study as well as development scheme, divided into three sub projects: 1) landscape development on the edge of the swamp, 2) road and bridge construction around swamp project, and 3) swamp dredging project. In addition to Prince of Songkla University, under city planning project of Surat Thani province, Provincial Department of Public Works and Town& Country Planning, is assigned to make the procurement. The plan is based on the one designed by Prince of Songkla University, the purpose of which is to develop Kun Ta Le lagoon to become the provincial tourist spot, recreational place and ecological study site. However, given this project, the author deems that for the sustainable development of the swamp, policies, measures and management plans require active participation of government sectors, private sectors, local administrative organizations, and related experts. Meanwhile, constant transfer of related knowledge and enhancement of ecological awareness and environmental consciousness remain essential for all people groups concerned. The benefits deserved to be highlighted include its roles in coping with poverty, drought and flood, which are reported persistent and intractable but overlooked problems. Thus, taking such actions are deemed necessary to prevent detrimental effects and biological wetland and biological diversity or further impacts on environment and weather. In this study, a definition of natural resource and environment conservation areas was by law elaborated for the purpose of stipulating wetlands or other areas with similar purposes as the conservation areas. In respect of this definition, the stakeholders, including non-profit organizations or individual groups running their activities of protection, promotion, and conservation of environment, could call for license application to

be environment private organizations or environment community organizations. In addition, the author investigated the relevant laws, regulations and provisions so that these groups could drawing policies, laws, regulations, and plans as well as evaluating and monitoring the performance of authorized government agencies.

## 2) Objectives of Study

2.1 To investigate awareness of Khun Ta Le lagoon of people, communities and stakeholders living around Khun Ta Le lagoon.

2.2 To investigate solutions to develop Khun Ta Le lagoon to be an important wetland with respect to ecological system utilized by human, vegetation, ecology, economy, society and politics in local, national and international levels.

2.3 To investigate legal measures to promote conservation and protection of wetlands. This legal guideline was expected to encourage and enhance understanding of community roles in collaboration with related authorities to manage natural resources and environment with effectiveness and equality.

## 3) Relevant Knowledge, Concepts, Theories and Review of Literature

### 3.1 Wetland of Important

A wetland is a unique ecosystem that, either permanently or on a seasonal basis, is covered in water. This type of land is of unique features that benefits both humans and wildlife in respect of flooding protection, water supply sources during droughts, and serving as a habitat for a wide range of life beings. Wetlands, like rainforests and coral reefs, are reported the most productive ecosystems in the world, which become substantial food sources for a wide variety of animal species, including fish, amphibians, reptiles, birds, and mammals. Realizing the importance of the country's wetlands, the Government of Thailand signed the Ramsar Convention in 1998, promising to work toward wetland conservation. Today, this country has 14 Ramsar Sites, also known as Wetlands of International Importance, which cover a total of area of 1,543 square miles.

The inventory was conducted to compile, list and classify wetlands nationwide. The project, implemented during the period 1996-1999, found approximately 42,653 wetlands, covering a total area of more than 36,616.16 square kilometers, accounting for 7.5 percent of the country, all of which freshwater wetlands accounted for 44.8 percent and coastal wetlands covered 55.12 percent. Riparian systems, such as rivers, canals and creeks were identified as the most common types of wetlands and accounted for at least 25,008 sites, followed by static reservoirs such as lakes and ponds, with no less than 14,128 sites. Northeastern Thailand was found to accommodate the highest number of wetlands with 14,750, while the southern region was found to have the largest total area of wetlands with 28,465.88 square kilometers (Narong Veeravaitaya, Focal Point for Wetlands Department of Fisheries Biology., Faculty of Fisheries, Kasetsart University). The inventory also listed at least 61 wetlands entitled to be of international importance, 108 sites of national importance and 42,396 locally important wetlands, respectively (OEPP3, 1999).

Most of the wetlands in Thailand are safeguarded and maintained by a protected area system (i.e., national parks, wildlife sanctuaries and wildlife non-hunting areas). Despite being officially identified as public lands, several important wetlands remain a vital part of daily life of Thais, particularly those in rural areas who have relied on wetland services and resources for generations. Not included in the protected area system, these wetlands have been vulnerable to encroachment and other development activities. For example, freshwater ecosystems in the floodplains of northern and central Thailand have been adversely affected by greater demand for agricultural land use. To illustrate, mangrove forests along the coastlines and estuaries of the Gulf of Thailand and on both shorelines of southern Thailand have been severely damaged by aquacultures operations, meanwhile, the swamp forests and marshlands in northeastern and southern Thailand are now facing degradation due to certain development projects. Despite the value and benefits derived from wetlands, the



ecosystem has long been directly and indirectly destroyed at an alarming rate. In addition, despite all the protective measures that have been put in place, the wetlands over the world have been challenged by serious threats (The Asian Wetland). The directory indicates that of 42 listed wetlands in Thailand, 47 percent of which face moderate to high threat, 8 percent under some of the forms of protection, while a mere 2 percent are adequately protected. Considerable evidence suggests a significant reduction in the number and size of natural wetlands; nevertheless, there are few quantitative assessment of wetlands nationwide. It is also the case that the total area of mangrove forests decreased from 3,680 square kilometers in 1961 to 1,680 square kilometers in 1996 (OEPP, 2002b), whereas the number of man-made reservoirs has been increasing. However, surveys and monitoring of qualitative changes in the wetlands also remain inadequate. There is, however, a trend indicating deterioration in water quality and biodiversity among wetlands throughout the country. The underlying causes of the declining areas of wetlands in Thailand may lie in the following factors:

1) The increase in the population: Modern socioeconomic development has significantly increased the exploitation of wetland resources and generated larger demand for conversion of the ecosystem for development activities.

2) The inefficient use of wetlands: Improper use of wetlands, particularly conversion of natural wetlands for farming, marine aquaculture, industry, urban expansion and for infrastructure development, has adversely affected the wetland hydrology owing to disruption of the flow of water in the ecosystems. Both civil engineering projects (e.g., road construction) and commercial development (e.g., tourism) have been reported as the critical causes of ecological destruction of wetlands as well as livelihood of locals whose daily life depends on such systems. Thus, all of relevant agencies are required to realize those effects and take action to preserve such ecosystems.

3) Wetland management problems: Despite the value and benefits derived from wetlands,

the society at large, including public and private organizations and general public in both urban and rural areas, seem to lack accurate knowledge and understanding of wetland ecosystems.

This results in the lack of due appreciation and recognition of the true function, value and benefits of wetlands and thus improperly using the ecosystem. Indeed, coordination between public agencies in managing wetlands remains inadequate; in addition, the relevant laws and regulations seem ineffective in enforcement and in many cases unlikely to facilitate sustainable management of wetlands. This is the case of the Khun Ta Le Lagoon.

The Khun Ta Le Lagoon to the south of the district is the source of two short minor rivers which meander through the city, Khlong Ma kham Tia and Khlong Tha Kup. The district is divided into 11 sub-districts, which are further subdivided into 70 villages. Surat Thani itself is a city and covers the tambon Ta Lat and Bang Kung, and parts of the tambon Khlong Chanak, Bang Chana, Bang Bai Mai, and Ma kham Tia. Wat Pradoo and Khun Tha Le acquire the sub-district municipality status and cover the whole same named sub-district. There are a further eight tambon administrative organizations (TAO) in each sub-district except the three completely covered by municipalities.

The Khun Ta Le Lagoon is an integral part of the Ta Pee River's catchment area; whose geographical location is a small lake. The swamp, located in the lower part of the Ta Pee river, has the average depth of 2.2 meters, covering the area approximately 2.03 km<sup>2</sup>. Interestingly, the local authorities and the provincial government have planned to develop this swamp as a site for tourism in Surat Thani province. Since the environmental scientific information of this swamp has not been updated, this study was carried out in order to assess water quality, identify the pollution sources as well as to determine the biodiversity of this ecosystem. This information brings understanding of the existing ecosystem of the Khun Ta Le Lagoon and its water pollution condition. The study reveals that the

Khun Ta Le swamp has suffered from pollution through a wide variety of sources. To illustrate, more than 30 factories drained polluted water into the swamp; in addition, domestic wastewater and agricultural discharge are also identified as the potential sources of pollution in the swamp, which is abundant with aquatic species. Given the biodiversity information, 47 genera within 3 divisions of phytoplankton and 21 genera of zooplankton were found in this swamp. Moreover, 60, 44 and 41 genera of aquatic animals, plants, and birds were identified in this area, respectively. This suggests that the Khun Ta Le Lagoon embraces both biological and ecological diversity in Surat Thani province, which requires effective protection. Therefore, the author provides suggestions and alternative approaches for sustainable water pollution management of the Khun Ta Le Lagoon.

The Khun Ta Le Lagoon is influenced by sea-water and encroachment on the wetlands, especially during in the dry season. Seashells shells in this swamp are deemed important in respect of both ecological systems and socio-economic conditions of Surat Thani locals. The earlier, it provides the natural habitat of waterfowl species and many other species; the latter, it is the principal source of fresh water fish and also accommodates spectacular scenery; in particular, locals residing around have exploited this source for cultivation, livestock raising and fishery for their livelihood. Considering its location, the link of ecosystems to other systems may contribute to ecological change in the composition of the marsh, thus affecting the lives of people accordingly.

Recently, the Khun Ta Le Lagoon has become shallow and transformed due to the spread of some marsh plants and invasion of human along the edge of the Khun Ta Le Lagoon. To address the issues, Prince of Songkla University was hired to study and propose a scheme to develop the Khun Ta Le Lagoon. Eventually, they proposed a project comprising three sub-projects, namely landscape improvement, road construction, and bridge construction around the lake and swamp dredging. In addition, Surat Thani province has a

plan to develop the sea and assigned the Office of Public Works and Town Planning of Surat Thani Province to carry out the plan. The plan was designed by Prince of Songkla University to develop the Khun Ta Le Lagoon as a tourist attraction, a place to relax and study the ecosystems of the province. In addition, the author suggested that the conservation of the wetland requires to take the sustainability of the area into serious account; thus any management, policies, measures concerning the wetland are essentially in basis of the participation of stakeholders concerned such as public sector, local government, academics, politicians or NGOs. .

As for sustainability, all levels of people should be educated and make them aware of the importance of ecological functions by making use of the means of media available. If triggered, the management of the plan based on ecological systems may also address economic challenges, drought and repetitive floods. Unless the immediate actions are taken, it may result in loss of biodiversity and further climate change.

The researcher is interested in studying the development of natural resources management for sustainability through environmental awareness in the community, a case study of Khun Ta Le swamp. According to the preliminary study, it revealed that there are initiatives of government agencies such as local government organizations, stakeholders, including people in Tambol Ma kham Tai, Tambol Khun Ta Le, Tambol Wat Pradoo, who have participated in sharing knowledge and understanding to protect and conserve the area of wetlands as a major wetland of Surat Thani. Additionally, some funds were also invested to support research on wetlands in order to create adequate and ongoing knowledge about the natural features of wetland ecosystems. In addition to the financial support, the awareness of the substantial roles, functions, value and benefits of wetlands were raised among the people concerned. Particularly, a learning center for wetland was established; meanwhile, the laws were enacted to promote the conservation and protection of wetlands as well as promote the stakeholders to play a greater role. All stakeholders are required

to use the best management strategies and best practices. Furthermore, for sustainability, the project took such challenges as irrigation, agriculture, fishery as well as tourism into account.

### 3.2 Threats to Wetlands in Thailand

Ramsar wetlands, although protected sites, face many environmental threats. One of the biggest threats to these sites is the fishing industry, particularly in those wetlands located in coastal areas. Overfishing endangers the natural fish population, which has a domino effect on bird and mammal species that rely on fish as a dietary staple. Additionally, nearby urban development places wetlands in danger of polluted waters and infrastructure projects, such as hydroelectric dams, threaten natural water flow and obstruct fish migratory routes.

In some areas, invasive species are a concern. This is primarily because nearby fish farming uses sections of natural waterways to cultivate market valuable fish, which presents the very real risk that the cultured species will escape and out compete local fish species for food resources. Another common concern for these sites includes unsustainable use of resources. For example, uncontrolled livestock grazing destroys local plant life and eucalyptus farming changes the wetland structure, requiring significant amounts of water for growth. All of these changes result in reduced biodiversity within wetland habitats.

### 3.3 Conservation of Wetlands in Thailand

In addition to protecting some of its many wetlands as Ramsar Wetland sites, the government of Thailand and nonprofit organizations are working together to ensure conservation of these important ecosystems. In 2008, this country took a significant step toward protecting additional sites across the country as Wetlands of International Importance. The plan is to involve local communities in surveying the wetlands and documenting ongoing health of the sites. In this way, researchers will be able to work closely with the community members who will benefit from future conservation. This opportunity also provides the chance for increased public education and awareness about the ecological importance of wetlands. Involving local communities gives them

a stake in conservation efforts, which research has shown results in increased levels of success.

According to the 8<sup>th</sup> national policies and strategic research, National Research Council of Thailand, it is oriented to be a guideline of conducting research as well as a framework to approve proposals of government agencies calling for budget in each fiscal year. In addition, according to the 3<sup>rd</sup> national strategic planning, country development makes it likely through the sufficiency economy philosophy, in which research on natural resource management, diverse biology, conservation and sustainable use of natural resources is promoted. This research therefore rests on this guideline and framework in respect to designation of Khun Ta Le lagoon to be the country's important wetland in compliance with Ramsar Convention. (The Ramsar Convention is the agreements made between governments for international collaboration intended to conserve and wisely use wetlands. According to the survey of Office of Natural Resources and Environmental Policy and Planning (ONEP), Thailand belongs to wetlands including mangrove forest, peat forest, lagoon, swamp, Salix, lake and river, covering 21.36 million rai of land, accounting for 6.75% of country's area. They are divided according to the Ramsar Treaty as follows: 10 wetlands with national importance and registered in Ramsar Treaty, 61 wetlands with international importance, 48 wetlands with national importance, 19,294 wetlands with local importance, 28 wetlands deserving protection and restoration.

The following is the related literature on development of the country wetlands and would be references for developing legal measures.

1. A project entitled Lifestyle, People and Wetland Project: Dynamics of resource management in "Kud" (literally meaning old river or natural water source subject to change by a mainstream river) in urban community situated between Ubon Ratchathani municipality and Warinchamrab municipality, Ubon Ratchathani province (Phase 1). The objective of this project is to explore "Potential" of the urban community through investigation of community context on local resource management of two local wetlands called Kud and Pa Bung Tam. The studied

area covered ten communities, including Don Ngiw community, Hat Suan Yang community, Tha Bong Mang community, Kud Pla Kaow community, Ku Yang community, Tha Kor Phai community, Dee Ngam community, Ket Keaw community, and Hat Suan Suk community. The research methodology employed was participatory action research, where local scholars and local residents, known as local researchers, collaborated to conduct the study. The finding suggests that this wetland becomes a part of Mun River, one of the main river branches of the mainstream Khong River. Despite the underestimation of importance by outsiders, the local people rely on this area for their livelihood. The complicated relation between people and resources contributes to diversity and local wisdom of managing the natural resource. However, due to the shift into urbanization, this area attracts the interest of business and local government sectors, thus resulting in the transition into economic exploitation or specialized used through a means of city planning policy, which changes public area into government or private property. To cope with this problem Local people may need to adjust their lifestyle. And find solutions to problems. However, according to this study, the city planning arouses potential conflicts among government sectors, business sectors and local residents. The suggestions of this project is to adopt strategic plans to manage the wetland through people participation method of all of the stakeholders in order to handle all likely changes and restoration of the area.

2. Ecological System Management and Development Project: wetland areas of Khong Long lagoon, Nam Mao, Nam Song Kram, Khong river, Bungkarn province and Nakhon Phanom province. The objective of this project is to address the potential threat to those wetlands covering more than 40 villages. Such threat results from considerable factors for example environmentally unfriendly agriculture practices (i.e. the use of chemicals, weed killer, pesticide), inappropriate means of fishing (i.e. fish shock, fish poisoning in natural water sources), and inappropriate design of irrigation system making fish unlikely to migrate, nest, lay eggs, or breed.

3. Integrated Wetland Management Project : Bung Tom. This wetland becomes degraded owing to contributing factors. The extension of agricultural areas results in consequent impacts on Bung Tom wetland. To develop land, pesticide and weed killer are used and drained into the lagoon, thus hurting its ecological system. In addition, it become shallow due to the massive influx of sediment from Khong River. To address this issue, the comprehensive integrated strategic plan is introduced through the decentralization of responsibility to individual communities.

4. Young Tour Guide for Conservation of Natural Resources and Environment Project, Khun Ta Le lagoon, Surat Thani. The objective of this project is to foster key young leaders in conserving natural resources and environment of Khun Ta Le lagoon, thus increasing people participation in protection of this wetland. Given the objects of the project merely to develop, establish or promote ecotourism, community shops, holy place, natural balance, local foods, raft restaurants, long boat racing, and animal being, there has remained lack of provision of knowledge and understanding in conserving the ecosystem of Khun Ta Le lagoon, which is deemed critical in implementing conservation of diverse Bung Khun Ta Le lagoon.

#### 4) Results and Discussion

4.1 To understand how the individuals residing in Khun Ta Le Lagoon area realize the value of the swamp, we analyzed their knowledge and understanding. On the basis of characteristic study, the lagoon is deemed a large freshwater lake, which plays potential roles both in the ecology and the socio-economic conditions of the communities in the area in addition to being a tourist attraction of the people in Surat Thani Province. This swamp accommodates diverse species of water birds and a natural source of freshwater fish. With beautiful scenery, people living in the surrounding area depend mainly on water from the marsh and canals for planting, raising animals, catching fish and other related activities, which could generate both their primary and secondary income. However, these human

activities affect the ecosystem of the wetland and lead to natural resource and environment threat. Recently, the Khun Ta Le marsh becomes relatively shallow and deteriorated in relation to original characteristics owing to aquatic weeds spreading over the surface area of the swamp.

Natural resources and environment play crucial roles in the country's economy, society and livelihood development; however, recently Thailand has been challenged from a variety of problems, one of the most alarming threats is the global warming, resulting in water shortage for consumption, production, and labor migration into big cities. Realizing such problems, the governments have adopted policies on natural resources and environment management for protection and restoration of biological resources and biodiversity. To illustrate, for sustainable development, the authorities should promote community participation in streamlining the natural resource and environment management. There is a case fostering community participation in Khun Ta Le lagoon. Several visits were undertaken to meet each community group such as fishing group and plantation group for informal interactions. Subsequently, workshops, attended by relevant sectors, were held in order to collaborate in adopting practical strategic plans for Khun Ta Le lagoon management to promote it to be the national wetland. This seminar aroused the exchange of solutions to natural resource management, which increases not only community participation but also potential of local people and local officials or authorities through the process of plan or policy making. In addition, being affiliated with the Ramsar treaty could not only establish a mutual agreement in exploiting the resource for the purpose of sustainability, thus reducing the detrimental effects on diversity, but be allocated budget on technical support. Indeed, the use of the wetland area may be an efficient solution to addressing poverty in the communities, conserving local culture and promoting the secondary source of income of the locals as well as providing habitats for aquatic vegetation and animals. These measures make it likely to officially designate this

area as a conservative area and draw action plans for conservation and restoration as the procedure of issuing a protective law seems relatively time-consuming.

Compared to a project entitled Lifestyle, People and Wetland Project: Dynamics of resource management in "Kud", the Khun Ta Le lagoon seems to experience the similar catastrophes. To illustrate, such wetland is located in the urban area and considered by certain groups of people unlikely to bring neither benefits nor advantages; thus, business sectors and local government attempted to use this area for economic purposes or particular use through such state mechanisms as city planning. Nevertheless, indeed the locals remain dependent on resources for their livelihood and they thus struggle to live using their own ways, thus arousing conflicts among local people, business sectors and government sectors.

To prevent such incidences, the findings of this study suggest adopting strategic plans to manage this wetland through participation of all stakeholders to handle likely potential conflicts. The researcher puts forward a suggestion for conducting a research project through data collection by interview key informants using open-ended questions and participatory observation. According to the findings, seminars or trainings on wetland management should be held and resource persons from the office of Natural Resources and Environmental Policy and Planning, the authority in charge of wetland management should be invited to transfer knowledge and understanding to local authorities, community heads, and locals for better understanding on wetland. The researcher expects to establish a collaborative network among related agencies responsible for promotion and conservation of Khun Ta Le lagoon under the Ramsar treaty. Eventually, it is expected the local natural resource is conserved with sustainable use through taking account of ways of life of human beings and living beings, ecosystem, economy, society, and politics in local, national and international levels.

4.2 A solution to developing Khun Ta Le lagoon to become the country's mainstream wetland



significant for ecosystem, human's livelihood, living beings, society, economy and politics for all of the level is based on the following projects.

According to the research's view on the integrated wetland management project: Bung Tom, this wetland turns degraded owing to certain significant factors. The extension of agricultural areas ruins Bung Tom wetland. Pesticide and weed killer are used and drained into the lagoon, thus affecting its ecological system. In addition, the massive influx of sediment from Khong River makes this wetland shallow. Like Bung Tom wetland, Kun Ta Le lagoon becomes shallow due to the decomposition of aquatic weed on the surface and edge of lagoon. On the upstream, the ground-cover is eradicated, so sandy soil influxes into the wetland. In addition, land is invaded for farming or housing such as constructions of shops, food shops, thus resulting in the collection of waste and becoming sediment. According to such review, the researcher's suggestion is that the government sectors are required to issue the primary regulations and guidelines on conservation, restoration and promotion of this area to be under environmental protection. This could make it likely by clearly identifying the wetland zone through legal incentives such as protective license, promotion of participation from all related sectors and levels. In addition, the amount of water use by all of occupational groups should be regulated for effective water allocation as well as relevant to natural balance. To achieve this, it is necessary to take cultural context and lifestyle of locals into account.

According to the study of the last project entitled Young Tour Guide for Conservation of Natural Resources and Environment Project, Khun Ta Le lagoon, Surat Thani, the objective of this project is to create key young leaders in conservation of natural resources and environment of Kun Ta Le lagoon and increase people participation in protection of this wetland. Indeed, it seems that the objective of the project merely to develop, establish or promote ecotourism, community shops, holy place, natural balance, local foods, raft restaurants, long boat racing, and animal being. However, the provision

of knowledge and understanding in conserving the ecosystem of Kun Ta Le lagoon remains questionable despite the fact that the integration of measures is deemed critical in implementing conservation.

4.3 Legal measures to promote conservation and protection will be used as a guideline to encourage the public to have adequate understanding of the role of community in the proper management of natural resources and the environment. However, Thailand has no specific and comprehensive legislation protecting wetlands. Indeed, the mere laws with the provisions applicable to the wetland management is Utilization Wetland Protection, which is the sole obligation of the Ramsar Convention. This article deals merely with the provisions of the Wetlands Protection and Wetlands Act. Therefore, the author suggests the following legal tools to manage the challenges of the wetland as follows.

1. The Town Planning Act, B.E. 2558, on the basis of the study, the law permits the designation of urban areas in various types such as town planning for industry, commerce, housing, and agriculture. The public sectors are required to take into account the conservation of the environment. Consequently, prior to the declaration of the regulations, stakeholders should attend public hearing. The declaration of urban planning area is subject to evaluate every five years in order to assess whether there is any change of environmental quality. In this section of the urban planning guidelines, this law can be used as a tool to protect the wetland areas and may also serve as a legal measure to develop wetland areas for local communities.

2. The Building Control Act, B.E. 2522 is intended to control the construction of buildings in provinces, sub-district administration organizations, Bangkok Metropolitan Administration and Pattaya City. The Minister of Interior is the government agency who empowers local governments to issue regulations or ordinances to regulate the construction of buildings in accordance with the development plan of the local government. This is one of the legal tools to control buildings or constructions in the area of the Khun Ta Le lagoon.

3. Tambon Administrative Organization Act,

B.E. 2537 (1994) is also executed by the Ministry of Interior. The main objective of this act is to decentralize the administration to the subdistrict level (Tambon). The Tambon Administrative Organization (TAO) committee comprises members elected from local people. One of their principal duties is to conserve the natural resources within its territory, formulate annual development plans and issue regulations to implement the planned activities within its territory. The TAO budget is derived from two sources (i) taxes collected from activities within its territory, and (ii) annual budget allocated by the central government. The act stipulates that the fisheries tax and other taxes generated from the utilization of natural resources within its territory be delivered to the TAO. For example, once levying a fishery tax, the Department of Fisheries is obliged by law to pass to the TAO. Likewise, the entrance fees to national parks are mandated to send to the TAO. In respect of wetland management, the TAO could conserve wetlands by establishing local committees to manage wetlands located in its territory. In addition, the TAO can also collect taxes from the utilization of such wetlands. In other words, the TAO also can play an important role in community-based management of wetlands and other natural resources. This law can be used as a tool to manage and conserve water resources in the land, such as the Khun Ta Le Lagoon.

4. Fisheries Act, B.E. 2558 (2015), this law was enacted in 1947 and has been revised twice in 1953 and 1985. This act is executed by the Minister of Agriculture and Cooperatives through the director-general of the Department of Fisheries. This act, which directly governs fishing activities in the coastal areas, classifies fisheries by using an area approach into four categories; (1) Preservation fisheries, (2) Concession fisheries, (3) Reserved fisheries, and (4) Public fisheries. Regarding wetland management, the Fisheries Act essentially protects both coastal and inland wetlands from fishing activities and environmental degradation activities. Not least, this act also prevents the illegal occupation committed in wetland areas, illegal destruction of wetlands, and other unlawful actions by establishing protected areas

in both coastal and inland as preservation fisheries, thereby not permitting any fishing activities. The act also protects endangered species inhabiting wetlands. However, law enforcement has experienced potential challenges in implementation, thus leading to the constant wetlands loss. Given circumstances, these provisions could be management tools to address wetland issues. In addition to those provisions, the Fisheries Act, 1947, provides authority to exert preservation of the environmental quality of various water resources, including wetlands. In addition to the law, the provisions could be additional tools for the protection of endangered species as well as other aquatic live beings, including water birds in the area of the Khun Ta Le Lagoon.

5. National Environmental Quality Promotion and Preservation Act, B.E. 2535 (1992). This act has been revised and replaced the old act of 1975. The Ministry of Science, Technology and Environment (MOSTE) is authorized to enforce this law. Upon the enactment of this law in 1992, MOSTE was also restructured by dividing environmental agencies into three units: (i) Office of Environmental Policy and Planning (OEPP), (ii) Pollution Control Department (PCD), and (iii) Department of Environmental Quality Promotion (DEQP). The Ministerial Regulations of Article 55 of this act sets quality standards for the discharge of industrial waste water, excluding waste water discharged from aquaculture. Interestingly, this act requires environmental impact assessment (EIA) for large-scale projects. What is more, Articles 43, 44 and 45 of this act empower the minister of MOSTE to proclaim ministerial regulations determining “environmentally protected areas” and “pollution control areas” in addition to regulating the activities in such areas. However, it lacks enforcement because MOSTE has experienced inadequate staff in the provinces. Indeed, by law, provincial police and various provincial government offices are permitted for law enforcement. This act could serve as a legal instrument to protect wetlands by designating wetlands as “environmentally protected areas” regardless of private wetlands or public wetlands. The “environmentally protected areas” can be established by ministerial regulations; in addition,

restricted activities within “the environmentally protected area” can also be proclaimed by ministerial regulations as well. In other words, it may be argued that these provisions are more flexible and applicable to wetland management and conservation in comparison to other legal instruments. However, such law enforcement act essentially requires competent officers of other governmental line agencies such as the Police Department, Royal Forest Department, Department of Fisheries, Royal Thai Navy, Harbour Department and other relevant agencies.

Currently although Thailand remains lack of specific laws applicable to directly protect water resources, there are provisions of protection under the laws, regulations and resolutions of the Cabinet. Not least, several agencies are obliged by law to implement the conservation and management of water resources, and local government agencies in particular. However, the establishing effective laws and the wise and efficient use and conservation of water resources could assure sustainability.

## 5) Conclusion

Khun Ta Le lagoon plays significant roles in both ecosystem and socioeconomic of Surat Thani province. In addition to spectacular scenery, this wetland is home to a variety of aquatic live beings such as a various species of birds and abundant of fresh water fish. Moreover, people living nearby have depended primarily on this area for agriculture, consumption, livestock rising and livelihood. Nevertheless, due to its exposure to other ecological and environmental systems, it is rendered vulnerable to changes or threats such as from temperature change, and means of livelihood. Recently, Khun Ta Le lagoon becomes endangered and at risk of being affected by the government mechanisms and residents. The effects may be doubled due to the lack of integrated approaches to the problems adopted by the community participation, thus increasing complicated situations. Therefore, the author suggests legal actions of developing Khun Ta Le lagoon to be a wetland. According to the present study, the author suggested a definition

of natural resource and environment conservation areas whose meanings could designates wetlands or other areas with similar purposes as the conservation areas. Moreover, through this extended definition, nonprofit groups of individuals or organizations dedicated to protection, promotion, and conservation of environment could apply for a license of being an environment private organization or environment community organizations. Furthermore, essential roles and responsibilities are clarified so that they could take a key part in policy law, regulation, and plan enactment process or other actions implemented by the government agencies. It is anticipated that through the given laws, regulations and provisions, this proposal could partly promote and preserve natural resources and environment particularly the country’s wetlands. The suggestions include integrated management through community participation, restoration of ecological system through awareness of utilities and services to ecosystem, and promotion of sustainable irrigation, agriculture and fishery as well as recreational place.

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