

Community-Based Natural Resource and Environmental Management in Songkram River Basin, Tha Kon Community, Sakon Nakhon Province, Thailand

Pissadarn Saenchat

Faculty of Management Science, Sakon Nakhon Rajabhat University, Thailand

E-mail: pisdpc7@gmail.com

Chardchai Udomkijmongkol

Faculty of Management Science, Sakon Nakhon Rajabhat University, Thailand

E-mail: chardchai_u@hotmail.com

Sanyasorn Swasthaisong

Faculty of Management Science, Sakon Nakhon Rajabhat University, Thailand

E-mail: sanyasorn@hotmail.com

Phakdee Phosing

Faculty of Political Science and Public Administration, Maha Sarakham Rajabhat University, Thailand

E-mail: eliti_pana@hotmail.com

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Abstract

The objectives of this research are to explore potential and utilization, problems and needs for natural resources and environment development and to search for the approaches in community-based natural resource and environmental management in Songkram River Basin, Tha Kon Sub-district, Akat Amnuai District, Sakon Nakhon Province. It is the qualitative research with the theory formed by the data. The research target group consists of 30 stakeholders in the natural resources and environment of the community. The data is collected by using in-depth interviews. The notes are used in the group discussions and participatory observation. The research results reveal that; 1) Songkram River Basin, Tha Kon Sub-district, has the potential and utilization in food, function, and learning and tourism sources, 2) This river basin area has problems of shallow river, flood, bank erosion, reduction in the number and size of aquatic animals, reduction of forest areas, swamp forests, and inefficient waste management, 3) There is the need in the development of creating a bank flap and stairs down the river, aquatic conservation area, sustainable conservation, restoration and use of soil, forest and water, solid waste management system, and awareness raising to the youth, and 4) Guidelines for natural resource and environment management by the community consist of strong policies, organizational management, network partners, group management, knowledge management, responsibilities, activities, and morality.

Keyword: Community-Based Management, Natural Resource, Environment

Introduction

Community- Based Natural Resource Management (CBNRM) is the framework for progress, community integration, and concrete conservation by transferring the ownership or user rights from the government to local communities. This can encourage the community to have necessary economic incentives for conserving and using natural resources and environment sustainably (WWF Global, 2006). It is the mechanism in dealing with environmental, social, and economic goals as well as creating the balance in the use and conservation of valuable ecological elements. This requires the decentralization of decision-making and ownership in natural resources to communities and community organizations. It is an effort to promote better resource management results with full participation of the community, decision-making activities of the resource users, integration of local institutes, customary practices, knowledge management system, availability of regulations and enforcement (Armitage, 2005). The management of natural resources by the community makes the protected areas increase biological integrity which provides knowledge and benefits to local communities along with enhancing the role of area protection in local plans sustainably (WWF Global, 2006). The cooperation is managed by trying to create an agreement between local communities or resource users and conservation agencies in order to negotiate the access to natural resources which is usually under the form of legal authority to be changed back to the conservation model by the community for sustainable natural resource management. The control power or authority is given to those resources to become the main objective of the community (Awimbo et al, 2004: 6). The main principles of natural resource management by the community are public participation and movement, social capital and cooperation of various parties, resources and equality, communication and information dissemination, information research and development, decentralization and capacity building, trust and righteousness, audit, suggestions and responsibilities, leadership, adaptation, co-management, participatory decisions, environmental use, conflict resolution and cooperation (Gruber, 2010)

Tha Kon Community, Tha Kon Sub-district, Akat Amnuai District, Sakon Nakhon Province, is located in the lower Songkram River Basin which is the branch of Mekong River. There is a lot of natural and environmental changes from the cultivation of the main economic crops, namely rice, rubber, sugar cane and cassava. This results in the decrease of natural forest areas and the accumulation of chemicals in the soil and water. Moreover, the flood in some years affected the lives that had been abundant in the past to reduce in number. People gain less food from nature. Some people have illness from using chemicals in agriculture. Besides, with the participation in learning process management in the Sanitary Sub-district Project of the Office of Health Promotion Foundation, people become realizing the value of living with nature and being friendly to the environment as the ancestors used to perform (Takon Municipality, 2016). This causes local administrators, government agencies, community leaders, and people leaders in Tha Kon Sub-district Community realize the importance of preserving and restoring natural resources and environment of the community to return to fertility as in the past. Especially in soil, forest, fish and water, there is the need to develop the community's environmental management system including solid waste, waste water, housing sanitation, cleanliness as the regulation of the community as well as raising the awareness to the youth in creating sustainable livelihood community by sufficiently living and being friendly to the environment.

This research aims to study the state and find the approaches in the management of natural resources and environment of such communities by studying the concrete changes of lifestyle that are consistent with the approaches for natural resource management by communities. This include seedling breeding, forest plantation, family economic, organic agriculture, indigo dyed local cloth weaving, food processing, cattle conservation, aquaculture, and local

fishery conservation, basketry group and community tourism management which will be a good lesson applied to other areas of the Mekong region countries.

Methods

This research is the Grounded Theory Research specifically selected the area of Songkram River Basin Tha Kon Community, Tha Kon Sub-district, Akat Amnuai District, Sakon Nakhon Province.

The target group of this research consists of the main informants which are 30 stakeholders in natural resource management of Tha Kon Community consisting of 10 household representatives, 10 professional group representatives, and 10 community management groups including 1 Tha Kon Sub-district Chief, 1 secretary of Tha Kon Sub-district Chief, 1 Tha Kon Deputy Sub-district Chief, 1 Policy and Plan Analyst of Tha Kon Sub-district Municipality, 2 teachers, 1 public health officer, 1 monk, and 2 Tha Kon Community Leaders.

The data is collected from the in-depth interviews with 30 stakeholders in natural resource management of Tha Kon Community and participatory observation from 3 sub-groups of 10 people each, namely, household representatives, professional groups, and community management groups. The Data triangulation is conducted from the study of related documents, in-depth interview, and return of information to check altogether in the overall stage for the accuracy and reliability.

The data analysis is Analytic Induction by interpreting and generating the data summary from the concrete objects or phenomena obtained from over 2 sets of data. Then, the facts are summed up from many parts of facts which have concrete features. After that, the large set of facts is summarized in the abstract features covering those small parts of facts. The inductive summary analysis method can be used in 3 ways; analysis of data summary from field records which are detailed notes or descriptive notes, analysis of data summary obtained from analysis, classification or grouping, and analysis of data of component analysis (Lincharearn, 20125: 25).

Results

1. The potential and utilization of natural resources and environment in Songkram River Basin, Tha Kon Community, consists of:

1.1 In food, there are approximately 100 kinds of fish which are for people consumption such as Naked catfishes, carp, Kui Lam Fish, E Tu Fish, Striped catfish, Keaw Kai Fish, Seuam Fish, Kang Fish, catfish, striped snake-head fish, Giant snakehead, Clown featherback, Mu Fish, Sut Fish, Sut Thong Fish, horseface loach, Tong Fish, Kob Fish, Goby, Thai river sprat, Earn Fish, Rice fishe, Lad Fish, Siamese mud carp, Cyprinidae, Sheatfishes, Nang Fish, Kayaeng Fish, spiny eel, eel, Nile Tilapia, etc. The fish is cooked as grilled fish, spicy minced fish, fish soup, fish curry, fish cake, etc. Some fish is processed such as pickle fish, dried fish, sour fish, etc. In Bung Pa Tham Forest around Songkram River, there are several edible plants such as bamboo shoots, Tiew, Mek, Man Saeng, Kadon, mushrooms, etc.

1.2 In utilization, people in Tha Kon Sub-district use Songkram River as the source of untreated water in producing the community tap water. It is also the source for local fishing, the transportation route of small boats, and is used as the place for arranging the activities following the traditions of community which are long boat racing, Loi Krathong, and Songkran festival. The natural wood to be utilized importantly is bamboo. The villagers weave bamboo into the household utensils such as sticky rice containers, sticky rice steamers, baskets, trays for drying fish, walls of the houses, litters, stairs, and the devices used for catching and containing the aquatic animals such as fishing rod, fishing container, etc.

1.3 In being learning and tourism sources, Songkram River in the part flowing in front of Wat Sri Boonreaung, Tha Kon village, is the thalweg with water all year round and plenty of aquatic animals. The monks and villagers have announced to be a marine conservation area for a distance of about 1 kilometer by stretching the rope across the river and flagging it as a symbol. There are also clear pinning coordinates. The bamboo raft is made in a simple and non-durable condition for going down to feed the fish. There is a beautiful waterfront area of approximately 3 rai used as a place to support people who come to participate in the long paddle races on the day of Buddhist Lent, Loy Krathong and Songkran. It can create additional income for the community. In Songkram River, there is a way of fishing that is unique to the local people. There are swarms of buffalo across the river and under the tree tunnel. In addition, from the participation of the health promotion project with the Office of Health Promotion Fund, Tha Kon Sub-district Community has discovered 30 learning resources in the community. There are 107 activities that can be developed into community-based eco-cultural tourism.

2. Problems of natural resources and environment in the Songkram River basin area in Tha Kon Community are as follows:

2.1 Regarding the problems of Songkram River, in the dry season, the water in this river is shallow. But in the rainy season, there will be a lot of water until flooding. In 2018, the flood from the bank was around 160 cm. The water level in the rainy season also depends on the water level of Mekong River. If the reservoirs on the Phu Phan mountain range let the water converge, the flood will become more severe and the river banks can collapse.

2.2 Problems in reducing the number and size of aquatic animals in Songkram River.

2.3 The problem of Bung Pa Tham Forest is from the community expansion and monoculture causing the forest area to decrease and affecting the reduction of natural food sources and natural aquatic animals. The largest area of Bung Pa Tham Forest in Tha Kon village is Don Pu Ta with an area of about 20 rai located between the community and Tha Songkram Wittaya School.

2.4 Regarding the residential sanitation problems, many residences still lack cleanliness. The community is still not tidy and not beautiful. The road is ruined. The drainage canal is shallow. The drainage is not convenient with residual waste. People do not classify garbage. The collection of waste and landfill waste is inefficient affecting Songkram River.

2.5 Lack of in-depth information in several issues such as species and prevalence of aquatic animals, plant species, cattle population, coordinates and area size etc.

3. The need for the development on natural resources and the environment in Songkram River basin area of Tha Kon Community are as follows:

3.1 The need in building the bank flap and stais down to Songkram River.

3.2 The need in developing aquatic animal conservation areas, fish food production, creating of raft to feed fish, building the museum or learning sources about aquatic animals in Songkram River and local fisheries.

3.3 The need for the conservation and restoration of soil, forest, and water.

3.4 The need in developing the community's environmental management system including solid waste, waste water, sanitation, housing cleanliness and order of the community.

3.5 The need in raising the awareness to the youth in creating a sustainable livelihood community by sufficiently living and being friendly to the environment.

3.6 The need in developing the activities related to conservation and utilization of natural resources and the environment to be able to generate income until it becomes a learning resource and develop into a tourist village by eco-cultural community.

4. The approaches for managing natural resources and the environment by communities in Songkram River basin area of Tha Kon Community are as follows:

4.1 Strong Policy (S) is the policy of local administrators and local leaders in which Tha Kon Sub-district Chief and Tha Kon Village Headman have the strong commitment and have established the strong unified policy in managing the natural resources of the community for sustainable benefits as well as better environmental management of the community. There is the promotion and participation in establishing the community tourism enterprise by the community of Songkram River basin, Tha Kon Sub-district, based on the diversity of natural resources.

4.2 Organization Management (O): The working group of Tha Kon Sub-district Community consists of the Tha Kon Sub-district Chief who is the leader by the position and has manpower, budgets, materials, and management methods according to local government administration regulations of Tha Kon Sub-district Municipality. The Tha Kon Village Headman is the governing leader who has the authority and duties according to the local administration. Both leaders have collaborated in developing the community continuously for a period of time with unity both in concepts and practices. Both leaders use the participatory management on the basis of kinship relations and ethnic tribes of Yo causing the public to have a group of professional leaders, village health volunteers, village sages who have high voluntary spirit to come to think altogether without the opposing group.

4.3 Networking (N): There is the external community network that sees the potential of Tha Kon Sub-district Community and has taken part in driving all dimensions of development including the Office of Health Promotion Foundation. The process for developing leadership potential has been generated for local administrators, professional group leaders, village health volunteers, and government agency representatives in Tha Kon Sub-district through the Sanitary Sub-district Project. The Community Organization Development Office has promoted the establishment of community organization to work in coordination with the government sector. Sakon Nakhon Rajabhat University has brought the project to bring the King's philosophy to local development into the community. In addition, the Tha Kon Sub-district Municipality has coordinated with the government departments at the district level and every province to regularly support the development of the Sub-district.

4.4 Group Management (G): The group of activities in the management of natural resources and the environment in the community includes marine conservation group, local fishing group, food processing group, water user group, farmer group, environmental conservation volunteers, Village Public Health Volunteers, Cattle Conservation Group. These groups will unite informally. There is a simple management based on kinship ties with the division of work following the aptitudes. The village headman is the highest leader and there is natural leader in the group. The group members will have respect, obedience, and voluntary mind to work altogether.

4.5 Knowledge Management (K): Tha Kon Sub-district Municipality will conduct the project of professional knowledge and skill development in managing the natural resources and environment to people regularly. When the Sanitary Sub-district Project of Thai Health Promotion is implemented, there is the great change in knowledge with the knowledge management and adjustment of ideas of the community members resulting in the creation of activities covering all dimensions in economic, social, and environmental.

4.6 Responsibility (R): The people of the whole Sub-district have used and have ties to water, forest, fish and soil throughout their lives. Therefore, they cherish and preserve natural resources and the environment. They always adjust to the changes in the natural state. Although the current management of natural resources and the environment of the community is not perfect, the community has clear intention to receive assistance, new knowledge and practices for better treatment and development. There are many leaders by position and natural leaders in Tha Kon Sub-district and they are alliance to the development of natural resources and the environment.

4.7 Activities (A): The community of Tha Kon villagers agree to develop the areas of pier and fish feeding to be durable, permanent, and beautiful to benefit sustainably. Therefore, the cooperation is made with Sakon Nakhon Rajabhat University. The teachers and students in the course of Public Administration Program improve the landscape of pier and roads in the village to be clean, organized, beautiful, and safe. The project is defined to develop the potential and activities of seedling breeding, forest plantation, family economic, organic agriculture, indigo dyed local cloth weaving, food processing, cattle conservation, aquaculture, and local fishery conservation, basketry group and community tourism management. There is the promotion and development of potential of local tourist guides. The online communication system is made to disseminate public relations, produce, products, and tourism activities by community to outside.

4.8 Moral (M): When announcing the marine conservation area at the waterfront of Wat Sri Boonreaung, the monks have been the leaders in fish feeding. Every villagers therefore do not violate the conservation zone during the period announced from 1st November until the end of May on a regular basis every year. In 2018, the area was additionally expanded for 100 meters to allow fish to live in the abundant area. Obeying the leaders and having the voluntary mind are considered virtue in the majority of local Tha Kon villagers.

Conclusion and Discussion

1. According to the results of the survey on the potential and utilization of natural resources and the environment in the area of Songkram River basin, Tha Kon Community, it is found that in the area of Songkram River basin, there are about 100 kinds of fish and various kinds of plants which people can eat. This represents that such area has the biodiversity which can be used as food sources and can generate income from those resources. This is correspondent with WWF -Thailand (2016: 1) studying the lower Songkram River basin, in the area of Sri Songkram District, Nakhon Panom Province. There are over 124 kinds of fish including *Pangasianodon gigas*, *Dasyatis laosensis*, *Tenuulosa thibeaudaui*, *Clupeichthys aesarnensis*, *Boraras micros*, *Rasbora spilocerca*, *Probarbus labeaminor*, *Oryzias mekongensis*, *Catlocarprio siamensis*, *Wallago leerii*, *Setipinna melanochir*, *Clarias batrachus*, *Doryichthys martensii*, *Indostomus paradoxus*, *Pangasianodon hypophthalmus*, *Betta smaragdina*, etc. There are also 208 kinds of plants in Pa Tham Forest which can be beneficial. This is correspondent and different from Kalapapluek, Kulabthong, and Sunthonkij (2013:31) conducting the survey on the varieties of economic fish and fishing condition in the lower Songkram River basin, Nakhon Panom Province. There are 16 families and 46 kinds of fish with economic significance. *Phalacrodon apogon* is the most expensive economic fish followed by *Hemibagrus wyckioides* and *Wallago attu*, respectively. In fishing, it is found that fishing is conducted throughout the year but most fishing will be done in the flood season. The main fishing tools include nets. From the research results, it is found that Songkram River basin, Tha Kon Community has the potential in using as the source of untreated water for the production of community water supply and the source of local fishery occupation. It is also the route of small boats and is used as a place for activities according to the traditions of the community. There is the potential to be the learning and tourism sources. This demonstrates that Songkram River basin is important and related to the culture of living of people in the community. There is benefiting both directly and indirectly. This is correspondent and different with Pattanapon (2011: 54) suggesting that the Phetchaburi River is important in consumption, agriculture, industry, local fishing, and tourism. This includes the research of Ngamwitroj, Charoenkanton, and Samerkam (2008: 71) finding that the benefiting of Pathao River is in 2 features; water use for agriculture and consumption through the village water supply system.

2. According to the research results, it is found that the area of Songkram River basin encounters the problem of shallowness in the dry season and flood in the rainy season. This also depends on the water level. There are also the problems of bank erosion, reduction in the number and size of aquatic animals, forest swamps and forest areas having been reduced. It also affect the reduction of natural food sources and natural aquatic preschools indicating that the natural environment in this Songkram River basin is threatened by human and natural actions which all affect the lives of humans and other living things altogether. According to the research results, it is found that the problems are from sanitation lacking the cleanliness, the community is not orderly, and solid waste that is because of the rural community has built the traditional residence. This causes the sanitation of most residences to lack cleanliness and order. Moreover, due to the lack of community planning and the budget shortage of local government organizations causing the inefficient waste management and orderly management of the country. This is correspondent and different from Sookkua, Wirasith, and Sookkua (2013: 24) finding that the Chao Phraya River in Phra Nakhon Si Ayutthaya encounters the problem of waste disposal and wastewater that has not been treated by households into the water source. The chemical waste from farming is discharged and people still do not have knowledge of river conservation. This is consistent and different from Saenchat (2018: 342) finding that the water problem is in the southern reservoir of Sirindhorn Dam. The problems consist of the inability to use water for cultivation, shallowness of water level, reduction in the number and size of fish, contamination of chemical in water, death of fish or other aquatic animals without knowing the causes, use of electricity to shock fish, solid waste in water, fish prey use, bank erosion and flood problem.

3. According to the research results, it is found that people in the Tha Kon Community have the need in developing natural resources and the environment in the construction of bank flap and stairway down Songkram River, development of aquatic conservation areas, fish feed production, creation of raft to feed fish, building of museum or learning sources about aquatic animals in Songkram River and local fisheries, conservation and restoration of soil, forest and water resources showing that such people are aware of the importance of natural resource conservation to remain useful for the basic needs of life. For the need to develop community environmental management system, it include solid waste, waste water, sanitation, housing cleanliness and order of the community. This is for raising the awareness to the youth in creating the sustainable livelihood community by living a sufficient life and being friendly to the environment. Moreover, this includes the development of activities related to conservation and utilization of natural resources and the environment to enable income generation to become a learning and development center for becoming a tourist village by that eco-cultural community. It shows that people want a good environment and suitable for normal life. This is different from Koontanakulvong et al. (2016:8-9) proposing that there should be the consideration on the project to solve the problems in the Nan River basin. The Nan watershed area requires forest management to maintain the integrity of the watershed both in quantity and quality, community water management with reservoirs and village water supply, emergency flood warning system and drought. In the central area of Uttaradit province, the medium-sized water sources and dams should be developed. In the downstream area, Phitsanulok and Phichit Provinces want to develop a reservoir for water management and use of land suitable for water management.

4. From the approaches for natural resource management by communities in Songkram River basin area of Tha Kon Community, it is found that Tha Kon Community has defined 8 ways to manage natural resources which are Strong Policy, Organization Management, Networking, Group Management, Knowledge Management, Responsibility, Activities, Moral. The most important thing found from the research is the ideology of the Sub-district Chief and the village headman of Tha Kon Village to realize the importance of natural

resources and the environment in Songkram River basin. They behave as the models to persuade people in all sectors to come altogether to conserve and restore by promoting people to join the Sanitary Sub-district Project. They go to study and then come back to do the activities related to the management of natural resources and the environment altogether. This is correspondent to the principles of Transformational Leadership of Burn (1978) consisting of Idealized Influence or Leadership, Inspiration Motivation, Intellectual Stimulation, Individualized Consideration. This is correspondent and different from Ngamwitroj, Charoenkantoon, and Samerkam (2008: 35) proposing the model of community management to support natural resource management consisting of supporting small community forest management, adjusting the integrated agricultural model, strengthening the community organization group, restoring the watershed ecosystem by community participation, strengthening the learning potential of communities in upstream conservation.

Recommendation

According to the research results, it is found that the area of Songkram River basin, Tha Kon Sub-district, has the potential in utilization as well as being the learning and tourism sources. Therefore, relevant government agencies, local administrative organizations, and people should plan altogether in benefiting carefully in order to generate the sustainability and development in community-based eco-cultural tourism by linking the route to the areas of neighboring localities.

References

- Armitage, D. 2005. "Adaptive Capacity and Community-Based Natural Resource Management." **Environmental Management** 35:703-715.
- Awimbo, J., Barrow, E., and Karaba, M. 2004. **Community Based Natural Resource Management in the IGAD region**. Nairobi: Scan House Press Ltd.
- Buarapana, K. 2011. **Qualitative research**. Bangkok: Comma Design & Print Ltd.
- Burn, M.G. 1978. **Leadership**. New York: Harper & Row.
- Gruber, S. 2010. "Key principles of community-based natural resource management: a synthesis and interpretation of identified effective approaches for managing the commons." **Environmental management** 45 (1): 52-66.
- Kalapapluak, S., Kulabthong, S., & Sunthonkij, Y. 2013. "Preliminary survey on species diversity of economic fishes and fisheries status in the Lower Songkram River, Nakhon Panom Province." **Veridian E-Journal Science and Technology Silpakorn University** 1 (5): 30-40.
- Koontanakulvong, S. et al. 2016. **Water Resources Study for Strategic Water Management in Nan River Basin-Development of strategic water management system in the river basin under new risks and formulation of strategic plan recommendation**. Bangkok: The Thailand Research Fund.
- Lincharearn, A. 2012. "Qualitative Data Analysis Techniques." **Journal of Education Measurement Mahasarakhan University** 17 (1): 17-29.
- Ngamwitroj, B., Charoenkantoon, S., & Samerkam, P. 2008. **Local Wisdom on Water Resource Management a case of Chee River Basin, Thailand**. Bangkok: Department of Water Resource, Ministry of Natural Resources and Environment, Thailand.
- Pattanapon, P. 2011. **The Development of Cultural Tourism Route along the Phetchaburi River**. Master of Art Thesis, Thammasart University.

- Saenchat, P. 2018. **Using, Problem, and Development Need in the south area of Sirindhorn Dam reservoir, Ubon Ratchathani Province.** (A paper presented in the 5th National Conference of Nakhonratchasima College 2018).
- Sookkua, C., Wirasith, C., & Sookkua, P. 2013. **The Participant of Community to Chao Phraya River Conservation in Ayutthaya Province.** Bangkok: Rajamangala University of Technology Suvarnabhumi.
- Takon Municipality. 2016. **The Report of Healthy Community Project.** Sakon Nakhon: The office of Municipal Clerk, Takon Municipality, Thailand.
- WWF-Thailand. 2016. **Information of Songkram River.** Retrieved from www.wwf.or.th/what_we_do/wetlands_and_production_landscape/songkramriver.
- WWF Global. 2006. **Community Based Natural Resources Management Manual.** Retrieved from <http://wwf.panda.org/?uNewsID=88900>.