

Co-management for Reservoir/Lake Fisheries: Thailand Initiative

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In Thailand, fish especially freshwater fish is the main source of cheap protein for the people in the countryside. Freshwater fish could come from aquaculture or capture fisheries in reservoirs and lakes. There are many man-made reservoirs and natural lakes in Thailand as well as in the Southeast Asian countries. However, these reservoirs are usually constructed as source of hydro-electricity and irrigation, with fisheries considered only partly for economic purposes.

Thailand has 26 reservoirs and three lakes with a total water volume of around 77,114 million m³. The total fish production from such bodies of waters is about 7,640 mt annually (Sripatprasite, 1966) valued at around USD 5,340,508 (**Table 1**). The Reservoir Fisheries Management Unit of the Department of Fisheries (DOF) of Thailand has implemented activities and monitored the fisheries production in reservoirs. Tookwinas (Ekmaharaj) (1974 and 1975) reported that the local people earned their incomes from catching fish in the reservoirs using simple fishing gear such as dip net, cast net, line and trap. The fish caught are mainly for their own consumption although some are sold to increase their incomes and improve their living conditions. After the application of the concept of co-management and rights-based in reservoir fisheries management, the fishermen have been able to earn additional incomes from reservoir fisheries and their livelihood could now be managed toward sustainability.

The Co-management Process Adopted by Thailand

Co-management using Group User Rights is a formal process of sharing the responsibility and authority between the government and organized groups in a decentralized approach to decision-making that can be replicated (Augustinous, 2002). Without co-management, decision-making could lead to top-down management that involves fewer users in fisheries management, and oftentimes resulting in communication barrier. Since the users have no clear ownership or responsibility to take care of the local fishery resources, they could choose to engage in illegal fishing, which is often the cause of conflict among users and between users and government officials.

Considering the fact that the increasing population and over-exploitation of the fishery resources have accelerated the decline of such resources causing negative impacts on the people's livelihood, co-management could therefore

Table 1. Fish Production from Reservoirs in Thailand (Sripatprasite, 1966)

Name of Reservoir	Volume (million m ³)	Total Catch (Tons)	Total Value (USD)
Reservoirs of the Electricity Generating Authority of Thailand			
Mae Chang Reservoir	108.55	12.37	12,400
Bhumipol Reservoir	13,462.00	22.92	30,000
Sirikit Reservoir	10,640.00	576.10	688,400
Ubol Ratana Reservoir	4,640.43	1,418.89	1,421,200
Chulabhorn Reservoir	188.00	398.51	56,400
Nam Pung Reservoir	165.48	115.22	130,800
Sirindhorn Reservoir	2,082.61	418.30	*365,176
Pak Mun Reservoir	630.00	-	-
Khao Laem Reservoir	11,860.00	460.92	402,400
Srinagarind Reservoir	18,770.00	275.45	219,200
Rajjaprapha Reservoir	5,640.00	236.20	25,085
Bang Lang Reservoir	1,404.00	182.55	200,400
Reservoirs of the Department of Fisheries			
Kwan Phayao Reservoir	11.20	220.50	*242,060
Bung Boraped Reservoir	212.50	162.20	*184,133
Nong Han Reservoir	64.00	103.17	*117,121
Reservoirs of the Royal Irrigation Department			
Mae Ngat Reservoir	325.00	15.30	*15,337
Mae Kuang Reservoir	410.00	-	-
Klew Lorn Reservoir	112.00	115.80	*131,458
Tuep Salao Reservoir	196.00	-	-
Khlong Pho Reservoir	101.00	-	-
Hual Luang Reservoir	113.00	161.34	*183,156
Lam Pao Reservoir	2,640.00	1,669.00	84,481
Nam Un Reservoir	520.00	164.40	15,249
Lam Takong Reservoir	445.00	58.90	*59,043
Lam Phar Ploeng Reservoir	220.00	131.70	*149,508
Lam Nang Rong Reservoir	218.00	-	-
Kra Sieo Reservoir	390.00	425.70	*371,653
Kang Kra Chan Reservoir	895.00	174.69	*198,312
Pran Buri Reservoir	650.00	120.00	37,536
Total	77,113.77	7,640.13	5,340,508

* Estimate Value

be a way out. In co-management, the responsibility, authority and roles of the co-management participants (users, community and government) are provided and/or enhanced. This strategy could therefore strengthen the efficiency of fisheries management.

Who is involved in co-management? **Figure 1** shows the participants in co-management and their roles and responsibilities in the management of the fisheries resources.

In Thailand, Co-management Using Group User Rights for reservoir and lake fisheries had been implemented for about 30-40 years. Tookwinas (Ekmaharaj) (1974) cited that the Reservoir Fisheries Management Unit under the Inland Fisheries Division of the DOF which was established in 1972 has been in charge of conducting technical surveys as well as fisheries enhancement and enforcement activities following the concept of co-management and rights-based fisheries. Such activities have been carried out in cooperation with fishermen groups/associations. The step by step process adopted by the Reservoir Fisheries Management Unit of the Inland Fisheries Division of DOF Thailand is described below:

Technical Services

Conducted as a concerted effort of various units under the DOF, i.e. Technical Unit, Reservoir Fisheries Management Unit, and Inland Fisheries Survey Unit, the implementation of a reservoir and lake fisheries management in newly man-made reservoirs usually starts with a hydro-bio-physicochemical properties survey in order to obtain the basic fisheries and related information. A series of data such as water volume, shore line development, water quality, primary production, benthic fauna, fish standing crop, fish species composition, fish landing statistics, etc., are regularly recorded (Chridchupunsari, 1979). This kind of survey is usually conducted two to three times a year based on the seasons in Thailand, i.e. summer, rainy and winter.

Creel census (counting and interviewing fishers to determine fishing effort and catch) and socio-economic surveys are also conducted by the DOF Units in order to obtain the basic information on fisheries, fishing effort and catch per unit effort (CPUE). As in any co-management and rights-based fisheries program, the information and data collected from such surveys are necessary (Pan-Aram and Apirakmewan, 1986) to ensure success in any fisheries management program.

To enhance the resources, releasing fish fingerlings and freshwater prawn fry into reservoirs/lakes is also promoted, taking into consideration the information on fish species composition obtained from the hydro-bio-physicochemical properties survey. For the purpose of fishery resources management, herbivorous fish species are preferred for restocking the reservoirs/lakes.

Establishment of Fishermen Groups/Associations

The formulation of fishermen groups/associations around the reservoirs/lakes is being encouraged. In order to improve the capability of the fishermen in Fisheries Co-

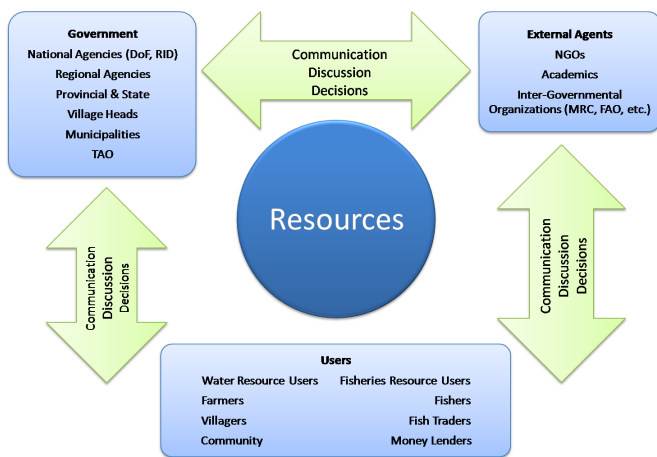


Figure 1. Roles of participants in the Co-management Using Group User Rights Process (After Augustinous, 2002)

management Using Group User Rights, training sessions, workshops and information services are conducted (Jaiyen, 2005 and Chatmalai, 2006) for the groups. After the capacity building sessions, fisheries group/association committees are elected by the fisher members of the respective groups/associations, where the elected

committees work closely with related government offices. A series of meetings for reservoir/lake fisheries are also conducted where regulations are developed by such groups/associations which should be in consonance to the Thai Fisheries Act. In the implementation process, the fisheries group/association committees would carry out the enforcement of the fisheries regulations that they have developed together with concerned government offices.

The regulations for reservoir/lake fisheries that the groups/associations set up could be reviewed from time to time depending on the results of the consultations conducted between the fisher groups/associations with concerned government offices. Based on the experience of Thailand, the efficiency of management for reservoir/lake fisheries depends largely on the efficiency of the fisher group/association committees. Therefore, the process of training the fishermen on co-management and rights-based fisheries has been considered very important for the capacity building of the fisher groups/associations.

Enforcement Process

In connection with the adoption of the concept of co-management, the established fisher groups/associations organize their respective Fisheries Enforcement Unit. This unit also conducts training and information services for their fishermen members to enable them to carry out enforcement activities under the guidance of their respective fisher groups/associations.

Setting-up of Fisheries Refugia

Setting-up of fisheries refugia is also conducted by convening the group committees for planning and



Restocking activities to enhance the resources

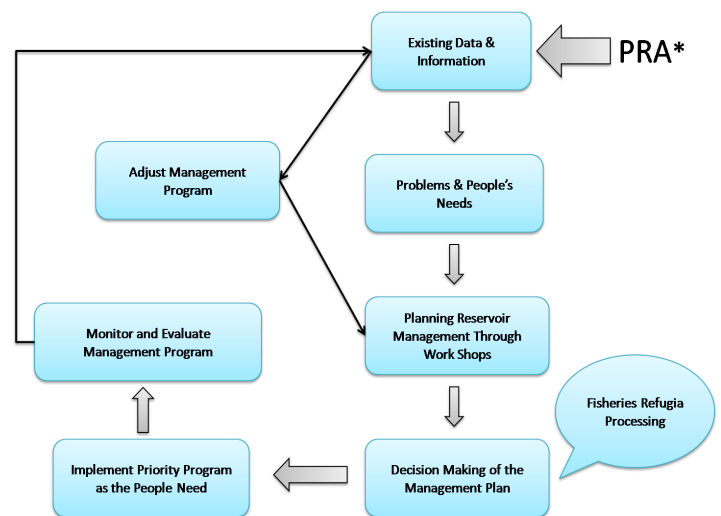


Figure 2. Fisheries Co-management Using Group User Rights (Adapted from MRC Fisheries Programme, 2005)

*PRA = Participatory Rural Appraisal

discussion. The committees select the appropriate areas for the development of the refugias, after which these are restocked with fish. A community regulation is then declared restricting the use of some fishing gears in the refugias. Members of the committees and the villagers work together in monitoring, inspecting and guarding the fisheries refugias. **Figure 2** shows the diagram of the steps in Fisheries Co-Management Using Group User Rights.

Co-management for Reservoir/Lake Fisheries: Experience of Thailand

Co-management concept has been integrated in the fisheries projects that are carried out in reservoirs and rivers in the northeastern part of Thailand. The experiences in major water bodies such as the Huay Luang Reservoir in Udon Thani Province, Nam Oun Reservoir at Sakhon Nakhon Province, the Songkhram River Basin, etc. could be used as models for co-management for reservoir/lake fisheries.

Huay Luang Reservoir

Many activities have been conducted in the Huay Luang Reservoir using the co-management process. Three activities have been implemented to address certain urgent needs of the villagers in the community when they participated in the workshop on data collection mechanism. First is the monitoring of the water quality owing to the water pollution caused by a nearby cassava factory. The villagers around the reservoir have been trained by biologists on water analysis using test kits. Results of such water monitoring activity are presented to the community meetings conducted every month.

The second activity is on nursing of fish fingerlings in cages before stocking them into the reservoir. Since fish fingerlings from hatcheries are normally quite small and

survival rate has been low, the villagers have worked together to nurse the fish fingerlings before stocking and the results have been very encouraging. The third activity involved the setting up of women's group to carry out fish processing and packaging. In order that the women could learn the methods of fish processing and packaging, fisheries extension officers took the women for a study tour to the central part of Thailand to observe the proper methods of fish processing and packaging.

Nam Oun Reservoir

The activities implemented by the stakeholders and government officers (Nam Oun Dam Inland Fishery Patrolling Center) in the Reservoir comprised the Fish Home and Training the Youths on Fish Conservation. The objectives of the Fish Home Project are to: establish a process of community participation in resources management, construct fish habitat and spawning area, and build a recreation area for the community.

The Fish Home Project, which has been conducted since June 2006, comprised as its first step the establishment of a group of committees consisting of a leader of the villagers, teacher, fisheries officer, representative from the women's group and other local organizations (about 10 persons). The next step was the conduct of a meeting to find out the suitable location for establishing the fish home and discuss about the working processes. In the identified fish home area, members of the group worked together to find some materials for developing the fish home area such as branches of trees, old tires, etc. and sank such materials into the water. The group also set the scope of the fish home area and the standard regulations including fishing restrictions.

The objective of the second project on Training the Youths about Fish Conservation is to build awareness among the students from schools around the Nam Oun Reservoir about fish conservation. Officers from the DOF introduced and trained the students about spawning seasons as well as on how to conserve fish and which fishing gears are illegal or legal, etc. At their school libraries, the students are encouraged to work together to improve their knowledge and gain information concerning fisheries, through such materials as posters, fisheries bulletins/gazettes/leaflets, models of fishing gears, etc.

Songkhram River Basin

Some research activities have been conducted in the Songkhram River Basin on how to optimize the use of a destructive fishing gear (barrage) in the river and on



Fish restocking activity at Huay Luang Reservoir involves the young and the old

the need to develop and implement conservation zones. The urgent need to address the problem on the use of barrage in the river was raised by the stakeholders during their meeting held in August 2005 at Nakhon Phnom Province. A research activity was therefore carried out using the co-management process to find out the suitable standard regulation for community utilization of the river basin resources. The research started with a discussion and planning among the researchers and villagers in the community, followed by the site selection and setting up of the committees.

The researchers and committees participated in designing the mesh size of the back net for the barrage as well as in harvesting and length-weight measurement of the fish caught. The water level of the river was recorded everyday. The research result showed that using mesh size of 2 cm, fish would be released to the river at about 16% of the weight of high economic value fishes, and when the water level is only 1 m, fish inside the barrage at 4-12% of the weight would be released back to the river. The results also showed that there were about 103 fish species caught by the barrage. The researchers then presented the results of the study through a public hearing. Upon acceptance by the community, the standard regulation was set up and is now being applied in the community.

Outcomes from the Fisheries Co-management Using Group User Rights Process

The outcomes from the Fisheries Co-management Using Group User Rights Process adopted in reservoir/lake fisheries in Thailand can be concluded briefly as follows:

- Active participation of the community and government in fisheries management
- The efficiency of illegal fishing gears which destroy fish population has been decreased
- The responsibility, authority and role of the community in fisheries management have been enhanced

What is very important is the efficiency of fisheries management have been strengthened and the awareness of the fishers and the communities on fisheries co-management have been enhanced.

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