Contribution of Kampong Preak Fish Sanctuary (Tonle Sap Lake, Cambodia) to Livelihoods in Two Adjacent Floating Villages

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Abstract This study focused on the contribution of natural resources (fish, wildlife, vegetation, flooded forest, etc) to the livelihoods of communities living in two floating villages located near Kampong Preak fish sanctuary, Krakor district, Pursat Province. The approach was based on a combination of Rapid Rural Assessment (RRA) and economic assessment methods. Data was collected from 60 households. Stratified random sampling was used to interview rich, medium and poor households. Quantitative information was complemented by interviews of key informants and of village chiefs. Analysis focused on i) quantitative data, and ii) perceptions of interviewees about the contribution of natural resources and of the fish sanctuary to their livelihoods. This study showed that the fish catch is an important element of income. The living standards of villagers varied, depending on fish production and aquatic plant collection. Labor, aquaculture, pig farming and wildlife catching were the other sources of income in the two floating villages. During six months of fishing season, rich households can catch up to 8020 kg of fish worth USD 1938 while medium households can catch 1,950 kg of fish (USD 778) and poor households can catch 1,426 kg of fish worth in average USD 422. The fish sanctuary contributed to household consumption and income generation in all households. Fish, snake, water bird, turtle, edible wild plant and fire wood are most important for daily subsistence of poor households. Overall people in rich households derive more benefits from natural resources because they have more capital to invest on fishing equipment and to bribe law enforcers.

Keywords: Conservation, fisheries, rural development, environmental management

INTRODUCTION

Cambodia has the most productive inland fisheries in the world. With an estimated production ranging between 290,000 and 430,000 tonnes per year (Van Zalinge et al., 2000), the fish yield is one of the highest in the world and contributes between 8 and 12 % of country's GDP (Kurien et al., 2004-2005). More than a million Cambodian rely upon fisheries for their livelihoods and the majority of Cambodian population lives within the central floodplain of Tonle Sap Great Lake and

Mekong River (ADB, 2003). At least 1.2 million people live the Tonle Sap Lake and exploit its resources. They depend on fish, flooded forest and wildlife as primary or secondary sources of income, employment, food and firewood (ADB, 2003, Chanthy, 2006). According to Balzer et al. (2002), in the Tonle Sap Great Lake, many wildlife species including birds, snakes, turtles, bee but also plants are used by the local people. Usually, the rural people catch wildlife for household consumption as well as for sale and income generation.

The Tonle Sap Great Lake is also a site of global ecological and conservation significance and was classified as a UNESCO international biosphere reserve (Royal Decree, 2001).Within this area, fish sanctuaries (i.e. zones where fishing is completely banned) were already recommended by Chevey and Le Poulain in 1940. In fact, two fish sanctuaries in Pursat Province (namely Kampong Preak and Reang Til) existed before 1950s (Deap, 1992). Two more fish sanctuaries (Kampong Pluk in Siem Reap province and Phat Sandai or Pi Stoun in Kampong Thom province) were established during the 1960s (Sovan,1992). Then four more fish sanctuaries were established later on (Chroy Sdey and Dey Roneat in Pursat province, Ba Lot fish in Kampong Thom province, and Park Konteal in Battambang province; Chheng, 2008); thus to date there are eight sanctuaries located around the permanent lake; they are characterized by different levels of law enforcement and of biological efficiency (Chheng, 2008).

The purposes of the current research is to i) identify the different social groups using natural resources in Kampong Preak fish sanctuary, ii) determine how these social groups use natural resources as a livelihood strategy, and iii) assess the contribution of natural resources to income generation in each social group.

RESEARCH METHODOLOGY

The research was conducted between December 2008 and May 2009. A Rapid Rural Appraisal (RRA) approach was used. RRA is a "Systematic, semi structured activity conduced on site, with the aim of acquiring new information and hypotheses about rural life and rural resources" (Coolison, 1981). This method is a way to identify rural priorities in a short time frame, focusing on aspects related to planned intervention or change.

The two villages selected for study were Anlong Raing and Kampong Preak villages, located outside the Kampong Preak fish sanctuary. The two floating villages were chosen because the local livelihoods are based on the natural resources, especially flooded forest, fish and wildlife in the Kampong Preak fish sanctuary. There has not been any organization to protect and conserve it in the past, and at the present there CI to provide funds to protect and conserve endangered animal and fish species as well as flooded forest within the fish sanctuary.

The differences between social groups, their wealth and the corresponding households in each village were determined during a preliminary stratification phase by a wealth ranking exercise and discussion with the village leaders. 60 households of different social group from a total of 148 households collecting directly resources around the fish sanctuary were randomly selected for in-depth interview using a structured questionnaire. The profit of each natural resource from fish sanctuary was calculated by the total income minus by the total expense which was not included the labor cost. The expenditure of employment was covered by the owner.

RESULTS

Contribution of natural resources to the livelihood of different social groups

An analysis of the household interviews gathered in the two floating villages near Kampong Preak fish sanctuary indicates how much natural resources around fish sanctuary are used by different social groups. Table 1 shows that fishing, snake catching, fire wood collection and water bird catching all play an important role in the livelihoods of all social groups. There is a substantial difference between social groups only about turtle catching. Rich and medium household catch turtles by using horizontal cylinder traps and enclosure nets, whereas poor households can not use

them because these gears are expensive and a boat is needed to use them far from their home. There are some differences between social groups involved in the use of edible wild plants because rich and medium household use them also for pig farming, whereas poor households don't raise pigs.

Table 1 Contribution of natural resources to livelihood of different social groups

Sources	Rich households		Medium households		Poor households	
	Frequency	(%)	Frequency	(%)	Frequency	(%)
Fishing	11	100	26	100	23	100
Snake catching	10	91	26	100	23	100
Fire wood collection	10	91	25	95	22	95
Edible wild plants collection	10	91	26	100	23	100
Water bird catching	6	55	14	58	11	55
Turtle catching	4	36	6	23	1	4

Kinds of fish caught by the different social groups

An analysis focussing on fish catch, fish groups and social groups is detailed in Table 2. Among the three fish groups, white fishes consist of long distance migrants (Tonle Sap - Mekong mainstream), black fishes of local residents (floodplain fishes), and grey fishes consist of short distance migrants (Tonle Sap - local tributaries).

Table 2 Fish caught by different social groups in the villages studied during 6 months

Fish guide	Rich households		Medium households		Poor households		Average total catch
	fish catch (kg)	(%)	fish catch (kg)	(%)	fish catch (kg)	(%)	fish catch (kg)
White fish	4,758	59	960	49	716	50	6,434
Gray fish	1,806	23	552	28	358	25	2,716
Black fish	1,456	18	438	23	352	25	2,246
Total	8,020	100	1,950	100	1,426	100	11,396

This table shows that there are substantial differences between social groups in terms of fish catch. In the six months of fishing season between December and May, rich households can catch more than 8,000 kg of fish (including 59% of white fish, 23% of gray fish and 18% of black fish) because they use bigger and illegal fishing gears such as enclosure nets (more than 500 m of nets) and giant lift nets (18m x 18m x 9m); whereas medium household can catch 1950 kg of fish (49% of white fish, 28% of gray fish and 23% of black fish) and poor households can catch only 1,426 kg of fish (50% of white fish, 25% of gray fish and 25% of black fish species) because they don't use large fishing gears and fishing equipment like rich households.

Fishing gear used by different social groups

According to Deap et al. (2003), more than 102 fishing gears have been identified in Cambodia. However, the main fishing gears used by social group in the villages studied are not that many; they consist mainly of gillnets, brush parks or fyke nets (Table 3).