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LIVELIHOOD IMPORTANCE AND VALUES OF TONLE SAP LAKE FISHERIES

Hap Navy
Ratana Chuenpagdee
John Kurien

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picture by Hap Navy

POLICY BRIEF

LIVELIHOOD IMPORTANCE AND VALUES OF TONLE SAP LAKE FISHERIES

Hap Navy, Ratana Chuenpagdee, John Kurien

Fisheries have long been central to Cambodian lifestyle and more than one million people, particularly those living in and around the Tonle Sap Lake, depend on fisheries and other aquatic resources for food, income and livelihoods. This statement implies the undeniable importance of Tonle Sap fisheries and aquatic ecosystem. But the 'total value' of this ecosystem, especially to people whose livelihoods depend heavily or entirely on these resources, remains largely unknown.

FISHING IN THE TONLE SAP LAKE

A number of studies have been conducted to enhance our understanding about socioeconomics and livelihoods of Tonle Sap Lake communities. The report conducted in 1995, titled "Socio-economic assessment of freshwater capture fisheries of Cambodia" (Ahmed *et al.*, 1998), is one of the most cited studies as it provides insights to the demographic characteristics, economic activities and livelihood strategies of over 5,000 households in the eight provinces in and around the Tonle Sap and the Mekong-Bassac River. There is every reason to believe that some of the characteristics of those who depend on fisheries resources have changed, given factors such as population growth, economic development, aquatic ecosystem health and the recent policy reforms related to fisheries. A new study of similar nature and magnitude is certainly required.

But what can we say about Tonle Sap fisheries using information drawn from existing reports and studies? Data from government sources suggest that fisheries from the Tonle Sap Lake contribute more than 60 percent of the total inland fisheries production, or between 200,000 to 218,000 tonnes, with an estimated landed value of

US\$150-250 million. Current fishing regulations enable small-scale fishers to fish in the Tonle Sap Lake all year round without any permit, while middle-scale fishers may fish only between October and May when the water level in the Tonle Sap begins to recede and the floodplain area is decreasing in size. Large-scale fishing (fishing lot) is an industrial operation done under a two-year leasing system.

The main factors distinguishing these different fishing types, apart from the gears used, relate to catch quantities, utilization of catches and the number of households engaged in such fishing. The study by Ahmed *et al.* (1998) estimated that catches from small-scale fishing average about 700 kg/year/household and those from middle-scale fishing are five times as much. Higher proportions of catches from small-scale fishing are used for household consumption, when compared to middle-scale fishing. The most striking difference pertains to the number of people engaged in fishing. The study stated that in 1995 about 85,000 households in the five provinces around the Tonle Sap Lake (Siem Reap, Battambang, Pursat, Kampong Chhnang and Kampong Thom) were actively involved in fishing, while only about 9,000 households engaged in

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middle scale fishing. Considering the recent fisheries policy reforms in Cambodia, the current number of households involved in fishing is most likely to have increased.

SMALL-SCALE FISHERS OF THE TONLE SAP LAKE

What are some of the social and cultural characteristics of these small-scale fishers of the Tonle Sap Lake? Studies of the demographics of Tonle Sap Lake communities report an average household size of six, headed mainly by a male member. Over two-thirds of all household members, including women and children, are involved in some form of work related to harvesting, processing or marketing of fish and maintaining of gears. The main ethnic origin of household members is Khmer, with Chinese, Vietnamese and Cham in the minority. As a large number of these households live in rural riparian communities and many build their houses on water, access to schools is restricted. This in part explains the low level of literacy and education, for example, as much as about 20-25 percent of household members have no formal education. The low education level applies particularly to female heads of households and female household members. This partly explains their lower income and socioeconomic status compared to male-headed households.

A more recent study undertaken in 2003, titled "Socioeconomics and values of resources in Great Lake - Tonle Sap and Mekong - Bassac Area" (Rab *et al.*, 2005), further distinguishes the households around the Tonle Sap Lake by the level of involvement in fishing activity. 'Fishing' villages refer to villages where 80-90 percent of households consider fishing as their primary occupation. 'Farming' villages are those with at least 80 percent of households engaged in farming, while 'fishing cum farming' villages are those with households relying on fishing during the wet season and farming during the dry season. Almost all households in fishing villages and about 66 percent of fishing cum farming households fish all year round. In farming villages, on the other hand, almost half of the households fish during the closed season, when the water level is high and farming impossible.

The distinction of fisheries-dependent com-

munities by village types offers several other insights. For example, Rab *et al.* (2005) show that ownership of assets and the level of debts varies between these villages. Some households in fishing villages build their houses on boats or over the water on cages and stilts because they own no land. The value of their houses is thus lower than that of households in farming villages. However, unlike predominately farming households, fishing households require higher investment in occupation-related equipment, such as boats for fishing and transportation, generator, engine and cell phone for fish processing and trade. They also tend to have a higher percentage of expenditure on consumables compared to fishing cum farming and farming households. Consequently, more fishers are in debt compared to farmers and their main sources of credit are relatives, friends, traders and local money lenders -- not financial institutions.

Fishing households tend to have higher percentage of expenditure on consumables compared to fishing cum farming and farming households. Thus, they are more in debt.

OCCUPATIONAL PLURALISM, LIVELIHOOD STRATEGIES AND GENDER ROLES

Households around the Tonle Sap Lake are distinguished by their occupational pluralism which is also marked by considerable seasonality. Consequently, the basis on which households report their primary occupation is difficult to assess. Households that build their houses on land tend to report their primary occupation as farming though they may fish regularly. Those who live in houses built over water may spend considerable time fishing but may earn additional income from flooded rice fields and other farming activities.

The extent to which any household engages in fishing -- as a primary source of income, through maximum allocation of their time, merely for daily consumption needs, or as insurance against crop failure -- is hard to quantify because these involvements and motivations also vary across time and space. Further, all households are normally engaged in other fishing-related

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income generating and subsistence activities such as gear making, fish processing, fish marketing and fish culture.

Access to and utilization of common property resources are critical factors in sustaining people's livelihoods and are an important part of livelihood strategies, particularly for those with limited livelihood alternatives. The study by Rab *et al.* (2005) shows that more than 80 percent of households rely heavily on firewood collection and gathering of vegetables like morning glory and water spinach. Income from this activity could amount to about US\$26 per household per annum, which is considerable, given that the total per capita income is estimated at about US\$172 (see below). This is significantly lower than the national per capita income of about US\$311 in 2003.

Is fishing a preferred lifestyle or is it the only livelihood option? The main reasons for people's involvement in fishing are that it is an

Diversification of income generating and subsistence activities is an important livelihood strategy for the majority of the people living around the Tonle Sap Lake regardless of primary occupation, gender, age and education.

inherited family tradition, a part of traditional food collection for home consumption, and a cheap food source. Households living further away from the Tonle Sap Lake may have more mobility to change from fishing to other occupations, while those living closer to

water bodies are less able to change. It is important to acknowledge the importance of livelihood diversification and alternative employment opportunities outside the fisheries sector. Therefore, diversification of income generating and subsistence activities is an important livelihood strategy for the majority of the people living around the Tonle Sap Lake regardless of primary occupation, gender, age and education.

Traditional gender roles have a bearing on livelihood strategies. Women continue to bear the main responsibilities for home-making and child rearing. Men, on the other hand, work outside the house to earn income, including from fishing. Women are less frequently involved in fishing, but they are key actors in the supply chain of aquatic products, in fish culture and in the maintenance of fishing gears. Among the households headed by women -- and this is a considerable number

around the Tonle Sap Lake -- most reported similar primary occupations as male heads of households. Women's involvement in fishing may likely be higher than traditionally understood since much of their activity which is aimed at provisioning for the household is 'invisible'. It has been observed that where opportunities present themselves, women do fish in rivers using small gillnets, often with their children.

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VALUING FISHERIES AND AQUATIC RESOURCES

Valuing fisheries and aquatic resources is a complex proposition -- they can be valued for their use and non-use values (Figure 1). The use-values may further be divided into direct use, indirect use and option values. 'Direct use' values are obtained from production, consumption and sale of resources, such as through fishing, farming and firewood collection, as well as non-consumptive uses such as energy, shelter, transportation and recreation. However, there are also 'indirect use' values which are derived from ecological functions and services provided by aquatic resource systems in terms of, for example, use of flooded forests as natural fish nurseries and spawning and foraging grounds, maintenance of water quality, flow and storage, flood control and storm protection, nutrient retention and micro-climate stabilization. The 'option value' is obtained when the deriving of a benefit is postponed to a later date like having a long term closed-season. Examples of non-use values are 'existence value' obtained from the knowledge and the joy associated with knowing that a natural resource exists in good health and 'bequest value' associated with the desire to set aside a resource to future generations. These non-use values are less tangible and more difficult to estimate than use values and thus are seldom considered in management decisions.

One method to estimate direct 'consumptive' use values of fisheries and aquatic resources is through surveys of gross household income from different activities. These estimates reflect the importance of resources in terms of income and livelihood dependency, which is the most tangible value of the resource. Using

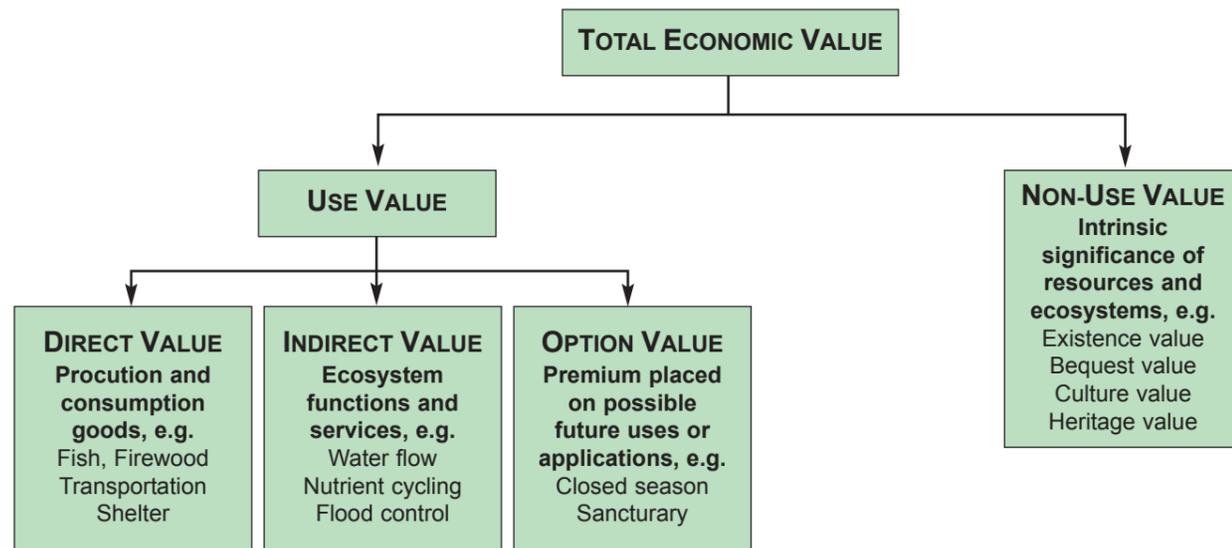


Figure 1 Different kinds of values associated with Tonle Sap aquatic ecosystem

data from household surveys conducted by Rab et al. (2005), direct use values of Tonle Sap fisheries and aquatic resources are estimated based on reported income from sampled households in fishing, fishing cum farming and farming villages. The estimates are also distinguished by income level in order to capture the distribution of wealth and existing income inequality.

annual income of only about US\$470, or per capita income of US\$78 (Figure 2). Put differently, about 12 percent of households (with annual income above US\$2,000) capture almost half of the total gross income from all households. Most likely, households with average income less than US\$1,000 are small-scale, subsistence fishers and farmers who rely heavily, if not entirely, on aquatic resources for their livelihoods, while those earning high income are middle-scale fishers and fishing lot owners. The disparity in income distribution between households is evidently an important concern that needs to be addressed.

When adding values of fisheries for home consumption (about US\$13 million) and direct values of other common property resources (about US\$5 million), the total gross direct consumptive use values from the Tonle Sap Lake is raised to about US\$233 million. It is important to note that several assumptions are made to obtain these estimates, and at best, they only represent the 'minimum' values of aquatic resources from the Tonle Sap Lake. The significant non-use values of the Tonle Sap Lake and the overall wetlands ecosystems need to be captured and discussed in the design of natural resource management policy to reflect the true importance of these resources to people's livelihoods.

The estimated gross income for all fisheries dependent households in the five provinces is about US\$215 million, which equals to an annual per capita income of about US\$172.

As shown in Table 1, there is a vast difference between average annual income of households in the lower end of the income range (less than US\$1,000) and those on the higher end (more than US\$5,000). The estimated gross income for all fisheries-dependent households in the five provinces is about US\$215 million. This implies an annual per capita income of about US\$172, based on the estimate number of about 209,000 households with an average size of six persons per household.

About 12 percent of households (with annual income above US\$2,000) capture almost half of the total gross income from all households.

When considering household income by income level, the situation is stark for the majority of households, as over 70 percent of all households earn

Table 1 Estimated 'gross' annual income of fisheries-dependent households in five provinces around the Tonle Sap Lake

Income level	Number of fisheries-dependent households ('000)	Total gross income for all households (Million US\$)
≤1000	151	71
1001 - 2000	34	44
2001 - 5000	18	60
>5000	6	40
Total	209	215

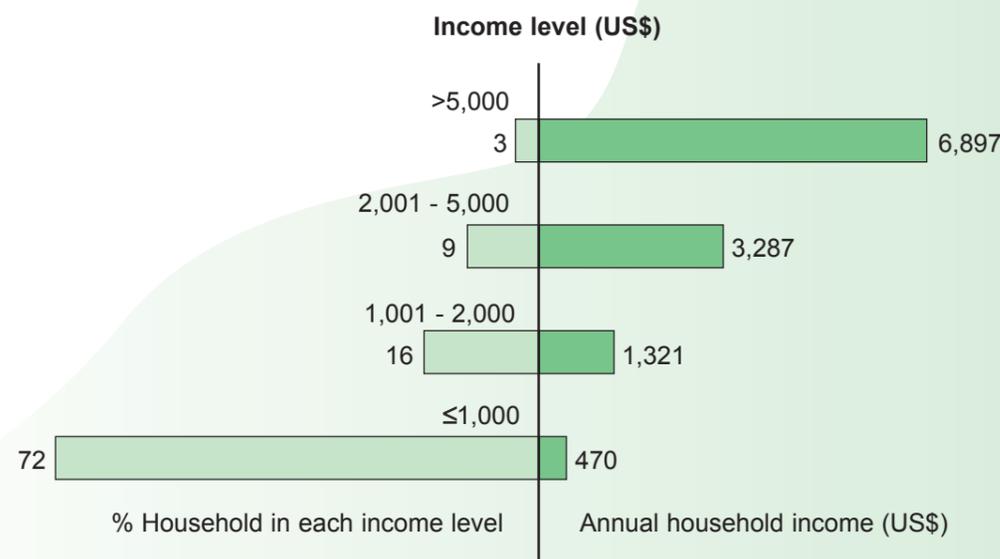


Figure 2 Percent distribution of number of households and estimated gross annual income by income level

ISSUES AND CHALLENGES IN SUSTAINING FISHING LIVELIHOODS

Factors adversely affecting people's livelihoods possibilities are many. There are environmental and ecological challenges, which include the natural variability in the level of rains and floods, and the timing and duration of flooded areas. These factors are however intensified through human activities such as dam construction, deforestation, use of pesticides in agriculture and land development. These indirect impacts, as well as the direct impacts caused by activities such as

overfishing and the use of illegal and destructive gears, have important consequences for the livelihoods of Tonle Sap Lake communities.

There are also other socio-economic factors that adversely impact livelihoods around the Tonle Sap Lake. They include greater population pressure, conflicts between stakeholders over access rights and uses of resources, disproportionate distribution of income and gender inequality. Aquatic-dependent communities are highly vulnerable to changes in the natural productivity of the Tonle Sap Lake as well as institutional and management changes, such as fisheries policy reforms that

Other socio-economic factors that adversely impact livelihoods around the Tonle Sap Lake include population growth, stakeholder conflicts over access rights and uses of resources, inequality in income distribution and gender issues.

can bring about opportunities as well as new sets of challenges. The vulnerability of people depending on the lake ecosystem is reinforced by the fact that most of the values of this ecosystem are still poorly accounted for. Taking greater account of these

values should help build awareness that can contribute to improving people's livelihoods.

What responses are needed to address the ecological, social, economic and governance challenges facing the aquatic resources and ecosystem of the Tonle Sap Lake? Some of the research needs and policy considerations are:

- Increasing knowledge about the ecosystems, e.g., the relationship between loss of habitats and flooded forests and impacts of fishing on the health and productivity of the Tonle Sap Lake;
- Understanding the social dynamics between stakeholders, including migrants, seasonal fishers and fishers of various ethnic groups in order to address issues related to use of illegal and harmful gears, stakeholder conflicts, resource access, market and credit systems;
- Increasing awareness about the existing disparity in income among households;
- Improving the estimates of total economic values of the Tonle Sap Lake fisheries and aquatic ecosystem by incorporating all use and non-use values and cost information;
- Exploring livelihood options, strategies and alternatives in order to assess impacts of various activities and different policy options on food security and quality of life;
- Understanding the roles and contributions of women to income generation and sustaining livelihoods, as well as in management and decision-making process; and
- Examining the effectiveness of the recent fisheries policy reforms, particularly in terms of benefit sharing and stakeholders' inclusion/exclusion

issues, in order to make necessary adjustments in the institutional arrangements and governance structures.

CONCLUSION

This brief describes the socioeconomics and livelihood strategies of the fisheries-dependent communities living in and around the Tonle Sap Lake, and summarizes the results of recent studies that provide 'partial' estimates of the total economic values obtained from this aquatic ecosystem. Methodologically, livelihoods assessments and valuation processes should be inter-related because understanding people's livelihood strategies provides one important path towards a full appreciation of the total values of the natural resources. Consequently, considerations of livelihoods and ecosystem values must be undertaken in tandem if we are to design truly sustainable resource use policies that will enhance the livelihood possibilities from the Tonle Sap Lake.

Responses to challenges:

- *Increasing knowledge about the ecosystem*
- *Understanding social dynamics of stakeholders*
- *Increasing awareness about income disparity*
- *Improving estimates of total values*
- *Exploring livelihood options*
- *Understanding roles and contributions of women*
- *Examining the effectiveness of the recent fisheries policy reforms*

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