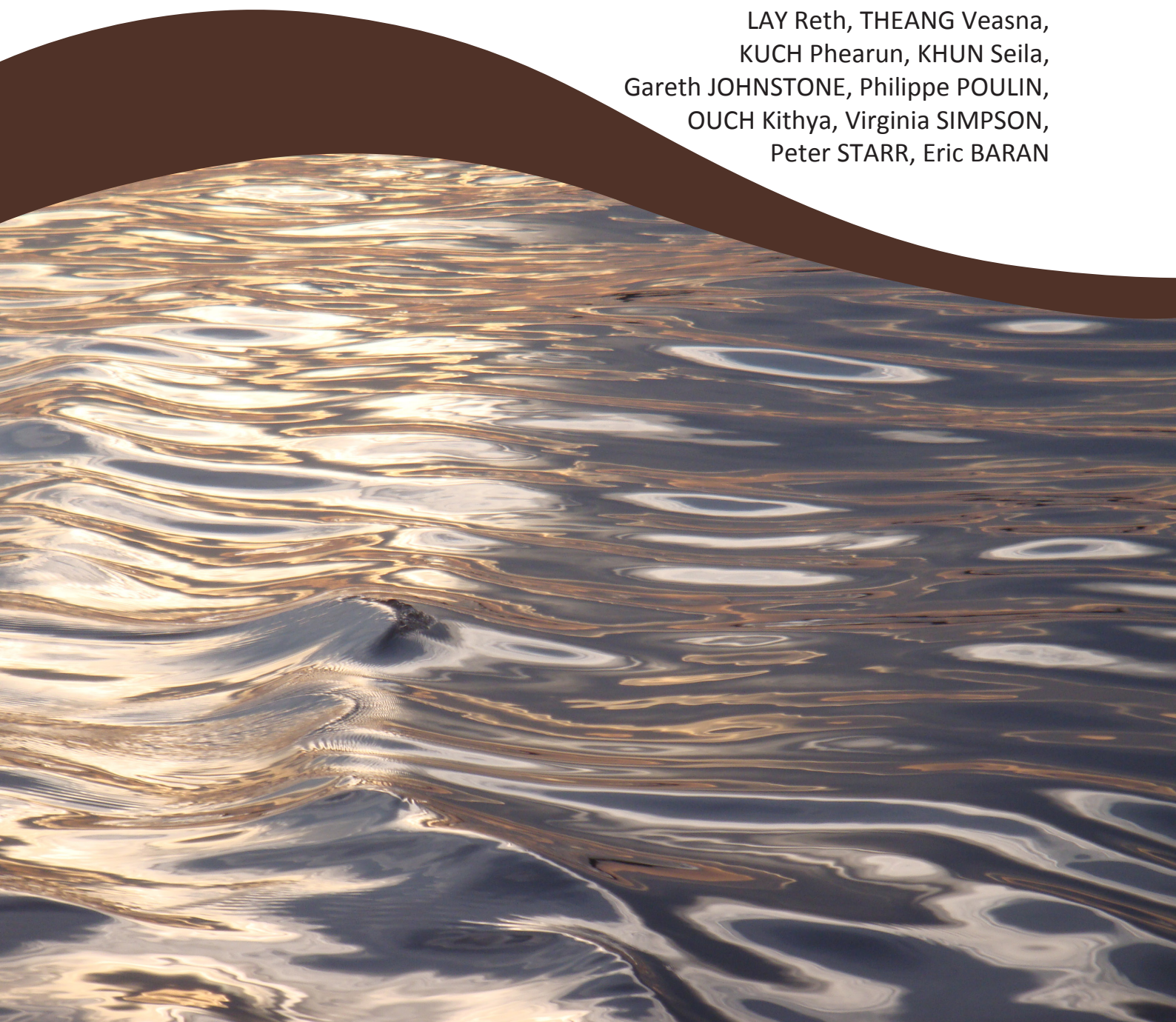


# TRENDS, OPPORTUNITIES AND CONSTRAINTS IN THE CONTRIBUTION OF FISH TO THE WELFARE OF RURAL COMMUNITIES IN CAMBODIA

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**Citation:**

Estepa N., Srey S., Lay R., Theang V., Kuch P., Khun S., Johnstone G., Poulin P., Ouch K., Simpson V., Starr P., Baran E. 2016. Trends, opportunities and constraints in the contribution of fish to the welfare of rural communities in Cambodia. Inland Fisheries Research and Development Institute (Fisheries Administration) and WorldFish. Phnom Penh, Cambodia. 34 pp.

**Key words:**

welfare – rural livelihoods – small-scale fisheries – environmental change – adaptive strategies

**ISBN-13:978-9924-9046-3-2**

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2016

Printed in Cambodia

*The Inland Fisheries Research and Development Institute (IFReDI) is a national agency under the supervision of the Fisheries Administration of the Ministry of Agriculture, Forestry and Fisheries in Cambodia. IFReDI aims at providing scientific information and technical support for the sustainable development and management of inland living aquatic resources in Cambodia, based on biological and socioeconomic research, for the country's food security and economic prosperity.*

*WorldFish is an international, nonprofit research organization that harnesses the potential of fisheries and aquaculture to reduce hunger and poverty. WorldFish is a member of CGIAR ([www.cgiar.org](http://www.cgiar.org)), a global research partnership for a food-secure future.*

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# **TRENDS, OPPORTUNITIES AND CONSTRAINTS IN THE CONTRIBUTION OF FISH TO THE WELFARE OF RURAL COMMUNITIES IN CAMBODIA**

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### **Acknowledgements**

Norberto Estepa organized and led the survey, analyzed data and prepared the report;

Srey Sinath led the survey team and provided inputs to the report;

Lay Reth, Theang Veasna, Kuch Phearun, Khun Seila implemented the survey;

Gareth Johnstone provided the methodological approach;

Philippe Poulin, Kithya Ouch and Virginia Simpson provided inputs;

Peter Starr edited the report; and

Eric Baran initiated and supervised the study, provided inputs and finalized the report.

### **Citation**

Estepa N., Srey S., Lay R., Theang V., Kuch P., Khun S., Johnstone G., Poulin P., Ouch K., Simpson V., Starr P., Baran E. 2016. Trends, opportunities and constraints in the contribution of fish to the welfare of rural communities in Cambodia. WorldFish and Inland Fisheries Research and Development Institute, Fisheries Administration, Phnom Penh, Cambodia. 34 pp.

# EXECUTIVE SUMMARY

The objective of this study is to better describe: (i) the contribution of fish to the welfare of rural households, (ii) how fish supports the welfare of the poor and vulnerable, (iii) the main changes, trends and seasonality in the contribution of fish to welfare, (iv) differences in perspectives of community leaders, men and women and (v) constraints and opportunities regarding the contribution of fish to welfare.

Focus group discussions were conducted with 238 participants in nine villages representing three agro-ecological zones (Lowlands, Tonle Sap and Upper Mekong) and three levels of fish dependency (non-dependent, medium-dependent and highly-dependent). In each village, separate discussions took place with village leaders, men and women with a focus on three wealth categories (medium, poor and very poor) and gender differences.

## **Lowlands agroecozone**

In the Lowlands Zone, fish and wetland resources are considered not so profitable but people fish year round for food, especially during the lean season. Earnings from fish-related activities increase from July to January after the rice-farming season. Fishing is the only source of food and income for the very poor who do not have other jobs, and for whom this activity requires least investment. Processing is mainly a business for the medium-wealth category with capital. Fishing is not a good source of income (better opportunities exist) and the number of fishermen is said to be decreasing. People also say that initial fisheries reforms in 2001 resulted in greater fish abundance for one year before fish populations started to decline and that subsequent reforms increased the number of fishermen and illegal fishing activities. Respondents suggest strengthening community fisheries management to ensure the sustainability of fisheries.

## **Upper Mekong agroecozone**

People in the Upper Mekong zone consider fish an important source of food. It is not the main source of income but helps the population, particularly during the lean season. Villagers fish year round. Earnings from fish-related activities are maximal between August and October. The very poor do not fish much as they cannot afford gear or boats. Fishing is important to the poor and medium-wealth categories (the poor having no or few alternative jobs). Only the medium-wealth category has enough money to buy fish from the poor and process fish. Dam development is a big concern and lifestyles are already changing (less fish, and new jobs in sectors such as forestry and plantations). River protection is seen as important. Local people see the *dai* (bagnet) fishery on the Tonle Sap River in Phnom Penh and Kandal Province as a source of overfishing and decline in fish populations.

## **Tonle Sap agroecozone**

Earnings from fish-related activities are maximal between August and December, which helps coping with limited food and income during that period. Fish is a good source of income, the second activity after rice farming and the main source of protein. The number of fishermen is said to be increasing around the Tonle Sap. Fishing is an important activity for the poor and the medium-wealth category. The very poor often work for the medium-wealth category, the group most involved in fish processing. Fisheries reforms have resulted in great challenges for community fisheries in managing their fishery domains including conservation areas.

### **Common patterns**

The price of fish is said not to have increased much over the past 10 years although the price of other commodities did. Fishing was the main source of income for household needs during severe floods in 2000 and 2012. Collecting aquatic animals and plants often provides money for children to go to school, especially among the poor and very poor. Fishing is an important occupation for households affected by HIV/AIDS or with handicapped people due to low incomes and difficulties in finding jobs.

### **Conclusions and recommendations**

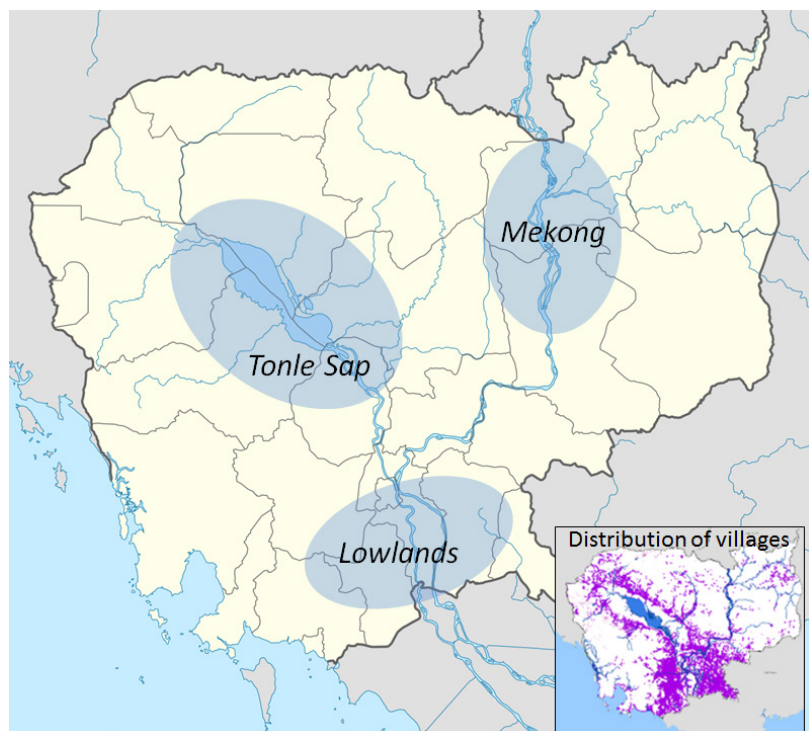
Reduced fish catches affect both the nutrition and incomes of the poor. Interviewees highlighted the risk of malnourishment and health problems for children as well as lower school attendance due to insufficient income. Fishermen from the three zones require technical and financial support to improve fish values and market chains. They seek help in getting organized and improving post-harvest activities and sales through the creation of women's groups, training and clear strategies.



# 1 INTRODUCTION

**Freshwater capture fisheries in the Lower Mekong Basin provides 47 to 80 percent of animal protein consumed, as well as livelihood opportunities on a large scale.** In the absence of a solid estimate of the economic value of these fisheries, however, their importance remains poorly recognized by institutions and in development plans, which hampers rural development. Furthermore, the specific role of fish and agricultural resources in livelihoods and rural welfare has never been quantified. Welfare is defined here as a contented state of prosperity, health and well-being.

**The present study is one of the contributions of the project “Assessing economic and welfare values of fish in the Lower Mekong Basin” funded by the Australian Centre for International Agricultural Research to assess the multiple values of fish resources in rural livelihoods.** The project combines quantitative approaches focused on income, nutrition or economic shocks to qualitative approaches focused on trends, processes, opportunities or obstacles. The present study is a contribution to the latter and corresponds in particular to two of the objectives of that project, i.e. (i) to assess the welfare value of fish for rural populations in Cambodia and identify strategies that maximize this value, and (ii) to inform a large range of stakeholders about the actual role of fisheries in the national economy and livelihoods.



**Figure 1: Agro-ecological zones based on access to water in relation to population distribution.**  
Background map: NordNordWest.

### **Approach of the study**

The present study assessed the welfare value of fish for rural populations in Cambodia. Activities focused on (i) identifying the main changes and trends in the contribution of fish to the welfare of rural households. The corresponding research questions are:

- (i) What is the contribution of fish to the welfare of rural households?
- (ii) How do fish support the welfare of poor and vulnerable social groups?
- (iii) What are the main changes, trends and seasonality in the contribution of fish to welfare?
- (iv) What are the difference in the perspectives of community leaders, men and women?; and
- (v) What are constraints and opportunities regarding the contribution of fish to welfare?

**To address the research questions, a focus-group discussion method and questionnaire were prepared.** These were based on the methodological recommendations of a project report (Johnstone, 2012). The approach and method reflected the intents of the quantitative questionnaire used in the welfare component of the project, and integrated elements from another project report (Schwartz *et al.*, 2016). The questionnaire was used in nine villages representing three agro-ecological zones (Lowlands, Tonle Sap and Upper Mekong) and three levels of dependency (non-dependent, medium and very high). Information was entered in Excel, coded thematically and descriptively analyzed.

The report includes: (i) the present introduction, (ii) the methodology, which discusses the study area, the social, biological and statistical methods used and (iii) results according to the three agro-ecological zone sections. Each of these sections consists of: (a) contribution of fish to the welfare of rural households, (b) how fish supports the welfare of the poor and vulnerable, (c) main changes, trends and seasonality in the contribution of fish to welfare, (d) difference in the perspectives of community leaders, men and women and (e) constraints and opportunities regarding the contribution of fish to welfare.

## 2 METHODOLOGY

### 2.1 STUDY AREA

Focus group discussions were carried out in selected villages in each of the three target agroecological zones (Figure 1) and three of the dependency quartiles. Nine discussions with 238 participants took place in April – May 2014 (see Table 1 below). The approach included discussions to assess the importance of fish and fisheries to those households that might not have been directly engaged in the sector.

**Table 1: Total number of focus group discussions and participants**

Zone	Dependency	Province	Village	Participants
Lowlands	Q2 (medium)	Kandal	Preaek Ta Baen	23
Lowlands	Q0 (not dependent)	Takeo	Samraong	29
Lowlands	Q4 (very high)	Takeo	Kampong Luong	28
Tonle Sap	Q4 (very high)	Battambang	Preaek Norint	28
Tonle Sap	Q2 (medium)	Kampong Thom	Ballangk	30
Tonle Sap	Q0 (not dependent)	Siem Reap	Dak Phka	29
Upper Mekong	Q0 (not dependent)	Kratie	Anhchanh	24
Upper Mekong	Q2 (medium)	Kratie	Dei Doh Kraom	24
Upper Mekong	Q4 (very high)	Stung Treng	Srae Kor Mouy	23
<b>Total</b>				<b>238</b>

### 2.2 DATA COLLECTION TECHNIQUES

**In each village, three discussions were conducted – one with village leaders, another with men and a third with women.** The discussions, conducted within a day in each village, focused on the contribution of fish to welfare, how fish supports the welfare of poor and vulnerable groups and the main changes and trends as well as constraints and opportunities.

## Selection of participants

Each group comprised 8 - 12 people. Community leaders included village chiefs, chairs of commune councils and heads of community fisheries as well as men and women recognized as being important in the community such as the elderly or local entrepreneurs.

### Group A (Men & Women Together)

Leaders group	Men & Women
<ul style="list-style-type: none"><li>• Village Chiefs</li><li>• Commune Councils</li><li>• Heads of community fisheries</li><li>• Recognized leaders</li><li>• Respected women</li><li>• Respected elders</li></ul>	8 -12

The second group was composed of people from a cross section of wealth categories and occupations, representing fishermen, farmers and people engaged in other livelihood activities. Village leaders were asked to help select households in villages where a sample of men and women from different wealth categories (medium, poor and very poor) were selected. The discussions took three to four hours and remuneration was provided to those who participated.

### Group B (Men and Women Separate)

Wealth status	Men	Women
Medium	3	3
Poor	3	3
Very poor	3	3
Total	9	9

# 3 RESULTS

## 3.1 LOWLANDS AGROECOZONE

The lowlands are very densely populated and trade is active in the zone, characterized by a dense road network and a relatively wealthy population (Un *et al.*, 2015). The lowlands have high rice production but relatively limited fisheries.

### 3.1.1 Contribution of fisheries to welfare in diversified farming systems

#### 3.1.1.1 Importance of fish and wetland resources to people

**The zone revealed the importance of fish and wetland resources to the community as a source of food.** Participants said people were fishing on a daily basis because of availability and free access. Fishing provided a secondary source of income and people caught fish all year round. Almost all households fished during the wet season, with activity becoming intense between September (late wet season) and January (middle of dry season). This coincides with the lean season when rice availability is a problem (Figure 2).

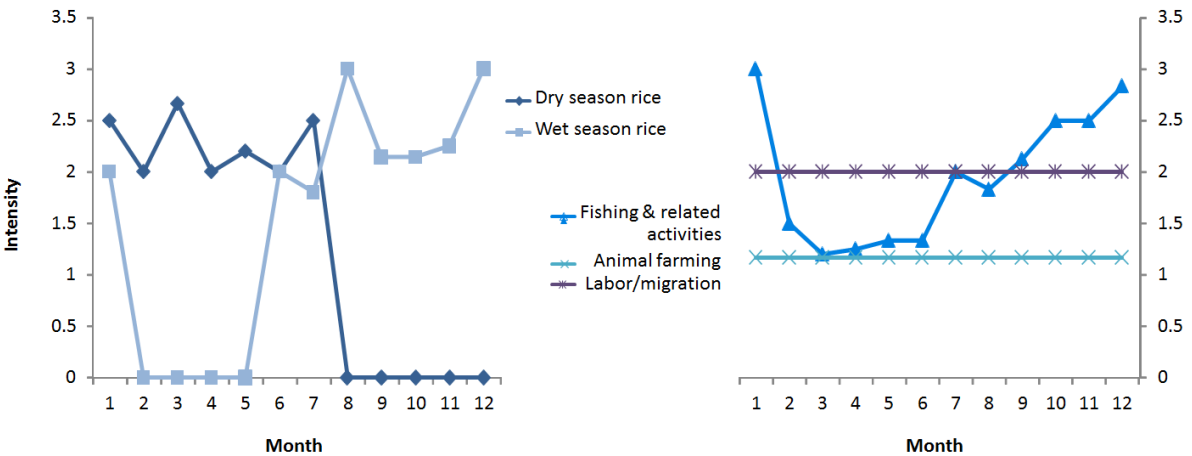


Figure 2: Main source of income of lowland communities

Around 67 percent of participants said that fishing and collecting floodplain animals and plants were very important for the very poor, older people and people with disabilities. The very poor did not have other jobs to support basic household needs such as buying rice so these activities helped sustain their living.

**Children and older people were actively involved in collecting plants and animals since such activities are accessible and easy.** Plants and animals collected provided food, income, and helped pay for children to go to school. Participants said the very poor did not usually have their own farmland so fishing and collecting aquatic animals and plants were the only sources of food and income. Fishing required little investment compared with other activities such as small businesses, especially fishing

in rice fields which did not require a boat. Fishing was a skill acquired from childhood. It was difficult for fishers to shift to other jobs because it took time for them to acquire other skills due to their limited education. Similarly, the poor and very poor did not process fish. With their hand-to-mouth existence, they could barely support the daily subsistence needs of the household with the fish they brought home. Participants said fishing had become the main occupation of those affected by HIV/AIDS, especially when their situation became public knowledge and no employer wanted to hire them.

Fish processing was an important business for households in the medium-wealth category. They had money to invest as well as equipment and materials to process the fish. They usually bought fish from the poor at a very low price. People involved in this activity had developed their skills at a young age.

**All participants said fishing was a man's job while selling and processing fish were seen as important tasks for women.** Men were perceived as having the necessary skills for fishing activities. Sons usually went with their fathers to fish, while daughters stayed at home to help their mothers with housework. Long experience taught the men where to find good fishing areas and the times when fish were abundant. Girls started selling fish at a very young age. Women were seen as being good at sales and having better communication skills than men, their lack of shyness making them more effective in convincing their customers to buy their products. Fish processing was also considered an important task for women. Traditionally, girls are trained in fish processing at an early age. According to the participants, women were skilled in this activity and knew how to select and prepare ingredients. Both males and females collected aquatic animals and plants.

### *3.1.1.2 Importance of fish to the welfare of the poor and vulnerable social groups*

**Participants said fish and other wetland resources were a free commodity appearing in rice fields and other water bodies during the wet season.** They provided food and income to villagers, particularly the poor, very poor and people with disabilities including those affected by HIV/AIDS. They said fishing in rice fields and collecting aquatic animals and plants were particularly important due to low investment requirements. Fish could be collected in rice fields that were shallow even during the wet season. During the wet season, water bodies expand to communal areas where everybody has access to fish, particularly poor and vulnerable social groups. Other aquatic animals and plants can also be collected in these areas.

**The main impact of declining fish catches was on the poor, very poor and people with disabilities including those affected by HIV/AIDS as fishing is their primary or only source of food and income.** "When fish go down, the poor go down," was a common remark. As fish catches decreased, participants said household expenses increased (as people had to buy more food). Children became malnourished, stopped attending school and worked to help their parents. Household debt may rise, incidences of domestic violence may increase because of lack of food and other necessities and heads of households may migrate, resulting in problems such as broken families. The decline in fish resources was said to affect all members of the household regardless of gender and age.

### *3.1.1.3 Increasing welfare and livelihood value of fish*

**Participants expressed support for cracking down on illegal fishing, expanding community fisheries and developing fish-processing activities.** Economically important species collected included striped snakehead or *trey ros* in Khmer (*Channa striata*), a carp known as *trey chkkok* (*Cyclocheilichthys enoplos*), bronze featherback or *trey slat* (*Notopterus notopterus*) and Boeseman croaker or *trey promah* (*Boesemania microlepis*). Participants in discussions said they considered fishing as a source of daily subsistence for fishermen but not a main source of income. Fish production was said to be decreasing

due to illegal and overfishing. Participants recommended efforts to stop illegal fishing, suggesting that the government disseminate information about fishery laws, prohibited fishing methods and penalties for illegal fishing. They also recommended close cooperation between villagers in reporting illegal fishing to authorities. The government, they said, should continue initiatives to stop illegal fishing by setting up community fisheries committees in every village to patrol fishing grounds. Participants also suggested organizing the wives of fishermen to start processing groups to add value to their catch, noting that processing was a skill already held by many women. Their constraint was that they needed cash for daily subsistence. If processing could be supported technically and financially, they could increase daily catch values and improve their economic situation.

#### *3.1.1.4 Main barriers and constraints in relation to fisheries*

**Declining catches were seen as the main barrier and constraint to improving the welfare and livelihood values in fisheries.** Fishing was not recognized as a major source of income because fishermen caught barely enough for household consumption. Participants said that most fishermen's children were looking for other opportunities in urban areas because it was difficult to earn a living from fishing. They also noted that the number of illegal fishermen had increased after fishery reforms, especially those who use electric fishing, and that fishing grounds were not adequately protected.

**The lack of technical expertise and capital for improving the quality of processed fish particularly affected the poor and very poor.** Government initiatives to improve post-harvest activities include the one village one product (OVOP) policy, although these were still being developed.

### 3.1.2 Importance of fish in terms of income, nutrition, labor, health and adaptation

#### *3.1.2.1 Contribution of fish to nutrition*

**Fish and other aquatic animals are the main source of protein and nutrition for poor people.** Fish is widely available, especially during the wet season, from any type of water body including rice fields. Villagers said they believed the fish they were eating were free of chemicals that could adversely affect their health unlike pork and poultry.

#### *3.1.2.2 Contribution of fish to labor*

**Participants said they get more income from dry-season rice farming and other occupations compared with fishing.** In Samraong in Takeo Province, villagers said fishing in rice fields was limited to the flood season, usually between August and December. They also said that the number of fishermen was decreasing as younger people were seeking better-paying jobs in urban areas, although they recognized the constraints – these young people were usually underpaid due to limited skills. Fishing was considered as a primary job for the poor because they had no land or other source of income. But few residents were engaged in fishing full time since jobs were available in urban areas. In Samraong, participants estimated that only 10 percent of the population were fishermen. Former fishermen were working as construction workers, electricians, mechanics, factory workers and in other jobs in cities.

**The poor and very poor do not usually have formal education and consider fishing-related activities as the main source of food and income for their households.** Participants said the poor and very poor combined at least four of the five main activities of fishing, selling, processing, collecting other aquatic animals and collecting plants. All household members had their own tasks and responsibilities. Heads of households (usually fathers) were responsible for fishing, usually with younger males (sons). They also prepared the fishing gear and the boats. Women and girls usually supported the men. They prepared meals for the household including food taken by men to the fishing grounds.

**Women and girls sell the catches of the husbands and sons, using skills acquired from their parents.** Fish processing is not considered a poor household activity because poor households did not have capital to buy and process fish. They also have limited skills in processing. Traders, also usually women and girls, processed fish bought from fishermen, stocking it during abundant months and selling it in the off season when prices were high.

**Men were usually the main collectors of other aquatic animals because the work is considered unsafe for women.** Some of these animals are collected at night. Women were mostly engaged in collecting aquatic plants for sale and household food. According to the participants, women are involved in this activity because aquatic plants are easy to collect and mostly used as vegetables (Figures 3 and 4).

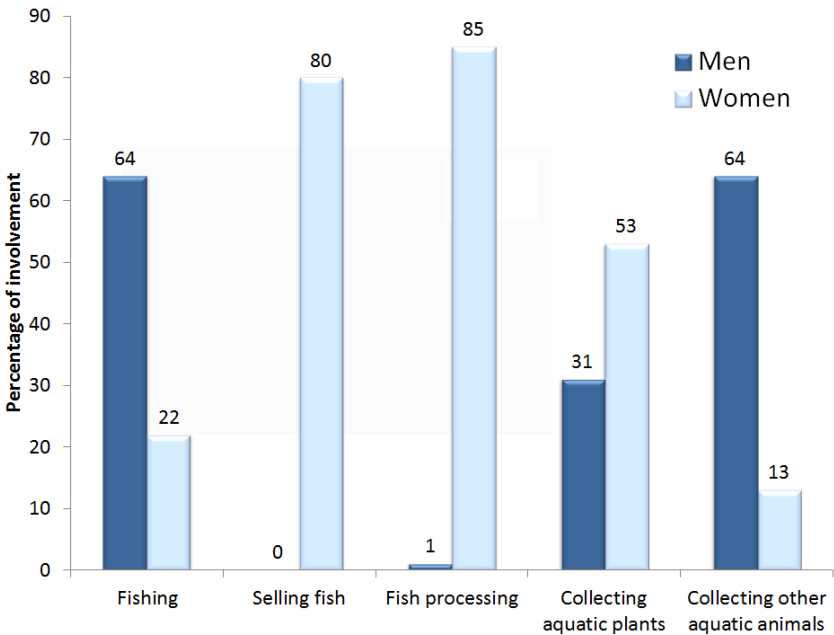


Figure 3: Adult involvement in fishing and related activities in Lowlands Zone



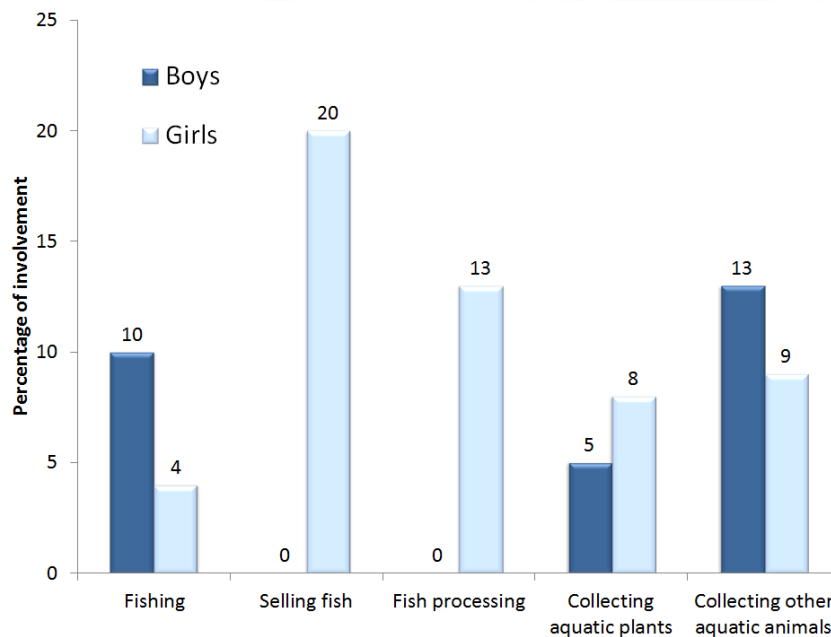


Figure 4: Children’s involvement in fishing and related activities in Lowlands zone

### 3.1.2.3 Contribution of fish to health

Participants said they believed fish did not harbor chemical substances that could adversely affect their health and was also low in cholesterol. They said doctors advised people with high blood pressure, diabetes, arthritis and related illnesses to change their diets by replacing meat with fish.

### 3.1.2.4 Contribution of fish to adaptation/resilience

In disasters such as floods and storms, fish become an important source of food for the poor. During the intense drought of 1993 when crops were damaged and livestock died, participants said their only source of food was fish from the floodplains. During times of abundance, processed fish served as a form of savings. The fish is then sold during the lean season or when children get sick.

### 3.1.2.5 Main changes and trends in the contribution of fish to welfare

After the initial fisheries reforms of 2001, participants said they observed increased fish abundance for one year followed by a decline because of increased illegal fishing. After the second reforms of 2012 opened up fishing grounds that were previously prohibited, catches were perceived to have declined due to inadequate protection, with poor and very poor households being the most affected. The result was deterioration in health and increased vulnerability. In poor and very poor households, children stopped attending school, reducing their future ability to compete for employment.

Participants said they perceived that droughts, floods and storms were becoming serious in recent years, forcing many people to depend on fish and other aquatic animals to survive. Low water levels in the wet season affected fish refuges and some aquatic animals died. Bigger floods destroyed most crops, leaving fish, other aquatic animals and plants as the only sources of food. Storms were seen as occurring more frequently with several people killed by lightning strikes.

**Labor shortages occurred when heads of households and other fishermen migrated to urban areas after disasters or when fishing could no longer support household needs.** Other coping mechanisms during difficulties included usurious loans resulting in heavy household debt and children leaving school to work in factories or brothels in urban areas.

3.1.2.6 Constraints and opportunities regarding the contribution of fish to welfare

**Strengthening the management capacity of community fisheries will provide a better future and sustain fishery resources.** All stakeholders should address post-harvest issues such as market and value chains. Social enterprises need to be developed to sustain community fisheries and conservation areas should be protected.

3.2 TONLE SAP AGROECOZONE

**The Tonle Sap Lake lies in the central plains of Cambodia, and is surrounded by five main provinces.** It is estimated that between 1.2 and 1.7 million people live in this zone (Keskinen, 2012). The area is divided into three distinct regions: fishing zones (5% of the population), agricultural zones (60%) and urban zones (35%) (Keskinen, 2012). The Tonle Sap Lake is characterized by abundant fisheries and high agricultural productivity (Un et al., 2015).

3.2.1 Contribution of fisheries to welfare in diversified farming systems

3.2.1.1 Importance of fish and wetland resources

**Participants in focus-group discussions said they consider fishing as their next source of income after rice farming.** They said that fish provides additional household income, especially during the peak season between July and December, and is also a main source of food. People consume fish daily because it is available in nearby bodies of water, which anyone can freely access. Most people also go fishing during the lean season because food, especially rice, is limited then. Participants estimated that numbers of fishermen were increasing and that many people – including those in the medium-wealth category – started fishing intensively in the area after the government abolished fishing lots (Figure 5).

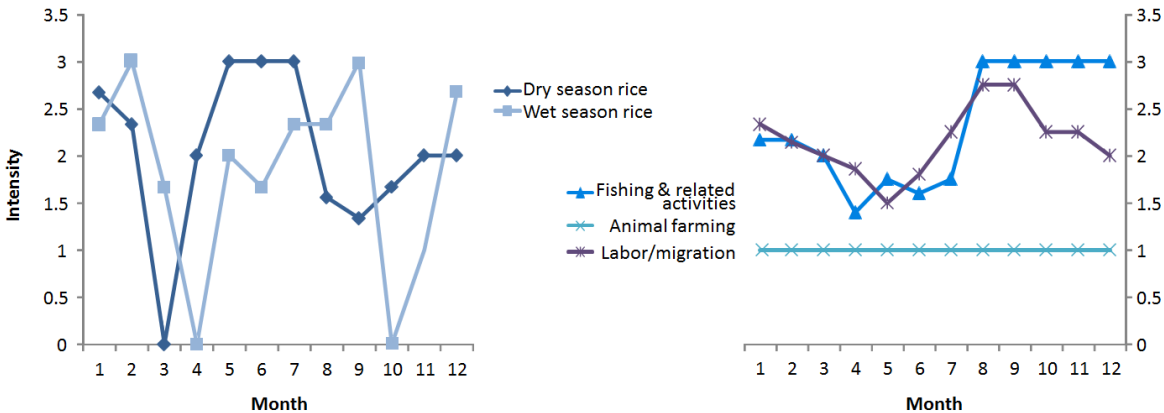


Figure 5: Main source of income of Tonle Sap communities

**Fishing is seen as an important activity for those in the medium-wealth and poor categories who have money to invest in boats and fishing gear to fish in more remote or deeper parts of the Tonle Sap Lake.** The availability of funds to invest also makes fish processing a profitable activity with good returns for those in the medium-wealth category, mostly traders. They usually buy from fishermen at very low prices, store the fish and sell it when prices are high. Some make loans to fishermen who repay with their catches. Collecting aquatic animals and plants is an important activity for households in the medium-wealth and very poor categories. This is important for the very poor because it does not imply high operating costs and can be done near their homes.

**All the participants said that fishing is a man's job and that processing is an important job for women.** According to interviewees, men are more skilled at fishing than women whose tasks include sales, since they are skilled in convincing customers to buy their products, and collecting aquatic plants, which they can identify for commanding good market prices. Men are also skilled in collecting aquatic animals, which usually takes place at night.

### *3.2.1.2 Support of fish to the welfare of poor and vulnerable social groups*

**The situation of very poor and vulnerable social groups in the Tonle Sap Zone is more difficult than for those in the Lowlands Zone.** Fishing is usually done by medium-wealth and poor people who have boats and fishing gear. The very poor usually work as laborers or fishermen for medium-wealth and better-off households. They are provided with boats and fishing gear by financiers who buy entire catches and usually dictate the price. Participants in the discussions said the very poor exploit all sources of food and income around the Tonle Sap, and especially collect aquatic animals and plants. People sometimes require the very poor and vulnerable to do illegal fishing on their behalf.

### *3.2.1.3 Increasing welfare and livelihood value of fish*

**The second phase of fisheries reforms provided access to fishing lots and increased the number of fishermen using illegal fishing gear, putting pressure on fish resources.** Management of fishing grounds was devolved to community fisheries but some villages were not organized and capacity was weak. Corruption existed in community organizations where illegal fishing was allowed in conservation areas. Participants claimed that fish prices have not changed for ten years and have even gone down in peak seasons whereas prices of other commodities have increased. Post-harvest facilities do not exist and illegal exports of fish products are considered an issue.

**The participants suggested concerted efforts by government authorities and people to stop illegal fishing, highlighting the need for the very poor and vulnerable to strengthen collaborative efforts to develop assets such as boats and fishing gear.** They also noted the need to improve markets and value chains through networking and training supported by the government and development organizations with the aim of developing the post-harvest and export sectors.

### *3.2.1.4 Main barriers and constraints in relation to fisheries*

**People highlighted the need for reforms and a community approach to address corruption involving both their own community members and authorities.** Growing pressure from an increasing population was seen as another challenge along with technical knowledge and financial support for market and value chain development, which was constrained by a lack of networking at various levels.

### 3.2.2 Importance of fish in terms of income, nutrition, labor, health and adaptation

#### 3.2.2.1 Contribution of fish to nutrition: food source, alternatives, sources of money for other feeding, trigger effect.

**All participants said all household members ate fish every day.** People said they believed fish does not harbor chemicals harmful to humans, that they never feel sick when there is a sufficient supply of fish and that fish is more nutritious than meat. Fish is also seen as good for growing children and boosting immunity so people with heart, blood and other conditions are advised to eat fish instead of meat. During the peak season, fishermen can spend their income from fishing to buy other foods.

#### 3.2.2.2 Contribution of fish to labor: occupational participation (gender, age ranges)

**Fishing in the Tonle Sap Zone is done by male members of households who also prepare the fishing gear and boats while women usually do housework including preparing food brought to the fishing grounds.** Females can take part in fishing but their role is limited to rowing boats. Males are usually responsible for using the fishing gear.

**The participants said they consider selling fish as a female task since men are mostly tired after fishing and women are better at talking and bargaining with customers.** Boys are said to be ashamed to sell fish because they think it's a woman's job. Women acquire fish-processing skills after years of training and experience in preparing food.

**Collecting other aquatic animals is usually a male activity and sometimes takes place at night whereas collecting aquatic plants is mainly a female activity.** Men and boys are said to be familiar with aquatic animal behavior while women are perceived as knowing which plants fetched the best prices in different seasons. Men also collect plants while fishing. The low investment required in such activities encourages all household members to collect animals and plants for food and income (Figures 6 and 7).

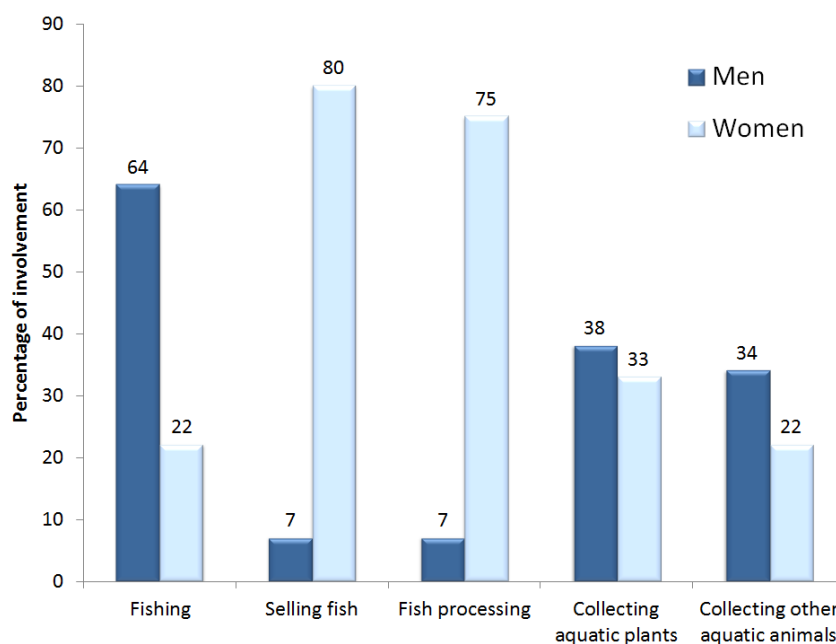


Figure 6: Adult involvement in fishing and related activities in the Tonle Sap Zone

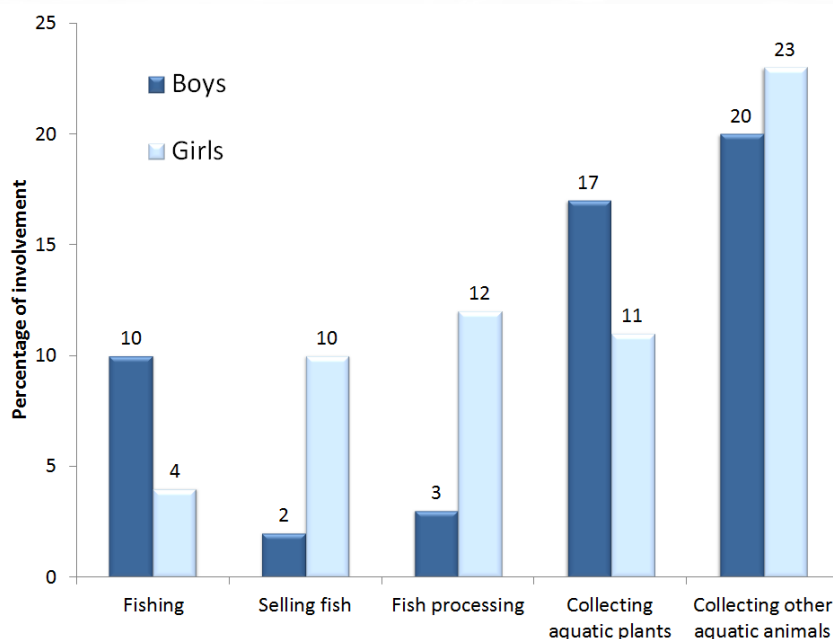


Figure 7: Children's involvement in fishing and related activities in the Tonle Sap Zone

### 3.2.2.3 Contribution of fish to health: food source, alternatives, sources of money for other feeding, trigger effect

**Participants were aware of the health benefits of fish.** Eating too much meat was seen as causing stomach problems and raising levels of uric acid. Fish is perceived as being chemical-free and containing vitamins that are especially beneficial for young children and older people suffering from arthritis and gout.

### 3.2.2.4 Contribution of fish to adaptation/resilience: climate shocks, income shocks, specific to poor and vulnerable social groups

**Fishing is considered an important source of income for households during emergencies.** The Tonle Sap Zone has experienced exceptional floods in recent years resulting in crop losses, notably in 2012. Participants said farmers who borrowed money to plant rice coped with such losses by increasing their fishing effort. A similar response was seen during droughts with farmers fishing more to compensate for the deaths of chickens in the early dry season.

### 3.2.2.5 Main changes and trends in that contribution of fish contribution to welfare (over years and between seasons)

**Participants expressed concern about declining fish resources, especially in shallower areas of the Tonle Sap Lake.** The need to go fishing in deeper or more remote portions of the lake is seen as an additional expense affecting the incomes and food of poor and very poor households. Although fishing lots have been abolished, participants perceived the *dai bagnet* fishery on the Tonle Sap River as still over-exploiting fish resources. They also said that community fisheries were too weak to manage newly opened fishing grounds, which had led to increases in illegal fishing.

### 3.2.2.6. Overall: constraints and opportunities regarding the contribution of fish to welfare

**Weak management is seen as a major constraint to managing fish resources and protecting conservation areas following the abolition of fishing lots.** Participants highlighted the need to support existing and new community fisheries to manage fishing grounds that used to be fishing lots. They also suggested improving post-harvest activities as well as value and market chains to develop export markets for processed fish products.

## 3.3 UPPER MEKONG AGROECOZONE

The Upper Mekong agro-ecological zone features important fisheries and low rice production. This zone is poor and isolated and is highly dependent upon fish resources (Un *et al.*, 2015).

### 3.3.1 Contribution of fisheries to welfare in diversified farming systems

#### 3.3.1.1 Importance of fish and wetland resources important to people

**Participants in focus-group discussions said they fished all year round but did not consider fishing as their main source of income** (Figure 8). Fishing was, however, seen as an additional source of income for people in the medium-wealth and poor categories. As with the Lowlands Zone and the Tonle Sap Zone, the peak fishing season is from August to October. These are lean months, requiring increased fishing effort to cope with limited food and income (Figure 8).

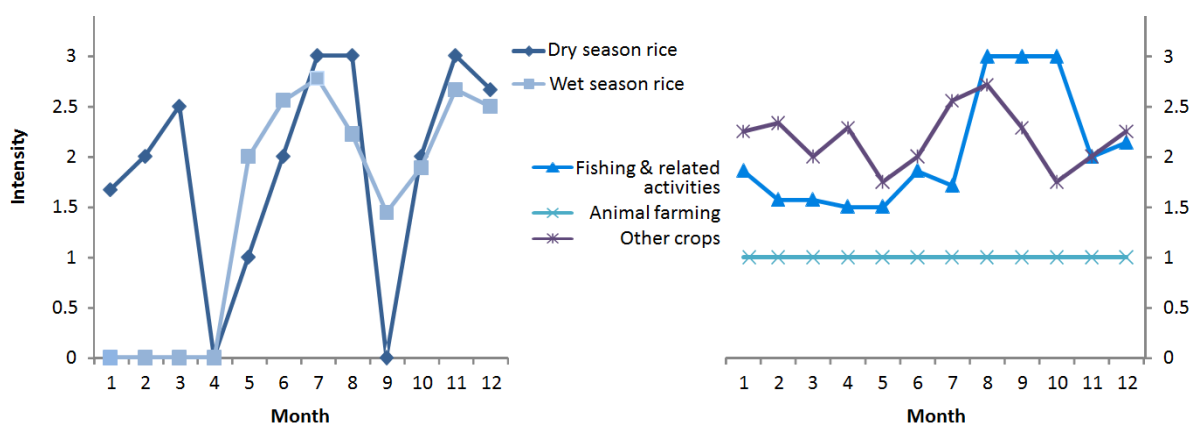


Figure 8: Main source of income of Upper Mekong communities

**Fishing is an important activity for people in the medium-wealth and poor categories who have their own boats and money to buy fishing gear – unlike the very poor who had only enough for daily subsistence.** Fish processing is usually important for people from the medium-wealth category who have the necessary skills and also enough money to buy fish from the poor. Selling fish is also an important activity for medium-wealth households who can usually transport fish from landing sites. Collecting other aquatic animals is important for medium-wealth, poor, and very poor households as a source of food and income whereas collecting aquatic plants is important for the poor and very poor.

**Fishing is seen as men's work while processing and selling fish is traditionally women's tasks.** The collection of other aquatic animals is usually done by men since this activity often takes place at night. Collecting aquatic plants is usually carried out by women, who had access to the plants.

### 3.3.2 Importance of fish in terms of income, nutrition, labor, health and adaptation

#### 3.3.2.1 Contribution of fish to nutrition

Participants said fish is an important part of a child’s diet to avoid malnutrition. Fish is also seen as the primary food supplement for older people with blood and heart problems.

#### 3.3.2.2 Contribution of fish to labor

According to interviewees, fishing is a traditional male activity since men are familiar with using fishing gear while sales is an activity for women trained from an early age to communicate with customers and be familiar with prices. Women are also in charge of fish processing since they have the skills and years of experience since mothers teach processing to their daughters.

The collection of aquatic animals is done by entire households but mostly by men when gathered at night. Collecting aquatic plants is usually a female activity although men also gather plants as they fish. Plants are often collected in the vicinity of people’s houses. Children also collect plants and sell them to help cover the cost of going to school (Figure 9 and 10).

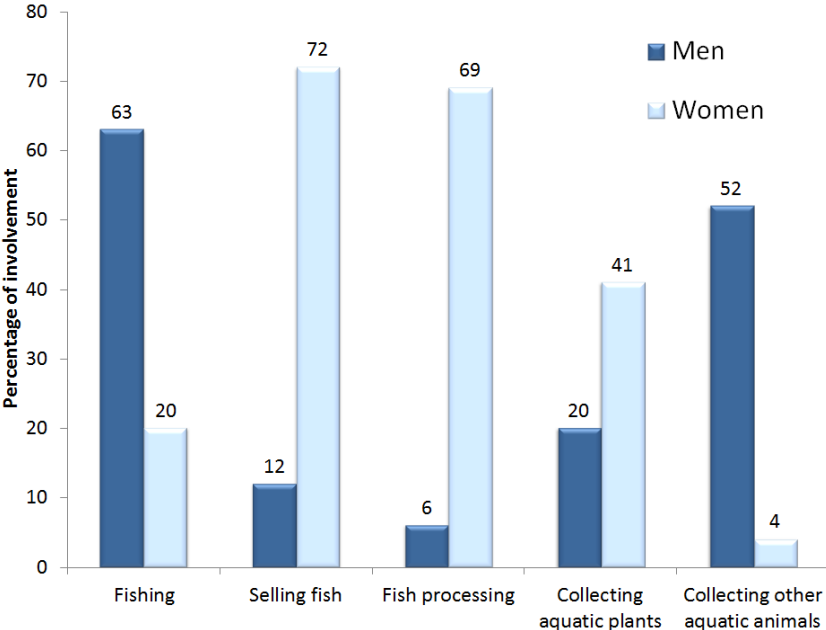


Figure 9: Adult Involvement on Fishing and Related Activities in Upper Mekong Zone

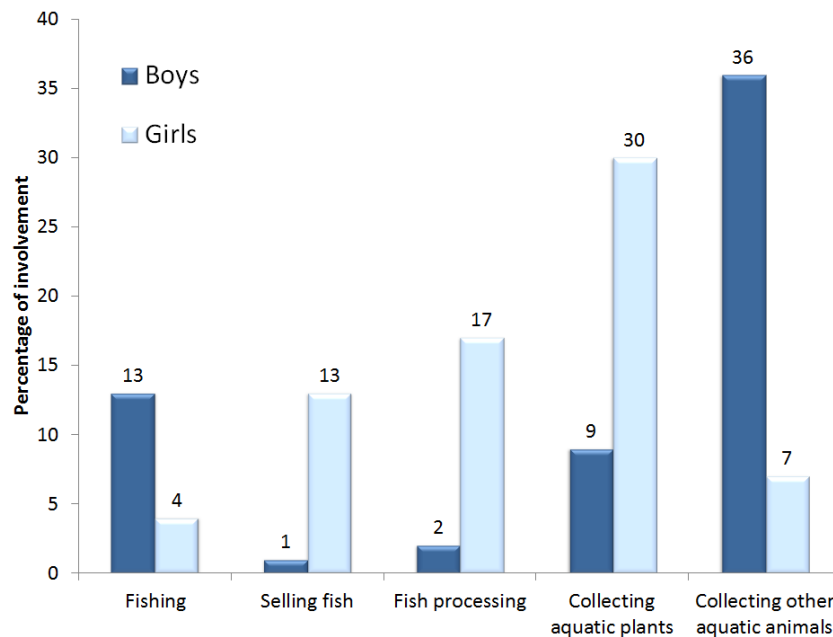


Figure 10: Children’s involvement on fishing and related activities in Upper Mekong zone

### 3.3.2.3 Contribution of fish to health

**Fish is seen as an alternative to meat, especially for those suffering from heart disease, high blood pressure, arthritis and gout.** Participants linked meat to uric acid problems and gout as well as bone problems, especially among older people. They said fish does not contain chemicals harmful to human health and that eating fish lowers body temperature compared with meat. Participants asserted that children who eat fish seldom get sick.

### 3.3.2.4 Contribution of fish to adaptation/resilience

**Participants said they relied on fish as their only source of food during flash floods triggered by the release of water from the Yali Falls Dam in Vietnam.** Flash flooding is or was regular, resulting in the deaths of livestock and damage to crops, including rice. Low water levels in the Sesan River, attributed to the dam being filled, and unprecedented storm activity were seen taking a further toll on crops, resulting in food shortages and loss of income.

### 3.3.2.5 Overall: main changes and trends in the contribution of fish

**Fish resources are seen declining with some species disappearing after the construction of the Yali Falls Dam in 1993.** Participants said water levels were higher than normal in the wet season and lower than normal in the dry season, which is the reverse of what is expected downstream of hydropower dams operated in a standard way. They also said that fish breeding and spawning areas have been affected and that dry conditions caused by dam filling has resulted in mass fish deaths, including



in fish refuge areas. It should be noted that the present study was undertaken in 2014, before the construction of the Lower Sesan 2 Dam had started.

**Participants said fish were no longer migrating back to the Sesan River from the Tonle Sap Lake.** For this they blamed barrages operating on the lake during the open fishing season.

**Declining catches have encouraged many fishermen to abandon fishing and move into the forestry and construction sectors.** Participants said forestry earnings were higher than income from fishing, which was now only a supplementary activity to provide food.

#### *3.3.2.6 Constraints and opportunities regarding the contribution of fish to welfare*

**Participants said measures against the impact of dam development in the area had not been taken and that support was needed to sustain fish resources.** They said nothing happened after they approached authorities in an effort to share their experience with the Yali Falls Dam in terms of its impacts of livelihoods and safety. Participants highlighted the need for the government to take measures to maintain the biodiversity of the Sesan River to sustain fishery resources and ensure the livelihoods of local people, especially the poor. Support to protect conservation areas was seen as a priority long with assistance to community fisheries organizations to develop markets and value chains.

#### *3.3.2.7 Support of fish to the welfare of poor and vulnerable social groups*

**Fishing is seen as the main source of food and income for the poor and the only source during natural disasters.** Consuming fish is linked to good health and income from fishing allowed poor households to send their children to school and support other needs.

#### *3.3.2.8 How can the welfare and livelihood value of fish be increased*

**Participants suggested cooperation between the community, government and other stakeholders to support the conservation of deep-pool habitats and improve the market and value chains of fish products.** They said dam construction should be reconsidered and community fisheries organizations strengthened.

#### *3.3.2.9 Main barriers and constraints in relation to fisheries*

**Lax implementation of fishery laws is seen as a major barrier to fisheries development.** Participants said fish resources were being depleted by dam development, the use of illegal fishing gear and overfishing. At the same time, market and value chains were not working and those involved in post-harvest activities were in need of a strategic development plan.

# 4 DISCUSSION AND CONCLUSIONS

## 4.1 CONTRIBUTION OF FISH TO THE WELFARE OF RURAL HOUSEHOLDS

**Fish is an important source of food in all villages surveyed and fishing can be an important economic activity.** These findings are in agreement with previous quantitative research, which found that households ate fish five times per week (Baran *et al.*, 2016) with quantities reaching 32.3 kg/person/year (Hortle, 2007), 40.3 kg/person/year (IFReDI, 2013) or 34.8 kg/person/year (Baran *et al.*, 2016). Fishing takes place all year round, becoming more intense between August and December, which is also the lean season during which food, particularly rice, is limited. The number of people involved in fishing rises during these months, in line with FAO estimates according to which around six million Cambodians are employed on a part-time basis in fisheries (FAO, 2011).

**The importance of fishing in the three agro-ecological zones varies.** Fishing in the Lowlands Zone is considered to be generating the least income due to availability of other income sources and job opportunities in urban areas. In terms of wealth, the three agro-ecological zones also vary. Fishing is considered very important for the poor, very poor and vulnerable social groups in the Lowlands Zone, an extensive rice farming area where people have access to shallow fishing grounds in rice fields without using boats.

**The roles of men and women in fisheries and the collection of other aquatic animals and plants are said to be similar in all three zones.** Fishing is mainly considered a man's job. Sons can help their fathers but are not obliged to do so. Women are more involved in housework or activities within the perimeters of the house such as processing and cooking. Marketing is considered as women's work since they can communicate and sell better than men. Collecting aquatic animals, particularly at night, is considered a male activity whereas collection of plants is a female activity. Almost all household members are involved in gathering activities, including people with disabilities and people affected by HIV/AIDS. Selling aquatic animals and plants often helps to send children to school.

## 4.2 HOW FISH SUPPORTS THE WELFARE OF POOR AND VULNERABLE SOCIAL GROUPS

**Fish is the main source of protein for the poor and vulnerable including those affected by HIV/AIDS because of free access to fisheries.** Most poor and vulnerable people having only small pieces of land or nothing are expected to suffer from declines in fishery resources since fishing is their main occupation and source of income. In the Lowlands Zone, the poor and vulnerable have lower investment costs because they do not need boats or fuel for fishing. In the Tonle Sap Zone and Upper Mekong Zone, the very poor usually fish with better-off or medium-wealth households and are obliged to remit their catch to owners of boats and fishing gear.

**The timing of peak fishing effort among the poor and vulnerable varies slightly between zones.** In the Lowlands Zone, income from fishing and fish-related activities increases at the beginning of the rainy season and peaks in January the following year. In the Tonle Sap Zone, fish-related income rises in August and remains high until December. In the Upper Mekong Zone, fish-related income peaks between August and October. In all three zones, the increased importance of fish-related income coincides with the lean season when food, particularly rice, is limited.

### 4.3 MAIN CHANGES, TRENDS AND SEASONALITY IN THE CONTRIBUTION OF FISH TO WELFARE

**In the Lowlands Zone, people reckon that the number of fishers is decreasing because of other opportunities attracting young people.** Participants in discussions indicated that one lowland village had noted an increase in the population of climbing perch (*Anabas testudineus*), known as *trey kranh* in Khmer, which was attributed to management of a community fish refuge (the government has been promoting fish refuges in every commune to increase rice-fish production).

**In the Tonle Sap Zone, the number of fishermen is considered to be increasing, together with the number of illegal fishers.** After initial fisheries reforms in 2001, participants said they observed increased fish around the Tonle Sap Lake for a year. But with increases in the number of fishermen and illegal fishing activities in areas managed by community fisheries, fish became less abundant. Illegal fishing activities proliferated after 2012, when the government abolished all fishing lots and handed them over to community fisheries. The government has been setting up conservation areas and community fisheries to protect the areas. The continued operation of the *dai* bagnet fishery on the Tonle Sap River is seen contributing to declining fish stocks in the Tonle Sap Lake. It can be noted that interviewees blame fish catch declines on the abolition of legal fishing lots and the legal “*dai*” fishery remaining in operation.

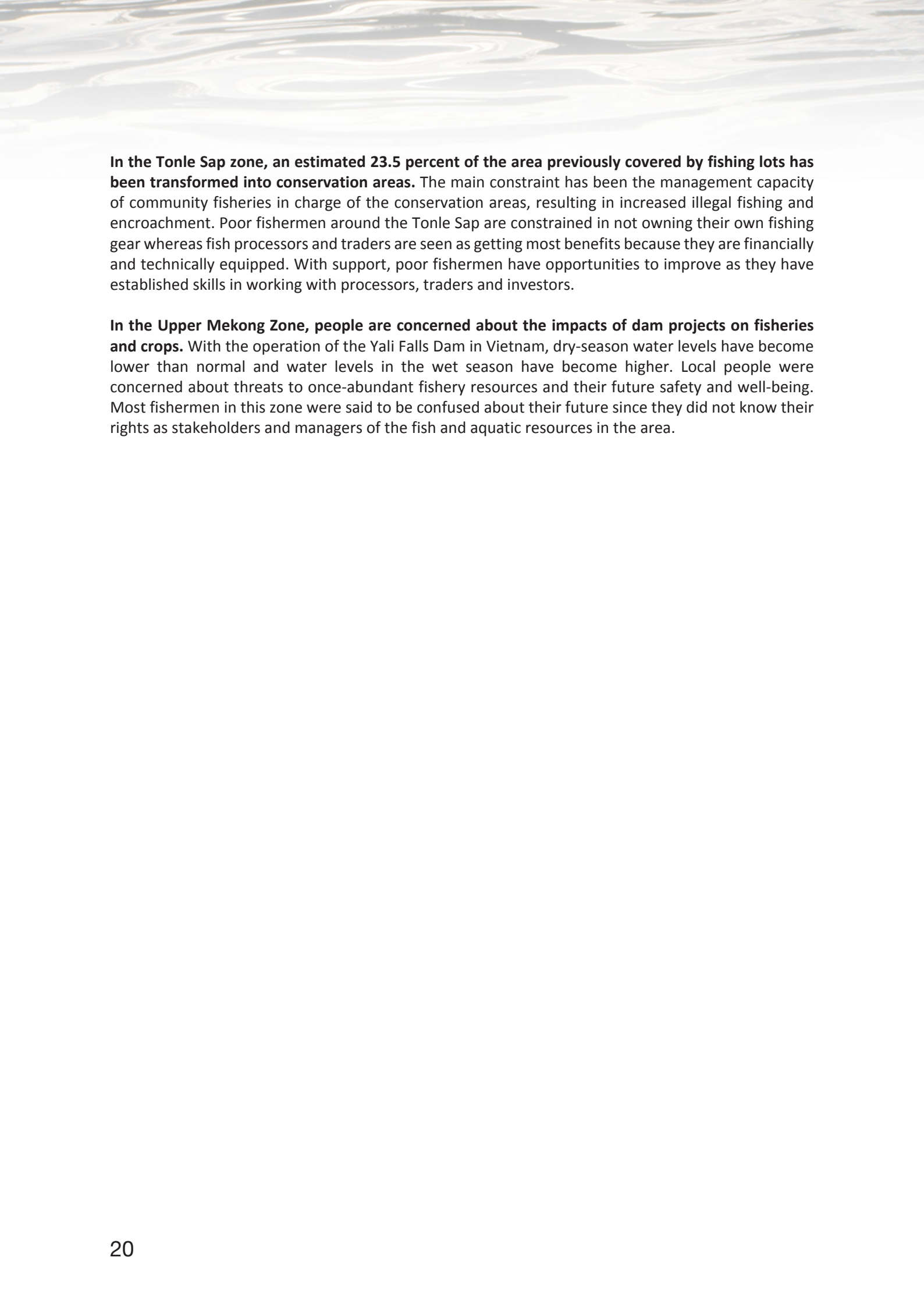
**In the Upper Mekong Zone, the Yali Falls Dam in Vietnam is seen as adversely affecting livelihoods and endangering people’s lives.** Local people also complained about unregulated fishing as well as alleged mismanagement of fishing gear and infrastructure on the Tonle Sap Lake. For dam development projects, they suggested the government consider “free and prior informed consent” from stakeholders before projects are approved.

### 4.4 DIFFERENCE IN THE PERSPECTIVES OF COMMUNITY LEADERS, MEN AND WOMEN

**Community leaders had different views from men and women towards development.** Leaders said they believed development could be achieved through infrastructure and new technologies. Men and women agreed that fish resources were significant for people’s welfare and livelihoods. Some had innovative suggestions for the development of the sector. In the Mekong Zone, however, people said they were helpless with regard to government priorities and noted the contribution of fish to welfare and livelihoods, especially the poor and vulnerable who depend on natural resources.

### 4.5 CONSTRAINTS AND OPPORTUNITIES REGARDING THE CONTRIBUTION OF FISH TO WELFARE

**In the Lowlands Zone, community fish refuges are believed to provide good opportunities to increase production and improve access to fish resources among poor and vulnerable people.** Aquaculture is developing in the Lowlands Zone but is constrained by the availability of wild fish to be grown in cages, as well as limited technical expertise and availability of inputs.



**In the Tonle Sap zone, an estimated 23.5 percent of the area previously covered by fishing lots has been transformed into conservation areas.** The main constraint has been the management capacity of community fisheries in charge of the conservation areas, resulting in increased illegal fishing and encroachment. Poor fishermen around the Tonle Sap are constrained in not owning their own fishing gear whereas fish processors and traders are seen as getting most benefits because they are financially and technically equipped. With support, poor fishermen have opportunities to improve as they have established skills in working with processors, traders and investors.

**In the Upper Mekong Zone, people are concerned about the impacts of dam projects on fisheries and crops.** With the operation of the Yali Falls Dam in Vietnam, dry-season water levels have become lower than normal and water levels in the wet season have become higher. Local people were concerned about threats to once-abundant fishery resources and their future safety and well-being. Most fishermen in this zone were said to be confused about their future since they did not know their rights as stakeholders and managers of the fish and aquatic resources in the area.

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# 6 ANNEX: STUDY QUESTIONNAIRES

“Adaptation to environmental change among fishing-dependent households in Cambodia: a qualitative assessment of trends and adaptation processes”(2014)

ការបន្តទៅនឹងការផ្លាស់ប្តូរឋានភូមិសាស្ត្រក្នុងចំណោមការនេសាទជាលក្ខណៈគ្រួសារ ក្នុងប្រទេសកម្ពុជា ការប៉ាន់ប្រមាណគុណភាពនៃដំណើរនិរន្តរភាពនិងការបន្ត(២០១៤)

## FOCUS GROUP DISCUSSION GUIDE

### ទម្រង់ណែនាំក្នុងការពិភាក្សាក្រុម

#### FGD GUIDELINES

#### ទម្រង់នៃការពិភាក្សាក្រុម

- 1. Three FGDs will be conducted in each Village: the village leaders; men fisher-farmers; and women

ក្រុមពិភាក្សាចំនួន៣នឹងត្រូវបានធ្វើក្នុងភូមិនីមួយៗ មានមេភូមិ កសិករ ជាអ្នកនេសាទត្រី បុរស និងស្ត្រី

- 2. Each facilitating team is comprised of two people: a facilitator and a note taker. Team members are among those trained beforehand.

ក្រុមសម្របសម្រួលនីមួយៗ មានគ្នាចំនួន២នាក់ មានម្នាក់ជាអ្នកសម្របសម្រួល និងម្នាក់ទៀតជាអ្នកកត់ត្រា ។

- 3. The maximum number of participants for each FGD will be 8-12 persons.

ចំនួនអ្នកចូលរួមក្នុង១ក្រុមពិភាក្សា នឹងមានច្រើនបំផុតចន្លោះពី៨- ១២នាក់

- 4. Participants:

អ្នកចូលរួម

- 4.1. Local leaders group – (commune councillors, village head, head of the CFi, recognized leaders, respected women, and respected elders).

មេដឹកនាំក្រុមក្នុងមូលដ្ឋាន (ក្រុមប្រឹក្សាឃុំ មេភូមិ មេដឹកនាំសហគមន៍នេសាទ មេដឹកនាំដែលគេទទួលស្គាល់ ស្ត្រីនិងចាស់ទុំដែលគេគោរពក្នុងភូមិ)

4.2. Fisher-farmer group – mixed of wealth background (medium, poor, very poor), the poor will be identified using the list of ID poor from the commune and will be selected randomly.

ក្រុមកសិករ អ្នកនេសាទដែលមានកំរិតទ្រព្យធនចម្រុះគ្នា (មធ្យមក្រីក្រក្រីក្រខ្លាំង) ។ អ្នកក្រីក្រ និងត្រូវបានកំណត់តាមរយៈការប្រើប្រាស់តារាងកំណត់អ្នកក្រីក្រពីថ្នាក់ឃុំ និងត្រូវបានជ្រើសរើសតាមរយៈចៃដន្យ

4.3. Women group – mixed of wealth background (selection is the same as the men’s group).

ក្រុមស្ត្រីដែលមានកំរិតទ្រព្យធនចម្រុះគ្នា (ការជ្រើសរើសនេះដូចខាងលើ) ។

5. The FGDs will last for about 1-2 hours depending on the participation levels of invited participants.

ការពិភាក្សាក្រុមនីមួយៗប្រើពេលចន្លោះពី១-២ម៉ោង ដោយអាស្រ័យលើកំរិតយល់ដឹងរបស់អ្នកចូលរួមដែលបានអញ្ជើញមកចូលរួម ។

6. The FGDs should be conducted in any of the following proposed locations: village meeting area, local pagoda, school, and the village chief’s house.

ការពិភាក្សាក្រុមនីមួយៗនឹងធ្វើនៅទីកន្លែងដែលបានកំណត់ទុក មានរោងប្រជុំភូមិ វត្តសាលារៀន និងនៅផ្ទះមេភូមិ

7. Materials needed: flipchart paper and marker.

សំភារៈដែលត្រូវការមានក្រដាសធំ និងប៊ិចហ្វឺត

8. Methods:

វិធីសាស្ត្រ

8.1 The facilitator begins the session with the standard introduction, already provided below. The introduction states the purpose of the FGD and encourages participation in the discussion.

អ្នកសម្របសម្រួលនឹងចាប់ផ្តើមដំណើរការ តាមរយៈការណែនាំដែលមានលក្ខណៈស្តង់ដារដែលមានដូចខាងក្រោម ។ ការណែនាំគោលបំណងនៃការពិភាក្សាក្រុមនិងលើកទឹកចិត្តក្នុងការចូលរួមក្នុងការពិភាក្សានេះ ។

8.2 Self-introduction of the facilitating team and participants.

ការណែនាំគ្នាឲ្យស្គាល់របស់ក្រុមអ្នកសម្របសម្រួល និងអ្នកចូលរួម

8.3 To ensure consistency, only the facilitator should lead the FGD till completion. The note taker should focus on his or her tasks (e.g. noting down list of participants, discussion results). The note taker should consult/ask in private or switch roles with the facilitator when necessary.

ធានានូវភាពជាប់លាប់ ដោយអ្នកសម្របសម្រួលគួរតែដឹកនាំការពិភាក្សាក្រុមរហូតដល់បញ្ចប់។ អ្នកកត់ត្រាគួរផ្ដោតទៅលើកាតព្វកិច្ចរបស់ខ្លួន (ឧទាហរណ៍កត់ឈ្មោះអ្នកចូលរួមលទ្ធផលពិភាក្សា)។ អ្នកកត់ត្រាគួរពិគ្រោះ/សួរជាលក្ខណៈឯកជន ឬបញ្ចប់តួនាទីជាមួយអ្នកសម្របសម្រួលកាលណាចាំបាច់។

8.4 The facilitator and notetaker should produce a write-up on the discussion results of each and every FGD for submission to the team for processing.

អ្នកសម្របសម្រួល និងអ្នកកត់ត្រាគួរតែសរសេរលទ្ធផលពិភាក្សានិមួយៗនិងគ្រប់ក្រុមពិភាក្សាសម្រាប់ក្រុមដើម្បីធ្វើបន្ត។

## FOCUS GROUP DISCUSSION

### ទម្រង់ណែនាំក្នុងការពិភាក្សាក្រុម

Identification អត្តសញ្ញាណកម្ម	
Province / ខេត្ត ៖	
District / ស្រុក ៖	
Commune/ ឃុំ ៖	
Village / ភូមិ ៖	
Location of the FGD / កន្លែងនៃការពិភាក្សាក្រុម ៖	
Date of the FGD / កាលបរិច្ឆេទនៃការពិភាក្សាក្រុម ៖	
Time of the FGD	Start (ចាប់ផ្ដើម) ៖
ម៉ោងពិភាក្សាក្រុម	End (បញ្ចប់) ៖
Group ID / អត្តសញ្ញាណក្រុម ៖	
Facilitator / អ្នកសម្របសម្រួល ៖	
Note taker / អ្នកកត់ត្រា ៖	



**1. INTRODUCTION AND CONSENT**

**សេចក្តីផ្តើម និងការយល់ព្រម**

Hello. My name is \_\_\_\_\_ I am working for the research team that is organizing this discussion with the support of the WorldFish Center. This particular discussion will focus on identifying the main changes and trends in the contribution of fish to the welfare of rural households in this village. The information resulting from it will quantify the different types of values that fish resources have for the rural communities in Cambodia. We would like also to inform everybody that this project is a research project, not a development project: we do this survey to understand the situation better, not to propose intervention in your village.

សួស្តី ខ្ញុំបាទ/នាងខ្ញុំឈ្មោះ..... ខ្ញុំកំពុងធ្វើការសម្រាប់ក្រុមសិក្សាដែលកំពុងរៀបចំការពិភាក្សាដោយមានការគាំទ្រពីមជ្ឈមណ្ឌលវិទ្យាសាស្ត្រលើស្តីស្រាវ។ ការពិភាក្សានេះ នឹងផ្តោតទៅលើការកំណត់នូវការផ្លាស់ប្តូរនិងនិន្នាការសំខាន់ៗរបស់ត្រី ក្នុងការចូលរួមចំណែកលើសុខុមាលភាពគ្រួសារនៅក្នុងភូមិនេះ។ ព័ត៌មានដែលទទួលបានពីការពិភាក្សានេះ នឹងកំរិតនូវប្រភេទនៃគុណតម្លៃផ្សេងៗគ្នានៃធនធានត្រី សម្រាប់សហគមន៍ជនបទនៅក្នុងប្រទេសកម្ពុជា។ យើងសូមជម្រាបថា គម្រោងនេះ ជាគម្រោងសិក្សាស្រាវជ្រាវ មិនមែនជាគម្រោងអភិវឌ្ឍន៍ទេ។ យើងធ្វើការសិក្សានេះដើម្បីដឹងពីស្ថានភាពមិនមែនផ្តល់ការអន្តរាគមន៍នៅក្នុងភូមិរបស់អ្នកទាំងអស់គ្នាទេ។

Given time limitations, all households in your village cannot be represented in the discussion. You have been selected based on the commune list to take part because we believe you can provide us more detailed information about household wealth, livelihoods, gender & tasks and policy and changes trends and changes in your village given your position in the household/village. The discussion will take about 2 hours. You are not obliged to participate in the discussion but we hope you will because your views are important and can be really helpful. We respect anonymity, so rest assured that all of your answers will be strictly confidential and used for research purposes only. You can choose not to answer any question and you can also stop participating in the discussion any time.

ដោយសារតែពេលវេលាមានកំណត់ គ្រួសារទាំងអស់នៅក្នុងភូមិរបស់អ្នក មិនអាចមកចូលរួមការពិភាក្សានេះបានទាំងអស់ទេ។ អ្នកត្រូវបានជ្រើសរើសតាមផ្នែកខ្លះនៃតារាងថ្នាក់ឃុំ យើងជឿជាក់ថា អ្នកអាចផ្តល់នូវព័ត៌មានលំអិតពីកំរិតទ្រព្យធនគ្រួសារអ្នក ការចិញ្ចឹមជីវិត វិស័យផ្សេងៗ កាតព្វកិច្ចគោលនយោបាយ និងនិន្នាការផ្លាស់ប្តូរ និងការផ្លាស់ប្តូរផ្សេងៗក្នុងភូមិអ្នកដូចជាតួនាទីរបស់អ្នកក្នុងគ្រួសារ/ភូមិ។ ការពិភាក្សានេះមានរយៈពេល២ម៉ោង ហើយមិនបានតម្រូវឲ្យអ្នកចូលរួមក្នុងការពិភាក្សានេះដែរ តែយើងសង្ឃឹមថាអ្នកនឹងចូលរួម ពីព្រោះទស្សនៈរបស់អ្នកវាមានសារៈសំខាន់ណាស់ និងមានសារៈប្រយោជន៍។ យើងរក្សានូវចម្លើយរបស់អ្នកជាសម្ងាត់ និងប្រើប្រាស់សម្រាប់តែគោលបំណងនៃការសិក្សាតែប៉ុណ្ណោះ។ អ្នកអាចមិនឆ្លើយនឹងសំណួរណាមួយ ហើយអាចឈប់ចូលរួមការពិភាក្សានេះបានគ្រប់គ្រប់ពេល។

Will you participate in the discussion? (In this relation, the facilitator should ask each and every invited individual while the note taker takes note of agreement or disagreement to participate.)

តើអ្នកនឹងចូលរួមក្នុងការពិភាក្សានេះទេ? (ក្នុងករណីនេះ អ្នកសម្របសម្រួលគួរសាកសួរម្តងម្នាក់ៗហើយអ្នកកត់ត្រាត្រូវធ្វើការកត់ត្រានូវនាក់ដែលយល់ព្រម និងមិនយល់ព្រមក្នុងការពិភាក្សានេះ)។

Do you have any questions?  
តើអ្នកមានជាសំណួរ?

May I begin the session now?  
តើខ្ញុំអាចចាប់ផ្តើមបាន?

## 2. SELF-INTRODUCTION

ការណែនាំគ្នាឲ្យស្គាល់

The facilitating team members should introduce themselves first followed by the participants. The participants should be requested to state their names, sex, age and occupation. The note taker should write down these details.

សមាជិកក្រុមអ្នកសម្របសម្រួលគួរតែធ្វើការណែនាំខ្លួនមុន បន្ទាប់មកអ្នកចូលរួម។ អ្នកចូលរួមគួរតែបង្ហាញឈ្មោះ ភេទ អាយុ និងមុខរបរ។ អ្នកកត់ត្រាធ្វើការកត់ត្រាលម្អិត នៅតារាងខាងក្រោម:

Identification ចំនួនអ្នកចូលរួម	Sex ភេទ	Age អាយុ	Occupation/Position មុខរបរ/តួនាទី

**3. DISCUSSION PROPER**

ការពិភាក្សាចម្បងៗ

**A. Main Livelihoods**

ការចិញ្ចឹមជីវិតសំខាន់ៗ

1. What are the major income sources (livelihood activities) in this village? When this activity occurs over a 12 month period?

Use the codes 1: low importance, 2: medium importance, 3: high importance

តើអ្វីជាប្រភពចំណូលសំខាន់ៗនៅក្នុងភូមិរបស់អ្នក? (សកម្មភាពចិញ្ចឹមជីវិត) ពេលណាខ្លះដែលសកម្មភាពនេះមានក្នុងរយៈពេល១២ខែ?

ប្រើកូដ: ១) មានសារៈសំខាន់តិចតួច ២) មានសារៈសំខាន់មធ្យម ៣) មានសារៈសំខាន់ខ្លាំង

Rank	Production activity សកម្មភាពផលិតកម្ម	1	2	3	4	5	6	7	8	9	10	11	12

- 2. Why did you rank fishing at the current level? What are your basis?
- 3. Based on your estimate, is there an increase or decrease of fishermen in this village from 1990-2014? Why?

No. / កាលវេយ	1993	2014	Why / ហេតុអ្វី?
% of household fishermen			
% of household fish raising			

4. Based on your own perception, which of the identified fisheries related activities is the most to least important activity? To whom? According to wealth, gender and age.

Use the codes 1: low importance, 2: medium importance, 3: high importance

អាស្រ័យលើការយល់ឃើញរបស់អ្នកតើសកម្មភាពនេសាទណាខ្លះដែលបានកំណត់ថាវាជាសកម្មភាពសំខាន់បំផុតទៅមិនសូវមានសារៈសំខាន់? ដោយផ្ដោតលើទ្រព្យធនវ័យនិងអាយុ។

ប្រើកូដ: ១) សំខាន់តិច ២) សំខាន់មធ្យម ៣) សំខាន់ខ្លាំង

No. ល.រ	Production activity សកម្មភាពផលិតកម្ម	Better-off គ្រាន់បើ	Medium មធ្យម	Poor ក្រី	Very poor ក្រីខ្លាំង	Reason why this category the most important?
1	Fishing នេសាទត្រី					
2	Processing កែច្នៃត្រី					
3	Selling fish លក់ត្រី					
4	Gleaning floodplain animals ការចាប់សត្វនៅតាមតំបន់ទំនាប					
5	Gleaning floodplain plants ការប្រមូលរុក្ខជាតិ តាមតំបន់ទំនាប					
6	Others ផ្សេងៗ					

No. ល.រ	Production activity សកម្មភាពផលិតកម្ម	Men ប្រុស	Women ស្រី	Boys ក្មេងប្រុស	Older people មនុស្ស ចាស់	Reason why this category the most important?
1	Fishing នេសាទត្រី					
2	Processing កែច្នៃត្រី					
3	Selling fish លក់ត្រី					
4	Gleaning floodplain animals ការចាប់សត្វនៅ តាមតំបន់ទំនាប					
5	Gleaning floodplain plants ការប្រមូលរុក្ខជាតិ តាមតំបន់ទំនាប					
6	Others ផ្សេងៗ					

5. Based on these listed fisheries related activities, please indicate how much time is being spent as percentage of the sub-activity according to gender, age group and wealth categories.

អាស្រ័យលើតារាងនៃសកម្មភាពនេសាទដែលបានកំណត់ សូមប្រាប់ពីការចំណាយពេលនៃការចាប់ផ្តើមតំបូង ជាភាគរយនៃសកម្មភាពទាំងមូល ដោយផ្ដោតលើយេនឌ័រ អាយុ និងថ្នាក់ទ្រព្យធន

Activities / Gender & age សកម្មភាព / យែនឌ័រ និងអាយុ	Men ប្រុស	Women ស្រី	Boys ក្មេងប្រុស	Older people មនុស្ស ចាស់	Comments ពន្យល់
Fishing នេសាទត្រី					
Gear preparation ការរៀបចំឧបករណ៍					
Food preparation ការរៀបចំអាហារ					
Boat preparation ការរៀបចំទូក					
Fishing/ Operating ការនេសាទ/ការរៀបចំ					
Rowing អ៊ុំចែលទូក					
Repair/Fix gear ការរៀបចំ/ជួសជុលឧបករណ៍					
Transportation ការធ្វើដំណើរ					
Selling ការលក់					
Processing កែច្នៃត្រី					
Gleaning floodplain animals ការចាប់សត្វនៅតាមតំបន់ទំនាប					
Gleaning floodplain plants ការប្រមូលរុក្ខជាតិតាមតំបន់ទំនាប					

6. What are the most economically important species for this village? Please rank them in order of importance to the village. For each species please state in which season fishing occurs, which gears are used, and whether its abundance has increased, decreased, or remained the same over the past ten years.

តើពូជត្រីណាខ្លះដែលមានសារៈសំខាន់ខាងសេដ្ឋកិច្ចជាងគេសម្រាប់ភូមិនេះ? សូមធ្វើចំណាត់ថ្នាក់តាមសំខាន់ៗសំខាន់ៗក្នុងភូមិ។ សម្រាប់ពូជនីមួយៗដាក់តាមរដូវនេសាទដែលបានជួប? ឧបករណ៍ណាខ្លះដែលបានប្រើ? ហើយមួយណា សម្បូរ កើន ថយ ឬ នៅដដែល ក្នុងរយៈពេល១០ឆ្នាំចុងក្រោយ?

Rank ថ្នាក់	Fish species in this village (list according to its economic importance) ពូជត្រីក្នុងភូមិ (ដាក់តាមសារៈសំខាន់ខាងសេដ្ឋកិច្ច)	Occurrence (months) ការជួបប្រទះ (ខែណាខ្លះ)	Gear used to catch ឧបករណ៍ដែលប្រើ សម្រាប់នេសាទ	Increased/decreased in the past 10 years? កើន/ថយ ក្នុងរយៈពេល១០ឆ្នាំចុងក្រោយ	Reason of increase/decrease មូលហេតុ កើន/ថយ

Main changes ការប្រែប្រួល សំខាន់ៗ	When it Happened	Impacts ឥទ្ធិពល			Who is affected most on wealth Codes: 1: no impact; 2: limited impact; 3: high impact				Why	Who is affected most on gender/age Codes: 1: no impact; 2: limited impact; 3: high impact					Why													
		Physical រូប	Social សង្គម	Economic សេដ្ឋកិច្ច	Better-off គ្រាន់លើ	Medium មធ្យម	Poor ក្រី	Very poor ក្រខ្លាំង		Men	Women	Boys	Girls	PWD														
Fishery reform 1																												
Drought																												
Flood																												
Storm																												
Fishery reform 2																												
Drought																												
Flood																												
Storm																												



8. What are the important environmental conditions that affected the fishery resources and fishing?

Environmental changes	Affected activities	Coping mechanism?	Trends in this condition overtime	Reason for trends
Drought				
Flood				
Storm				

9. What are the importance of fish to your household based on nutrition, health, labor and adaptation? Ask them to share a concrete example? (As much as possible give example and complete details such as who, where, when, why, and how it was happened)

Category
Nutrition
Health
Labor
Adaptation
Savings

10. What do you think will happen if we lose fish in this village?

តើអ្នកគិតថានឹងមានអ្វីកើតឡើងប្រសិនបើយើងបាត់បង់ត្រីក្នុងភូមិនោះ? (ប្រើការចាប់ត្រីជាឧទាហរណ៍)

Reduction of Fish ការថយចុះរបស់ត្រី	Possible impact ឥទ្ធិពលដែលអាចកើតឡើង
50%	
Lose of fish/បាត់បង់ត្រី	

11. Based on the issues mentioned in the decrease of different types of fish in this village and other challenges you are facing, can you provide possible solutions? How to do this?

Issues/Challenges	Possible Solutions	How to do? របៀបធ្វើ
Electric Fishing		
Vietnamese Trawling		
Low Price of Fish		





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The project “Assessing economic and welfare values of fish in the Lower Mekong Basin” was funded by the Australian Centre for International Agricultural Research (ACIAR). It was implemented by WorldFish between 2012 and 2016, in collaboration with the Inland Fisheries Research and Development Institute of the Fisheries Administration (IFReDI), the Cambodian Agricultural Research and Development Institute (CARDI), the Royal University of Phnom Penh (RUPP) in Cambodia, Ubon Ratchathani University (UBU) in Thailand, and Can Tho University (CTU) in Vietnam.



CARDI



RUPP



UBU



CTU