



**Assessing economic and welfare values of fish in the Lower Mekong Basin**  
*Project funded by ACIAR*

**Market Component**

**FISH MARKET PRICES IN CAMBODIA  
AND ADDED VALUE ALONG THE FOOD CHAIN  
Survey methodology report**

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## Abstract

This report covers the development of the fish market price survey. We present the research methodology, detail the sampling framework and detail the development of three questionnaire covering fishers, traders and fish exporters to assess the variation of fish prices along the fish marketing chain in Cambodia. The questionnaires were developed using questionnaires of similar studies in Cambodia and modified according to the findings of field testing. We found that in order to be effective, questionnaires on fish market values need to be focussed on fish prices, mostly to avoid lengthy interviews. Developing a value chain analysis or estimating the cost and profit margins of the target stakeholders will require different tools, questionnaires and resources.

## Keywords:

Cambodia; fish; market; price; economic value

## Table of contents

1. INTRODUCTION.....	3
1.1. Background.....	3
1.2. Purpose of the study.....	3
1.3. Approach .....	3
1.4. Content of the report.....	4
2. RESEARCH METHODOLOGY .....	5
2.1. Study Area .....	5
2.2. Scope of the study .....	5
2.3. Selection of Samples .....	5
2.4. Data Collection .....	6
2.5. Data Analysis.....	6
3. FISHERS QUESTIONNAIRE .....	7
3.1. Section 1: General information .....	7
3.2. Section 2: Fishing Activities .....	7
3.2.1. Fish Capture .....	7
3.2.2. Marketing of the fish .....	8
3.3. Aquatic Animal Capture .....	8
3.4. Borrowing system .....	8
3.5. Perception on fishing activities .....	9
4. FISH TRADERS QUESTIONNAIRE .....	9
4.1. Profile of the respondent .....	9
4.2. Marketing of Fish.....	9
4.3. Borrowing System and PErception of fish marketing .....	10
5. EXPORTERS QUESTIONNAIRE .....	11
6. CONCLUSIONS .....	12
7. BIBLIOGRAPHY.....	13
8. APPENDIX 1: Fishers Questionnaire.....	13
9. APPENDIX 2: Traders Questionnaire .....	13
10. APPENDIX 3 : Exporters Questionnaire .....	13

## **1. INTRODUCTION**

### **1.1. BACKGROUND**

Research concerning the role of fisheries in economic development has permanently evolved. In turn, the types of research questions considered relevant for fishery-related policy development have continued to change. In that context, the WorldFish Center supported by ACIAR launched a project in 2012 called “*Valuation of Fisheries in Cambodia*”.

The overall objective of the project is to quantify the multiple values of fish resources and convey information to national decision-makers and development agencies for sustainable and improved rural livelihoods. The objectives of the project are to:

- i. assess the economic value of capture fisheries in Cambodia;
- ii. assess the welfare value of fish for rural populations in Cambodia and identify strategies that maximize this value;
- iii. establish a coordinated monitoring of fish resources through a network of universities;
- iv. improve national statistics about fisheries resources;
- v. inform a large range of stakeholders about the actual role of fisheries in national economy and livelihoods.

### **1.2. PURPOSE OF THE STUDY**

The present market study aims to collect new information about the monetary value of inland fish resources along the market chain. This information, together with other components will provide information to estimate the total market value of the inland fisheries in representative agro-ecological zones of Cambodia.

The expected outputs of this market study are:

- an assessment of the seasonal price variation along the market chain for the main fish and other aquatic animals;
- an estimate of fish trade and export over 12 months for different stakeholder of the market chain;
- qualitative information about relationship between stakeholders within the fish value chain

### **1.3. APPROACH**

The market study includes 3 agroecological zones and includes the following stakeholders:

- Fishers (subsistence, semi-commercial and commercial);
- Traders
- Exporters

Therefore our study requires 3 specific survey questionnaires. We anticipate repeating the survey 4 times a year, and the questionnaires will cover a 3 month period each time.

The questionnaire is mainly limited to market prices and most of the effort will be focused on precisely measuring fish market prices. We do not intend to develop a full value chain analysis with the repartition of the margin along the value chain, nor do we intend to complete an analysis of the interaction between stakeholders or the flow of fish trade volumes across the country.

The questionnaire is based on several sources:

- *Socioeconomics and Values of Resources in Great Lake-Tonle Sap and Mekong-Bassac area: Results from a sample survey in Kampong Chhnang, Siem Reap and Kandal Provinces, Cambodia (Rab et al. 2005);*
- *Marketing Infrastructure, Distribution Channels and Trade Pattern of Inland Fisheries Resources in Cambodia: An Exploratory Study.(Rab et al. 2005);*
- *Making value chains work better for the poor (M4P 2008);*
- *Case Study of shrimp in Coastal Zones of Cambodia (Adi. 2010).*

Those references combined with previous market and socio-economic surveys on fisheries sector in Cambodia and a more general manual for value chain analysis.

#### **1.4. CONTENT OF THE REPORT**

The first part of this report is about the research methodology and the sampling approach. The second part is divided in 3 sections corresponding to the 3 questionnaires: *i) Fishers, ii) Traders and iii) Exporters*. In each section we discuss the content of the final questionnaire and the reasons for selecting the questions. We explain the choices made in developing the questionnaire in order to achieve our goal.

However, since several survey questions are repeated throughout all 3 questionnaires, the choices and reasons of including them are similar and are explained only once.

## **2. RESEARCH METHODOLOGY**

### **2.1. STUDY AREA**

This study will be conducted in three agroecological zones. These zones are chosen for the study because they represent different agronomic and ecological combinations of the Lower Mekong Basin. This includes river banks along the Mekong mainstream (e.g. Stung Treng province), lowland floodplains with intensive trade from and to Vietnam (e.g. Takeo Province), and Tonle Sap floodplains (e.g. Pursat province).

### **2.2. SCOPE OF THE STUDY**

This market study will be taken for 2 years to be completed on data collection. The study will be conducted once in every 3 months. Therefore, there will be 4 times of the survey within a year in the three agroecological zones. Fishing villages (villages with low, medium, and high fishing population), at landing sites, markets, and the border points from each selected study areas will be chosen for the survey.

### **2.3. SELECTION OF SAMPLES**

The sampling and data collection methodology for this study will focus on three type of samples, including fishers, traders, and exporters. In this study, fishermen are categorized into 3 types – subsistence, semi-commercial, and commercial fishermen, whereas traders will be fish collectors/middlemen, wholesalers and retailers in different level of market and landing site etc. Moreover, exporters are known as traders who export fish to other countries by land border point or importing countries. Number of sample selection by agroecological zone and type of stakeholder is shown in Table 1. In total, 1,104 samples will be interviewed in the three zones, which include 864 fishers, 192 traders, and 48 exporters selected for this study.

Table 1: Number of sample by selected agroecological zone in the study areas.

Stakeholders	Samples by zone			Total	Note
	Mekong main-stream	Tonle Sap flood-plains	Lowland flood-plains		
<b>1. Fishers</b>					
- Subsistence fishers	240	240	240	720	- 10 fishers from each village (6 villages) of each zone; 4 times/year - Random (20% are women)
- Semi-commercial fishers	40	40	40	120	- 10 fishers from each zone; 4 times/year)
- Commercial fishers	8	8	8	24	- 2 fishers from each zone; 4 times/year)
<b>2. Traders</b>	64	64	64	192	- 2 fish collectors, 4 wholesalers and 10 retailers from each zone; 4 times/year
<b>3. Exporters</b>	16	16	16	48	- 4 exporters from each zone; 4 times/year
Total:	368	368	368	1,104	

#### 2.4. DATA COLLECTION

Both secondary and primary data will be included in the study. Secondary data is the review of all related studies on market chain, fish trade and market study in Cambodia. This information will be derived from data and document from government and other sources to complement primary data collection and observations. The primary data will be collected through individual interviews (semi-structured and structured interviews) with key stakeholders such as fishers, fish traders, and exporters who are involved in market chain of inland fisheries. There are 3 different types of questionnaires designed for the interview.

#### 2.5. DATA ANALYSIS

The primary data and information will be stored in the Access software program. The data will be analyzed by using Excel, SPSS and Access software program. The descriptive analysis will be used to describe the secondary data and to present the characteristics of the target groups. Frequency, percentage, mean, standard deviation, and range will be used in the comparative analysis. Moreover, cross-tabulation will be made to describe and to compare the data within and between the group households. Comparative analysis will be made to compare the mean value between the groups.

### 3. FISHERS QUESTIONNAIRE

The questionnaire (Appendix 1) is divided in 5 sections : i) *General information*; ii) *fishing activity*; iii) *Aquatic Animals Capture*; iv) *Borrowing system and* v) *Perception of fishing activities/marketing*

#### 3.1. SECTION 1: GENERAL INFORMATION

This section is extremely limited for fishers compared to the other questionnaires (Rab et al. 2006 or Adi 2010). Since the overall project also includes a substantial welfare component we do not need information about respondent demography or asset holdings. We limit our questions to the type of fishers (small scale; medium and large scale) and contact information as well as gender of the respondent. The welfare component will collect more in-depth data about livelihood and households characteristics than the resources of the Market survey allow.

#### 3.2. SECTION 2: FISHING ACTIVITIES

This section is divided in 2 sub sections: a) *fish capture* and b) *fish marketing*

##### 3.2.1. Fish Capture

This part of the questionnaire is inspired by Rab et al. 2006.

In this section, we investigate the purpose and incentive for fishing (**Q5** and **Q7**).

The seasonality of fishing activity is grouped into 2 main season based on the official open and closed season in order to standardized grouping systems common to all interviews (**Q6**).

Average fishing effort in number of fishing days per month is broadly estimated per fishing season (Open and Close), in order to get a broad idea of seasonal differences (**Q8**).

Based on questionnaire field testing and the reviewed literature (Rab et al. 2006; Adi 2010), fish prices varies according to grade (quality, size) and those grades vary according to fish species. Therefore before asking for selling prices we need to understand the main grades of the dominant fish species (**Q9**). This exercise will require the use of a photo flip chart of the main fish species in Cambodia, in order to prompt respondents. During field testing, we found that without prompting, respondents have a tendency to limit their answer to a small number of fish species.

Once the different grades for the dominant species are listed, **Q11** investigates the catch volume and average selling price broken down by fish species and fish grade, by month. This table will provide the share of the catch per species and the average fish price. We can later calculate the average weighted fish price for each species per month using the methodology described in M4P (2008).

We decided to remove questions concerning labour involved in fishing, type of fishing grounds, fishing gear and operational cost since this information will be collected by the Welfare survey.

Compared to the first version of the questionnaire and following field testing, we decided to avoid using a pre-listing of fish species. It is easier for respondents to list fish species themselves, the process being facilitated by the use of a flip chart. Fish prices and quantities are

not separated by “open” and “closed” seasons, but on a monthly basis in order to capture monthly variation.

### **3.2.2. Marketing of the fish**

This section is succinct and covers only the frequency of fish selling and the fish marketing location and type of buyer

We decided to modify the questionnaire from Rab et al. 2006 and the original version which disaggregated catch destination into categories such as home consumption, sale for food, sales for processing and sale as animal feed. These types of questions will be covered in the Welfare survey and the price difference due to different uses of the catch will be integrated in the grading system (see **Q 11**).

### **3.3. AQUATIC ANIMAL CAPTURE**

For the main other aquatic animal (OAA), we investigate their values and catch volumes using a similar time frame (3 months). We selected the main OAA to include in the questionnaire based on IFREDi expertise and experience. The questionnaire covers the following OAA: clams, crabs, frogs, molluscs, snails, swamp eels, toads and turtles (**Q15**).

For each category of OAA, we investigate the quantity sold and consumed and both the selling price and the values earned over the 3 last months. This provides a quantification of the values of those OAA products. In addition we also investigate the frequency of marketing (**Q16**) as well as the type of buyer (**Q18**) and the location of the buyer (**Q17**) to understand if OAA products are marketed away from their capture location or are mostly sold within the community.

We decided not to investigate the destination of the products (no disaggregation into categories such as home consumption, sale for food, sale for processing and sale as animal feed). Calculating an average price is sufficient (based on our field testing) and takes less time. Also we decided to remove the section concerning the collection and marketing of other natural resources found in wetlands since these questions do not specifically concern fisheries.

### **3.4. BORROWING SYSTEM**

Often, fishers and fish traders have a complex contractual relationship which includes money lending and price fixing. We added this section to the first version of the questionnaire since the credit provided by traders is important to the functioning of Cambodia’s inland fishery sector (Chea and McKenney 2003). Therefore, we use **Q19-Q28** to characterize this relationship and investigate the type and origin of credit fishers can contract.

We assess the amount of money borrowed, its origin and the purpose of the credit to investigate if there is any relationship between fishery activity and investment in equipment. In **Q25, Q26** and **Q27** we inquire about the credit affecting fish marketing and fisher bargaining power.

### **3.5. PERCEPTION ON FISHING ACTIVITIES**

The questionnaire ends with several semi-structured questions concerning respondent perceptions of the fishery sector. Previous versions of the survey had questions that were open-ended (e.g. “*What are the difficulties in your sector?*”) and were not oriented toward different sub-themes. By using a structured approach, we intend to determine more accurately fisher perception of some specific aspects that might not be captured with open-ended questions.

In addition, because similar questions are asked to traders and exporters, a comparative analysis across the three types of stakeholder will be made possible.

## **4. FISH TRADERS QUESTIONNAIRE**

The Fish trader questionnaire (Appendix 2) is divided in 4 sections: i) *General information*; ii) *marketing of fish*; iii) *Borrowing system* and iv) *Perception of fishing activities/marketing*

After testing, we determined that the questionnaire needed to be shortened since traders do not have much free time to answer all questions initially planned. We reduced our questionnaire to ensure that its total duration would be no more than one hour. In addition, because we will be interviewing the same trader 4 times a year, we had to avoid respondent fatigue.

### **4.1. PROFILE OF THE RESPONDENT**

Personal contact details are important here since we return to the same trader four times during the year of the survey. Other characteristics of the household such as livelihood activities are not required for this study.

### **4.2. MARKETING OF FISH**

Like in the Fishers questionnaire, we group annual activities into the 2 main official and legal fishing seasons (open and closed).

Field testing revealed that for trade purposes fish are classified by grades (according to size, quality or origin) for each species. However, we do not know if the buying and selling grades stay similar or change. Therefore, we included a table (**Q11**) where enumerators ask for the buying and selling grade for the same species traded in the last 3 months (dominant species only).

Knowing the different grades for the dominant species, **Q12** investigates the buying price of fish species for each grade and for each month over a 3 months period. For each fish species, the main supplier and the place of origin of the fish is also included in the table. Beside the usual fish suppliers (traders, fishers, and fish farmers) we also include fish importers, since field testing showed that they may be important stakeholders as well.

In **Q13**, we use a similar table for the selling price and the relative volume of fish sold, broken down by species and grade. We decided to ask those questions upfront in order to capture this essential data at the beginning of the interview.

**Q14 to Q16** concerns the market chain and the characteristics of the trader in order to estimate the number of employees, the number and type of fish suppliers (and how it they vary throughout the year) and the type of contracts fish traders and suppliers engage in. This information is required to get a better understanding of the context. **Q7, Q8, Q9, Q14** and **Q16** to **Q14** will not be asked during the second phase of the interviews, since these questions are more for background market chain information and relate to annual activity only. Therefore we ask these questions only once, during the baseline questionnaire.

**Q17 to Q23** concerns market chain characteristics, and are similar to questions asked in the Fishers questionnaire. These questions concern the number of fish buyers, their location and how the market price is set (in order to to understand the bargaining power of the traders).

**Q24** and **Q25** concern post harvest losses and storage capacity of the fish traders, which is found to be problematic in Cambodia according to Chea and McKenney (2003). These questions are broad and cover the whole year. Therefore we ask these questions only once, during the baseline questionnaire.

**Q26** is about Other Aquatic Animals. Here we simplified the questionnaire with a single table, collecting information about monthly trade volumes and the average price during that period. We hypothesize that the volume and value of OAA are minor compared to that of fish.

After field testing, we shortened the questionnaire to limit the duration of the interview and increase the questionnaire's focus on fish prices. We deliberately avoided socio-economic aspects of the fish trade such as household income and primary and secondary occupation since they will be covered in the welfare valuation survey.

To avoid questionnaire redundancy, we preferred to ask fish volume and price questions per fish species instead of per fish suppliers. We focus on a shorter time frame (3 months) and include monthly variations in fish prices instead of assessing fish prices and catch volumes per fishing season (i.e. open and closed ).

We also collect details about fish grades since this information is not available in the literature. Instead of repeating the same questions about buying and selling price at different time of the interview, we opted for back-to-back question related to buying and selling prices. We decided to avoid questions about fish trader equipment or expenses since we do not try to characterize or develop categories of fish traders nor detail a full value chain.

#### **4.3. BORROWING SYSTEM AND PERCEPTION OF FISH MARKETING**

These two sections conclude the questionnaire and are similar to the sections found in the Fishers Questionnaire (see section 2.4 and 2.5).

## 5. EXPORTERS QUESTIONNAIRE

This questionnaire (Appendix 3) is similar to the Trader questionnaire and contains similar sections. However, there are some specific differences concerning the questions that focus on characterizing annual export activity.

### 5.1. MARKETING OF FISH

In **Q8** and **Q10** we want to estimate the monthly activity and trade volumes (exported and imported) per month and per day. During field testing we realized that exporters are also involved in importing fish, mostly farmed fish from Vietnam or Thailand, and that therefore importing activities should be recorded.

The peak import and export periods are assessed in **Q9** and **Q11**.

Like in the Traders questionnaire we assess the dominant fish species and their different buying and selling grades in **Q14**. This question is intended to assess whether exporters are re-sorting and re-grading the product between buying and selling to accommodate export market standards and/or to maximise their margin.

**Q15** covers the main objective of the survey: collecting information on the fish prices (buying and selling) for the dominant species, broken down by grade. This question also includes information about the main supplier.

**Q16** to **Q234** concern the licence permit and bargaining power of the exporter. These questions are similar to those found in the Traders and Fishers questionnaires and thus allow performing a comparative analysis. We want to understand the type of contractual relationships fish suppliers (**Q17**) and fish buyers (**Q 21**) engage in since this type of information is not well documented in the literature.

As with the Traders questionnaire, the post harvest losses throughout the year are assessed (**Q24** and **Q26**). Similarly to the other questionnaires, the Exporter questionnaire ends with semi-structured questions about fish marketing (difficulties and solutions).

After field testing, we decided to refocus the questionnaire on fish prices and removed all socio-economic questions related to household characteristics and equipment. Also breaking down buying and selling price by species and grade was found easier and more efficient than asking first buying prices of all the fishes and after all selling prices. We decided not to collect information about expenses, since do not intend to calculate the margins of the exporters.

## **6. CONCLUSIONS**

Experience from the field testing shows that fishers and especially traders and exporters did not have time to answer our lengthy questionnaire. Therefore, we designed a shorter questionnaire, made more efficient by listing fish species by grades and collecting prices and catch volumes. This information is the survey's main objective. In order to avoid any data collection gaps, questions about fish prices have been moved to the beginning of the questionnaire.

The origin and destination of the fish is also collected during the survey in order to understand flows of fish trade and also to distinguish capture fisheries from aquaculture fish. This information is often missing in Cambodia and relative volumes of aquaculture fish trade and their origin can provide new information about the fisheries sector and its entire value chain.

This questionnaire does not include a value chain analysis. However, a one day workshop at the end of the survey to present the results to the respondent can be organized to validate the results. During this workshop some participatory exercise can be organized in order to characterise the fishery value chain and answer some of the questions that arise from the Market Survey.

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## **8. APPENDIX 1: FISHERS QUESTIONNAIRE**

## **9. APPENDIX 2: TRADERS QUESTIONNAIRE**

## **10. APPENDIX 3 : EXPORTERS QUESTIONNAIRE**