

ECONOMIC VALUE OF FISH IN CAMBODIA AND VALUE ADDED ALONG THE TRADE CHAIN

Guillaume MILLE
HAP Navy
LOENG Nob



Citation:

Mille G., Hap N., Loeng N. 2016 Economic value of fish in Cambodia and value added along the trade chain. Inland Fisheries Research and Development Institute (Fisheries Administration) and WorldFish. Phnom Penh, Cambodia. 62 pp.

Key words:

Socioeconomics – fisheries sector – market prices – variability

ISBN-13:978-9924-9046-6-3

Copyright © 2016, Inland Fisheries Research and Development Institute (Fisheries Administration) and WorldFish, Cambodia.



This work is licensed under a Creative Commons Attribution-Non Commercial-Share Alike 4.0 International License

You are able to:

Share — copy and redistribute the material in any medium or format

Adapt — remix, transform, and build upon the material as long as credit is duly noted

For more information go to:

Inland Fisheries Research and Development Institute (IFReDI)

PO Box 582, Phnom Penh, Cambodia

Website: ifredi-cambodia.org

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), a global research partnership for a food-secure future.

Disclaimer:

The authors' views expressed in this publication do not necessarily reflect the views of the Inland Fisheries Research and Development Institute (IFReDI) or WorldFish.

ECONOMIC VALUE OF FISH IN CAMBODIA AND VALUE ADDED ALONG THE TRADE CHAIN

Guillaume MILLE¹, HAP Navy², LOENG Nob²

¹Consultant, Phnom Penh, Cambodia

²Inland Fisheries Research and Development Institute, Phnom Penh, Cambodia



TABLE OF CONTENTS

- 1 INTRODUCTION 1**
 - 1.1 Background 1
 - 1.2 Approach 1

- 2 RESEARCH METHODOLOGY 3**
 - 2.1 Study area 3
 - 2.2 Scope of the study 4
 - 2.3 Selection of samples 4
 - 2.4 Data collection..... 4
 - 2.5 Data analysis 5
 - 2.5.1 Currency considerations 5
 - 2.5.2 Weighting considerations 5
 - 2.5.3 Reservation on exporter sample representativity 6
 - 2.5.4 Confusion over species 6

- 3 RESULTS AND DISCUSSION 7**
 - 3.1 Fish sales by fishermen 8
 - 3.1.1 Volume of species or species groups sold by fishermen..... 8
 - 3.1.2 Value of species or species groups sold by fishermen 10
 - 3.1.3 Most expensive species or species groups sold by fishermen 12
 - 3.1.4 Overall price of fish sold by fishermen (first-sale value) 13
 - 3.2 Fish sales by traders 14
 - 3.2.1 Volume of species or species groups sold by traders 14
 - 3.2.2 Value of species or species groups sold by traders 16
 - 3.2.3 Most expensive species or species groups sold by traders 18
 - 3.2.4 Overall price of fish sold by traders 19
 - 3.3 Fish sales by exporters 20
 - 3.3.1 Volume of species or species groups sold by exporters..... 20
 - 3.3.2 Value of species or species groups sold by exporters 22
 - 3.3.3 Most expensive species or species groups sold by exporters 23
 - 3.3.4 Overall price of fish sold by exporters 26

- 4 EVOLUTION OF FISH PRICES ALONG THE TRADE CHAIN 28**

- 5 CONCLUSIONS 33**

- 6 BIBLIOGRAPHY 34**

- 7 ANNEXES 35**

**Acknowledgements**

Guillaume Mille checked the database, analyzed data and wrote the report;
Hap Navy led the field survey, contributed to the report (methodology) and supervised data quality;
Loeng Nob created the database and supervised data entry.

Citation

Mille G., Hap N., Loeng N. 2016. Economic value of fish in Cambodia and value added along the trade chain. Inland Fisheries Research and Development Institute (Fisheries Administration) and WorldFish. Phnom Penh, Cambodia. 62 pp.

EXECUTIVE SUMMARY

This study of fish market prices aimed to collect new information about the monetary value of inland fish resources along the market chain to provide information to estimate the total market value of inland fisheries in Cambodia. The three zones sampled for that purpose were the Upper Mekong (Stung Treng and Kratie), the Tonle Sap floodplains (Pursat and Siem Reap) and the Lowlands (Takeo and Svay Rieng). The study also covered Phnom Penh.

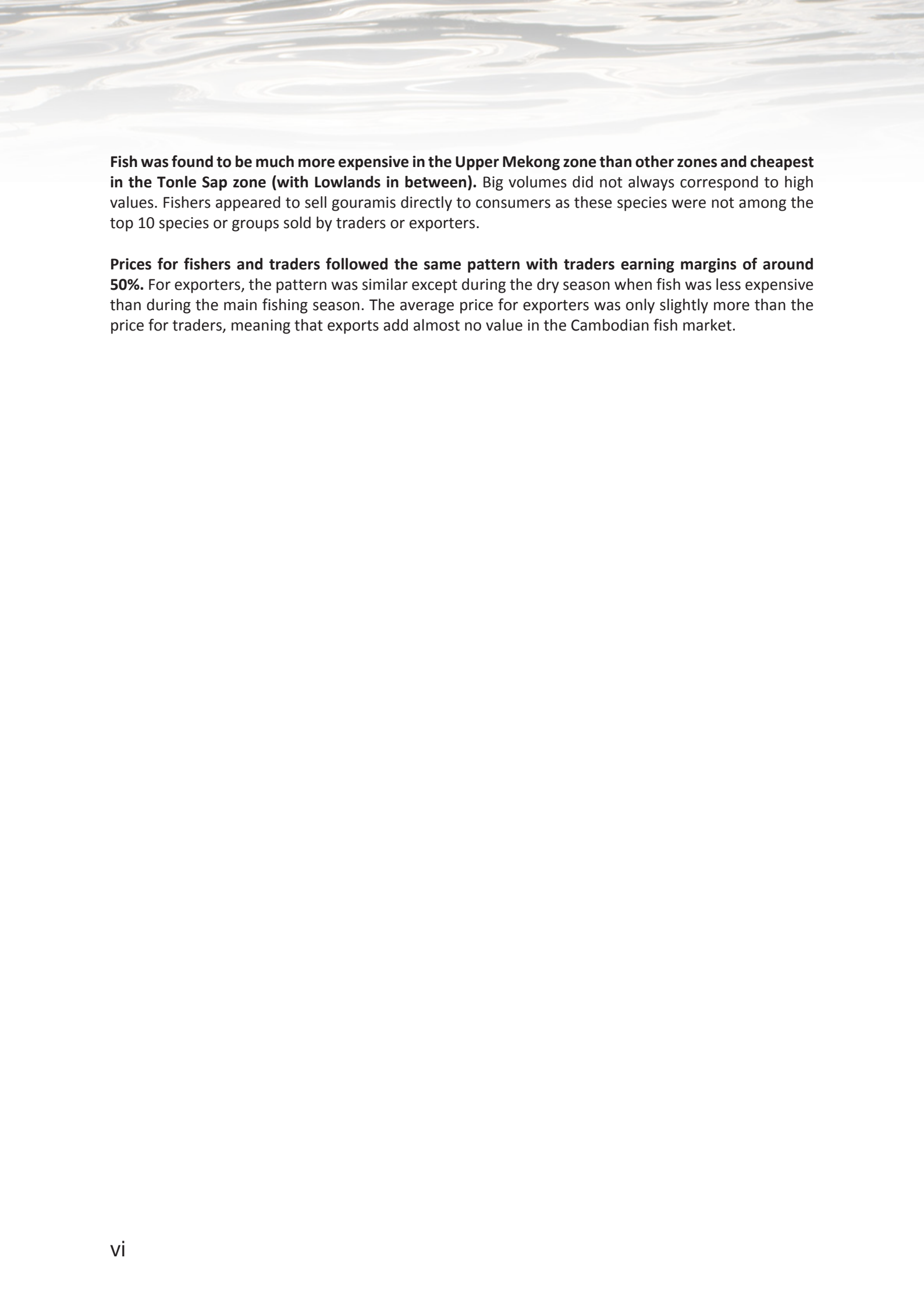
The study lasted one year with surveys of fishers, traders and exporters conducted every three months in 2012 and 2013. Sales were recorded under the Khmer names of fishes. Areas chosen were villages with low, medium and high fishing populations as well as landing sites, markets and border points. Fishers were categorized as subsistence or semi-commercial fishers. Traders included fish collectors/middlemen, wholesalers and retailers at different levels at locations such as markets and landing sites. Exporters were traders who exported fish to other countries by land or water. The 1 516 people interviewed comprised 1 225 fishers, 241 traders and 50 exporters.

At the level of fishermen, the species group sold the most was gouramis (*Osphronemus*, *Trichopodus* and *Trichogaster* spp., i.e. *trey kawmpheanh*, *trey kawnthor*, *trey romeas* in Khmer; 14%). These were followed by *Mystus* catfishes (*trey kanchos*, 7%), *Hypsibarbus*, *Barbonymus* and *Puntioplites* (medium-sized cyprinids, *trey chhpin*; 5%), Siamese mud carps (*Henicorhynchus* spp., *trey riel*; 5%), *Wallago* (*trey sanday*), a *Bagrus* catfish and airbreathing catfishes. This ranking reflects sales by fishermen rather than their catches, i.e. on average, 39% of the catch – possibly of lower value – is consumed at the household level and not sold. These 10 most sold species or species groups represent 53% of the sales, while the remaining 47% are divided among 84 different species.

The species or species groups that generated the most value were Siamese mud carps (*Henicorhynchus* spp., *trey riel*) followed by gouramis, a *Bagrus* catfish and airbreathing catfishes. The most expensive species groups sold by fishermen were sheatfishes (*Phalacronotus* spp., *trey kes*) followed by spiny eels (*Mastacembelus* spp., *trey kchoeung*), and medium-sized cyprinids (*Hampala* spp. and *Scaphognathops bandanensis*, *trey khmann* and *trey paphat*). The average value for a tonne of fish at the fishermen's level (weighted average integrating value and proportion in sales of each species over a year) was \$1 096 a tonne (variation between \$632 and \$2 032 depending on the zone).

At the level of traders, the species or species groups sold the most were medium-sized cyprinids (*Cyclocheilichthys* spp. and *Cosmochilus harmandi*, *trey chhkok*; 16%) followed by striped snakehead (*Channa striata*, *trey raws*; 11%) and Siamese mud carps (*Henicorhynchus* spp., *trey riel*; 11%). The groups that generated the most value were the same cyprinids and snakehead followed by another group of cyprinids (*Hypsibarbus* spp., *trey chhpin*). The ten most sold species or groups represented 75% of the value of the total sale. The most expensive species or groups were Mekongina (*trey pasee*), sheatfishes (*trey kantuy moan*, *trey kamplieu* and *trey kes*) and spiny eels. The weighted average value of fish sold by traders was \$1 776 a tonne.

At the level of exporters, the species sold the most was striped snakehead (*Channa striata*, *trey raws*). The species or species groups that generated the most value were striped snakehead, spiny eels, Boeseman croaker, Thai river sprat and bronze featherback. The most expensive species or species groups were marble goby, spiny eels, Boeseman croaker and a pangasiid. The average weighted value of one tonne of fish sold by exporters was \$1 813.

The background of the page features a close-up, top-down view of water with numerous concentric ripples and small waves, creating a textured, shimmering effect. The colors are muted, ranging from light beige to soft grey.

Fish was found to be much more expensive in the Upper Mekong zone than other zones and cheapest in the Tonle Sap zone (with Lowlands in between). Big volumes did not always correspond to high values. Fishers appeared to sell gouramis directly to consumers as these species were not among the top 10 species or groups sold by traders or exporters.

Prices for fishers and traders followed the same pattern with traders earning margins of around 50%. For exporters, the pattern was similar except during the dry season when fish was less expensive than during the main fishing season. The average price for exporters was only slightly more than the price for traders, meaning that exports add almost no value in the Cambodian fish market.

1 INTRODUCTION

1.1 Background

In 2012, WorldFish launched a fisheries valuation project in Cambodia with the support of the Australian Centre for International Agricultural Research (ACIAR). The overall objective of the project was to quantify the multiple values of fish resources and convey information to national decision-makers and development agencies for sustainable and improved rural livelihoods. Specific objectives were 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 on fisheries resources; and
- v. inform a large range of stakeholders about the actual role of fisheries in the national economy and livelihoods.

The present fish market prices study constitutes one component of the project. It aims to collect new information about the monetary value of inland fish resources along the market chain. Together with other components, this will provide information to estimate the total market value of 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 main fish and other aquatic animals;
- an estimate of fish trade and exports over 12 months for different stakeholders in the market chain; and
- qualitative information about the relationship between stakeholders within the fish value chain.

1.2 Approach

The market study includes three agro-ecological zones and the following stakeholders:

- fishers (subsistence, semi-commercial and commercial);
- traders (middlemen/fish collectors, wholesalers and retailers); and
- exporters (land and waterways).



Our study required three specific survey questionnaires. We repeated the survey four times with the questionnaires covering periods of three months. Most of the effort was focused on precisely measuring fish market prices. We did not intend to develop a full value-chain analysis or an analysis of the interaction between stakeholders or the volume of fish trade flows across the country. The questionnaires were developed based on previous related studies in Cambodia by Rab et al. (2005 and 2006), M4P (2008) and Ali (2010). These references were combined with market and socio-economic surveys on the fisheries sector in Cambodia and a more general manual for value-chain analysis.

2 RESEARCH METHODOLOGY

2.1 Study area

The study was conducted in Phnom Penh and six provinces in three agro-ecological zones, namely the Upper Mekong zone (Stung Treng and Kratie), the Tonle Sap floodplains (Pursat and Siem Reap) and the Lowlands floodplains (Takeo and Svay Rieng) (Figure 1). These zones represent different agronomic and ecological combinations of the Lower Mekong Basin including riverbanks along the Mekong (Stung Treng and Kratie) and floodplains with intensive trade with Vietnam (Takeo and Svay Rieng).

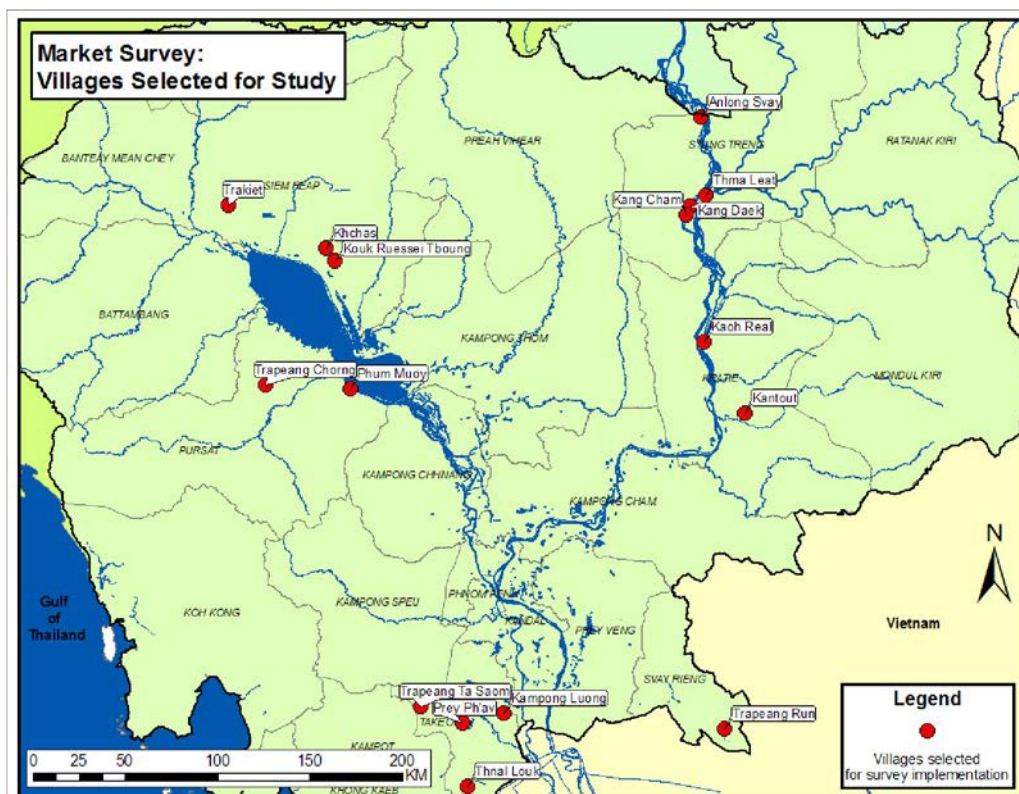


Figure 1: Map of Cambodia showing selected villages study areas in six provinces

2.2 Scope of the study

The study covered a one-year period with surveys conducted every three months in 2012 and 2013. Areas chosen were villages with low, medium and high fishing populations as well as landing sites, markets and border points.

2.3 Selection of samples

The sampling and data-collection methodology for the study focused on fishers, traders, and exporters. Fishers were categorized as subsistence or semi-commercial fishers. Traders included fish collectors/middlemen, wholesalers and retailers at different levels at locations such as markets and landing sites. Exporters were traders who exported fish to other countries by land or water. The 1 516 people interviewed comprised 1 225 fishers, 241 traders and 50 exporters (Table 1).

Table 1: Number of selected samples by agro-ecological zone

Number of Samples by Zone						
Stakeholders	Mekong Mainstream	Tonle Sap Floodplains	Lowland Floodplains	Phnom Penh	Total	Remarks
1. Fishers (subsistence and semi-commercial)	408	409	408	0	1 225	17 fishers from each village (6 villages) of each zone; 4 times/year; random (20% women)
2. Traders	66	66	64	45	241	4 fish collectors/middlemen, 2 wholesalers and 10 retailers from each zone; and Phnom Penh (11); 4 times/year
3. Exporters	16	18	12	4	50	4 exporters from each zone; 4 times/year
Total	490	493	484	49	1 516	

2.4 Data collection

Both secondary and primary data were used in this study. Secondary data were the review of all related studies on fish markets and trade in Cambodia, derived from documents from government and other sources to complement primary data and observations. The primary data were collected through individual interviews (semi-structured and structured) using three different types of questionnaires for fishers, traders and exporters involved in the market chain of inland fisheries. The primary data were collected between December, 2012 and October, 2013.

2.5 Data analysis

The primary data was stored in Access software and analyzed with Excel and Access programs.

2.5.1 Currency considerations

All prices were collected in riel. For better readability and considering the heavy dollarization of the Cambodian economy, however, all prices mentioned in this report are in US dollars based on an exchange rate of 4 000 riel for \$1.

2.5.2 Weighting considerations

Unless otherwise specified, all price averages and other calculations are weighted. This means that a price associated with a big quantity of fish in the raw data will have more importance in the results than a price for a small quantity of fish. For example, if one fisherman sells 1 kg of fish for \$5 and a second sells 10 kg of fish for \$2, the simple average is \$3.50 $([5 + 2]/2)$. But the weighted average is \$2.27 $([1 \times 5 + 10 \times 2]/11)$ which is much closer to the price with the big quantity. A graphic representation could be:

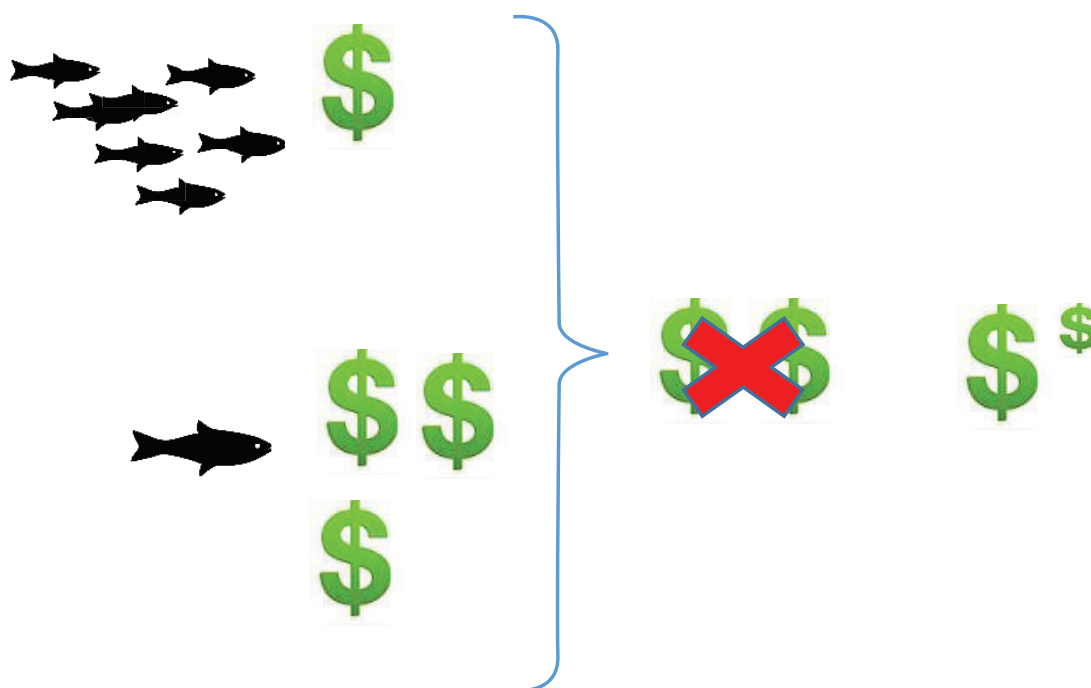


Figure 2: Graphic representation of a weighted average

2.5.3 Reservation on exporter sample representativity

The exporter sample is small due to difficulties in conducting interviews. Using weighted averages therefore sometime leads to results reflecting the responses of only one exporter, especially during single periods in one zone.

2.5.4 Confusion over species

It was decided to merge up to eight species of gourami into one group covering three genera (*Osphronemus* spp., *Trichopodus* spp. and *Trichogaster* spp.). This was due to lack of detail in the Khmer common names for these species and issues related to fish size at the time of identification.

3 RESULTS AND DISCUSSION

Almost 500 people were surveyed in each of the three zones and almost 50 in Phnom Penh (Table 2).

The study was divided into four periods – the flood recession season when fish leave the floodplains from September to November (2012), the period of high fish abundance and low fish prices from December (2012) to February (2013), the low-abundance and high-price period from March to May (2013) and the flood season when fish enter the floodplains from June to August (2013).

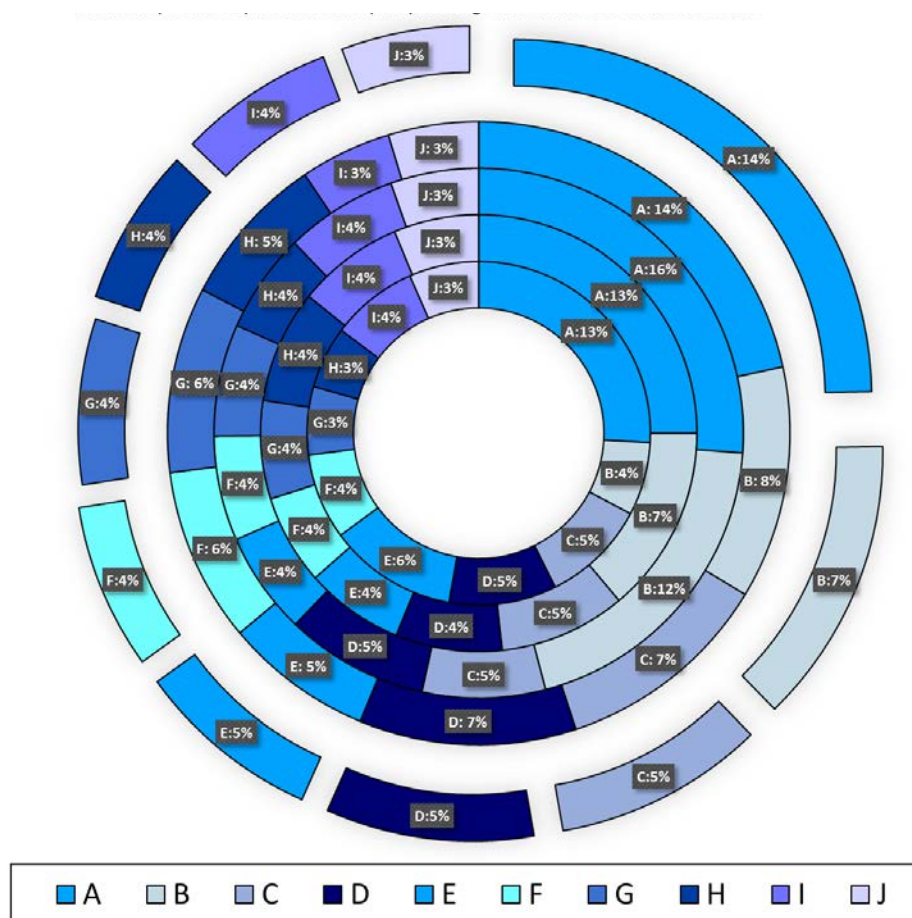
Table 2: Number of Samples by stakeholder, province and zone (2012-2013)

Number of Samples				
Province and Zone	Fishers	Traders	Exporters	Total
Stung Treng	271	34	18	323
Kratie	137	32	0	169
Zone 1 (Mekong mainstream)	408	66	18	492
Pursat	204	34	9	247
Siem Reap	205	32	8	245
Zone 2 (Tonle Sap floodplains)	409	66	17	492
Takeo	272	33	8	313
Svay Rieng	136	32	3	171
Zone 3 (Lowland floodplains)	408	65	11	484
Phnom Penh	0	44	4	48
Phnom Penh	0	44	4	48
Total	1 225	241	50	1 516

3.1 Fish sales by fishermen

3.1.1 Volume of species or species groups sold by fishermen

- The external ring below represents average annual sales.
- Each of the internal rings represents a season; from the outside, monsoon (Jun-Aug), dry season (Mar-May), main fishing season (Dec-Feb) and receding water (Sep-Nov).
- Each box represents one or several species followed by percentage contribution to overall sales.



Scientific names: A - *Osphronemus* spp., *Trichopodus* spp., *Trichogaster* spp., B - *Mystus* spp. (6 species), C - *Hypsibarbus* spp. (5 species); *Barbonymus gonionotus*, D - *Puntioplites falcifer*; *Puntioplites proctozyron*, E - *Henicorhynchus* spp. (2 species), F - *Wallago attu*, G - *Hemibagrus spilopterus*, H - *Clarias* spp. (3 species), I - *Thynnichthys thynnoides*, J - *Labeo chrysophekadion*

Common English names: A - Gouramis, B - *Mystus* catfishes, C - Medium cyprinids, D - Medium cyprinids, E - Siamese mud carps, F - *Wallago*, G - *Bagrus* catfish, H - Airbreathing catfishes, I - Small cyprinid, J - Black sharkminnow

Common Khmer names: A - *Trey kawmpheanh*, *Trey kawnthor*, *Trey romeas*, B - *Trey kanchos*, C - *Trey chhpin*, D - *Trey chrakaing*, E - *Trey riel*, F - *Trey sanday*, G - *Trey chhlang*, H - *Trey andaing*, I - *Trey linh*, J - *Trey kaek*

Figure 3: Species or species groups dominant in the sales of fishermen over one year

The 10 species or species groups that fishermen mostly sold were gouramis (14% of annual sales) followed by *Mystus* catfishes (7%), medium-sized cyprinids (5%), other medium-sized cyprinids (5%), Siamese mud carps (5%), Wallago (4%), a *Bagrus* catfish (4%), airbreathing catfishes (4%), a small cyprinid (4%) and black sharkminnow (3%).

The 10 most sold species or species groups represented 56% of the annual sales, while the remainder was made up of 84 different species.

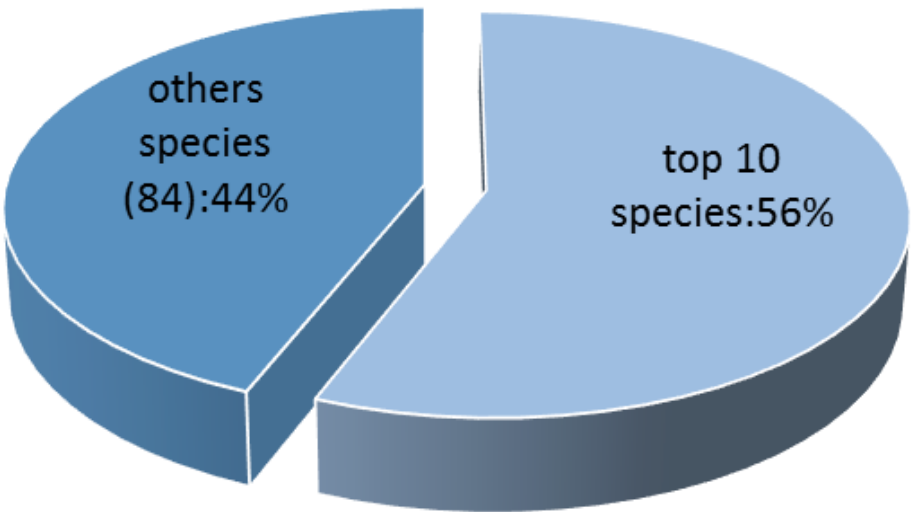
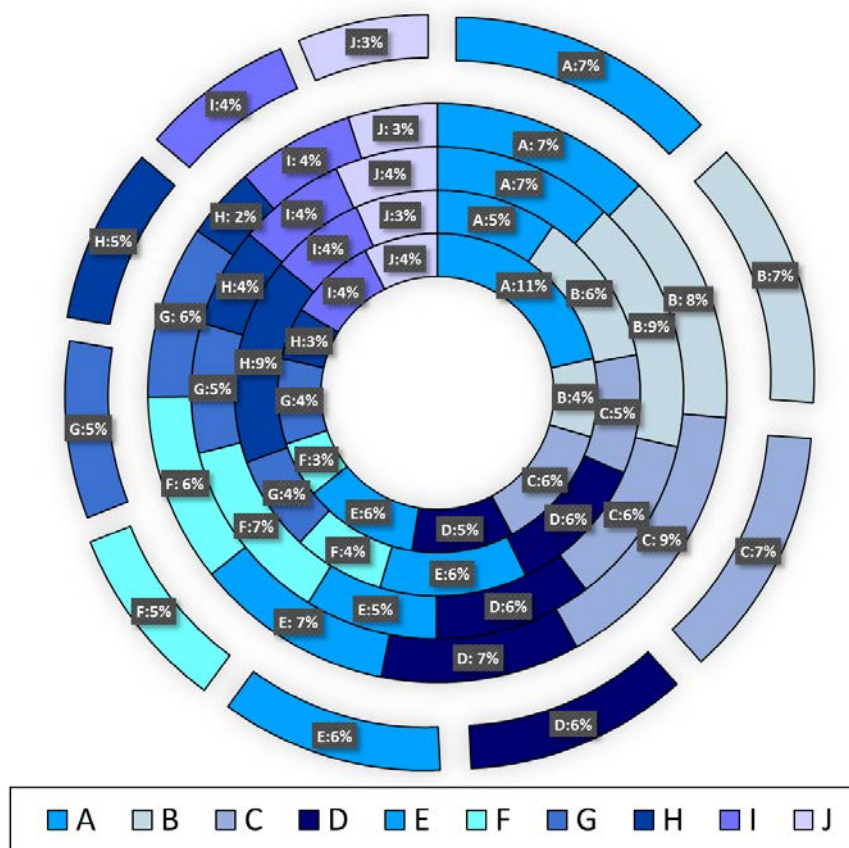


Figure 4: Volume of top 10 species or species groups traded by fishermen over one year compared to other species or species groups sold

3.1.2 Value of species or species groups sold by fishermen

- The external ring below represents average annual sales.
- Each of the internal rings represents a season; from the outside, monsoon (Jun-Aug), dry season (Mar-May), main fishing season (Dec-Feb) and receding water (Sep-Nov).
- Each box represents one or several species followed by percentage contribution to overall sales.



Scientific names: A - *Henicorhynchus* spp. (2 species), B - *Osphronemus* spp., *Trichopodus* spp., *Trichogaster* spp., C - *Hemibagrus spilopterus*, D - *Clarias* spp. (3 species), E - *Hypsibarbus* spp. (5 species); *Barbonymus gonionotus*, F - *Mystus* spp. (6 species), G - *Puntioplites falcifer*, *Puntioplites proctozysron*, H - *Leptobarbus rubripinna*, I - *Labeo chrysophekadion*, J - *Cyclocheilichthys furcatus*; *Cyclocheilichthys enoplos*; *Cosmochilus harmandi*.

Common English names: A - Siamese mud carps, B - Gouramis, C - Bagrus catfish, D - Airbreathing catfishes, E - Medium cyprinids, F - Mystus catfishes, G - Medium cyprinids, H - Medium cyprinid, I - Black sharkminnow, J - Medium cyprinids.

Common Khmer names: A - *Trey riel*, B - *Trey kawmphleanh*, *Trey kawnthor*, *Trey Romeas*, C - *Trey chhlang*, D - *Trey andaing*, E - *Trey chhpin*, F - *Trey kanchos*, G - *Trey chakraing*, H - *Trey chrawlang* / *Trey prorlung*, I - *Trey kaek*, J - *Trey chhkak*.

Figure 5: Ten fish species or species groups generating the most value over one year

The 10 species or species groups that generated the most value for the fishermen were Siamese mud carps (7% of annual value) followed by gouramis (7%), a Bagrus catfish (7%), airbreathing catfishes (6%), medium-sized cyprinids (6%), Mystus catfishes (5%), other medium-sized cyprinids (5%), one more medium-sized cyprinid (5%), black sharkminnow (4%) and more medium-sized cyprinids (3%). Cyprinids accounted for 19% of the value.

The 10 species or species groups generating the most value represented 54% of the total value with the remaining 46% spread among 84 different species.

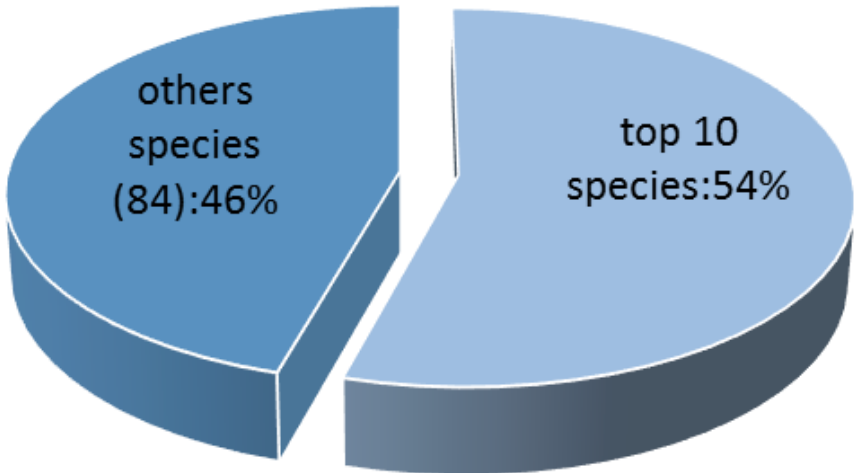
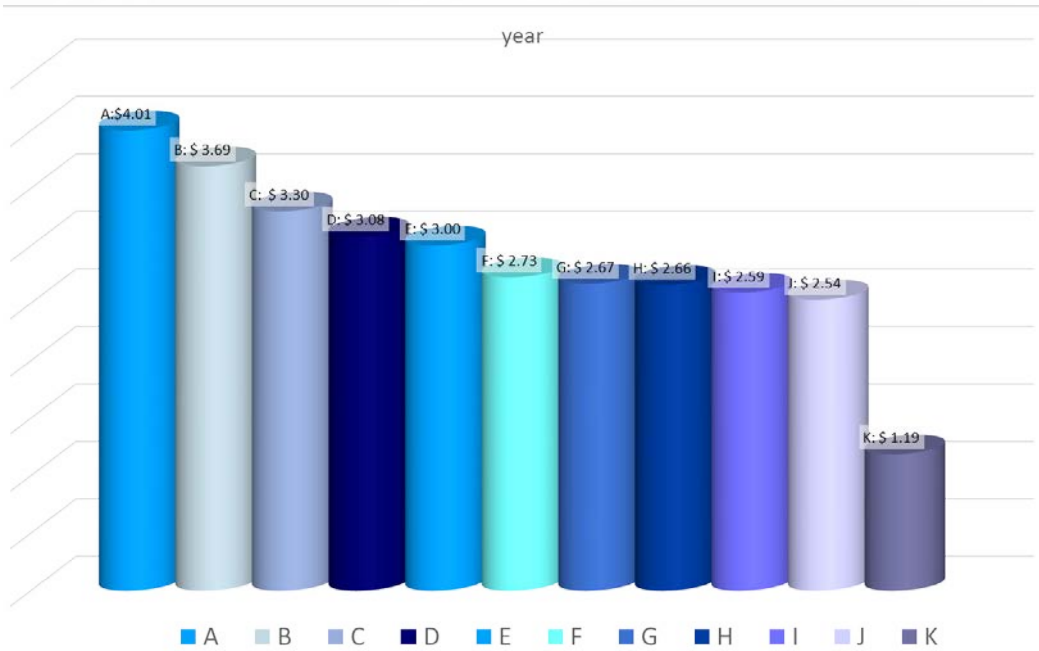


Figure 6: Value of top 10 species or species groups traded by fishermen over one year compared to other species or species groups sold

3.1.3 Most expensive species or species groups sold by fishermen



Scientific names: A - *Phalacrotonotus* spp. (3 species), B - *Mastacembelus* spp. (2 species), C - *Hampala* spp. (2 species), D - *Scaphognathops bandanensis*, E - *Balantiocheilus ambusticauda*, F - *Bangana behri*, G - *Notopterus notopterus*, H - *Chitala ornata*; *Chitala lopis*, I - *Cyclocheilichthys armatus*, *Cyclocheilichthys apogon*, *Cyclocheilichthys lagleri*; *Cyclocheilichthys repasson*, J - *Neolissochilus stracheyi*, K - Others

Common English names: A - Sheatfishes, B - Spiny eels, C - Medium cyprinids, D - Medium cyprinid, E - Burnt tail fish, F - Large cyprinid, G - Bronze featherback, H - Featherbacks, I - Medium cyprinids, J - Small cyprinid, K - Others

Common Khmer names: A - *Trey kes*, B - *Trey kchoeung*, C - *Trey khmann*, D - *Trey paphat*, E - *Trey kiet sawng*, F - *Trey pava* / *Trey proul thmor*, *Trey pava mook pi*, G - *Trey slat*, H - *Trey kra*, I - *Trey sawka kdam*, J - *Trey kolprech*, K - Others

Figure 7: Ten most expensive species or species groups (\$/kg) over one year

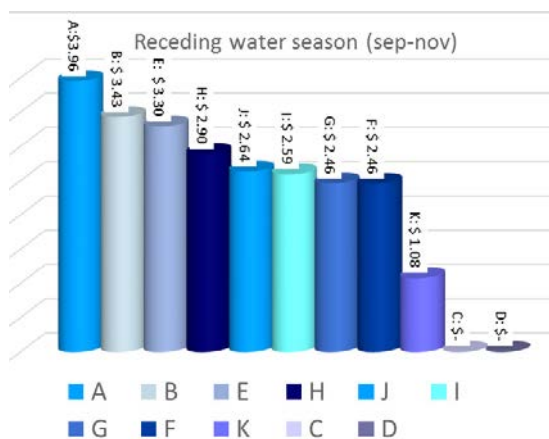


Figure 8: Ten most expensive species or species groups (\$/kg) in receding water season

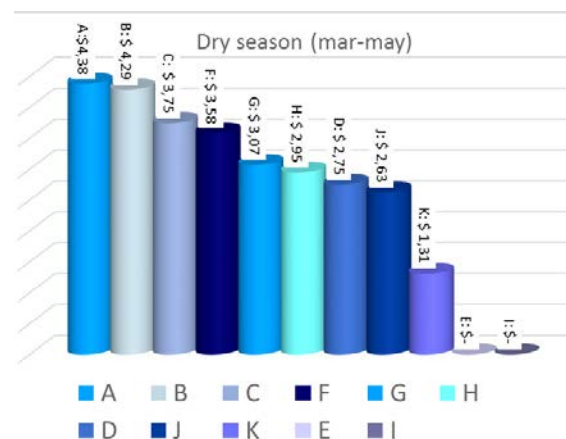


Figure 9: Ten most expensive species or species groups (\$/kg) in dry season season

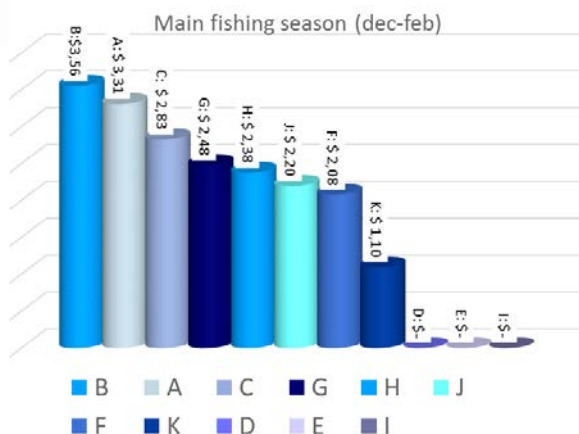


Figure 10: Ten most expensive species (\$/kg) in main fishing season

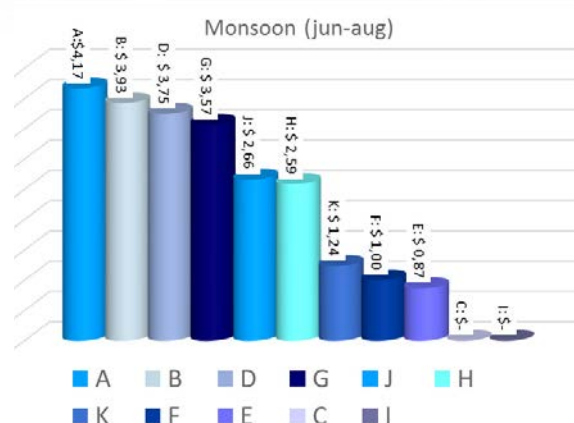


Figure 11: Ten most expensive species (\$/kg) in monsoon season

The 10 most expensive species or species groups sold by fishermen were sheatfishes (\$4.01/kg) followed by spiny eels (\$3.69/kg), medium-sized cyprinids (\$3.30/kg), another medium-sized cyprinid (\$3.08/kg), burnt tail fish (3.00/kg), a large cyprinid (\$2.73/kg), bronze featherback (\$2.67/kg), other featherbacks (\$2.66/kg), other medium-sized cyprinids (\$2.59/kg) and a small cyprinid (\$2.54/kg). The average (not weighted) price for the other 84 species was \$1.19/kg.

3.1.4 Overall price of fish sold by fishermen (first sale value)

- In the Mekong zone, which had the highest prices, the value of a tonne of fish at the fishermen’s level varied between \$1 720 in the main fishing season (December to February) and \$2 032 in the receding water season (September to November).
- In the Tonle Sap floodplain zone, which had the lowest prices, the value of a tonne of fish at the fishermen’s level varied between \$632 in the receding water season (September to November) and \$878 in the monsoon season (June to August).
- In the lowland floodplain zone, the value of a tonne of fish at the fishermen’s level varied between \$1 026 in the receding water season (September to November) and \$1 525 in the monsoon season (June to August).
- The average value for a tonne of fish at the fishermen’s level was \$1 096 a tonne.

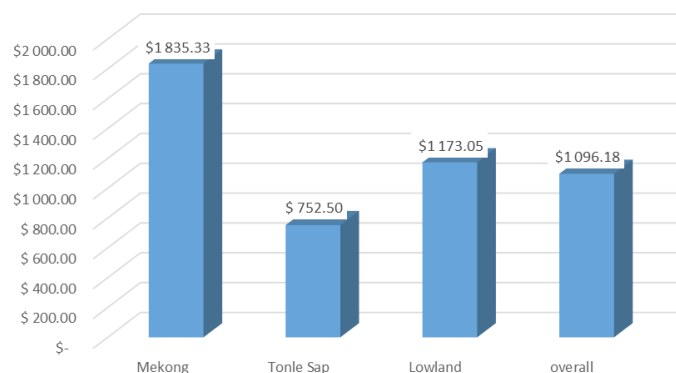
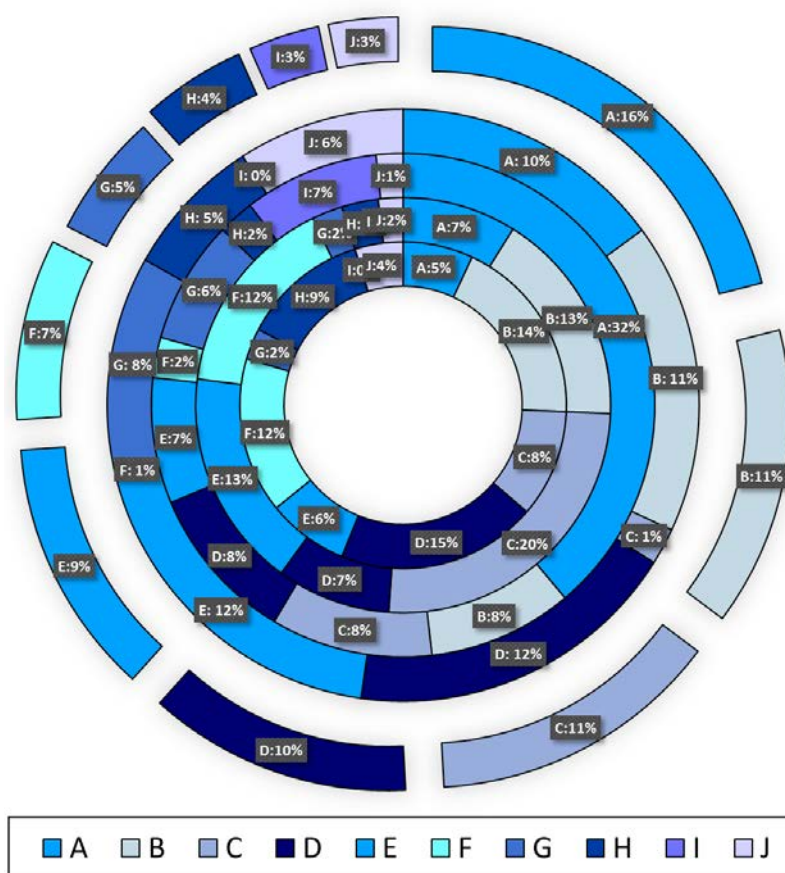


Figure 12: Prices of one tonne of fish sold by fishermen

3.2 Fish sales by traders

3.2.1 Volume of species or species groups sold by traders

- The external ring below represents average annual sales.
- Each of the internal rings represents a season; from the outside, monsoon (Jun-Aug), dry season (Mar-May), main fishing season (Dec-Feb) and receding water (Sep-Nov).
- Each box represents one or several species followed by percentage contribution to overall sales.



Scientific names: A - *Cyclocheilichthys furcatus*, *Cyclocheilichthys enoplos*, *Cosmochilus harmandi*, B - *Channa striata*, C - *Henicorhynchus* spp. (2 species), D - *Hypsibarbus* spp. (5 species); *Barbonymus gonionotus*, E - *Puntioplites falcifer*, *Puntioplites proctozyron*, F - *Channa micropeltes*, G - *Mystus* spp. (6 species), H - *Pangasius mekongensis*, *Pangasianodon hypophthalmus*, *Pangasius bocourti*, I - *Coilia cf. lindmanni*, J - *Clarias* spp. (3 species)

Common English names: A - Medium cyprinids, B - Striped snakehead, C - Siamese mud carps, D - Medium cyprinids, E - Medium cyprinids, F - Indonesian snakehead, G - *Mystus* catfishes, H - Pangasiids, I - Anchovy, J - Airbreathing catfishes

Common Khmer names: A - *Trey chhkak*, B - *Trey phtuok* (small) / *Trey raws* (big), C - *Trey riel*, D - *Trey chhpin*, E - *Trey chrakaing*, F - *Trey diep* (small) / *Trey chhdaur* (big), G - *Trey kanchos*, H - *Trey pra*, I - *Trey chonluanh moan*, J - *Trey andaing*

Figure 13: Ten most traded species or species groups over one year

The 10 species or species groups mostly sold by traders were medium-sized cyprinids (16%) followed by striped snakehead (11%), Siamese mud carps (11%), other medium-sized cyprinids (10%), more medium-sized cyprinids (9%), Indonesian snakehead (7%), *Mystus* catfishes (5%), pangasiids (4%), an anchovy (3%) and airbreathing catfishes (3%).

These 10 species or species groups represented 77% of fish trade volume during the year with the other 23% divided among 66 species.

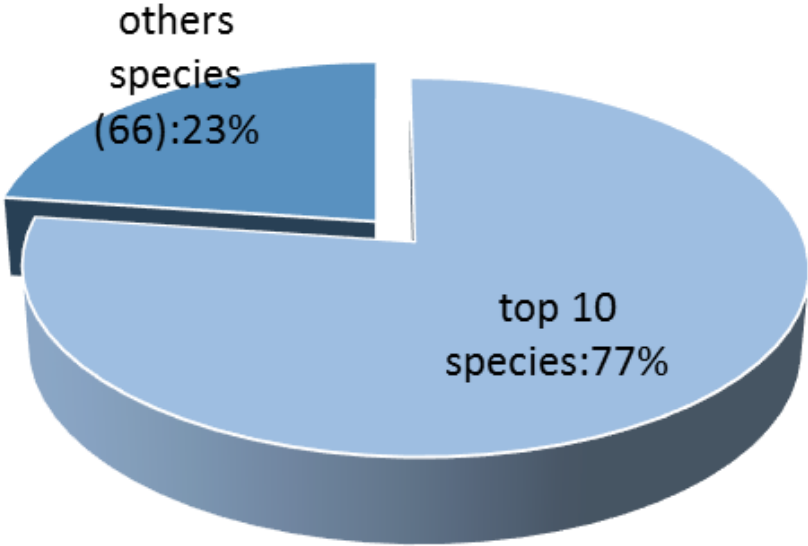
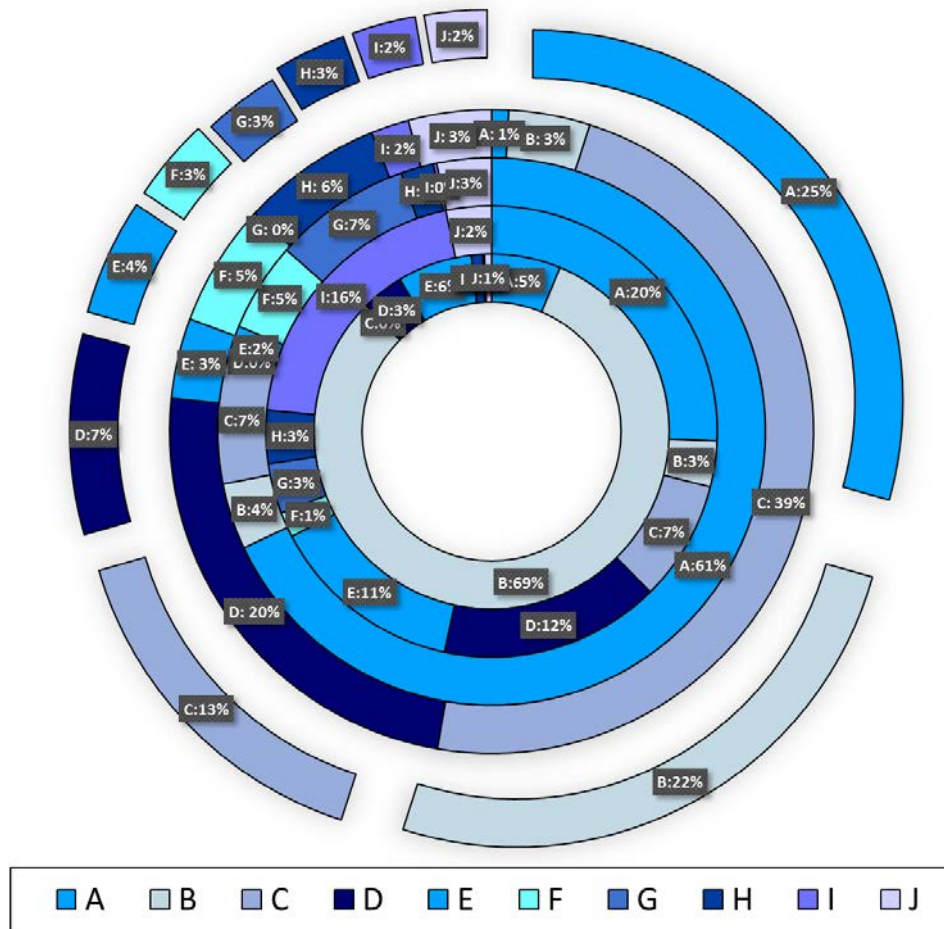


Figure 14: Volume of top 10 species or species groups traded by traders over one year compared to other species or species groups sold

3.2.2 Value of species or species groups sold by traders

- The external ring below represents average annual sales.
- Each of the internal rings represents a season; from the outside, monsoon (Jun-Aug), dry season (Mar-May), main fishing season (Dec-Feb) and receding water (Sep-Nov).
- Each box represents one or several species followed by percentage contribution to overall sales.



Scientific names: A - *Cyclocheilichthys furcatus*; *Cyclocheilichthys enoplos*; *Cosmochilus harmandi*, B - *Channa striata*, C - *Hypsibarbus* spp. (5 species); *Barbonymus gonionotus*, D - *Channa micropeltes*, E - *Puntioplites falcifer*; *Puntioplites proctozyron*, F - *Mystus* spp. (6 species), G - *Hemibagrus spilopterus*, H - *Clarias* spp. (3 species), I - *Phalacrotonotus* spp. (3 species), J - *Macrogathus* spp. (4 species)

Common English names: A - Medium cyprinids, B - Striped snakehead, C - Medium cyprinids, D - Indonesian snakehead, E - Medium cyprinids, F - *Mystus* catfishes, G - *Bagrus* catfish, H - Airbreathing catfishes, I - Sheatfishes, J - Spiny eels

Common Khmer names: A - *Trey chhkok*, B - *Trey phtuok* (small) / *Trey raws* (big), C - *Trey chhpin*, D - *Trey diep* (small) / *Trey chhdaur* (big), E - *Trey chrakaing*, F - *Trey kanchos*, G - *Trey chhlang*, H - *Trey andaing*, I - *Trey kes*, J - *Trey chhlonh*

Figure 15: Ten fish species or species groups generating the most value for traders over one year

The 10 species or species groups that generated the most value for traders were medium-sized cyprinids (15%), striped snakehead (14%), other medium-sized cyprinids (12%), Indonesian snakehead (9%), more medium-sized cyprinids (8%), *Mystus* catfishes (3%), a *Bagrus* catfish (3%), airbreathing catfishes (3%), sheatfishes (3%) and spiny eels (3%).

These 10 species or species groups represented 74% of the value of fish traded during the year with 66 other species or species groups accounting for the remaining 26%.

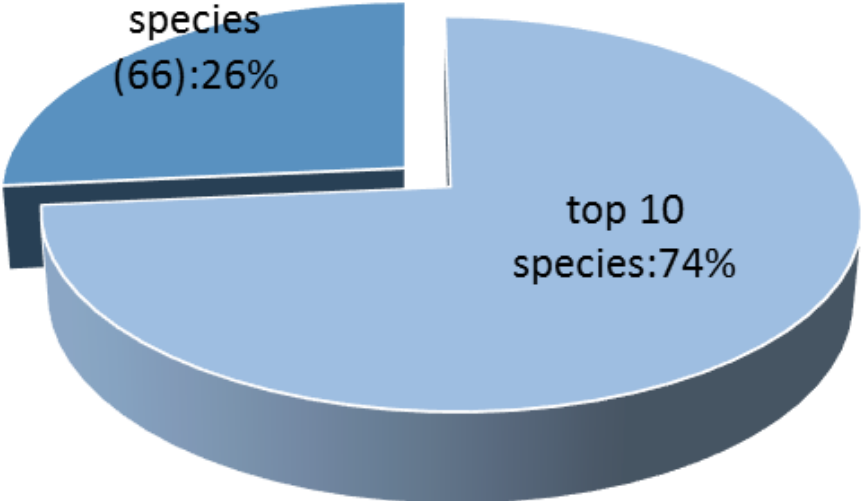
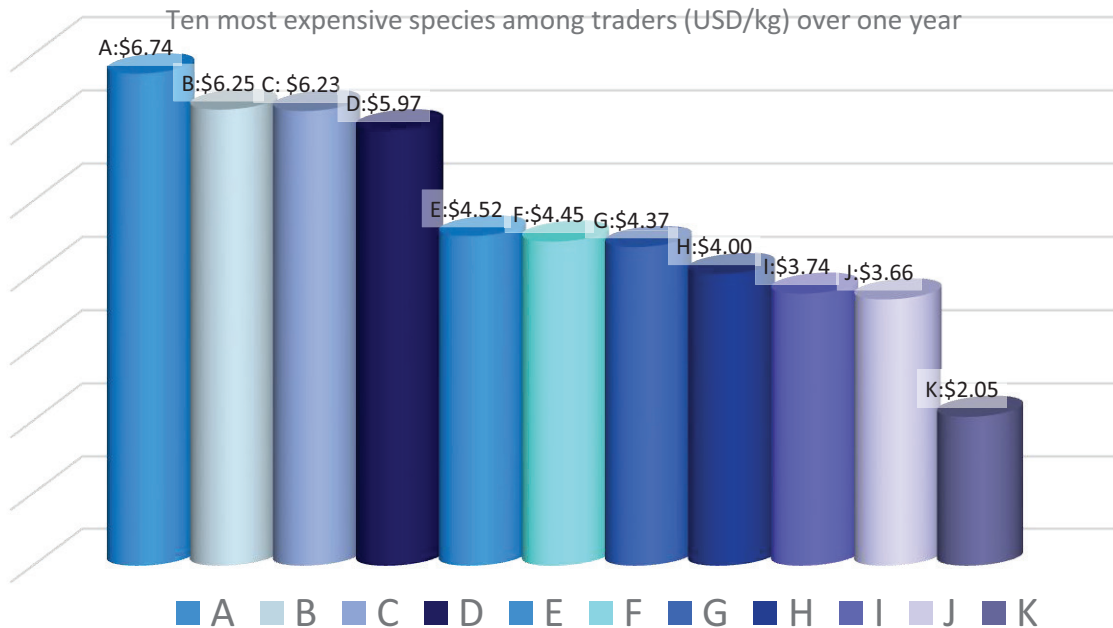


Figure 16: Value of top 10 species or species groups sold by traders over one year compared to other species or species groups sold

3.2.3 Most expensive species or species groups sold by traders level



Scientific names: A - *Mekongina erythrospila*, B - *Micronema cheveyi*; *Kryptopterus* spp. (3 species), C - *Phalacrotonotus* spp. (3 species), D - *Mastacembelus* spp. (2 species), E - *Osteochilus melanopleurus*, F - *Datnioides undecimradiatus*, G - *Hemibagrus wyckioides*; *Hemibagrus wyckii*, H - *Wallago attu*, I - *Brachirus* spp. (3 species); *Cynoglossus microlepis*, J - *Bagrithys* spp. (2 species), K - Others

Common English names: A - Mekongina, B - Sheatfishes, C - Sheatfishes, D - Spiny eels, E - Medium cyprinid, F - Mekong tiger perch, G - Bagrus catfishes, H - Wallago, I - Flatfishes, J - Black lancer catfishes, K - Others

Common Khmer names: A - *Trey pase ee / Trey proul ksach*, B - *Trey kantuy moan / Trey kamplieu*, C - *Trey kes*, D - *Trey kchoeung*, E - *Trey krum*, F - *Trey khlar*, G - *Trey khya*, H - *Trey sanday*, I - *Trey andat chhke*, J - *Trey chek tum*, K - Others

Figure 17: Ten most expensive species for traders (\$/kg) over one year

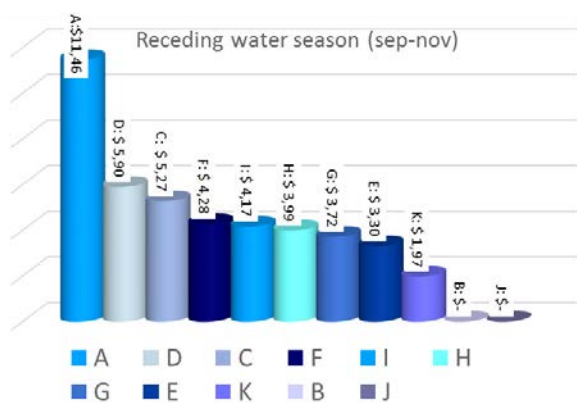


Figure 18: Ten most expensive species for traders (\$/kg) in receding water season

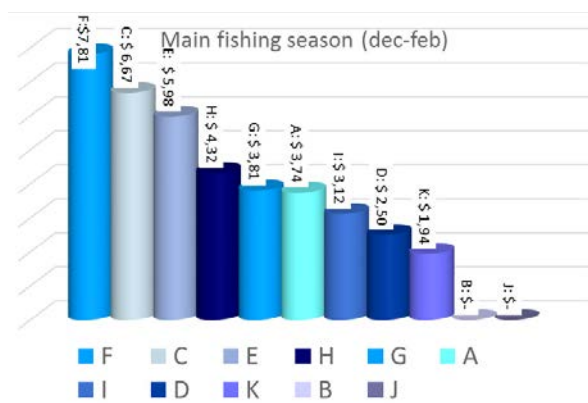


Figure 19: Ten most expensive species for traders (\$/kg) in main fishing season

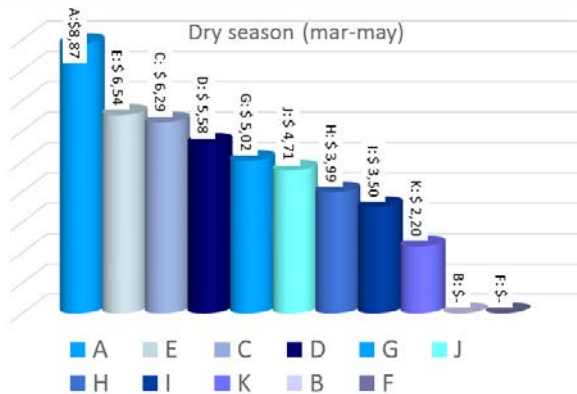


Figure 20: Ten most expensive species for traders (\$/kg) in dry season

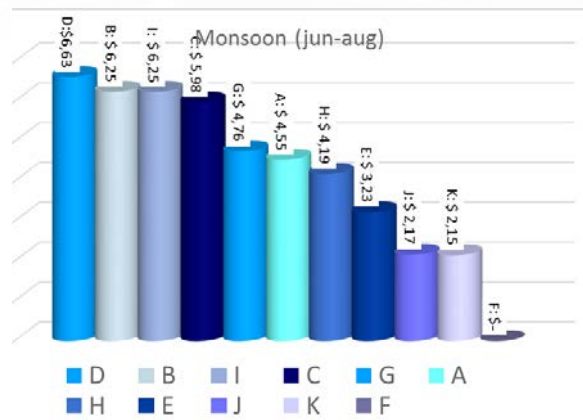


Figure 21: Ten most expensive species for traders (\$/kg) in monsoon season

The 10 most expensive species or species groups sold by traders were Mekongina (\$6.74/kg), sheatfishes (\$6.25/kg), other sheatfishes (\$6.23/kg), spiny eels (\$5.97/kg), another medium-sized cyprinid (\$4.52/kg), Mekong tiger perch (\$4.45/kg), Bagrus catfishes (\$4.37/kg), Wallago (\$4.00/kg), flatfishes (\$3.74/kg) and black lancer catfishes (\$3.66/kg). The average (not weighted) price for the other 66 species was \$2.04/kg.

3.2.4 Overall price of fish sold by traders (first-sale value)

- In the Mekong zone, where prices were highest at almost three times those in the Tonle Sap zone, the value of a tonne of fish at the traders' level varied between \$2 665 in the main fishing season (December to February) and \$3 574 in the dry season (March to May).
- In the Tonle Sap floodplain zone, the value of a tonne of fish at the traders' level varied between \$793 in the main fishing season (December to February) and \$1 232 in the monsoon season (June to August).
- In the lowland floodplain zone, the value of a tonne of fish at the traders' level varied between \$1 617 in the receding water season (September to November) and \$2 985 in the dry season (March to May).
- In Phnom Penh, the value of a tonne of fish at the traders' level varied between \$1 800 in the receding water season (September to November) and \$2 903 in the monsoon season (June to August).
- The average value of fish sold by traders was \$1 776 a tonne.

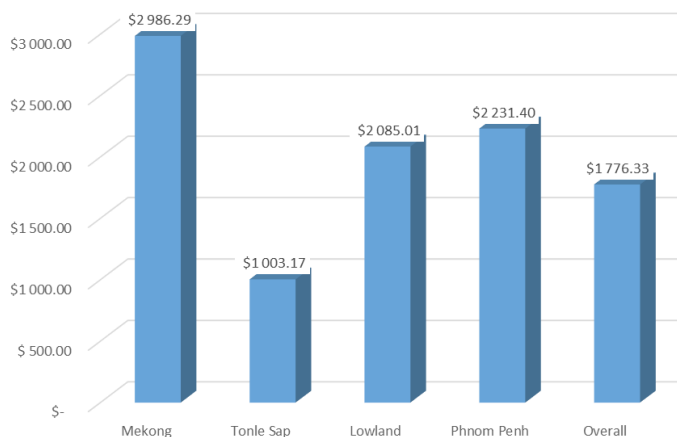
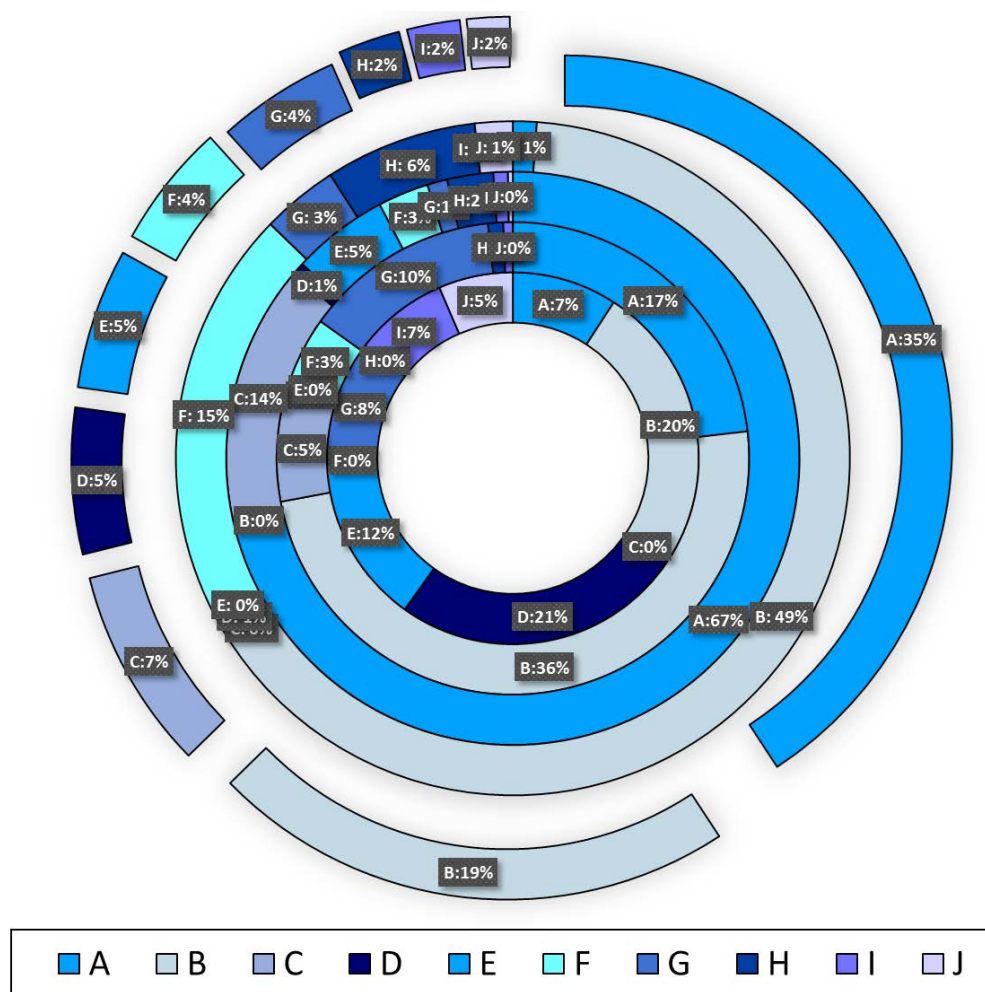


Figure 22: Prices for 1 tonne of fish sold by traders

3.3 Fish sales by exporters

3.3.1 Volume of species or species groups sold by exporters

- The external ring below represents average annual sales.
- Each of the internal rings represents a season; from the outside, monsoon (Jun-Aug), dry season (Mar-May), main fishing season (Dec-Feb) and receding water (Sep-Nov).
- Each box represents one or several species followed by percentage contribution to overall sales.



Scientific names: A - *Channa striata*, B - *Clupeichthys aesarnensis*, C - *Trichopodus trichopterus*, *Trichopodus microlepis*, D - *Mastacembelus* spp. (2 species), E - *Rasbora* spp. (22 species), F - *Boesemania microlepis*, G - *Notopterus notopterus*, H - *Macrogathus* spp. (4 species), I - *Mystus* spp. (6 species), J - *Thynnichthys thynnoides*

Common English names: A - Striped snakehead, B - Thai river sprat, C - Gouramis, D - Spiny eels, E - Small cyprinids, F - Boeseman croaker, G - Bronze featherback, H - Spiny eels, I - *Mystus* catfishes, J - Small cyprinid

Common Khmer names: A - *Trey phtuok* (small) / *Trey raws* (big), B - *Trey bawndol ampeou*, C - *Trey kawmphleanh*, D - *Trey kchoeung*, E - *Trey changva*, F - *Trey promah*, G - *Trey slat*, H - *Trey chhlonh*, I - *Trey kanchos*, J - *Trey linh*

Figure 23: Ten most exported species or species groups over one year

The 10 species or species groups that exporters sold the most were striped snakehead (35%), Thai river sprat (19%), gouramis (7%), spiny eels (5%), small cyprinids (5%), Boeseman croaker (4%), bronze featherback (4%), spiny eels (2%), *Mystus* catfishes (2%) and another small cyprinid (2%).

The top 10 species or species groups sold by exporters represented 85% of the total volume. The other 15% were spread among 33 different species.

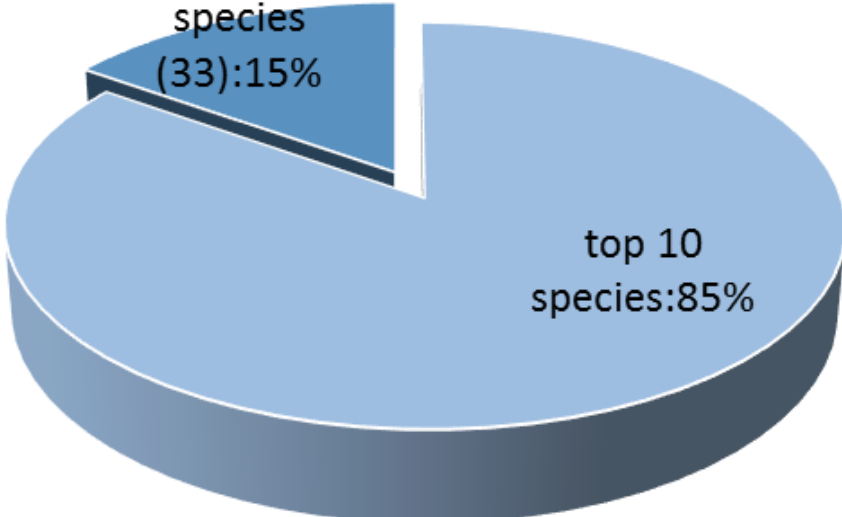
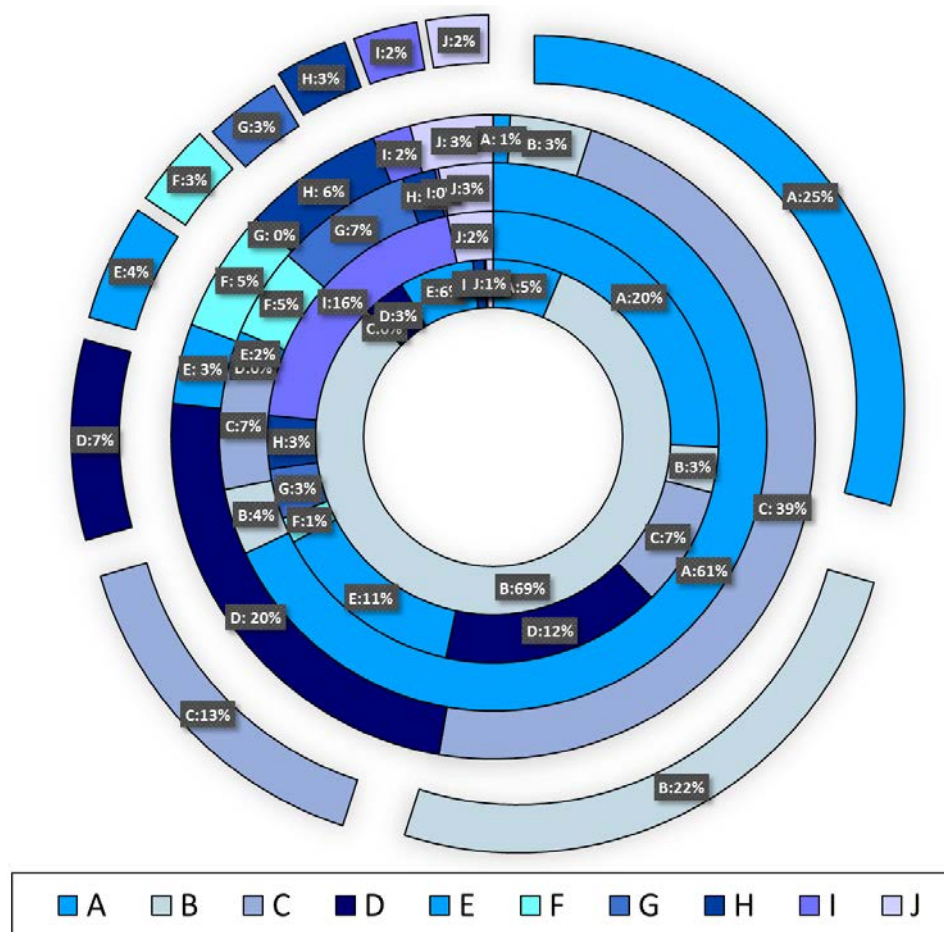


Figure 24: Volume of top 10 species or species groups traded over one year by exporters compared to other species or species groups sold

3.3.2 Value of species or species groups sold by exporters

- The external ring below represents average annual sales.
- Each of the internal rings represents a season; from the outside, monsoon (Jun-Aug), dry season (Mar-May), main fishing season (Dec-Feb) and receding water (Sep-Nov).
- Each box represents one or several species followed by percentage contribution to overall sales.



Scientific names: A - *Channa striata*, B - *Mastacembelus* spp. (2 species), C - *Boesemania microlepis*, D - *Clupeichthys aesarnensis*, E - *Notopterus notopterus*, F - *Macragnathus* spp. (4 species), G - *Osphronemus* spp, *Trichopodus* spp., *Trichogaster* spp., H - *Hemibagrus wyckioides*, *Hemibagrus wyckii*, I - *Pangasius conchophilus*, J - *Phalacrotonotus* spp. (3 species)

Common English names: A - Striped snakehead, B - Spiny eels, C - Boeseman croaker, D - Thai river sprat, E - Bronze featherback, F - Spiny eels, G - Gouramis, H - Bagrus catfishes, I - Pangasiid, J - Sheatfishes

Common Khmer names: A - *Trey phtuok* (small) / *Trey raws* (big), B - *Trey kchoeung*, C - *Trey promah*, D - *Trey bawndol ampeou*, E - *Trey slat*, F - *Trey chhlonh*, G - *Trey kawmpheanh*, *Trey kawnthor*, *Trey Romeas*, H - *Trey khya*, I - *Trey ke* / *Trey pra ke*, J - *Trey kes*

Figure 25 : Ten fish species or species groups generating the most value for exporters over one year

The 10 species or species groups that generated the most value for the exporters were striped snakehead (25%), spiny eels (22%), Boeseman croaker (13%), Thai river sprat (7%), bronze featherback (4%), spiny eels (3%), gouramis (3%), Bagrus catfishes (3%), a pangasiid (2%) and sheatfishes (2%).

The 10 species or species groups most exported species accounted for 85% of the value generated by the exporters. The other 15% are spread among 33 species.

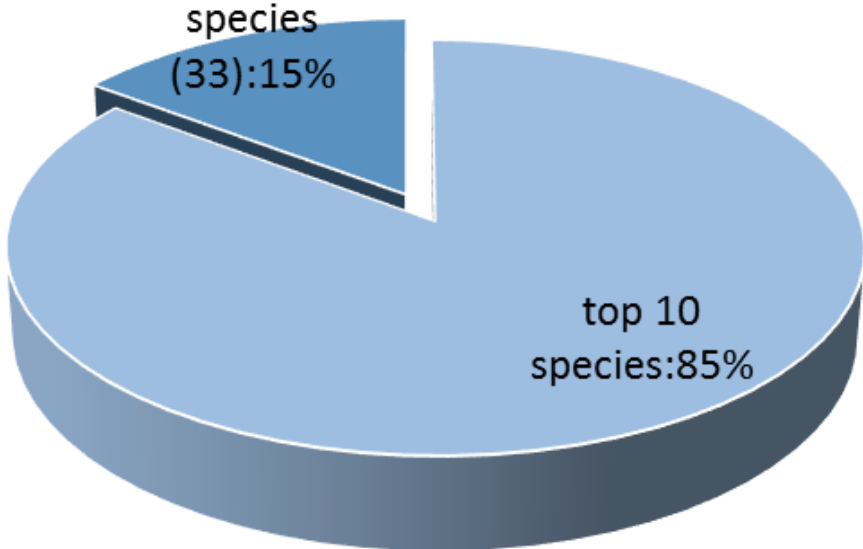
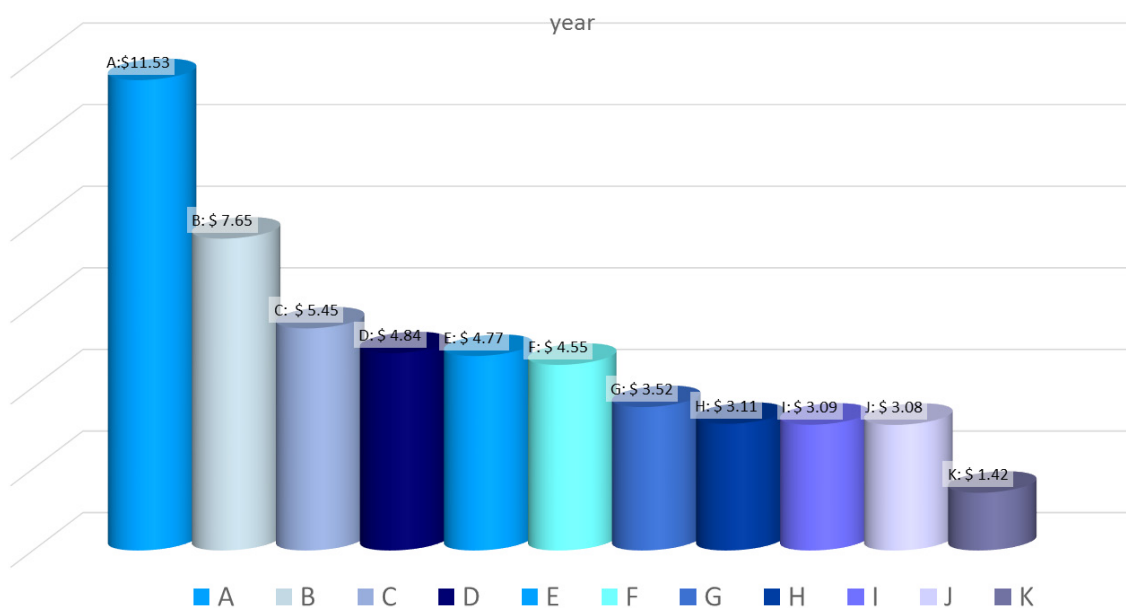


Figure 26: Value of top 10 species or species groups traded by exporters over one year compared to other species or species groups sold

3.3.3 Most expensive species sold by exporters



Scientific names: A - *Oxyeleotris marmorata*, B - *Mastacembelus* spp. (2 species), C - *Boesemania microlepis*, D - *Pangasius conchophilus*, E - *Phalacronotus* spp. (3 species), F - *Hemibagrus wyckiioides*, *Hemibagrus wyckii*, G - *Belodontichthys truncatus*, H - *Hemibagrus filamentus*, I - *Bagarius* spp. (3 species), J - *Pangasius larnaudii*, K - Others

Common English names: A - Marble goby, B - Spiny eels, C - Boeseman croaker, D - Pangasiid, E - Sheatfishes, F - Bagrus catfishes, G - Sheatfish, H - Bagrus catfish, I - Bagarius catfishes, J - Spot catfish, K - Others

Common Khmer names: A - *Trey damrey*, B - *Trey kchoeung*, C - *Trey promah*, D - *Trey ke / Trey pra ke*, E - *Trey kes*, F - *Trey khya*, G - *Trey klang hay*, H - *Trey tanel*, I - *Trey krawbey*, J - *Trey po*, K - Others

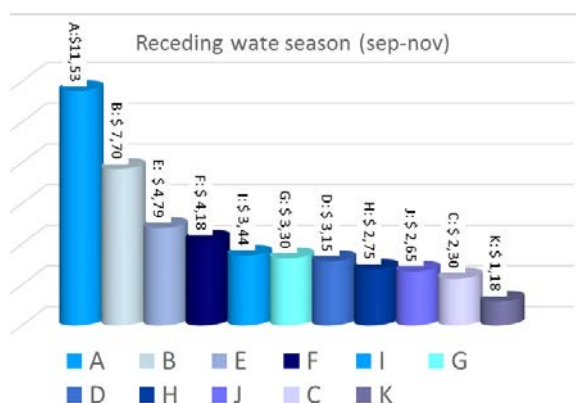


Figure 28: Ten most expensive species or species groups sold by exporters (\$/kg) in receding water season

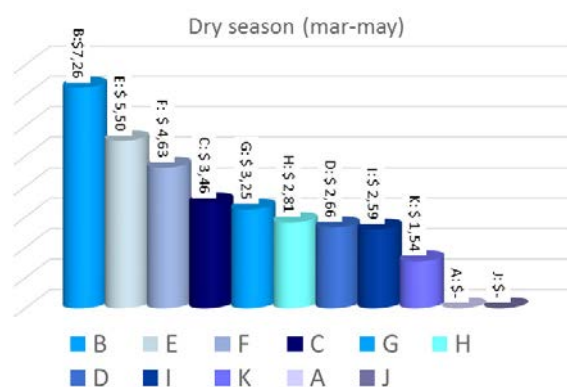


Figure 29: Ten most expensive species or species groups sold by exporters (\$/kg) in dry season

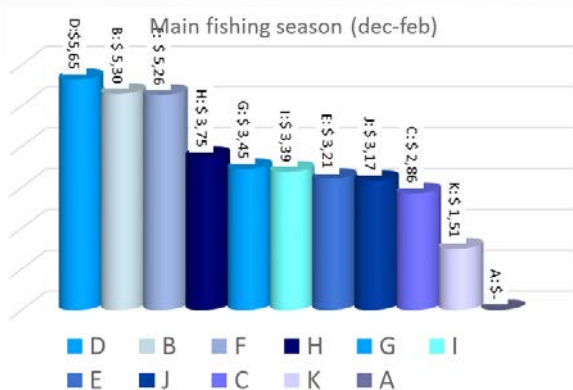


Figure 30: Ten most expensive species or species groups sold by exporters (\$/kg) in main fishing season

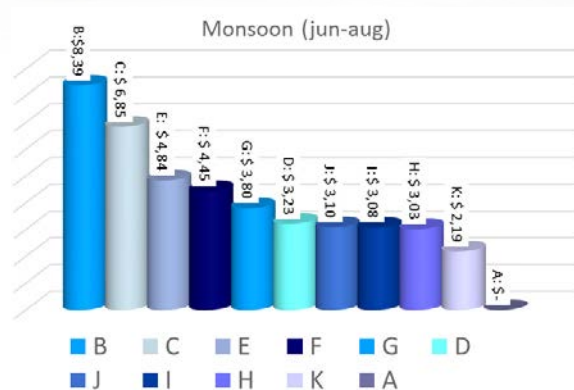


Figure 31: Ten most expensive species or species groups sold by exporters (\$/kg) in monsoon season

The 10 most expensive species or species groups sold by exporters were marble goby (\$11.53/kg), spiny eels (\$7.65/kg), Boeseman croaker (\$5.45/kg), a pangasiid (\$4.84/kg), sheatfishes (\$4.77/kg), Bagrus catfishes (\$4.55/kg), another sheatfish (\$3.52/kg), another Bagrus catfish (\$3.11/kg), Bagarius catfishes (\$3.09/kg) and spot catfish (\$3.08/kg). The average price (not weighted) for the 33 other species or species groups was \$1.42/kg.

3.3.4 Overall price of fish sold by exporters

- In the Mekong zone, the value of a tonne of fish at the export level varied between \$3 100 in the monsoon season (June to August) and \$3 959 in the dry season (March to May).
- In the Tonle Sap floodplain zone, where prices were lowest and suggested much bigger volumes, the value of a tonne of fish at the export level varied between \$442 in the receding water season (September to November) and \$2 313 in the monsoon season (June to August).
- In the lowland floodplain zone, where prices were highest, the value of a tonne of fish at the export level varied between \$1 893 in the main fishing season (December to February) and \$5 138 in the receding water season (September to November).
- In Phnom Penh, the value of a tonne of fish varied between \$828 in the receding water season (September to November) and \$3 128 in the monsoon season (June to August).
- The average value of one tonne of fish sold by exporters was \$1 813.

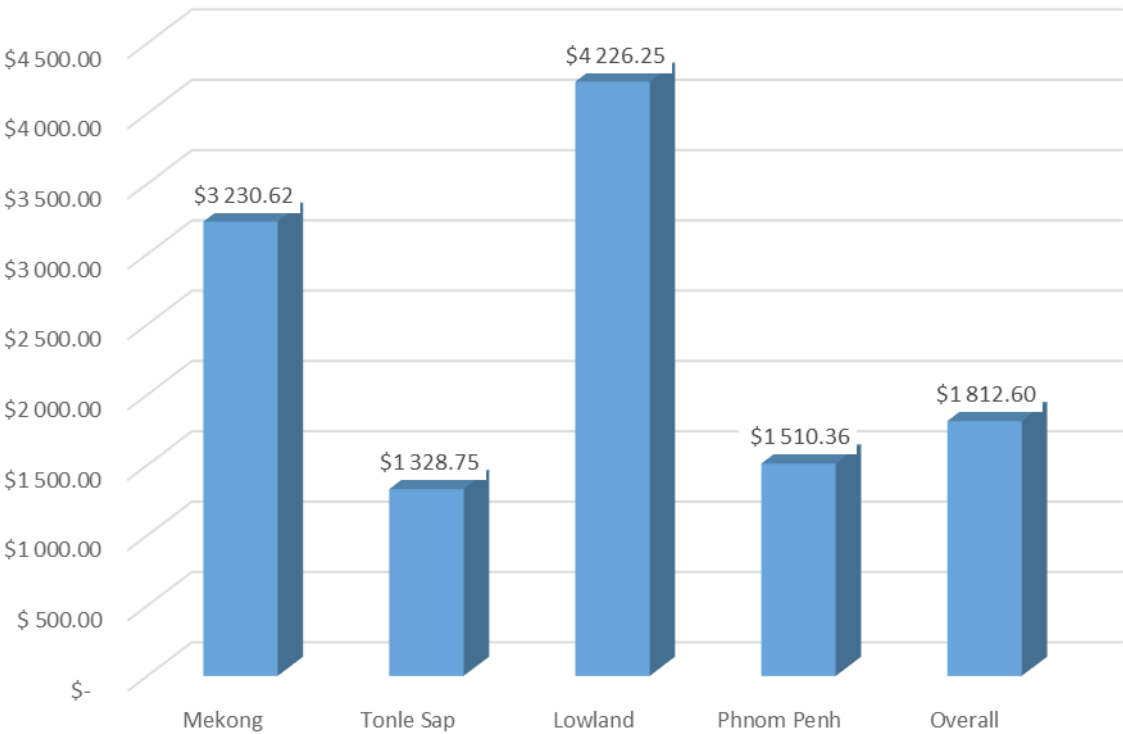


Figure 32: Prices for 1 tonne of fish sold by exporters

4 EVOLUTION OF FISH PRICES ALONG THE TRADE CHAIN

Species variety declines with progression along the trade chain (Figure 33). That's why when looking at the evolution of the price we focused on 41 species shared through the whole chain. The complete list all of the species surveyed is in Annex A and the list of the species common to fishermen, traders and exporters is in Annex B.

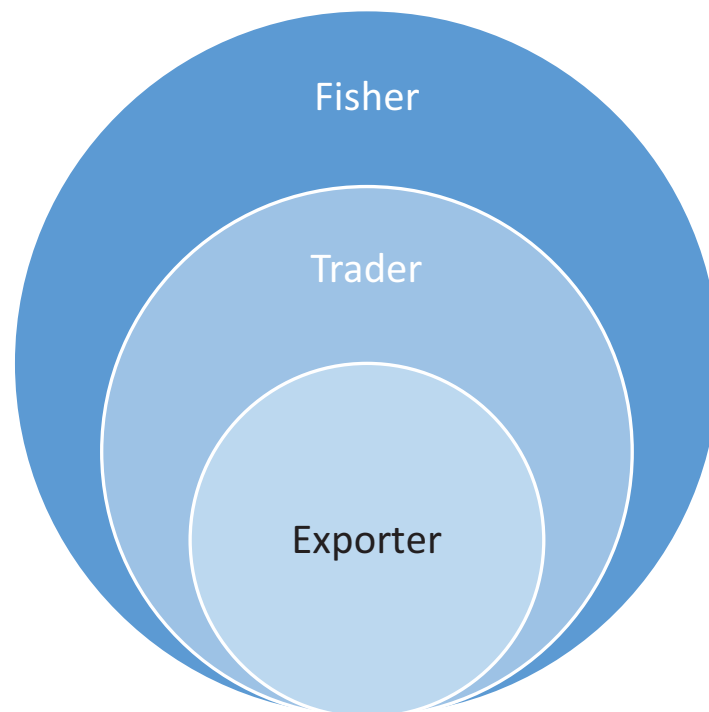


Figure 33: Evolution of species variety through the market chain

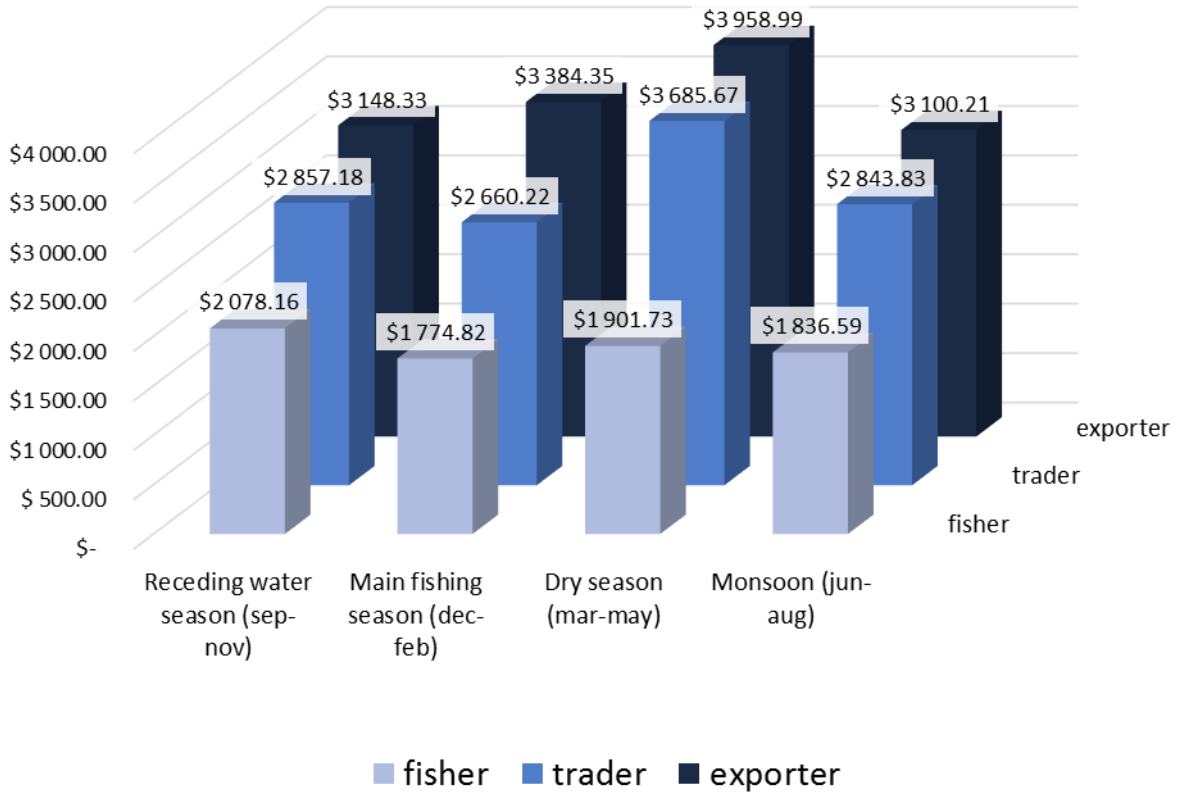


Figure 34: Evolution of fish prices in the Mekong zone

In the Mekong zone, price increases between fishers and traders are bigger than increases between traders and exporters. Prices do not vary much at the fisher level but increase a lot during the dry season at the trader and exporter level.

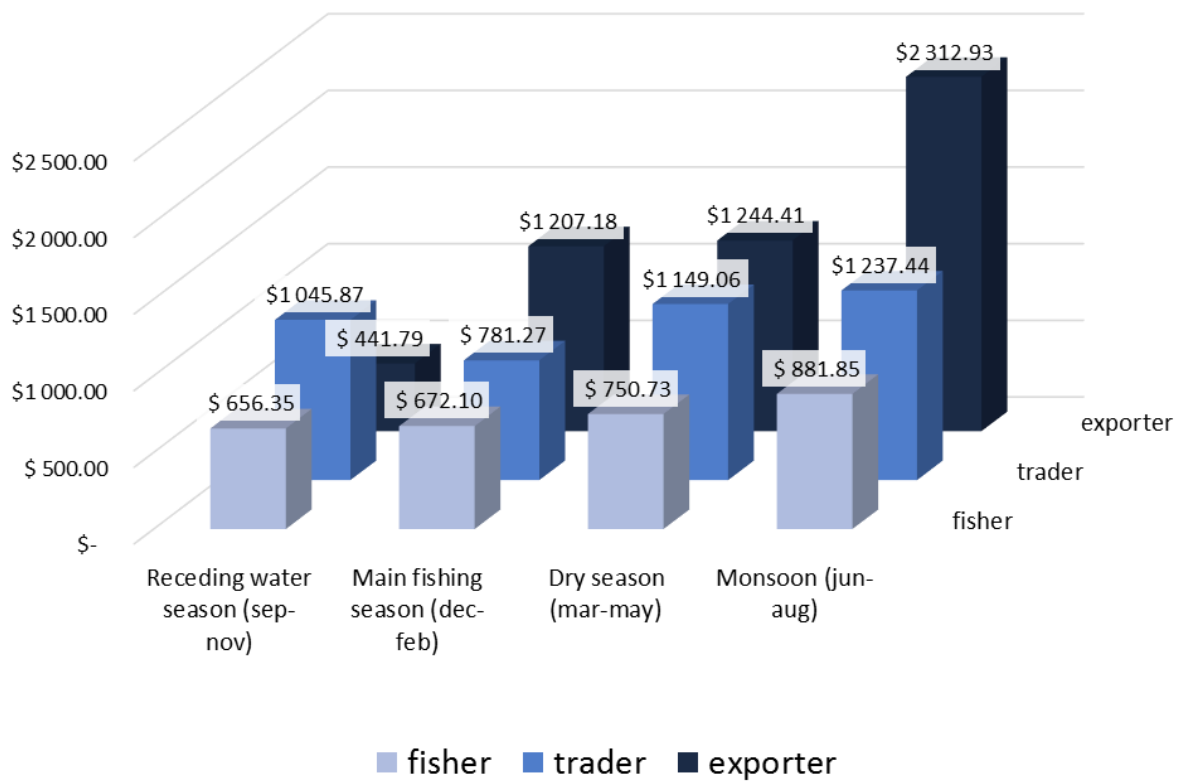


Figure 35: Evolution of fish prices in the Tonle Sap zone

In the Tonle Sap zone, prices are much lower than in the Mekong zone. The margins for traders and exporters are rather thin. During the receding water season, export prices are lower than fisher prices as more than 80% of the export volume comprises species sold from \$0.10 to \$0.35 per kg.

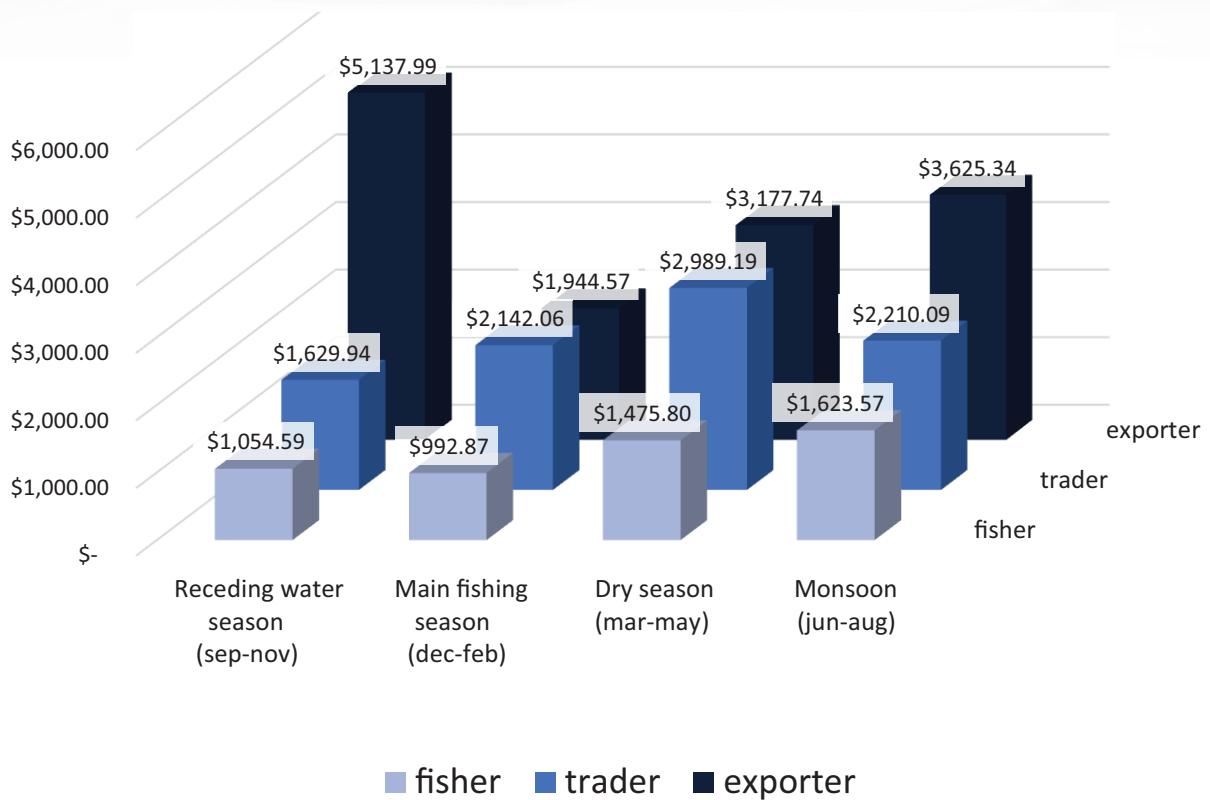


Figure 36: Evolution of fish prices in the lowland zone

In the lowland zone, distribution is closer to that of the Mekong zone – big margins for traders over fishers and small margins for exporters over traders except during the receding water season. During this period from September to November, exporter prices are more than three times the level of trader prices. This is because the biggest volume of fish exported in this period is spiny eels sold at very high prices.

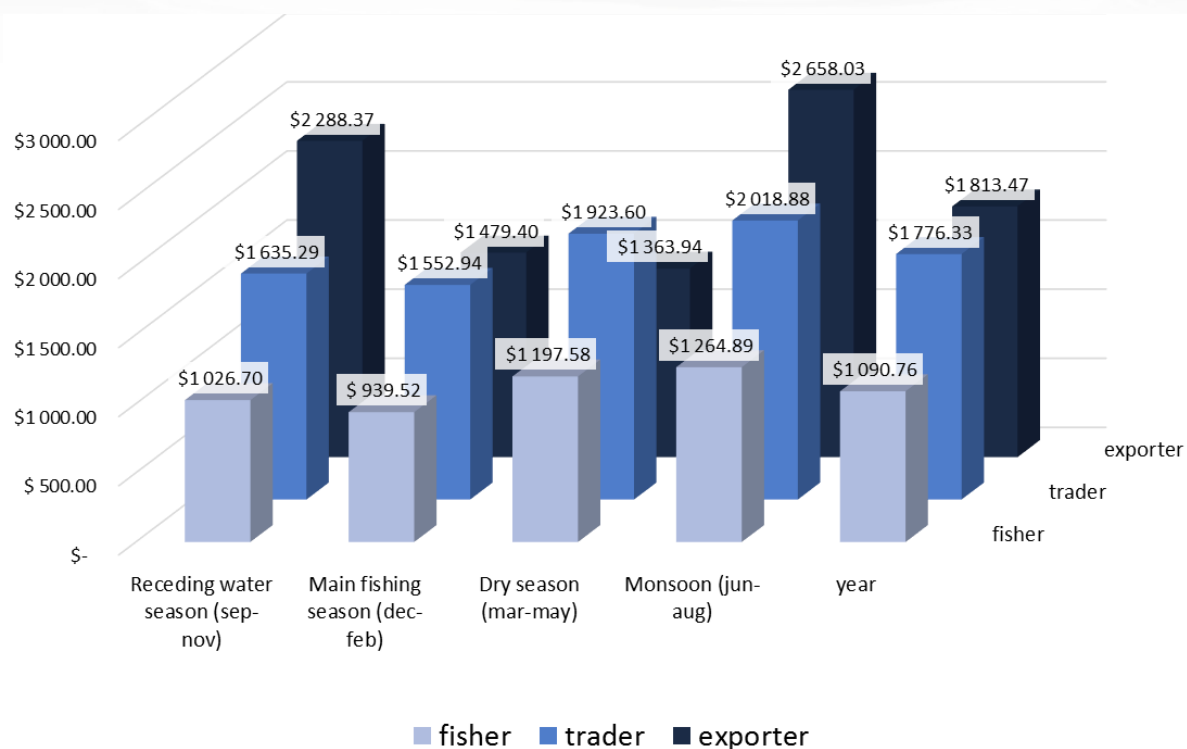


Figure 37: Evolution of fish prices

Trader prices are 54% to 63% higher than fisher prices in all seasons. In the dry season, export prices fall below trader prices, possibly because some exporters bypass middlemen to buy directly from fishers or fish farmers. A larger pool of exporters may have yielded different results. In each zone were around 10 exporters with different volumes of activity. Results sometimes reflected the response of a single exporter of large volumes of one species.

5 CONCLUSIONS

Fish is much more expensive in the Mekong zone than other zones, being very cheap in the Tonle Sap floodplain zone and usually close to average in the lowland floodplain zone. Big volumes do not always correspond to high values. Gouramis, for example, represent 11% of sales volume but only 6% of the total value whereas Siamese mud carps account for 5% and Bagrus catfishes 4% of volume with each making up 7% of the total value. Fishers appear to sell gouramis directly to consumers as these species are not among the top 10 species or species groups sold by traders or exporters.

Prices for fishers and traders follow the same pattern with traders earning margins of around 50%. For exporters, the pattern is similar except during the dry season when fish is less expensive than during the main fishing season. The average price for exporters of \$1 813/tonne is only slightly more than the price at the level of traders, meaning that exports add almost no value in the Cambodian fish market.

6 BIBLIOGRAPHY

- Adi. 2010. Case study of shrimp in coastal zones of Cambodia. Agricultural Development International. Phnom Penh, Cambodia.
- Chea Y., McKenney B. 2003. Domestic fish trade: a case study of fish marketing from the Great Lake to Phnom Penh. Working Paper 29, Cambodia Development Resource Institute. Phnom Penh, Cambodia.
- M4P 2008. Making value chains work better for the poor: a toolbox for practitioners of value chain analysis, Version 3. Making Markets Work Better for the Poor (M4P) Project. Department for International Development (DFID). Agricultural Development International. Phnom Penh, Cambodia.
- Rab, M. A., Hap N., Ahmed M., Seng K., and Viner K. 2006. 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. WorldFish Center Discussion Series No. 4. 98 pp.
- Rab M. A., Hap N., Seng L., Ahmed M., and Viner K. 2005. Marketing infrastructure, distribution channels and trade pattern of inland fisheries resources in Cambodia: an exploratory study. WorldFish Center, Penang, Malaysia. 42pp.

ANNEX A: SCIENTIFIC/KHMER/ENGLISH NAMES OF FISH SPECIES IN THE SURVEYS

The table below was prepared Thach Phanara, Chhouy Samol, Chheng Phen and Eric Baran.

Scientific name	Khmer common name	English common name
<i>Acanthopsoidea</i> spp. (3 species)	<i>Trey bawndol chek</i>	Small loaches
<i>Acantopsis</i> spp. (4 species)	<i>Trey ruschek</i>	Small loaches
<i>Albulichthys albuloides</i>	<i>Trey chhkok tituy</i>	Small cyprinid
<i>Amblyrhynchichthys micracanthus</i>	<i>Trey kambot chramos</i>	Medium-sized cyprinid
<i>Anabas testudineus</i>	<i>Trey kranh</i>	Climbing perch
<i>Bagarius</i> spp. (3 species)	<i>Trey krawbey</i>	Bagarius catfishes
<i>Bagrithys</i> spp. (2 species)	<i>Trey chek tum</i>	Black lancer catfishes
<i>Balantiocheilos ambusticauda</i>	<i>Trey kiet sawng</i>	Burnt tail fish
<i>Bangana behri</i>	<i>Trey pava/trey proul thmor/trey pava mook pi</i>	Large cyprinid
<i>Barbonymus</i> spp. (2 species)	<i>Trey kahe</i>	Medium-sized cyprinids
<i>Belodontichthys truncatus</i>	<i>Trey klang hay</i>	Sheatfish
<i>Betta splendens</i>	<i>Trey kroem phloek/trey kroem meas</i>	Siamese fighting fish
<i>Boesemania microlepis</i>	<i>Trey promah</i>	Boeseman croaker
<i>Brachirus</i> spp. (3 species); <i>Cynoglossus microlepis</i>	<i>Trey andat chhke</i>	Flatfishes (soles and tonguefish)
<i>Catlocarpio siamensis</i>	<i>Trey kolreang</i>	Giant carp
<i>Cephalocassis borneensis</i> ; <i>Arius maculatus</i> ; <i>Hemiaris verrucosus</i>	<i>Trey kaok</i>	Sea catfishes
<i>Channa gachua</i> ; <i>Gobiidae</i> spp. (several genera and species)	<i>Trey ksan/krasan</i>	Small snakehead and gobies
<i>Channa gachua</i> ; <i>Gobiidae</i> spp. (several genera and species)	<i>Trey krasan</i>	Small snakehead and gobies
<i>Channa marulius</i>	<i>Trey amboung</i>	Great snakehead
<i>Channa micropeltes</i>	<i>Trey diep (small)/trey chhdaur (big)</i>	Indonesian snakehead
<i>Channa striata</i>	<i>Trey phtuok (small)/trey raws (big)</i>	Striped snakehead
<i>Chitala blanci</i>	<i>Trey kaey</i>	Indochina featherbacks
<i>Chitala ornata</i> ; <i>Chitala lopis</i>	<i>Trey krai</i>	Featherbacks
<i>Cirrhinus jullieni</i>	<i>Trey phka cha</i>	Cyprinid
<i>Cirrhinus microlepis</i>	<i>Trey krawlang (small)/trey proul (big)</i>	Small scale mud carp

Scientific name	Khmer common name	English common name
<i>Cirrhinus molitorella</i>	<i>Trey phka kor</i>	Mud carp
<i>Clarias</i> spp. (3 species)	<i>Trey andaing</i>	Airbreathing catfishes
<i>Clupeichthys aesarnensis</i>	<i>Trey bawndol ampeou</i>	Thai river sprat
<i>Coilia</i> cf. <i>lindmani</i>	<i>Trey chonluanh moan</i>	Anchovy
<i>Cosmochilus harmandi</i>	<i>Trey kampoul bay</i>	Large cyprinid
<i>Crossocheilus reticulatus</i>	<i>Trey chunh chuak dai/trey changwa chunh chuak</i>	Small cyprinid
<i>Cyclocheilichthys armatus</i> , <i>Cyclocheilichthys apogon</i> , <i>Cyclocheilichthys lagleri</i> ; <i>Cyclocheilichthys repasson</i>	<i>Trey srawka kdam</i>	Medium-sized cyprinids
<i>Cyclocheilichthys furcatus</i> ; <i>Cyclocheilichthys enoplos</i> ; <i>Cosmochilus harmandi</i>	<i>Trey chhkok</i>	Medium-sized cyprinids
<i>Cyprinus carpio</i>	<i>Trey carp samanh</i>	Common carp
<i>Dasyatis laosensis</i> ; <i>Himantura polylepis</i>	<i>Trey bawbel</i>	Rays
<i>Datnioides undecimradiatus</i>	<i>Trey khlar</i>	Mekong tiger perch
<i>Datnioides undecimradiatus</i>	<i>Trey khlar</i>	Mekong tiger perch
<i>Esomus</i> spp. (2 species)	<i>Trey changva phlieng</i>	Mekong flying barb
<i>Glossogobius</i> spp. (2 species)	<i>Trey khsan khsach</i>	Gobies
<i>Gyrinocheilus</i> spp. (2 species)	<i>Trey smok/trey ses</i>	Siamese algae-eaters
<i>Gyrinocheilus</i> spp. (2 species)	<i>Trey smok/trey ses</i>	Siamese algae-eaters
<i>Hampala</i> spp. (2 species)	<i>Trey khmann</i>	Medium-sized cyprinids
<i>Hemibagrus filamentus</i>	<i>Trey tanel</i>	Bagrus catfish
<i>Hemibagrus spilopterus</i>	<i>Trey chhlang</i>	Bagrus catfish
<i>Hemibagrus wyckioides</i> ; <i>Hemibagrus wyckii</i>	<i>Trey khya</i>	Bagrus catfishes
<i>Henicorhynchus</i> spp. (2 species)	<i>Trey riel</i>	Siamese mud carps
<i>Hypophthalmichthys molitrix</i>	<i>Trey carp sor</i>	Big head carp
<i>Hypsibarbus</i> spp. (5 species); <i>Barbonymus gonionotus</i>	<i>Trey chhpin</i>	Medium-sized cyprinids
<i>Kryptopterus</i> spp. (3 species)	<i>Trey kamplieu</i>	Sheatfishes
<i>Labeo chrysophekadion</i>	<i>Trey kaek</i>	Black sharkminnow
<i>Labeo pierrei</i>	<i>Trey pava mook mouy</i>	Large cyprinid
<i>Labiobarbus</i> spp. (2 species)	<i>Trey ach kok</i>	Medium-sized cyprinids
<i>Leptobarbus rubripinna</i>	<i>Trey chrawlang/trey prorlung</i>	Medium-sized cyprinid
<i>Leptobarbus rubripinna</i>	<i>Trey chrawlang/trey prorlung</i>	Medium-sized cyprinid
<i>Lobocheilos</i> spp. (3 species)	<i>Trey changva ronoung</i>	Small cyprinids
<i>Luciosoma</i> spp. (2 species)	<i>Trey dawng dao/trey bong kouy</i>	Medium-sized cyprinids
<i>Macrochirichthys macrochirus</i>	<i>Trey dangkteng</i>	Long pectoral-fin minnow

Scientific name	Khmer common name	English common name
<i>Macrogathus</i> spp. (4 species)	<i>Trey chhlonh</i>	Spiny eels
<i>Mastacembelus</i> spp. (2 species)	<i>Trey kchoeung</i>	Spiny eels
<i>Mekongina erythrospila</i>	<i>Trey pase ee/trey proul ksach</i>	Mekongina
<i>Micronema cheveyi</i> ; <i>Kryptopterus</i> spp. (3 species)	<i>Trey kantuy moan/trey kamplieu</i>	Sheatfishes
<i>Mystus</i> spp. (6 species)	<i>Trey kanchos</i>	Mystus catfishes
<i>Neolissochilus soroides</i>	<i>Trey kolprich</i>	Small cyprinid
<i>Neolissochilus stracheyi</i>	<i>Trey kolprech</i>	Small cyprinid
<i>Notopterus notopterus</i>	<i>Trey slat</i>	Bronze featherback
<i>Ompok siluroides</i>	<i>Trey krormorm</i>	Sheatfish
<i>Ompok urbaini</i> ; <i>Ompok bimaculatus</i>	<i>Trey ta aun</i>	Sheatfishes
<i>Oreochromis niloticus</i>	<i>Trey tilapia chhnoht</i>	Nile tilapia
<i>Osphronemus exodon</i>	<i>Trey romeas</i>	Elephant ear gourami
<i>Osteochilus melanopleurus</i>	<i>Trey krum</i>	Medium-sized cyprinid
<i>Osteochilus schlegelii</i>	<i>Trey lolok sor</i>	Giant sharkminnow
<i>Osteochilus vittatus</i> ; <i>Osteochilus lini</i> ; <i>Osteochilus microcephalus</i> ; <i>Osteochilus waandersii</i>	<i>Trey kros</i>	Medium-sized cyprinids
<i>Oxyeleotris marmorata</i>	<i>Trey damrey</i>	Marble goby
<i>Pangasius conchophilus</i>	<i>Trey ke/trey pra ke</i>	Pangasiid (shark catfish)
<i>Pangasius elongatus</i>	<i>Trey chhwiet kantuy smer</i>	Pangasiid (shark catfish)
<i>Pangasius krempfi</i>	<i>Trey bong lao</i>	Pangasiid (shark catfish)
<i>Pangasius larnaudii</i>	<i>Trey po</i>	Spot catfish
<i>Pangasius mekongensis</i> ; <i>Pangasianodon hypophthalmus</i> ; <i>Pangasius bocourti</i>	<i>Trey pra</i>	Pangasiids (shark catfishes)
<i>Pangio</i> spp. (3 species)	<i>Trey kaet</i>	Small loaches
<i>Parachela</i> spp (4 species +)	<i>Trey chanteas phluk</i>	Small cyprinids
<i>Paralaubuca typus</i>	<i>Trey slak russey</i>	Small cyprinid
<i>Parambassis siamensis</i> ; <i>Parambassis apogonoides</i>	<i>Trey kanchanh chras</i>	Asiatic glassfishes
<i>Parambassis wolffii</i>	<i>Trey kantrang preng</i>	Duskyfin glassy perchlet
<i>Phalacrotonotus</i> spp. (3 species)	<i>Trey kes</i>	Sheatfishes
<i>Piaractus brachypomus</i>	<i>Trey chap</i>	Pirapitinga (Serrasalminidae, aquaculture fish)
<i>Polynemus</i> spp. (2 species)	<i>Trey kampream/trey pream/trey poukmort chhma</i>	Threadfins

Scientific name	Khmer common name	English common name
<i>Polynemus</i> spp. (2 species)	<i>Trey pream</i>	Threadfins
<i>Pristolepis fasciata</i>	<i>Trey kantrawb</i>	Malayan leaffish
<i>Probarbus</i> spp. (2 species)	<i>Trey trawsak</i>	Large cyprinids
<i>Pseudolais pleurotaenia</i> ; <i>Clupisoma sinense</i> ; <i>Lalides longibarbis</i> ; <i>Pangasius macronema</i>	<i>Trey chhwiet</i>	Pangasiids (shark catfishes) and schilbid catfishes
<i>Puntioplites bulu</i>	<i>Trey kuch chrea</i>	Medium-sized cyprinid
<i>Puntioplites falcifer</i> ; <i>Puntioplites proctozysron</i>	<i>Trey chrakaing</i>	Medium-sized cyprinids
<i>Puntius brevis</i> ; <i>Barbodes aurotaeniatus</i>	<i>Trey angkat prak</i>	Small cyprinids
<i>Rasbora aurotaenia</i> ; <i>Rasbora dusonensis</i> ; <i>Rasbora tornieri</i>	<i>Trey changva mool</i>	Small cyprinids
<i>Rasbora</i> spp. (22 species)	<i>Trey changva</i>	Small cyprinids
<i>Scaphognathops bandanensis</i>	<i>Trey paphat</i>	Medium-sized cyprinid
<i>Scaphognathops stejneri</i>	<i>Trey paphien/trey trasek thom</i>	Medium-sized cyprinid
<i>Scaphognathops stejneri</i>	<i>Trey trasek thom</i>	Mediums-sized cyprinid
<i>Setipinna melanochir</i> ; <i>Lycotrhissa crocodilus</i>	<i>Trey chhmar</i>	Anchovies
<i>Systemus orphoides</i>	<i>Trey ampil tum</i>	Medium-sized cyprinid
<i>Tenualosa thibaudeaui</i>	<i>Trey kbork</i>	Laotian shad
<i>Thynnichthys thynnoides</i>	<i>Trey linh</i>	Small cyprinid
<i>Toxotes</i> spp. (2 species)	<i>Trey kancheak sla</i>	Archerfishes
<i>Trichopodus pectoralis</i>	<i>Trey kawnthor</i>	Snakeskin gourami
<i>Trichopodus trichopterus</i> ; <i>Trichopodus microlepis</i>	<i>Trey kawmpheanh</i>	Gouramis
Undetermined; probably a very local name	<i>Trey krob ampil</i>	
Undetermined; probably a very local name	<i>Trey momok</i>	
Undetermined; probably a very local name	<i>Trey thmar</i>	
Undetermined; probably a very local name	<i>Trey kampo</i>	
Undetermined; probably a very local name	<i>Trey krawpoeu</i>	
<i>Wallago attu</i>	<i>Trey sanday</i>	Wallago
<i>Xenentodon</i> sp.	<i>Trey phtoung</i>	Needlefish
<i>Yasuhikotakia</i> spp. (6 species); <i>Syncrossus</i> spp. (2 species)	<i>Trey kanchrouk</i>	Botia loaches

ANNEX B: FISH SPECIES COMMON TO FISHERMEN, TRADERS AND EXPORTERS

Scientific name	Khmer common name	English common name
<i>Anabas testudineus</i>	<i>Trey kranh</i>	Climbing perch
<i>Bagarius</i> spp. (3 species)	<i>Trey krawbey</i>	Bagarius catfishes
<i>Belodontichthys truncatus</i>	<i>Trey klang hay</i>	Sheatfish
<i>Boesemania microlepis</i>	<i>Trey promah</i>	Boeseman croaker
<i>Channa marulius</i>	<i>Trey amboung</i>	Great snakehead
<i>Channa micropeltes</i>	<i>Trey diep</i> (small)/ <i>trey chhdaur</i> (big)	Indonesian snakehead
<i>Channa striata</i>	<i>Trey phtuok</i> (small)/ <i>trey raws</i> (big)	Striped snakehead
<i>Chitala ornata</i> ; <i>Chitala lopis</i>	<i>Trey kraï</i>	Featherbacks
<i>Clarias</i> spp. (3 species)	<i>Trey andaing</i>	Airbreathing catfishes
<i>Clupeichthys aesarnensis</i>	<i>Trey bawndol ampeou</i>	Thai river sprat
<i>Cyclocheilichthys armatus</i> , <i>Cyclocheilichthys apogon</i> , <i>Cyclocheilichthys lagleri</i> ; <i>Cyclocheilichthys repasson</i>	<i>Trey srawka kdam</i>	Medium-sized cyprinids
<i>Cyclocheilichthys furcatus</i> ; <i>Cyclocheilichthys enoplos</i> ; <i>Cosmochilus harmandi</i>	<i>Trey chhkok</i>	Medium-sized cyprinids
<i>Datnioides undecimradiatus</i>	<i>Trey khlar</i>	Mekong tiger perch
<i>Hampala</i> spp. (2 species)	<i>Trey khmann</i>	Medium-sized cyprinids
<i>Hemibagrus filamentus</i>	<i>Trey tanel</i>	Bagrus catfishes
<i>Hemibagrus spilopterus</i>	<i>Trey chhlang</i>	Bagrus catfishes
<i>Hemibagrus wyckioides</i> ; <i>Hemibagrus wyckii</i>	<i>Trey khya</i>	Bagrus catfishes
<i>Henicorhynchus</i> spp. (2 species)	<i>Trey riel</i>	Siamese mud carps
<i>Hypsibarbus</i> spp. (5 species); <i>Barbonymus gonionotus</i>	<i>Trey chhpin</i>	Medium-sized cyprinids
<i>Kryptopterus</i> spp. (3 species)	<i>Trey kamplieu</i>	Sheatfishes
<i>Labeo chrysophekadion</i>	<i>Trey kaek</i>	Black sharkminnow
<i>Macrogathus</i> spp. (4 species)	<i>Trey chhlonh</i>	Spiny eels
<i>Mastacembelus</i> spp. (2 species)	<i>Trey kchoeung</i>	Spiny eels
<i>Mystus</i> spp. (6 species)	<i>Trey kanchos</i>	Mystus catfishes
<i>Notopterus notopterus</i>	<i>Trey slat</i>	Bronze featherback

Scientific name	Khmer common name	English common name
<i>Ompok urbaini</i> ; <i>Ompok bimaculatus</i>	<i>Trey ta aun</i>	Sheatfishes
<i>Osteochilus vittatus</i> ; <i>Osteochilus lini</i> ; <i>Osteochilus microcephalus</i> ; <i>Osteochilus waandersii</i>	<i>Trey kros</i>	Medium-sized cyprinids
<i>Oxyeleotris marmorata</i>	<i>Trey damrey</i>	Marble goby
<i>Pangasius conchophilus</i> <i>Pangasius larnaudii</i>	<i>Trey ke/trey pra ke</i> <i>Trey po</i>	Pangasiid (shark catfish) Spot catfish
<i>Pangasius mekongensis</i> ; <i>Pangasianodon hypophthalmus</i> ; <i>Pangasius bocourti</i>	<i>Trey pra</i>	Pangasiids (shark catfishes)
<i>Phalacronotus</i> spp. (3 species)	<i>Trey kes</i>	Sheatfishes
<i>Pristolepis fasciata</i>	<i>Trey kantrawb</i>	Malayan leaf fish
<i>Probarbus</i> spp. (2 species)	<i>Trey trawsak</i>	Large cyprinids
<i>Puntioplites falcifer</i> ; <i>Puntioplites proctozyron</i>	<i>Trey chrakaing</i>	Medium-sized cyprinids
<i>Rasbora</i> spp. (22 species)	<i>Trey changva</i>	Small cyprinids
<i>Systemus orphoides</i>	<i>Trey ampil tum</i>	Medium-sized cyprinid
<i>Thynnichthys thynnoides</i>	<i>Trey linh</i>	Small cyprinid
<i>Trichopodus trichopterus</i> ; <i>Trichopodus microlepis</i>	<i>Trey kawmpheanh</i>	Gouramis
<i>Wallago attu</i>	<i>Trey sanday</i>	Wallago
<i>Yasuhikotakia</i> spp. (6 species); <i>Syncrossus</i> spp. (2 species)	<i>Trey kanchrouk</i>	Botia loaches

ANNEX C: QUESTIONNAIRES TO FISHERS, TRADERS AND EXPORTERS

Project Assessing the economic value of fish
ACIAR/WorldFish/IFREDI/CARDI

MARKETS STUDY

Date: Interviewer:

Interview number(Code): Place:

Questionnaire for Fishermen

Inform the interviewee that his/her name is not recorded (anonymity)

SECTION 1: PROFILE OF RESPONDENT

1. Name of fisher:

2. Type of fishing:

(1 = small scale; 2 = medium scale; 3 = large scale/bag net (*Dai*); 4 = others

(specify:

Name of fishing gear used:

3. Address: Village: Commune:

District:..... Province:.....

4. Contact/Telephone number: /

5. Age: years

6. Sex: (1 = male; 2 = female)

SECTION 2: FISHING ACTIVITIES

Fish Capture

7. How long have you been involving in fishing?years / Since:

8. What is your purpose of fishing? *Only one answer (Please tick (✓) in the box below):*

- For household consumption only (fresh and processed forms)
- For sale only
- For processing only
- For household consumption and sale (fresh)
- For household consumption. sale (fresh) and processing
- Other (specify)

9. What time of the year do you fish? *(Please tick (✓) in the box below)*

Description Remarks

- Open season* (month:)
- Closed season* (month:)
- Both seasons (month:)
- Occasionally (specify: which month?)
- Other (specify)

***Note: Closed season:** from 1st June – 30th September
Open season: from 1st October – 30th May (for the region North of the Chaktomouk parallel)
Closed season: from 1st July – 31st October
Open season: from 1st November – 31st June (for the region South of the Chaktomouk parallel)

10. Why do you fish at this time? *(Please tick (✓) in the box below):*

- Fish is abundant
- The water is deep/much/large enough for fishing
- Fish can be sold at higher price
- Other (specify).....

11. Number of months per year. number of days per month and number of hours per day you went fishing in open and closed seasons **during last year** (2011 - 2012).

Description	Season	
	Open season	Closed season
No. of months per year (month/year)		
No. of days per month (day/month)		
No. of hours per day (hrs./day)hrs. (.....to))hrs. (.....to))

12. On average, how much fish could you sell per day **during the last 3 months (2012)**?

Description	Quantity of fish caught/day (kg/day)	Quantity of fish caught/ month (kg/month)
This month		
Last month		
2 months ago		
Total (for the last 3 months)(kg/3months)		

13. Use a flip chart to identify the fish species.

What are the **top 10** dominant species caught **during the last 3 months (2012)**. their rank, the quality grades for each species and the grade description?

Fish Species	Rank	Grade	Grade description
1.		1	
		2	
		3	
		4	
		5	
2, 3, 10		1	
		2	
		3	
		4	
		5	

14. How was the change (trend) of total sell of fish per household per day **during the last 3 months (2012)** compared to the same 3 months of last year **(2011)**? (Please tick (✓) in the box below):

Increasing by: (%) Why?

Decreasing by: (%) Why?

No change at all. Why?

15. What species and quantities of fish did you sell and sell PER DAY during the last 3 months (2012)? Use a flip chart to identify the fish species.

Fish species	Grade	This month		Last month		2 months ago	
		Quantity (kg/day)	Price (Riel/kg)	Quantity (kg/day)	Price (Riel/kg)	Quantity (kg/day)	Price (Riel/kg)
1.	1						
	2						
	3						
	4						
	5						
2, 3, 10	1						
	2						
	3						
	4						
	5						
Total							

Marketing of Fish

16. How often did you sell out your fish **during the last 3 months (2012)**? (Please tick (✓) in the box below):

- Every day. Why?
- Every 2 days. Why?
- Every 3 days. Why?.....
- Others (specify:.....) Why?

17. Who did you sell your fish to **during the last 3 months (2012)**? (Circle (O) the type of buyers)

Types of buyers	Quantity (kg)	(%) of total Quantity	From where/Province?
1. Consumers in markets (own sale)			
2. Local collectors/Middlemen			
3. Local wholesalers			
4. Local retailers			
5. Collectors/Middlemen from other provinces			
6. Wholesalers from other provinces			
7. Retailers from other provinces			
8. Super markets/restaurants			
9. Fish farmers			
10. Animal/crocodile farmers			
11. Fish processors			
12. Money lenders (who?.....)			
13. Other (specify)			
Total		100.0	

18. How did you market your fish **during the last 3 months (2012)?** (Multiple choices/answers) (Please tick (✓) in the box below):

- Carried the fish to and sold it at markets.
- Carried the fish to and sold it at landing site.
- Sold the fish directly at fishing grounds.
- Sold the fish directly at the villages/their (fishers') houses.
- Others (specify):

19. How often did you sell out these aquatic animals **during the last 3 months (2012)?** (Please tick (✓) in the box below):

- Every day. Why?
- Every 2 days. Why?
- Every 3 days. Why?
- Others (specify:.....) Why?

20. To whom did you sell these aquatic animals during the last 3 months (2012)? (Please tick (✓) in the box below):

Types of buyers

From where/province?

- Consumers:
- Local collectors/middlemen:
- Local wholesalers:
- Local retailers:
- Fish farmers:
- Animal/crocodile farmers:
- Other (specify):

21. How did you market these aquatic animals during the last 3 months (2012)?
(Please tick (✓) in the box below):

- Carried and sold it at markets
- Carried and sold it at landing site
- Sold it directly at fishing grounds
- Sold it directly at the villages/their houses
- Others (specify):

Signature of interviewer:.....

Thank you very much for your cooperation!

Project Assessing the economic value of fish
ACIAR/WorldFish/IFREDI/CARDI

MARKETS STUDY

Date: Interviewer:.....
Interview number(Code): Place:.....

Questionnaire for Fish Traders

Inform the interviewee that his/her name is not recorded (anonymity)

SECTION 1: PROFILE OF RESPONDENT

- 22. Name of fish trader:
- 23. Permanent Address: Village:
Commune:..... District:..... Province:.....
- 24. Purchasing/selling address:..... Village:
Commune: District: Province:.....
- 25. Contact/Telephone number: /
- 26. Age: years
- 27. Sex:(1 = male; 2 = female)
- 28. Type of fish trader: (1 = retailer; 2 = wholesaler; 3 = collector/middleman)
- 29. How long have you been involving in fish trade? years / Since:
- 30. How many fish traders are there in this location?
(no. of persons); Location:
(1 = market; 2 = landing site; 3 = village; 4 = province/city; 5 = others (specify:))

SECTION 2: MARKETING OF FISH

31. What time of the year do you do your business? (Please tick (✓) in the box below)

Description, Remarks

- In open season* (months:)
- In closed season* (months:)
- Whole year (months:)
- Occasionally (specify: what months?)
- Other (specify)

* **Note:** (*) Closed season Open season: from : from 1st 1 st October June – 30– 30th September th May
(for the region North of the Chaktomouk parallel) Closed season Open season: from: from 1st 1 st November
July – 31st– October 31st June (for the region South of the Chaktomouk parallel)

32. How much fish did you sell per day and per month during the last 3 months (2012)?

Description	This month	Last month	2 months ago	Total
Number of months selling fish per year (2011) (month/year)				
Number of days selling fish per month(day/month)				
Quantity of fish sold per day (kg/day)				
Quantity of fish sold per month (kg/month)				

33. Use a flip chart to identify fish species. What are the **top 10** dominant species YOU BOUGHT and SOLD during the last 3 months (2012). their rank. quality grades for each species and grade description?

Fish Species	Rank	Grade	Grade description
1.		1	
		2	
		3	
		4	
		5	
2, 3, 10		1	
		2	
		3	
		4	
		5	

34. What was the quantity and price of fish YOU BOUGHT and SOLD in the last 3 months (2012)?

Species	Grade	Total quantity (kg/3 months)	Main fish suppliers? (*)	From where? (e.g. province)	Buying price (Riel/kg)			Selling price (Riel/kg)			To where? (e.g. province)
					This month	Last month	Two months ago	This month	Last month	Two months ago	
1.	1										
	2										
	3										
	4										
	5										
2, 3, etc.	1										
	2										
	3										
	4										
	5										

(*) Code: 1 = fishers; 2 = fish farmers; 3 = fish collectors/middlemen; 4 = wholesalers; 5 = importers; 6 = others (specify).....

35. What is the number of laborers involved in your fish trade activities and the estimated local wage rate by sex and season?

	Number of family members involved				Number of hired persons involved			
	Male	Riel/day	Female	Riel/day	Male	Riel/day	Female	Riel/day
During open season								
During closed season								

Note: This includes involvement of children above 12 years age

36. Do you have agreements/contracts for your fish trade activities?
 (Yes = 1; No = 2)

If Yes:

- a. What type of agreement/contract is it?
- b. (Code: 1 = hand-writing; 2 = oral; 3 = others
- c. (specify):
- d. Duration of agreement/contract: (months; years)
- e. Who do you have agreement/contract with? (Code: 1 = fishers; 2 = fish farmers; 3 = collectors/middlemen; 4 = wholesalers; 5 = importers; 6 = others (specify):

If No, why? (Please tick (✓) in the box below):

- Not a habit
- Not necessary
- Free markets
- Trust/Permanent customers
- Other (specify).....

Buying Fish

37. From whom did you buy fish during the **last 3 months (2012)**? (Circle (O) the type of fish suppliers)

Type of fish suppliers	Number of fish suppliers (persons)		From where? (e.g. province)
	Open season	Closed season	
1. Fishers			
2. Fish farmers			
3. Collectors/middlemen			
4. Wholesalers			
5. Importers (Vietnam, Thailand and Lao PDR)			
6. Others (specify):			

38. Where did you buy fish **during the last 3 months (2012)**? (Multiple choices/answers) (Please tick (✓) in the box below):

- At fishing grounds
- At landing sites
- In the village/fishermen’s houses
- In the village/collectors’ and middlemen’s houses/shops
- In the village/fish farmers’ houses/farms
- At local markets
- Other (specify).....

39. Who set the price of fish when you bought fish **during the last 3 months (2012)**? (Please tick (✓) in the box below):

- Yourself (Buyer)
- Fish sellers (can be fishers. fish farmers. collectors/middlemen/wholesalers
- Others (specify:

40. How was the price of fish set **during the last 3 months (2012)**? (Multiple choices/answers) (Please tick (✓) in the box below):

- Fish quantity in markets
- Market demand on fish
- Quality of fish
- Size of fish/grading
- Fish species
- Numbers of traders
- Market price
- Others (specify).....

Selling Fish

41. Where did you sell fish **during the last 3 months (2012)**? (Multiple choices/answers) (Please tick (✓) in the box below):

- Nomadic
- At landing sites
- At homes/shops
- Local market
- Other (specify).....

42. To whom did you sell your fish **during the last 3 months (2012)**? (Circle (O) the type of buyers):

Type of buyers	Number of buyers (person)	To where?
1. Wholesalers		
2. Retailers		
3. Exporters		
4. Processors		
5. Restaurant		
6. Supermarkets		
7. Consumers		

43. Who set the price of fish when you sold fish **during the last 3 months (2012)**? *(Please tick (✓) in the box below):*

- Yourself (seller)
- Fish buyers
- Others (specify:)

44. How was the price of fish set **during the last 3 months (2012)**? *(Multiple choices/answers) (Please tick (✓) in the box below):*

- Fish quantity in markets
- Market demand on fish
- Quality of fish
- Size of fish/grading
- Fish species
- Numbers of traders
- Market price
- Others (specify).....

45. How many hours or days did you keep fish (from buying to selling time)?

24.1. In open season: (hrs.). or (days)

24.2. In closed season:(hrs.). or (days)

46. How many kilograms (kg) of fish did you lose per ton between buying and selling time?

Description	Quantity lost (kg/ton)		
	Capture fish	Cultured fish	Both
Open season			
0 (selling immediately)			
Keep 1-2 days			
Keep 3-4 days			
Keep 5-6 days			
Keep ≥7 days			
Closed season			
0 (selling immediately)			
Keep 1-2 days			
Keep 3-4 days			
Keep 5-6 days			
Keep ≥7 days			

Signature of interviewer:

Thank you very much for your kind cooperation!

Project Assessing the economic value of fish
ACIAR/WorldFish/IFREDI/CARDI

MARKETS STUDY

Date: Interviewer:.....
Interview number(Code): Place:.....

Questionnaire for Fish Exporters

Inform the interviewee that his/her name is not recorded (anonymity)

SECTION 2: PROFILE OF RESPONDENT

47. Name of fish exporter:

48. Permanent Address: Village:

Commune:..... District:..... Province:.....

49. Purchasing/selling address: Village: Commune:.....

District:..... Province:.....

50. Contact/Telephone number: /

51. Age: years

52. Sex:(1 = male; 2 = female)

53. How long have you been involving in fish export?years / Since:

54. How many fish exporters are there in this location?

(no. of persons); location:

(1 = market; 2 = landing site; 3 = village; 4 = province/city; 5 = others (specify))

SECTION 2: MARKETING OF FISH

Buying Fish

55. What time of the year do you do this business? (Please tick (✓) in the box below):

Description Remarks

In open season* (months:)

In closed season* (months:)

Whole year (months:)

Occasionally (specify: which month?)

Other (specify)

Note: () Closed season: from 1st June – 30th September (for the region North of the Chaktomouk parallel)

Open season: from 1st October – 30th May

Closed season: from 1st July – 31st October (for the region South of the Chaktomouk parallel)

Open season: from 1st November – 31st June

56. What quantity of fish did you EXPORT per time and per month **during the last 3 months?**

Quantity	This month	Last month	2 months ago	Total
No. of times exporting per year (2011) (time/year)				
No. of times exporting per month (time/month)				
Qty. of fish exported per time (kg/time)				

Qty. of fish exported per month (kg/month)				
--	--	--	--	--

57. What are the peak and low months in a year for EXPORTING fish?

Description	Name of months	Remarks
Peak month		
Low month		

58. What quantity of fish did you IMPORT per time and per month **during the last 3 months?**

Quantity	This month	Last month	2 months ago	Total
No. of times importing per year (2011) (time/year)				
No. of times importing per month (time/month)				
Qty. of fish imported per time (kg/time)				
Qty. of fish imported per month (kg/month)				

59. What are the peak and low months in a year for IMPORTING fish?

Description	Name of months	Remarks
Peak month		
Low month		

60. Are the grading system and grades similar for buying and selling fish?: (Yes = 1; No = 2)
 If **No.** please explain?

.....

.....

.....

.....

61. Use a flip chart to identify fish species.

What are the **top 10** dominant species you bought and sold **during the last 3 months (2012)**. their rank. the quality grades for each species and the grade description?

Species	Rank	Buying Grade	Grade description	Selling Grade	Grade description
1.		1		1	
		2		2	
		3		3	
		4		4	
		5		5	
2, 3, etc		1		1	
		2		2	
		3		3	
		4		4	
		5		5	

62. What was the quantity (kg) and price of fish (Riel/kg) you BOUGHT and EXPORTED in the last 3 months?

Species	Grade	Total quantity (kg/3 months)	Main fish suppliers? (*)	From where? (e.g. province)	Buying price (Riel/kg)			Selling price (Riel/kg)			To where? (e.g. province)
					This month	Last month	Two months ago	This month	Last month	Two months ago	
1.	1										
	2										
	3										
	4										
	5										
2, 3, etc.	1										
	2										
	3										
	4										
	5										

(*) Code: 1 = fishers; 2 = fish farmers; 3 = fish collectors/middlemen; 4 = wholesalers; 5 = importers; 6 = others (specify).....

63. Do you have permission and license for fish export? (Yes = 1; No = 2)

17.1 If **Yes**. how many kilograms of fish were allowed to be exported one time?kg/time

17.2 If **No**. why?

.....

64. Do you have agreements/contracts with the fish suppliers?..... (Yes = 1; No = 2)

If **Yes**.

a. What type of agreement/contract is it? (1 = hand-writing; 2 = oral; 3 = others)

(specify):

b. Duration of agreement/contract: (months; years)

c. Who do you have agreement/contract with? (1 = fishers; 2 = fish farmers;

3 = collectors /middlemen; 4 = wholesalers; 5 = others (specify):

If **No**. why? (Please tick (✓) in the box below):

Not a habit

Not necessary

Free markets

Trust/Permanent customers

Other (specify).....

65. Who set the price of fishwhen you bought fish during the last 3 months (2012)?

(Please tick (✓) in the box below):

Yourself (Buyers)

Fish sellers (can be fishers. fish farmers. collectors/middlemen/wholesalers)

Others (specify:

66. How was the price of fish changed **during thelast 3 months (2012)?**

(Please tick (✓) in the box below):

Decreased. Why?

Increased. Why?

No change. Why?

Selling Fish

67. Who and how many numbers of buyers did you sell fish to **during the last 3 months (2012)?** (Circle (O) the type of buyers)

Type of buyers	Number of buyers (person)	To what countries?
1. Middlemen/Wholesalers		
2. Companies		
3. Others 1:		
4. Others 2:		

68. Do you have agreements/contracts with the fish buyers? (Yes = 1; No = 2)
 If **Yes**, what type of agreement/contract is it? (1 = hand-writing; 2 = oral; 3 = others (specify):.....)
 Duration of agreement/contract: (months; years)

69. How did you export fish **during the last 3 months (2012)?** (Please tick (✓) in the box below):

- Took the fish to the country border points only
- Took the fish directly to importing countries/market/port/landing site
- Others (specify):

70. Who set the price of fish when you sold fish **during the last 3 months (2012)?** (Please tick (✓) in the box below):

- Yourself (Seller)
- Fish buyers
- Others (specify:))

71. How many hours or days did you keep fish (from buying to selling time)?

25.1 In peak period: hrs.; days

25.2 In low period: hrs.; days

72. How and how long was the fish stored during handling and exporting? (Please tick (✓) in the box below):

(✓)	Description	How long? (no. of days; hrs.)	
		Storage	Transported
<input type="checkbox"/>	Fish was kept a live		
<input type="checkbox"/>	Fish was chilled		
<input type="checkbox"/>	Others (specify:)		

73. How many kilograms (kg) of fish do you lose per ton between buying and selling time?

Description	Quantity lost (kg/ton)		
	Capture fish	Cultured fish	Both
Open season			
0 (selling immediately)			
Keep 1-2 days			
Keep 3-4 days			
Keep 5-6 days			
Keep ≥7 days			
Closed season			
0 (selling immediately)			
Keep 1-2 days			
Keep 3-4 days			
Keep 5-6 days			
Keep ≥7 days			

Signature of interviewer:

Thank you very much for your kind cooperation!



Australian Government

Australian Centre for
International Agricultural Research



Inland Fisheries Research and
Development Institute (IFReDI)
186, Norodom Blvd., P.O. Box 582,
Phnom Penh, Cambodia
E-mail: info@ifredi-cambodia.org
Website : www.ifredi-cambodia.org

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