OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

Cambodia Export Diversification and Expansion Program (CEDEP II)- Marine Fisheries Component








Final Report

Value Chain Assessment of Marine Fisheries Sector and Roadmap for Development

Prepared

for

Royal Government of Cambodia

By

United Nations Industrial Development Organization (UNIDO)
Fisheries Administration (FiA), MAFF

August 2015

Cambodia Export Diversification and Expansion Program (CEDEP) II:

Marine Fisheries Component

Final Report

on

Value Chain Assessment of Marine Fisheries Sector and Roadmap for Development

Prepared

for

Royal Government of Cambodia

By

United Nations Industrial Development Organization (UNIDO)

Fisheries Administration (FiA), MAFF

August 2015

The views expressed in this report are based on the actual information and data collected during the study period and through review of currently available literatures. The views expressed in this report do not necessarily reflect those of the UNIDO or any participating organizations.

Abbreviations

Acronym	Full title
ADB	Asian Development Bank
BEE	Business Enabling Environments
CA	Competent Authority
CEDEP	Cambodia Export Diversification and Expansion Program
DFPTQ	Department of Post-Harvest Technologies and Quality Control
EU	European Union
FAO	Food and Agricultural Organizations of the United Nations
FiA	Fisheries Administration
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GHP	Good Hygienic Practice
GMP	Good Manufacturing Practice
HACCP	Hazard Analysis and Critical Control Points
IFReDI	Inland Fisheries Research and Development Institute
ILCC	Industrial Laboratory Center of Cambodia
ISC	Institute of Standards of Cambodia
IUU	Illegal, unreported and unregulated
MAFF	Ministry of Agriculture, Forestry and Fisheries
MoC	Ministry of Commerce
MEF	Ministry of Economy and Finance
MIME	Ministry of Industry, Mines and Energy
MIH	Ministry of Industry and Handicraft
MOH	Ministry of Health
TDSP	Trade Development Support Program
UNIDO	United Nations Industrial Development Organization

Executive summary

The fisheries sector of Cambodia plays an important role in the national economy contributing significantly to employment and livelihoods of the poor, to food security and to GDP. There are plenty of opportunities to further develop the sector through increasing productivity, better management of resources, upgrading of the infrastructure and strengthening the institutional climate. For achieving better market access for Cambodia's marine fishery resources, entire value chain must be developed to deliver product of higher quality and uniqueness. This can be done only through interventions at all stages of the value chain through proper understanding of the dynamics.

This study on value chain assessment of marine fisheries is undertaken under Cambodia Export Diversification and Expansion Program (CEDEP II) to provide an overview and good understanding of the marine fisheries value chain from fishing to the end market. The overall objective of the value chain assessment was to gather information on current status of the marine fisheries sector of Cambodia and to address major constraints being faced at multiple levels of the value chain in terms of developing human resource capacity, value addition, market development and compliance.

The study conducted detailed analysis of the actors along the marine fisheries value chain and their roles and functions in the value chain. Value addition of major products at post-harvest operations and processing was studied and reported along with the cost additions at various steps. Value chain analysis of major market channels were also studied and reported.

The results of the assessment indicated that the export trade in Cambodia has increasingly become informal due to many reasons. Major reasons for such informal trade were identified and discussed in the report. The study also looked into other cross-cutting issues such as environmental concerns, access to finance and most importantly gender Issues within the value chain. Evaluation of existing food safety practices at all levels of value chain was done through reviewing the fish processing, handling and storage practices at various facilities and hygiene practice at all levels.

Level of food safety knowledge and awareness among the actors along the value chain is found to be very limited in the study area. The results indicated that the levels of food safety practices are

far below the required level in global context which is making the products least competitive in export markets.

The study made a detailed assessment of Business Enabling Environment prevailing in the fisheries sector with key issues such as institutional environment, regulatory environment and supporting environments (Infrastructure, finance, business promotion services, etc).

Although there are five key ministries having legally recognized duties and responsibilities over food safety and quality, there are overlapping areas in the performance of their duties and responsibilities with direct impact on the effectiveness of the implementation of food safety and quality control system in the whole value chain. Based on the current legal framework, only primary activities are falling under the direct responsibility of the FiA while most other operational activities come under the jurisdiction of MIH or MIME which jeopardizes the independency and efficiency of Competent Authority.

Based on the review of the institutional capacity of FiA for official control such as laboratory testing, official inspection and financial resources, the study revealed that a strong and committed competent authority is required to be built or developed immediately for improving the food safety conditions of the Cambodian products for better market access.

Based on the constraints being faced by the industry, the current study identified following entry points for value chain upgrading:

- Compliance with food safety standards such as GMP, GHP and HACCP in the process operations
- Control of overfishing and illegal fishing- Implementing IUU requirements through better management of marine fishery resources and effective enforcement
- Building sound legislative frameworks with clear area of responsibilities
- Establishing an efficient Competent Authority with sufficient legal authority and capacity
- Private-Sector involvement in implementing food hygiene and safety systems
- Congenial atmosphere for investments in fisheries businesses and access to finance by private sector
- Better infrastructure at landing centers, processing centers and fishing vessels to meet the minimum requirements in terms of hygiene and safety standards

- Official control of fish and fishery products through inspection or audits of establishments, fishing vessels, distribution centers, landing centers and markets, ice plants, and means of transport.
- Using accredited laboratories for testing regulatory and commercial samples

A road map to marine fisheries value chain development was developed to create an environment for transition from informality to formality and to make it a priority policy agenda of the government. The intervention strategies for upgrading and development marine fisheries value chain focus on following:

1. **Manage marine fisheries resource**: The marine fisheries resource shall be effectively and sustainably utilized through proper management of fishing operations and enforcement of regulations, particularly on control of foreign fishing vessels
2. **Prevent illegal fishing through intensifying surveillance and regional cooperation**: Provincial governance shall be strengthened to oversee fishing operations in the deep sea and prevent illegal fishing.
3. **Develop infrastructure along the value chain**: Infrastructure along the value chain like landing centers, ice factories, roads, public health facilities, electricity, and cold stores shall be developed to improve the post-harvest handling and to avoid post-harvest losses in terms of quantity, quality and safety
4. **Strengthen and harmonize regulatory framework**: The legal framework shall identify a single body or organization as Competent Authority and clarify the role and responsibilities with sufficient authority to enforce and implement seafood safety requirements from farm to fork, avoiding overlapping mandates.
5. **Establish and strengthen of Competent Authority**: The CA shall have sufficient human, technical and financial resources to implement the food safety programs across the value chain including at provincial level. Piloting in one of the provinces is an option.
6. **Establish official control protocols and enforcement**: Currently, a transitional modality has been developed which is called “Quality Seal”. Implementation of this in pilot scale would develop skills among the CA personnel and create awareness among other stakeholders
7. **Develop capacity of Competent Authority**: Capacity of the CA shall be developed in terms of guidelines, policies, protocols, checklists/tools, trainers and training resources.
8. **Strengthen provincial fisheries offices for official control and enforcement**: Provincial government offices shall have fish inspection wings supervised or controlled directly by Competent Authority so as to have effective control along the value chain.

9. **Implement traceability through registration of actors**: Actors along the value chain including fishing vessels, landing centers, ice factories, processing centers shall be brought under registration process so as to facilitate traceability which is a major requirement of the importing markets.
10. **Improve food safety awareness and skills of producers and processors**: Food safety skills and knowledge of the actors need to be developed through better communication and awareness program. International donors and development partners may include such activity in their programs.
11. **Promote product diversification and identify new markets**: Promote enterprise development through modernization of handling and processing facilities for better productivity, value addition and product diversification which will create newer markets.
12. **Improve dialogue between producers and policy makers**: Stabilizing the business enabling environment is required through dialogues between producers, policy makers and supporting institutions.
13. **Liberalize business documentation systems**: Excessive documentations to start or to run the business are acting as a barrier in moving from informal to formal business. In addition, the formal business documentations consume lot of time. Reforms on reduced documentation, single-window approach and reduced fees of such registrations are required

The study concludes that comprehensive, inclusive and value chain approaches are required to develop the fisheries sector so as to make the Cambodia's fish and fishery products more competitive to gain better market access. Cambodia also needs to promote necessary investment in resource management, harvest and post-harvest technology, and, more importantly, in the quality infrastructure and legal framework that are required to meet global food safety requirements.

Table of Contents

ANNEX

LIST OF TABLES

1. Introduction

1.1. Context

Fisheries sector of Cambodia has been playing a major role in economic growth, employment and food security for the country due to its vast inland and coastal fish resources. There are plenty of opportunities to further develop the sector through increasing productivity, better management of resources, upgrading the infrastructure and strengthening the institutional climate.

Royal Government of Cambodia has clearly recognized the need for improving the trade sector competitiveness which is critical to growth, and, in turn, to the creation of new and better jobs as well as income generation, in its Cambodia Trade Integration Strategy and Trade SWAp Roadmap 2014-2018. In SPS-sensitive sectors such as fisheries, the document underlines the need for producers to bring their facilities up to standards that meet international requirements with Government putting in place surveillance and enforcement systems required to control safety of food and products in consumer markets.

The importance of the fisheries is also highlighted in the National Strategic Development Plan for 2009-13 (NSDP), and sets targets for the fisheries. The Strategic Planning Framework for Fisheries 2010-19 identified fisheries post-harvest and trade as one of the three pillars of development approach. It also developed action plans to support this pillar through appropriate and enabling regulation coupled with effective regulatory framework and service provision.

To expand market access for fishery products further, country needs to develop the capacity to meet the regulatory requirements of importing countries both regionally and globally. Cambodia also needs to promote necessary investment in resource management, harvest and post-harvest technology, and, quite importantly, in the quality infrastructure that is required to meet global food safety standards. Better market access needs sustainable and competitive fisheries industry. To achieve this, entire value chain must be developed through proper understanding of the dynamics.

The fisheries value chain can be defined as the full range of activities required to bring a fish or fishery product to final consumers passing through the different phases of catching, handling, processing and delivery (IDRC, 2010). Value chain analysis is essential for an understanding of markets, their relationships, the participation of different actors, and the critical constraints that limit the growth of fishery industry and consequently their competitiveness.

The current study provides an overview and good understanding of the dynamics of the marine fisheries industry from fishing to the end market, supporting service activities, business enabling environments and socio-economic factors and identifies potential area for future interventions for further development of the marine fisheries value chain.

1.2. Objectives

The overall objective of the value chain assessment was to gather information on current status of the marine fisheries sector of Cambodia and to design a roadmap for its development in terms of strengthening human resource capacity, resource management, value addition, market development and compliance.

The specific objectives of the value chain assessment are to:

- Conduct mapping of marine fisheries value chain to better understand its dynamics and identify the market segments, participants and actors in the supply chain and their functions and linkages
- Analyze the data to reveal constraints within the chain that prevent or limit the exploitation of end market opportunities
- Analyze the Value Chain with reference to food safety compliance requirements for better market access and consumer safety
- Review the existing business enabling environments governing the marine fisheries value chain in relation to trade facilitation
- Develop a road map for upgrading of marine fisheries value chain to better respond to changing market conditions targeting national economic growth

1.3. Expected outcome of the assessment

The expected outcome of the assessment is to create a platform for implementation of the roadmap for strengthening of marine fisheries value chain from farm to fork.

1.4. Scope of the assessment

The scope of the current assessment is limited to marine fisheries with a view to critically analyze all underlying factors of the value chain and develop a road map for further planned development. The scope of this assessment is also extended to analyze business enabling and policy environment for better understanding of strengths and weaknesses to develop a prioritized action matrix or roadmap for enhancing the value chain performance.

2. Background information of the marine fisheries sector

The fisheries sector of Cambodia has been contributing significantly to employment and livelihoods of the poor, to food security and to GDP. It has a marine coastline of about 435 km which covers two cities and two provinces. The Exclusive Economic Zone (EEZ) covers approximately 55,600 sq. km and is relatively shallow with an average depth of about 50 m. The marine fishing grounds are mostly located on the eastern bank of the Gulf of Thailand.

2.1. Importance of marine fish trade to economy

Cambodia's fisheries sector plays a major role in its economy. The data from FAO (2011) indicates the contribution of fisheries sector to national economy (Table: 1 and 2). As per the most recent official data, the country's total annual fish catch from inland and marine fisheries amounts to about 632,839 metric tons (FAO, 2012) making up around 10 percent of Cambodia's overall GDP.

Table: 1. General Geographic and Economic Data of Cambodia (FAO, 2011)

Area	181 035 km²
Permanent fresh water area:	4 520 km²
EEZ area:	55 600 km2
Length of continental coastline	435 km
Population (2007):	14 324 000
GDP at purchaser's value (2008)	USD 10.3 billion
GDP per head (2008)	USD 739
Agricultural GDP (2008)	USD 3.35 billion
Fisheries GDP (2008)	USD 720 million

As per FiA 2010 (The Strategic Planning Framework for Fisheries: 2010 – 2019) fisheries production is estimated to be worth around USD 200-300 million per year at the point of landing. The value of fish exports has been estimated to be as high as US$100 million per year. More recently, IFReDI (2013) estimated that at USD 1.6/kg the total economic value of freshwater fish and aquatic products reached USD 1 billion per year. The total value of fish production after processing and transportation is unknown but is thought to range between 8% and 12% of GDP (FiA 2009).

2.1.1. Importance of the marine fisheries to livelihoods

The fact that the sector employs over 2.4 million people (FAO 2011) either in primary sector or secondary sector, full-time or part-time, indicates this sector as a major driver of livelihood (Table 2). FiA (2009) estimated that the fisheries sector provides full-time, part-time and seasonal work

to around 2 million out of 14 million people, and that 10.5% of full time workers and 34% of part-time workers are involved in fishing (FiA 2009).

Table: 2. National Fishery Sector Overview (FAO 2011)

Estimated Employment (2009):	
(i) Primary sector (including aquaculture):	> 420,000
(ii) Secondary sector	> 2,000,000
Gross value of fisheries output (2007):	USD 608.7 million
Trade (2008):	
Value of fisheries imports:	USD 2.4 million
Value of fisheries exports:	USD 35.8 million

2.1.2. Fish and fishery products' contribution to food security

The fisheries sector is vital for Cambodia's food security. On an average, fish provides around 66 percent of daily animal protein and 19% of total protein consumption for Cambodians and is also a critical source of essential vitamins and micro-nutrients. As per FAO (2012), the per capita consumption of fish is one of the highest in the world- 40.5 kg/year (Table 3). There are reports on per capita consumption of fish in the range of 46 to 62 Kg/year.

Table: 3. Food balance sheet of fish and fishery products and contribution of fish to protein supply

Production	Non-Food Uses	Imports	Exports	Total Food Supply	Population	Per Capita supply	Fish protein	Animal Proteins	Total Proteins	Fish/Animal Proteins	Fish/Total Proteins
Metric Tons in live weight					in '000	(kilograms)	(grams per capita per day)			%	%
632,839	15,000	5,375	31,114	592,100	14,606	40.5	12.8	19.3	64.7	66.3	19.8

Source: FAO, 2012: FAO Year Book- Fishery and Aquaculture Statistics

2.2. Production and trade volume of marine fisheries

There are conflicting reports of data on fish catch in the country. FAO (2012) reports a total landing of 566,695 tons from capture fisheries (both marine and freshwater) and 74,000 from aquaculture production (Table 4). In fact, the actual catch of marine fisheries is assumed to be higher than the official statistics suggest. This is because the catches from subsistence fishing, including family-scale fisheries, are largely unrecorded. Further, catches from illegal fishing activities are not recorded. In addition, there are Thai vessels fishing in Cambodian waters and

some Cambodia's fishing vessels selling or transferring their catch to Thai vessels at sea or landing directly in Thai ports.

Table: 4. Capture and aquaculture production of fish, crustaceans and molluscs (in metric Tons) (Source: FAO, 2012)

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Capture fisheries production*	364,357	305,817	384,000	482,500	458,500	431,000	465,000	490,094	560,839	566,695
Aquaculture production	26,300	37,515	44,000	41,010	35,260	40,000	50,000	60,000	72,000	74,000
Total	390,657	343,332	428,000	523,510	493,760	471,000	515,000	550,094	632,839	640,695

* Inland + Marine

Cambodia's annual marine production is estimated to be approximately 60,000 tonnes and consists of 435 fish species, with mackerel, scad, anchovy, sardine, tuna and pomfret being the most commercially important pelagic fish species and threadfin bream, croaker big-eyes, lizard hair-tail fish, flat fish, snapper, barracuda, grouper, shark and conger eel being the most important demersal fish species. There are seven shrimp species, one squid species, and two cuttlefish species. Marine capture fisheries mainly take place in coastal and inshore sub-sectors. Due to the lack of complete and accurate data collection, information on marine landings is extremely scanty and fragmented (FiA 2009).

The total fishery export is estimated to be USD 45 million in 2012 as per FAO data (Table- 5). In addition to the official exports, a substantial quantity of marine fishery products, mainly high-value finfish, shrimp and cephalopods, leaves the border unreported. According to the provincial fisheries office in Sihanouk Ville, only 20 percent of the exports of marine fishery products take place officially, the remaining 80 percent are *smuggled* via sea to Thailand or Vietnam traders who – in return supply fuel and ice to Cambodian fishermen. Besides, the inland fisheries products are exported to other Asian markets, namely Singapore, Malaysia, Hong Kong, China and Taiwan (live fish). Fish sauces are exported to Thailand and Vietnam. It is to be noted here that the European Union (EU) Commission has imposed ban on export fishery products to the EU markets due to lack of quality control and certification systems.

Table: 5. Total value of international trade – Imports and exports (in USD '000)

Imports				Exports			
2009	2010	2011	2012	2009	2010	2011	2012
4,583	3,807	4,571	6,605	30,362	40,000 (est.)	60,000 (est.)	45,000 (est.)

Source: FAO, 2012: FAO Year Book- Fishery and Aquaculture Statistics

3. Approach and Methodology

3.1. Study location

The study was conducted in the three coastal provinces (Sihanouk Ville, Koh Kong and Kampoti) and Phnom Penh, as shown in the map below:

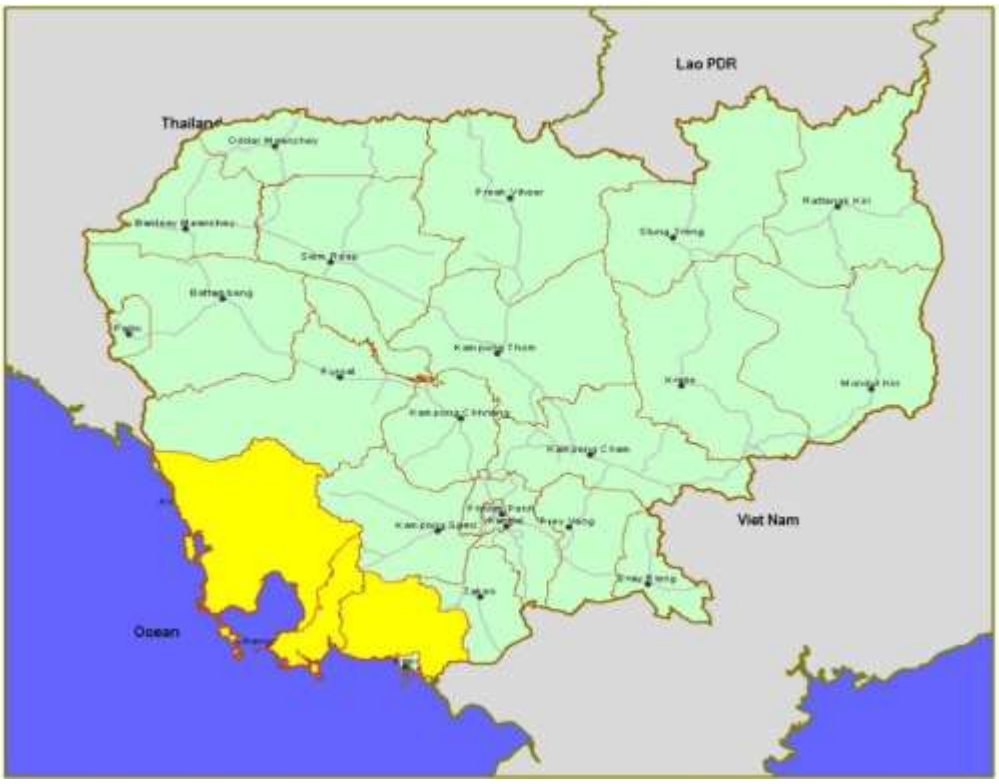


Fig: 1. Map of study location

3.2. Study period

The study was conducted for a period of five months from March to August 2015

3.3. Survey team

The surveys involved a group of experts who were trained on the nature of the sector, actors along the value chain, nature of fisheries business, and market channels.

3.4. Sample size

Table 6 below shows the sample details of different actors from various study areas. In this study, purposive and random sampling techniques were used for selecting the sample.

Table: 6. Sample details of the value chain assessment survey

Sl. No	Stakeholder type		Total	Kampot	SNV	KK	PP
1	Fishing vessels		45	26	13	6	0
2	Processing facilities	Dry Shrimp processors	5	3	2	0	0
		Fish Sauce processors	4	4	0	0	0
		Steam fish processors	3	1	2	0	0
		Crab peelers	4	1	2	1	0
		Fish ball processor	1	0	1	0	0
3	Fish/shrimp/dry shrimp collectors		13	4	4	4	0
4	Landing centers		2	0	1	1	0
5	Local fish markets	Wholesalers	12	3	1	3	5
		Retailers	19	5	5	5	4
6	Octopus and shrimp exporters		14	4	2	4	1
7	Consumer		24				24
8	Ice factories		6	2	3	1	0
9	Associations/fishery communities		8	2	4	2	0
10	Local FiA officers (Sangkot level)		3	1	1	1	0
11	Other officials/development partners/etc		18				

Note: SNV = Sihanouk Ville; KK = Koh Kong, PP = Phnom Penh

Sample size for different actor groups are shown (Table 6) above. The team members continued sampling until having achieved informational redundancy or saturation - the point at which no new information or themes were emerging from the data. The samples and locations of this study covered a diverse cross section of marine fisheries value chain actors taking into consideration their business levels (small/ medium/large), gender, backgrounds and cultures to give a better cross-section of information. As Sandelowski (1995) points out, 'determining adequate sample size in qualitative research is ultimately a matter of judgment and experience and researchers need to evaluate the quality of the information collected in light of the uses to which it will be put, and the research method, sampling and analytical strategy employed'.

3.5. Study Approach

The study comprised the following elements:

- Preliminary field survey
- Development of questionnaires
- Data collection
- Discussion with stakeholders

- Discussions with government agencies
- Discussion with stakeholder groups/common interest groups
- Case studies
- Focal Group Discussions (FGDs)
- Data analysis and reporting

3.5.1. Preliminary field survey and Development of questionnaires

The questionnaires were developed based on the current status of the sector through a preliminary study of the value chain and discussing with various actors across the study location. Survey team members were trained using the questionnaires developed with section of actors along the value chain. In this pre-testing, much attention was given to obtain new information from the field. These new information were added and the questionnaires were improved, rearranged and modified based on the experiences gained from the field tests (Annex IV).

3.5.2. Data collection

Data and information for this study were collected from both primary and secondary sources.

- Primary data source/collection
    - Primary data were collected through semi-structured interviews, key informant interviews, case studies, focus group discussions (FGDs) and final brainstorming workshop.
    - Stakeholders consulted through these participatory approaches comprised of different actors who are directly involved in the supply chain as well relevant government officials.
- Secondary data source/collection
    - Secondary data were collected from published documents and reports from various organizations; both governmental and non-governmental agencies (donors, implementing agencies, etc.) to have a preliminary understanding on the end market, market segments and market potential of the value chains.

For primary data collection, a combination of participatory, qualitative and semi-quantitative methods was used.

Types of data collected were:

- General information
- Official data from various agencies with regard to marine fisheries
- Marine fisheries resource
- Marine fishing fleet information
- Fishing practices information
- Marine Fish/shrimp catch data and export data
- Post-harvest and handling situation
- Post-harvest infrastructure
- Legal framework
- Donor mapping
- Marketing- both domestic and exports
- Processor association- Current status- activities
- Cross cutting issues- women, employment, and conservation

3.5.3. Focus Group Discussion (FGD)

After the collection of primary data, a Focus Group Discussion (FGD) session was held with actors involved in the marine fisheries from all the three provinces and Phnom Penh. The participants also included officials from FiA, MOC, Private Sector Development Department, Business Association and others. The data were validated through the FGD with the active participation of randomly selected actors. The detailed proceedings of the FGD are given as Annex (III) of this report.

3.5.4. Case study

In addition to semi-structured interviews with actors, some case studies were made with selected actors through collecting more information of their business and the constraints they face and possible solutions from their view (See Annex V)

3.5.5. Final validation workshop

A final validation workshop on value chain assessment and road map for development was held at Phnom Penh with active participation of stakeholders from across the value chain including private processors, exporters, business associations, donor agencies, and officials from various Ministries including MAFF, MOC, MIH, and others. The participants gave valuable feedback and some recommendations which were later included in the report (See Annex VI)

3.6. Data Analysis

After the collection of data, they were scrutinized and carefully edited to eliminate possible errors and inconsistencies contained in the questionnaires while recording them. The first step was to look into the data of each and every interview to ensure consistency and reliability with the aims and objectives of the study. The results were tabulated from the interview schedules. The sum, mean, averages, percentages, gross costs and margins etc. are the simple measures employed to examine the value chain analysis of marine fisheries.

4. Mapping of Marine Fisheries Value Chain

4.1. Description and role of value chain actors

The fisheries value chain in Cambodia is quite complex and unique, like many developing countries, with too many intermediaries involved in the supply chain and distribution systems. Many transactions take place between the point of capture and the point of reaching consumers. There are many middlemen are involved. The trading system would not function without these entrepreneurial individuals and their enterprises.

In general, fishes are landed after catch and sold to collectors, middlemen or retailers or wholesalers or processors, who in turn transport fishes to different markets and sell the product. A thorough description of these actors and their role are given in detail below.

4.1.1. Fishing vessels

The table # 7 and 8 below give the details of number of fishing vessels in the country for both inland and marine sector, from the available resources.

Table: 7. Number of total (inland and marine) fishing vessels (numbers)

	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012
PW	6,075	16,888	28,390	38,253	38,960	44,420	46,427	na	na	na
NP	27,401	18,292	39,724	58,853	56,964	57,298	61,718	na	na	na

PW: Motorized vessels propelled by engines. NP: Non-motorized vessels propelled by oars or sails

Source: FAO, 2012: FAO Year Book- Fishery and Aquaculture Statistics

Table: 8. Marine Fishing vessels data (FiA, 2014)

	Boats no engine (boat load)			Boat with engine (HP)					Grand Total
FiA Cantonments	< 5 ton	> 5 ton	T o t a l	<10	10-30	30-50	> 50	T o t a l	
Kampot	335		335	456	176	2	3	637	972
Kampong Som			0	1,095	1360	5	285	2,745	2,745
Koh kong	215		215	2,241	595	155	93	3,084	3,299
Total			550					6,466	7,016

FiA (2014): Annual Report: Statistics of Marine Fishing vessels, FiA, 2014

Table: 9. Number of Fishing Vessels in Cambodia (FAO, 2014)

Type of vessel	**Number of vessels**	**% of fleet**
Non-Motorized Boats		
< 5 tonnes	57,910	53.55
>5 tonnes	3,808	3.52
Motorized Boats		
<10 hp	37,338	34.53
10-30 hp	7,696	7.12
31-50 hp	792	0.73
>50 hp	601	0.56
TOTAL	108,145	100.00

Two systems exist for licensing motorized fishing vessels: one is a license issued by the provincial fisheries office for all motorized vessels equipped with engine power under 30 HP (horse power) and another is a license issued by the Fisheries Administration for all motorized vessels equipped with an engine power above 33 HP.

The study found that small-scale and non-motorized fishing vessels are family-scale, who catch fish primarily for family subsistence and daily household income. The number of small-scale fishers is increasing annually as alternative livelihoods. They usually fish for shorter period and in inshore waters. Medium-scale fishing vessels belong to extended families and village level partnerships. These kinds of fishing vessels sell fish to collectors and traders; sometimes they take fish directly to consumer or retail markets locally.

Table: 10. Fishing trip details

# of day per fishing trip	%
Day-night	51
1-2 week	44
1 month	4

Table: 11. Fishing vessel ownership

Owner of fishing vessel?	%
Yes	78
No	22

Use of ice:

The study noted that almost all the motorized fishing vessels (medium and large) are equipped with ice hold and 100% of them carry ice to the fishing site if it is farer than 4 hours sailing. Some boats operating in the inshore waters do not usually carry ice because of close vicinity to the markets.

Hygiene conditions:

In general, the physical conditions of the fishing vessels are considered acceptable for food safety requirements. However, none of the fishing vessels have personal hygiene, clean water or disinfection facilities onboard.

Depth of operation:

Most of the fishing is carried out in in-shore waters (51%) while rest is in off-shore deeper waters (Table 10). Fishing is carried out at deeper water with depth over 20 m which takes about 4 to 7 hours to reach the fishing zone.

Ownership:

78% of the owners operate their own boats while rests are given either on rent or run by workers (Table 11).

Resource:

There is general opinion (93%) that fishing resources are dwindling due to over fishing and fishing by foreign trawler vessels. However, the survey team does not take responsibility of the statements.

Fishing gear:

Most common fishing gears used are trawlers (58%), gill nets (36%) and traps (7%) - Table 12.

Table: 12. Fishing vessel types

Type of net	%
Trawler	58
Gill net	36
Traps	7

Pic: Traps and gill nets

Registration:

The study noticed that only 22% of the fishing vessels that were surveyed are registered while rests are not. The majority of the fishermen feel that registration or license cost is expensive and they do not see any benefit of registering.

Training:

None of the fishermen had any training on either fishing techniques, nor food safety and hygiene.

Finance:

100% of the fishermen take loans from either collectors or from family members. Access to the loans is poor.

Sale of fish:

The data shows that about 84% of the fishing vessels sell either to collectors/wholesalers or retailers, with whom they have financial obligations through verbal agreements.

Challenges:

The biggest challenge the fishermen (89%) facing is reported to be foreign illegal fishing. They expect the authorities to intensify patrolling and monitoring. Another major concern of all the fishermen is on the lack of signals from the shore which makes their night arrival risky.

4.1.2. Collectors/traders

The study found that most of the traders and collectors (93%) collect fishery products from fishing vessels directly with set price depending on the quality, market situation, supply situation and demand. Most of the fish collectors have capital for immediate cash payment to fishermen; however, they also provide credit to small fishers in the form of cash and/or in kind (e.g. fishing gear) during the off season. In the present study, it was observed that 64% of the collectors give advance loan to the fishers, while 21% buy from fishers with verbal agreement. During the course of the survey, it was found that some collectors also take loans from wholesalers, middlemen and exporters.

The collectors and traders invariably use ice after procurement (93%) and then sell the product either to Phnom Penh wholesalers or local retailers, while some percentage goes to either Vietnam or Thailand through the agents, with a profit margin of 0.25 to 0.50 USD per kg. Again, these collectors or traders (93%) have verbal agreements with their buyers too. These traders do get quality complaints from their buyers, for which they blame fishing vessels for their poor post-harvest handling.


Pic: Collectors and traders in landing centers

The biggest challenge they face is lack of cold storage for storage of products during peak seasons.

License: The study also reported that 43% of the traders/collectors take permit from FiA at the cost of 100 USD/year and transport permit from tax department (MEF) for 225USD/year with a monthly fees of 10 USD.

Skills or knowledge: None of them had any training or awareness on food safety and hygiene.

Workers: Majority (64%) of traders and collectors employ workers for their operation, of which 54% are females.

Table: 13 Employment structure by traders/collectors

<table>
<tr><th colspan="3">Use of workers</th><th>Remark</th></tr>
<tr><td colspan="2">Yes</td><td>No</td><td rowspan="2"></td></tr>
<tr><td colspan="2">64%</td><td>36%</td></tr>
<tr><td>Male</td><td>Female</td><td rowspan="2">n/a</td><td rowspan="2">Number of people employed ranges from 1 to 7 people per collector</td></tr>
<tr><td>46%</td><td>54%</td></tr>
</table>

4.1.3. Retailers

Retailers sell fish in markets directly to consumers or restaurant owners; in many cases they have a permanent stall inside or outside the market. Fish retailers are mostly women, but they often have their family members or partners who help them to go and buy fish from the landing site or from collectors.

As per the present study, the retailers buy the fishery products either directly from wholesalers (37%) or from fishing vessels (26%) or collectors (26%). Most of the retailers (95%) buy with a verbal agreement without any loan or advance payment. On an average each retailer sells about

5 to 15 kg of fish, crab, squid, shrimp or bivalves per day. They use ice for the display of their products purchased mostly from traders or their fish suppliers. They earn an average profit of about 0.75 USD per kg of the product. Again, the biggest challenge is the irregularity in fish supply and lack of cold storage facilities for storing the unsold fish. They do not (100%) have any knowledge or awareness on the importance of food safety and hygiene.

Table: 14 Source of fish at retail markets

	Wholesaler	Fishing vessels	Collector
%	37%	26%	26%

Pics: Retails fish markets in Phnom Penh

4.1.4. Wholesalers

Wholesalers buy the fishery products from fishing vessels or collectors (67%) while some of them buy the imported products from Vietnam (25%). The wholesalers (25%) give advance to their suppliers while rest through verbal agreement without advance. On an average they deal with 50 to 300 kg of the fishery products per day with a profit margin of 0.25 to 0.50 USD/kg. They either sell it to local markets or long distance PP market or even to agents who export to Vietnam or Thailand. The cost of transport to outside market varies from 0.13 to 0.16 USD/kg. Their knowledge on food safety and hygiene is nil- no training received. FiA issues license at a cost of 100 USD/year which they think is too high.

4.1.5. Landing centers

Landing centers are mostly private owned in the coastal provinces. Most of the landing center owners are collectors by themselves. Landing center facilities are limited and in most cases poorly developed. A significant amount of the marine catch is transferred to foreign vessels at sea and is not landed in Cambodia. The study confirms the statement made by FiA (2007) that most of the landing ports are small and rural, services and facilities are poor.

The study found that 90% of the fishing vessels are not charged for landing because they sell their products to the owner of the landing centers, while rest of them are charged either 1.25 to 2.50 USD or based on the catch per day/per landing. The owners of the landing centers also give advance to their suppliers. The landing centers buy ice from ice factories for icing the products after they are purchased. 40% of these larger landing sites have a license issued from FiA either as landing center or collector at a cost of 100 USD/year while they also pay 250 USD/year to tax department.


Pic: Landing centers at Sihanouk Ville

The study found that there is a complete lack of hygiene facilities such as toilets and hand wash in the landing centers; the landing center owners claim that they draw marine water from cleaner locations. The structures of some of the landing centers are concrete while most of them are wooden. They are aware of the need for hygiene facilities (100%), but they did not get any training. In Kampot provinces, many of the landings take place on the beach itself.

4.1.6. Ice factories

Most of the ice factories in the coastal provinces are supplying ice for both fisheries activities as well as for restaurants. They have a capacity of 20 to 60 tons/day. The study learnt that most of the ice factories (67%) in the provincial cities have undergone major change recently with the installation of stainless steel cans in place of iron can which are not rust proof. The owners have also undergone training program conducted by MIME.

Even though the ice factories have sanitary/toilet facilities for workers, the factories are far from reaching food safety compliance due to the absence of washable and hygienic walls/floors/ windows, lack of preventive mechanisms for entry of pests and animals through doors and windows and lack of fencing for animal control. They do have water treatment system such as UV treatment (40%) and sand filter (40%). There is no documentation or record of any cleaning, disinfection, hygiene and any food safety related activities. All the factories visited had tested their water source once a year for microbiological and chemical parameters.

The ice factories are controlled by Ministry of Industry. The Competent Authority of FiA has no linkage with the ice factories, no registration, no monitoring and no approval.

Pics: Ice factory inner view

Pic: Animal inside the ice factory

4.1.7. Processors

There are various small scale processors in coastal provinces producing following products: Dry shrimp, steam fish, fish ball, crab meat and fish sauce. These processing establishments are either small scale or family scale. Their productions depend on availability of raw materials at affordable price. Dry shrimp and steam fish processors procure their supplies from the fishing vessels (80-90%) while fish ball, crab meat and fish sauce manufacturers purchase their raw materials mostly from traders and collectors (70 to 90%) with prior agreements or pre-finance.

These processors do not use ice with the reason that they process immediately after the purchase of raw materials. Their yield percentage is given in table below (Table: 15).

Table: 15. Yield percentages of different fishery products

Products	Production yield (%)
Dry shrimp	8-9%
Steam fish	60 - 65%
Fish ball	40%
Crab meat	30%
Fish sauce	14 - 28%

While most of the above products are sold to local market, Phnom Penh and other provinces, 100% of crab meat is exported to Vietnam.

Value addition: It is found that 33% of the products undergo very minimum labeling while rest are sold in unlabelled or in bulk form to the buyers. Only in case of fish sauce, they are 100% packed and labeled with their logos.

Pics: Semi-processed crab meat

Pic: Final packing of dry shrimp on the wooden floor

Workers of the processing activities are mostly female workers (74%) in the study locations.

Skills: As per the study, 93% of the *owners* of the processing facilities have undergone training in the past; however, they expressed the need for further training on improving food safety conditions in their operations. Workers in the processing facilities have never undergone any training on basic food hygiene.

Processing types

Marine fish processing in Cambodia could be divided into three types, namely small, medium (both traditional) and modern or industrial processing.

Small scale (family scale)

Most of the low-valued marine fishes/shrimps undergo processing for fish sauce and dried shrimp. Most of these operations are family owned or small scale with least or no technological advances.

Pics: Dry shrimp processing (family scale) Dry shrimp processing in solar dryer

Medium-scale

This type of processing is generally operated by fisheries enterprises such as crab meat plants, steam fish, fish balls and fish sauce factories. They usually employ 20-40, mostly female workers. Many of these enterprises operate during peak period of fish supply, when volumes of fish are abundantly available (mackerels and sardines).

None of these small or medium enterprises are meeting the food safety requirements for their official exports, in terms of hygiene, operational and documentary requirements. Due to these constraints, they prove to be not competitive in export markets.

Pics: Processing operations at Sihanouk Ville (Meat picking and crab peeling)

Modern or Industrial Fish Processing

In general, these types of processing industries are processing fishery products for export to the international market. These enterprises are located in Phnom Penh and Sihanouk Ville. Currently, there is one factory in Sihanouk Ville that is processing

shrimp for exports. The factory is well designed and structured, mostly meeting the food safety requirements in terms of physical structure. But its production is too small in quantity questioning the feasibility.


Pic: Inside view of one of the modern processing facilities at Sihanouk Ville

Major challenges faced by all the processors are poor quality of raw materials, lack of access to funds and lack of resources to find export markets. Further, lack of quality infrastructure is making the products least competitive in the export markets.

4.1.8. Exporters

The marine fish exporters include mostly those who export squid, octopus and crab meat in iced/chilled form while one exporter exports live mantis shrimp. The products are exported to Thailand (46%), Vietnam (46%) and China/Hong Kong (8%). Except mantis shrimp, all the squid, shrimp, crab meat are exported in semi-processed and unlabelled form with not much value addition. Regarding the market complaints, 100% of the exporters had experienced quality problems and complaints from their respective buyers. One exporter of crab meat has even received complaint of Chloramphenicol (CAP) residue in the meat. The major challenges faced by exporters include poor quality, low technical know-how and lack of market/buyers. In addition, the exporters also face difficulties on meeting too many trade related official documentations, lead time and official (and unofficial) fees for formal exports which they think are major constraints.

4.1.9. Producer Associations

There are 8 associations in the coastal zones. These were developed for steam fish processors, landing centers and dry shrimp processors of Kampot and Sihanouk Ville, by the FiA during various projects including TDSP program. These associations have members between 9 and 18

from within the same business. At least 80 to 90% of the members of these associations were provided training on processing techniques, food safety and hygiene by FiA as well as some other NGOs. They neither have linkage with other associations nor do they have apex associations. Hence, their dialogue capacity is quite limited.

Pic: Crab peelers associations established by TDSP project at Kampot

4.1.10. Transporters

The current study revealed that most of the fishery products are transported through motor carts for local markets while it is transported through mini car or bus for long distance markets. Based on the information obtained from survey respondents, the cost of transportation varies from 0.13 to 0.16 USD per kg for long distance markets.

From fish landing sites, fishes are usually transported by motorbike, mini truck, or pickup car to local markets or fish distribution centers or to the export points near Thailand and Vietnam border. Most fish to Phnom Penh and other provinces are transported in pickup trucks with ice in insulated boxes; sometimes. Transportation is very crucial in preventing post-harvest losses during transit. Poor road infrastructure and lack of cold storage facilities, and inefficiencies associated with unofficial road taxes and license fees are other major constraints faced by transporters. Transporters informed the survey team that they pay a registration fee to the FiA and also pay a series of unofficial taxes from the landing site to the final destination.



Pic: Various means of transports used for fish and fishery products

4.1.11. Marine aquaculture

Marine aquaculture has a great potential in Cambodia. There are many aquaculture facilities in the coastal or offshore areas, depending mostly on wild seeds. The aquaculture production figures are shown in table 16.

Japan's JICA recently funded a new Marine Aquaculture Research and Development Center (MARDeC) in Sihanouk Ville with a yearly production target of 400,000 fingerlings. With this, there is an opportunity for marine aquaculture to grow in the coming years. But the establishment is yet to come out to its potential. Currently, marine aquaculture is not contributing much to the marine catch.

Table: 16. Marine Aquaculture Production 2000-10

Year	2000	2002	2004	2006	2008	2010
Production (tonnes)	20	53	75	40	75	65

FiA 2012: Fisheries Administration, MARDeC Strategic Plan 2012.


Pic: MARDeC hatchery at Sihanouk Ville

4.1.12. Consumers

Seafood consumers consider many facts which determine their preference: price, quality, convenience, availability, variety, safety and hygiene. Cambodians are one of the highest fish eating consumers in the world with highest per capita consumption.

The study indicates that majority of the consumers (>70%) buy the fishery products from local market and rest from super markets (13%). Most of them (67%) do not have awareness on the source or history of the products. Only 42% of consumers trust the specific seller of fishery products on quality and weight of the products while the rest (52%) do not have any preference on quality but on price.

When asked on what they prefer- price or quality, most of consumers (63%) expressed that they are not ready to buy a product of high or superior quality (with label/brand like ISO or HACCP certified) at higher price due to high price and affordability. The consumers (83%) raise their concerns on possible use of harmful chemicals to preserve fishes. Most of the consumers (71%) think that hygiene and sanitation in market area are ineffective (Table: 17).

Table: 17. Consumer responses on quality of products in retail markets and their hygiene status

Quality of the product in retail market	Very satisfied	Satisfied	Not satisfied	No idea on quality
%	0	58	13	29
Hygiene status of retail markets	Very effective	Effective	Not effective	No idea on hygiene
%	0	13	71	16

4.2. Case studies

During the survey of the value chain, some important enterprises have been identified and studied further to address some key issues with related to value chain development. These case studies are provided under Annex: V

4.3. Value addition in the marketing chain

An attempt was made to analyze the various costs involved during value addition of two products- fresh squid and dry shrimp.

Table: 18. Fresh squid value chain: Type of cost-additions

Actor in chain	Type of Value/cost-additions
Fishing vessel	Icing Fuel Workers
Collectors/landing center/ Wholesaler	Icing Transport Workers License fees
Retailer	Icing Transport Hygiene service fees

Fig: Amount of cost-additions in fresh squid value chain (In USD per kg of fresh squid)

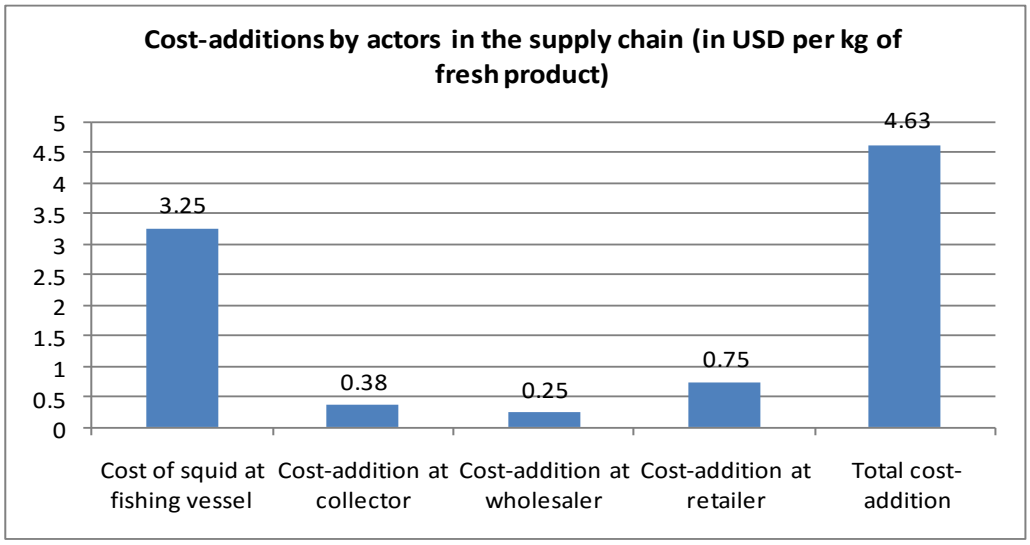


Table: 19. Dry shrimp value chain: Type of cost-additions

Actor in chain	Type of Value/cost-additions
Fishing vessel	Icing Fuel Workers
Collector/landing center	Icing Transport Workers License fees
Processor	Cold chain Transport Workers Packaging License fees
Traders	Store fee Hygiene service fees

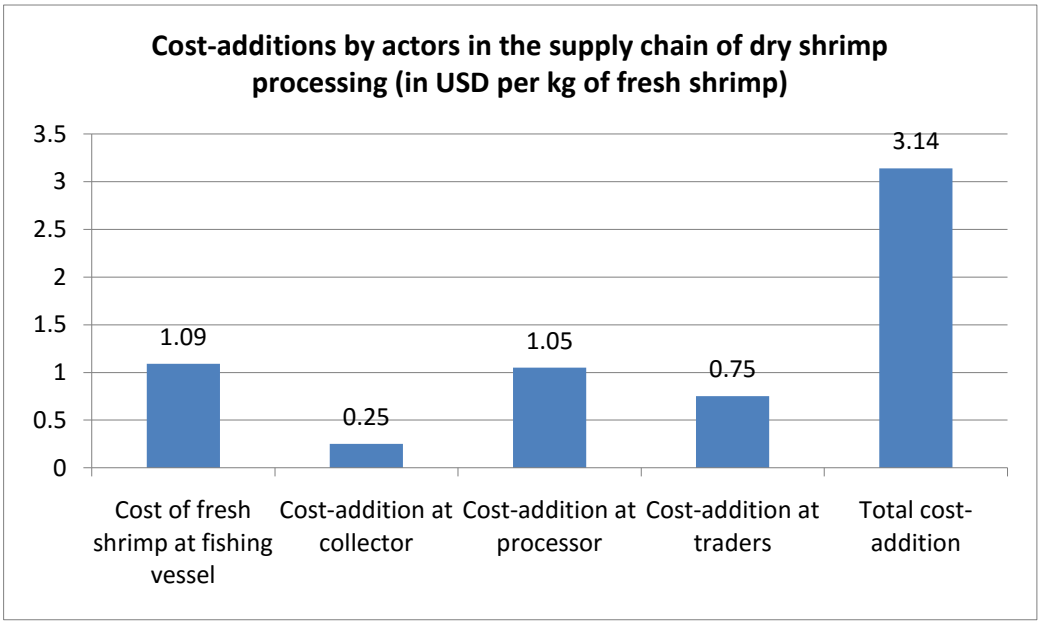


Fig: Amount of cost-additions in dry shrimp value chain (In USD per kg of fresh shrimp)

Profitability

Based on the interviews with many respondents on the costs involved in their respective activities, an effort has been made to find out the profit margins by various actors along the value chain. This should not be considered as a detailed economic and scientific analysis.

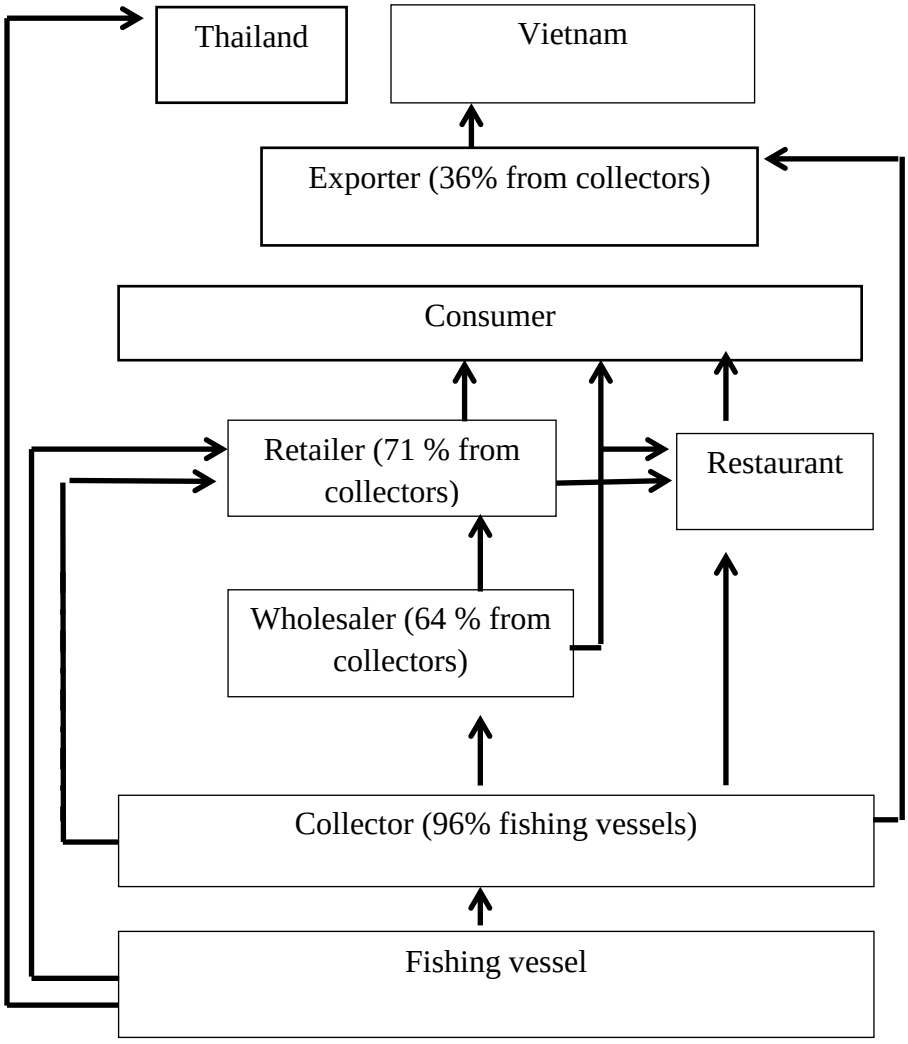
Table: 20. Generic Profit margins at various levels of value chain actors

Actors in chain	Profit margin ($/kg) (Excluding the cost of value-addition)	Value/cost-additions
Fishing vessel	0.75 - 1	• Icing • Fuel • Workers
Intermediaries	0.25 – 0.5	• Icing • Transport • Workers • License fees
Retailing	0.75 – 1	• Icing • Transport • Hygiene service fees
Processing	0.25 – 0.75	• Icing • Transport • Workers • Packaging • License/Informal fee

4.3.1. Marine Fish value chain

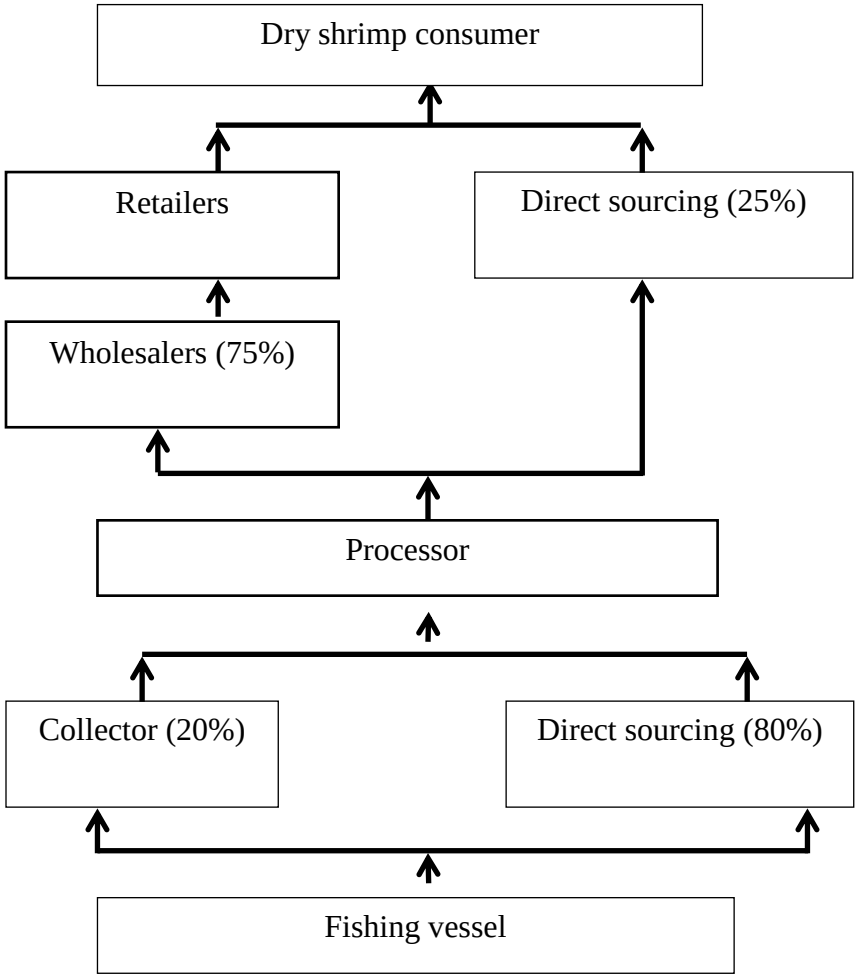
Marine fish and fishery products value chain are quite complex process with too many intermediaries. There are many fish collectors and traders in the fisheries sector who collect fish from fishermen and sell to retailers, processors or wholesalers. Even though this is general picture of marketing channels, the study team has drawn various value chain flow diagrams, as below, depicting the flow of fish and shrimp from marine fisheries based on the actual market situations:

Value chain of marine fishes (fresh/iced)- domestic and export



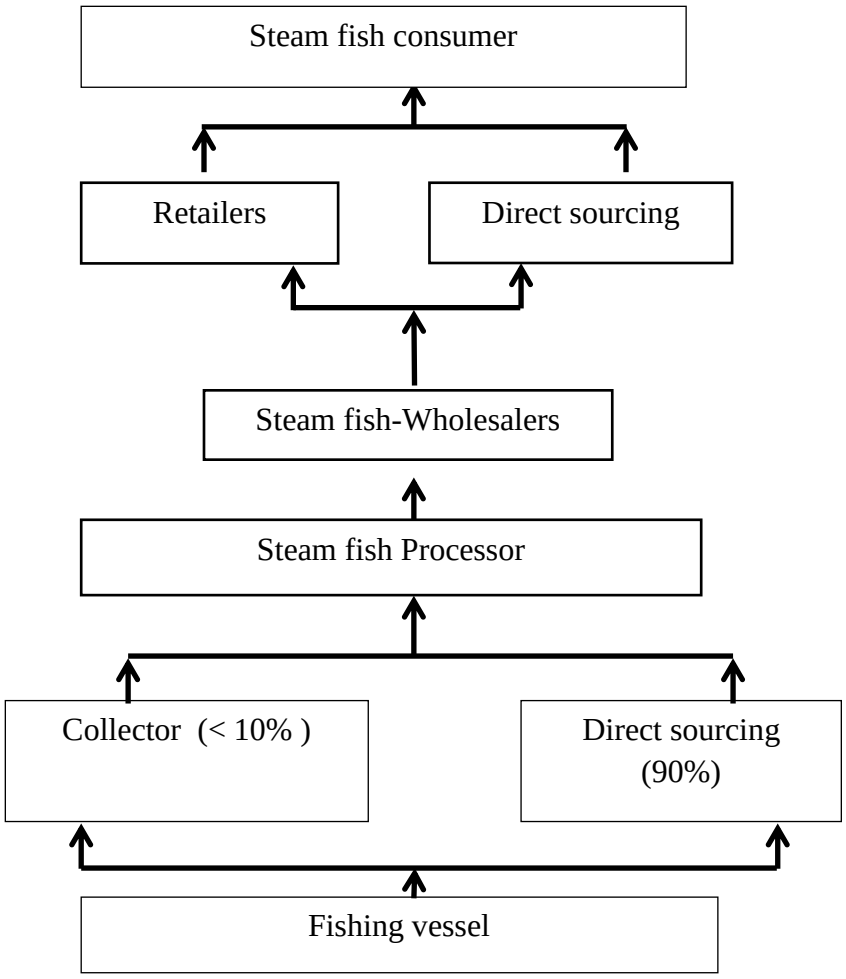
Legend: Number in parenthesis ( ) are percentage sourcing by collector and fishing vessels

Value chain of dry shrimp processing- domestic



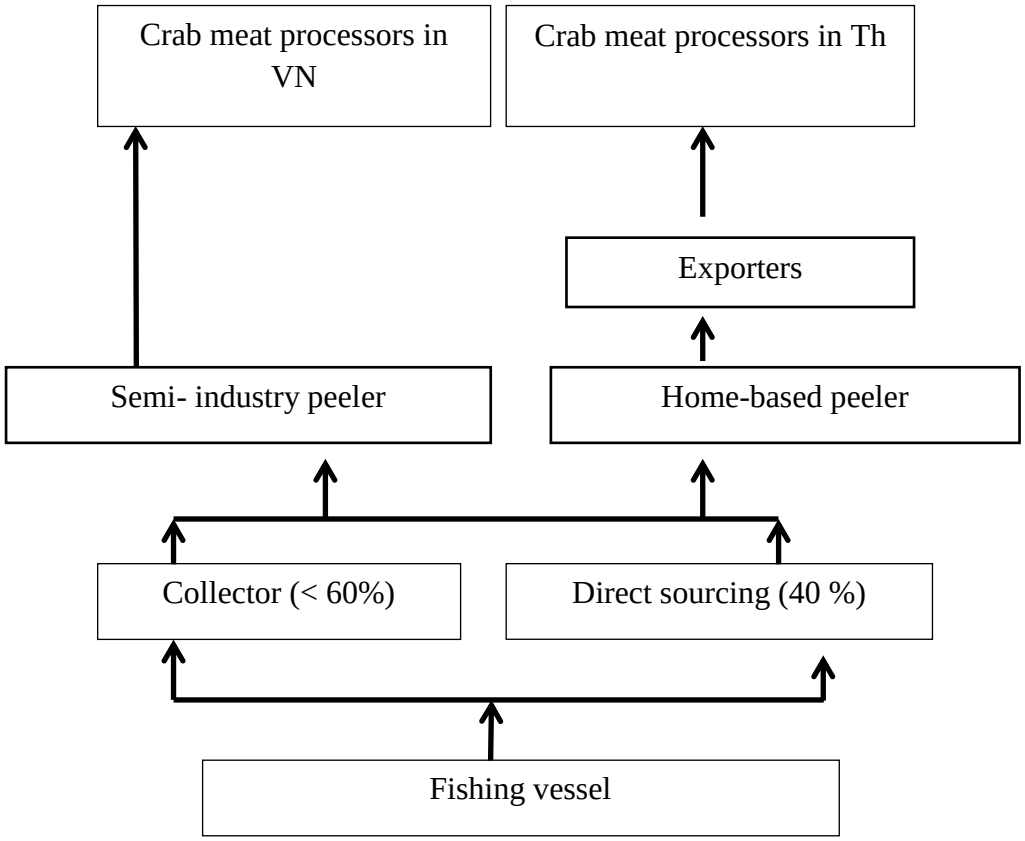
Legend: Number in parenthesis ( ) are percentage of shrimp sourcing

Value chain of steam fish processing- domestic



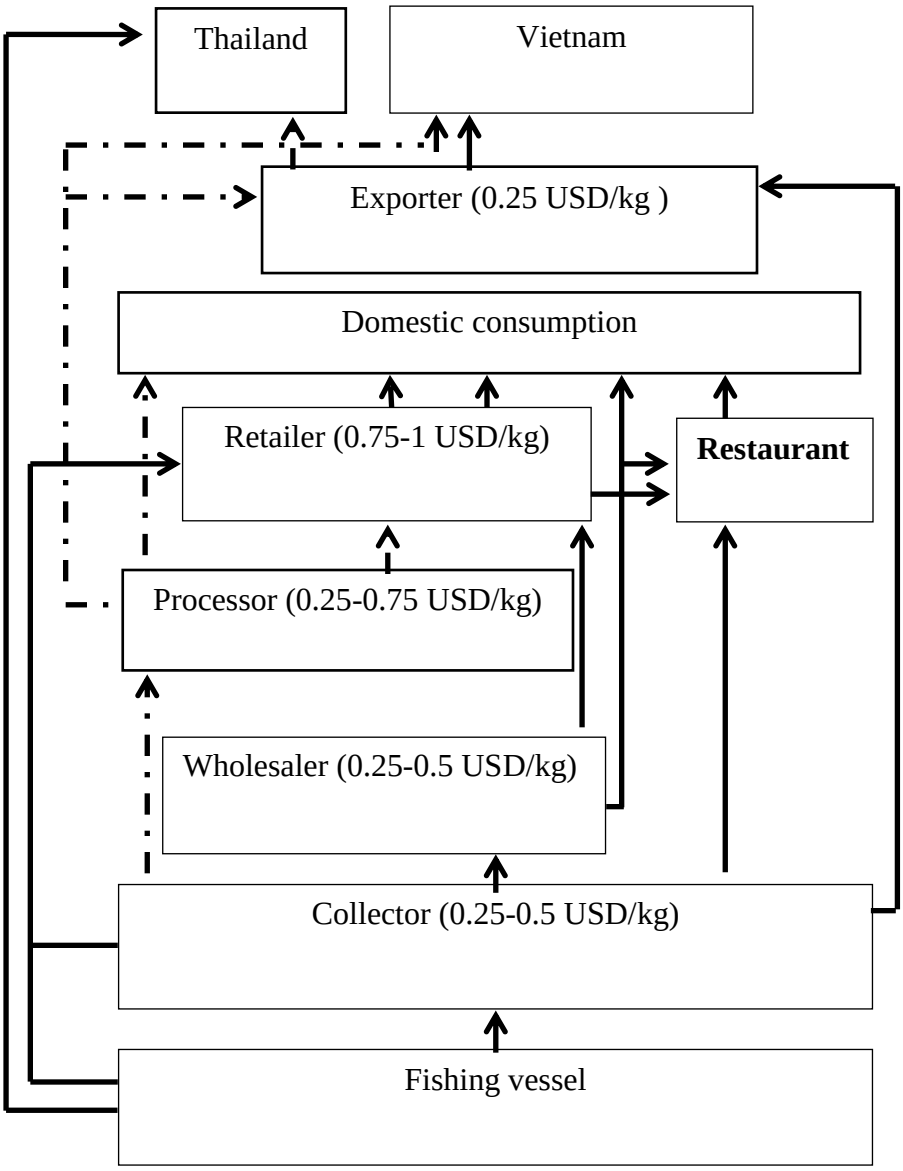
Legend: Number in parenthesis ( ) are percentage of Mackerel sourcing

Value chain of crab meat processing- export market



Legend: Number in parenthesis ( ) are percentage of crab sourcing

Marketing channel and Value-additions



Legend: Processed products ⇢, fresh caught product →
Number in parenthesis ( ) are amount of value addition

Note: The figures in ( ) are range for five different products- dry shrimp, steam fish, fish ball, crab meat and fish sauce

Table: 21. Market Flow of various groups of marine fishery products

Varieties	Marine fish catch (FiA, 2014)		Flow of marine fisheries products in market: (x = low, xx high)				
	# (tons)	%	Fresh consumption	Proces-sing	Export to VN (fresh prod.)	Direct Landing in TH (fresh)	Export to VN and TH (semi-processed product)
By-catch	43,150	43		xx		x	
Mix (low value) fish	~ 15,426	16	x	xx	x	x	
Mackerel	5,225	5	x	xx		x	
High value fish	~ 4,362	4	x			x	
Anchovy	4,750	5		xx		x	
Squid	9,470	10	x		x	x	
Octopus			x		xx	x	
Shrimp	8,806	9	x	x	x	x	
Crab	8,210	9	x			x	x

According to FiA Annual Report (2014), the marine fisheries catch is dominated by mainly by-catch (43%) followed by mix fish (16%), squid and octopus (10%), shrimp (9%), crab (9%), while high value fish account only for 4%, and mackerel and anchovy contribute 10%. The above table (Table 21) gives a brief picture on how the fish and fishery products move in to the market particularly for fresh consumption, processing, and exporting to Vietnam and Thailand.

Export trade channel

Official export procedures and the analysis will be discussed in the later part of the report under business enabling environment. However, a special mention is required on informal export mechanisms.

As discussed earlier, export trade is increasingly becoming informal due to many reasons. There are different products going through these informal routes such as: Fresh marine products (Octopus, squid, shrimp, and mixed fish) and semi-processed products (crab meat). There are many actors involved in this activity; they are: Fishing vessels landing directly in Vietnam and Thailand, traders buying from landing centers and sending through border points, processors and exporters sending their products in semi-processed form.

Why informal market?

Our study made some insight into the reasons behind this trend of informal export. The following reasons were provided by the respondents:

- Lower price of ice and fuel in Thailand
- Access to stable market and better price in Thailand/Vietnam
- Access to bigger boat workshops and spare parts in Thailand/Vietnam
- Lack of export know-how among exporters, particularly on legal compliance
- Lack of quality infrastructure in the country
- Lack of infrastructure facilities such as cold store, roads, finance, etc

4.4. Food Safety knowledge on compliance among actors

Food safety knowledge and awareness among the actors along the value chain is very limited. Our study made a special effort in identifying their level of knowledge on quality, food safety and personal hygiene. The results (Table 22) indicated that processors (only owners) and association members have obtained some training through FiA and other agencies. This is one of the crucial factors for effective value chain development.

There are no visibility materials or posters or pamphlets at anywhere in the coastal provinces, offices, establishments and facilities to create awareness on quality and safety. This is the basic requirements for any value chain development. When enquired with FiA local provincial offices, it was reported that there is no such funds for training, awareness workshops or viability posters under the government budget.

Table: 22. Knowledge level of actors along value chain

% of actors with knowledge on food safety and hygiene through training	
Actors	%
Fishing vessel	0
Collector/landing center	10
Wholesalers/traders	0
Processor: Owners Workers	 93 0
Exporter s	40
Association s	100

Please note: Having knowledge through training programs does not prove that quality and hygiene practices are followed in their respective operations unless documents exist. The study proved it so.

4.5. Education and training

Royal University of Agriculture (RUA) has a fisheries faculty and produces BSc graduates for the fisheries sector. It also offers a course leading to Master Degree on integrated farming system.

Two schools of agriculture, namely Prek Leap National School of Agriculture (PLNSA) and Kampong Cham National School of Agriculture (KCNSA), conduct certificate courses for 1 and 3 years.

4.6. Donor mapping

Since the mid 1990s there have been many international and regional organizations supporting the development of Cambodia's fisheries sector including: Mekong River Commission (MRC), FAO, Asian Institute of Technology, The Asian Development Bank (ADB), The World Fish Center, World Bank, the Southeast Asian Fisheries Development Center (SEAFDEC) and World Wildlife Federation (WWF). In terms of donor support to fisheries projects, EU, DANIDA, SIDA, DFID and JICA have been particularly generous. The principal focus of action has been on community fisheries, conservation, and increasing production for the domestic market and much of that effort has been centered on inland fisheries.

Recently, TDSP funded first phase of the project "Better Quality and Safety of Fish and Fishery Products for Improving Fish Trade Development in Cambodia" was implemented by the Department of Fisheries Post-Harvest Technologies and Quality Control (DFPTQ), Fisheries

Administration (FiA) of Ministry of Agriculture, Forestry and Fisheries (MAFF). The project's objective was to enhance trade in fisheries products through improving capacity of those engaged in post-harvest fisheries for better quality and value of fish and fishery products, and increasing access to domestic and international markets. Technical assistance was provided by UNIDO. Many trainers and various food safety guidelines including Quality Seal system were developed most of which are still pending for approval and implementation.

Any activity with the intent of developing value chain will be futile if such guidance or policy documents and Quality seal are not approved and implemented.

4.7. Cross-Cutting Issues

Gender Issues within the Value Chain

As per the findings of the study (Table 23), women are actively involved in the marine fisheries value chain activities such as retailing (>90%), processing (>74%) and trading or intermediary activities (>50%).

Table: 23. Women employment in marine fisheries sector

Actor in value chain	% female
Fishing vessels	3%
Traders and collectors	> 50%
Retailing	> 90%
Processing	> 74%

Working conditions

Working conditions for the workers in fish processing facilities are quite poor; in many of the facilities women sit on the floor for work. The study did not collect any data on wage inequality and other benefits for the women workers. Child labor is another issue to which the current study did not go deep into. However, child labors were observed working in many of the facilities visited.

Access to Finance

Small and medium level enterprises such as fishing vessels, traders, collectors, processors, and exporters need access to finance in order to maintain and grow their businesses. The study found

that many of the small and medium level producers and enterprises often lacked sufficient access to the finance they needed through institutional credit systems such as banks and microfinance. So they often tend to avail informal and unregulated finance with unfavorable terms. Informal way of finance such as hand-loans, advance, private loans, family loans, etc are very common. About 70% of fishing vessels get their informal advance from collectors and traders.

Environmental concerns

The study team observed some of the environmental issues along the marine fisheries value chain such as increasing landing of by-catch through indiscriminate trawling, poor waste disposal at landing centers/processing facilities and poor availability of drinking water due to salination along some of the coastal villages visited. No detailed assessment was done by this team.

By-catch or trash fish

As per FiA Annual Report (2014), the total by-catch landed was reported as 43,150 tons which is 36% of the total marine landings. This is quite alarming indicating the need for effective control on fishing gear in terms of mesh-size.

Employment along the chain

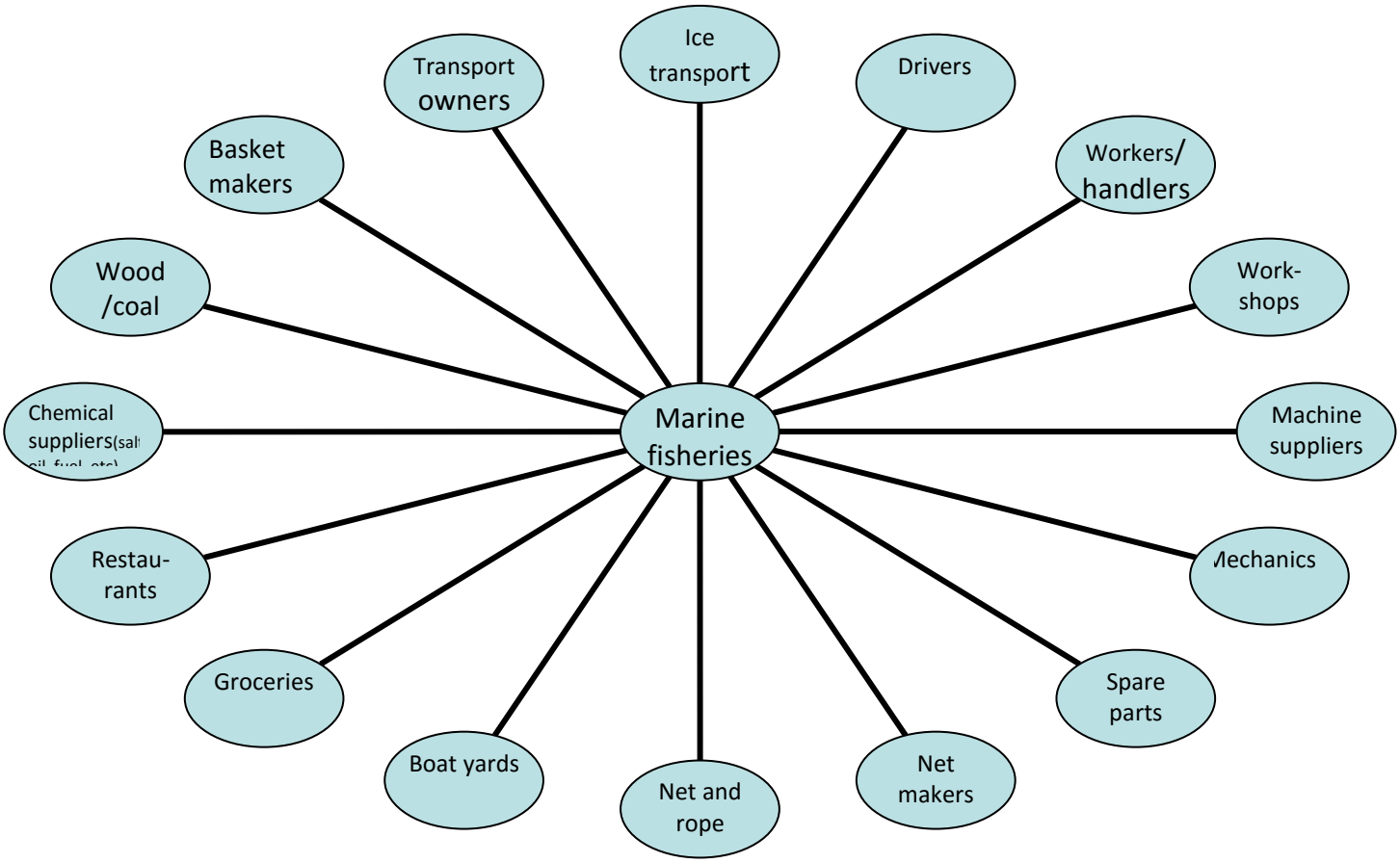
Along with the core activity of marine fisheries, there are many subsidiary activities or actors associated with the value chain who are mostly invisible. Even though they are mostly unnoticed, they play a crucial role in the marine fisheries value chain. They are listed as follows:

- Ice transporters
- Drivers
- Transport owners
- Workers/handlers at landing centers, packing centers, factories, etc
- Basket makers
- Wood/coal suppliers
- Workshops
- Machine suppliers
- Spare parts suppliers
- Net makers
- Net and rope suppliers
- Boat yards
- Groceries

- Restaurants
- Chemical suppliers (salt, oil, fuel, etc)

See the picture below:

Employment along the chain



5. Current status of food safety practices along the value chain

Evaluation of existing food safety practices at all levels of value chain is very important to identify the constraints. An International Expert mission under TDSP program (UNIDO 2013) has done a detailed evaluation of the food safety practices along the value chain. Since no change was observed since then, the survey team did not repeat the exercise. To avoid repetition and duplication, text of the International expert mission is reproduced here under 5.1 and 5.2:

5.1. Review on fish processing, handling and storage practices of Cambodia

An overall impression is that the "fish and fishery products export quality infrastructure of Cambodia" totally fails compliance with international hygiene/processing requirements, in particular those of the EU market. The failure of requirements crosses over all the main groups of criteria, with critical deficiencies which undermine any potential exports to the EU markets, unless significant changes are achieved. These apply to:

- *Facilities and Infrastructure;*
- *Hygiene conditions and Sanitation Operative Procedures;*
- *Handling, Processing and storage Procedures;*
- *Food Safety Assurance Systems.*

5.1.1. *Facilities – Infrastructure*

Land-based handling, processing and storage structures:

In general, fail the construction requirements regarding the hygiene conditions and necessary sanitation practices. In most cases there is no infra-structure or just a temporary type of supportive structure or a wooden structure which is completely against international requirements. Layout does not exist or not really applied with effective potential cross-contamination between the different procedures.

The same applies in general to landing sites, although layout for these facilities is of straight-forward application, due to simplicity of operations in these areas. In some places the landing site activities are squeezed due to crowded areas where selling of other products also take place (food preparation and prepared food stuffs, vegetables/fruits, live poultry, etc) plus several consumers looking for fish or others.

Sea Fishing vessels

Apparently, fishing vessels have a reasonable compliance level, although some wooden vessels have the wooden surfaces in very poor condition (not treated, not painted, which become an absorbing structure and therefore a contamination source for the fish). Holds are used to maintain fish which are of acceptable material and protected from bilge water and other sources of contamination.

Refrigeration equipment is in general not applied.

Freshwater transport / fishing vessels

The same applies as above for sea fishing vessels, however the living activities of the crew (families) in the vessel may become a source of contamination due to lack of protection of the fish holds.

5.1.2. *Hygiene practices*

Application of hygiene and sanitation practices was not seen in detail. However, from the observations in certain operators the following are highlighted:

- *Presence of residual dirt which indicates lack of appropriate cleaning schedules;*
- *Deficient pest protection and controls;*
- *Non-compliant behaviors regarding circulation of people and animals (pets and poultry); including living of people (staff) inside or in the vicinity of the processing facilities;*
- *Lack of appropriate potable water controls;*
- *Deficient use of potable water sources and clean water;*
- *Utilization of contaminated water, in particular at landing sites and collection centers (freshwater and marine);*
- *Ice production and crushing also potentiates use of contaminated ice, due to contaminated tools and equipment;*

5.1.3. *Handling, Processing and Storage practices*

Handling, sorting, fishery products preparation (fresh raw materials and processed products):

Handling fishery products, in general across the whole sector, seen in all places visited except for in Crab meat processor are identified and classified as the most critical issue of fish and fishery products production. Handling of fish and fishery products is the main route to contaminate the raw materials and products. Handling (including, sorting, fish preparation and packaging) is done with the products on the ground or floor, most of the time without any protection underneath and with contamination sources (like birds, poultry, animals and people) all around. In most cases, the area where these activities are held, have been subject to droppings from the animals which circulate in the vicinities or are subject to dust, mud, sand, dirty water, waste, litter, garbage, other food stuffs and pests and exposed wood tools and surfaces.

Processing of several product types, either traditional or from conventional industrial processing, are both characterized by having processing steps under non-hygienic conditions and inadequate manufacturing practices, with handling, sorting and preparation also done on the floor or having underneath non-appropriate surfaces (corrosion type surfaces, or exposed / wet wood).

Washing (fresh raw materials)

Washing of raw materials is equally a critical issue due to inherent contamination potential. Raw materials, including live fish are subject to clearly contaminated water. This happens at marine landing sites, where harbor water is used; also at freshwater landing/collection centres where water is used from the vicinity of these sites, being clearly contaminated from direct human and animal activities and from the villages next to these infrastructure. At floating villages the overall water environment is clearly highly contaminated. In all these situations animal production (poultry and pigs) increases greatly the contamination ratio.

Preservation, transport, and storage (fresh raw materials)

It seems that the preservation of fish and fishery products is well understood and reasonably applied in the several stages of the production chain, except in the first step of production and at marketing and storage steps.

It was seen that fishing vessels having more than 2 days fishing understand the need to use chilling methods (ice), because it is really a must for them or else they carry high risk to lose the catch due to deterioration. However, vessels doing daily fishing may not use ice at all (it is however not known what is exactly the trend of common use – if using ice – or not using ice). At landing the fish may also be exposed to sun and high temperature before putting in ice, which for histamine producing species (scombridae and clupeidae) it may become a critical factor responsible for histamine development (which accelerates at temperature above 28ºC).

In general fish transport is done using ice, although ice potentially contaminated, by ice production processes, block ice transport, crushing and subsequent transport. Vehicles used are adequate isothermic trucks which maintain the chilling environment but also non-appropriate transports, like normal cars (using trunk and back seats protected by tarpaulin / canvas / or just banana leaves).

Preservation at the central markets and wholesale stores is characterized by use of ice in good and adequate quantities but, also having similar contamination problem as above mentioned. However, these operators also use inadequate cold storage (domestic freezers or cold stores functioning below -1ºC to -18ºC, which is clearly insufficient to reach the required freezing temperature/time, usually below -35ºC and capable of efficient and quick freezing mediums by blast air or contact plates). The inadequate freezing applied is responsible for slow freezing and partial freezing of the products, promoting intracellular crystallization and consequent rupture of cellular walls, which after thawing, brings loss of intracellular liquid and texture disruption. This means that at this stage some raw materials (it is not known the proportion) are significantly affected by a critical loss of quality.

Frozen storage of adequately frozen products (products which have a core temperature of at least -18ºC in all parts of the product) is not subject to temperature recording devices or temperature monitoring (to guarantee the non-existence of temperature fluctuations which affect loss of quality of the product).

Processing

Artisanal / traditional processing are characterized by:

- *Steamed/Boiled Fish*
- *Fermented Fish*
- *Fish Balls*
- *Fish Sauce*
- *Dried products*
- *Smoked products*
- *Crab meat (cooked and refrigerated)*

Conventional industrial processing includes frozen products.

In addition to what has been identified in a), manufacturing (traditional or non-traditional) is characterized by not having good practices applied for controlling and registering relevant processing parameters, such as temperature, salt, time, etc.

Equipment's, when existing, are not calibrated and controlled effectively to produce guaranteed good quality processed products. Most equipment function without achieving the required capacity performance, mainly freezing equipment. Thus, the final product results in poor quality products.

Traditional processing is usually based on the personal knowledge of the manager to control processing parameters, which is done "by eye" (senses) or intuition / experience.

Hazards control do not exist, are not understood and are not recognized or acknowledged.

Labelling does not exist in most products, in particular those coming from processing establishments. When existing, information does not really indicate batch or production date.

Traceability is usually not possible nor applied. Traceability is also not understood and not fully recognized or acknowledged.

Market display and organization

The markets show a good utilization of adequate tables with appropriate surfaces. However, it is observed that several market sellers sit and stand on the surfaces where fish is displayed or prepared (cut, gutted, filleted) contaminating the fish. Additionally, there is no adequate separation of fish commodities from live poultry, meat, vegetables, etc, which is also a potential source of contamination.

5.2. Changes for better quality and safety improvement - conceptual framework of proposed changes for quality and safety improvement in fish and fishery products

It is proposed two approaches for better quality and safety improvement:

i. *Development of a "Quality Seal" concept and strategy, which comprises two lines of action, one with the sector stakeholders, the other one at the authority and control level. The objective of the developed strategy is to create best examples to be communicated to the fisheries sector for application.*

   This approach needs strategic cooperation with one of the main retail chain in Cambodia, which already has higher level hygiene/food safety and quality requirements in respect to purchasing and selling the products.

   The other line of action applies to the development and implementation of a pilot control/inspection system for assurance and control of the quality seal. This control system will be based on international requirements and will be the precursor system of an Official Control System to be implemented by the Competent Authority of fishery products. The control system is designed based on the usual structure and organization applied by the CA and OCS in compliance with international requirements, in particular those of the EU.

This approach recognizes in the "Quality Seal" the best and quickest way to upgrade quality and safety of fishery products in Cambodia, due to the two lines of action which it integrates, complemented with project support to stakeholders in better condition to reach the requirements.

ii. *Identification of key factors recommended and selected within a strategy for upgrading quality and safety practices.*

The high rate of lack of fulfillment of requirements related with hygiene/food safety and manufacturing (handling, preservation, processing, storage) conditions and practices makes it very difficult to make a decision overlooking international market requirements, in particular those of the EU. In consequence the present strategy focus in selecting key factors in a way to upgrade the sector homogenously in a consistent and expected sustainable manner, lifting the practices and conditions to a higher baseline level. Such strategy will/should be integrated with the "Quality Seal" strategy implementation.

The key factors to be applied across the sector (landing sites, collection centers, processors) are:

a. *Finish with all handling and fish preparation practices held on the floor/ground or using underneath exposed wooden tools. This means the target is to lift all the activities from the floor/ground to be held on tables or in appropriate containers. All activities and practices should therefore be held on tables, non-corrosion type, easy to clean, wash and disinfect (stain-less steel is recommended), or using high density plastic containers;*

b. *Clean Water or Potable water use; Focus on eliminating practices using contaminated water or potentially contaminated. Introduce necessary controls (periodical microbiological testing) and/or necessary water treatment (ex. using chlorine) to avoid contamination of the water and subsequent contamination of fishery products by the water.*

c. *Ice supply and respective use guarantees non-contamination of ice; Focus in 3 components – ice production, ice crushing, ice transport and delivery. Stakeholders should aim on undertaking adequate practices: proper clean/potable water source, adequate controls to ensure non-contamination, appropriate storage, crushing without contaminated equipment, handling and transport avoiding potential contamination.*

d. *Elimination of behavioral contamination practices and external contamination sources; Focus in protecting fish handling and preparation areas from animals, birds and persons not related with fish handling and processing practices. At landing sites protecting the area against entrance of animals and poultry and removing persons not related with the landing and fish handling activities. In processing premises protecting them against entrances of those elements and eliminating other activities which are not directly related with fish processing (ex. people living in the premises, food cooking, etc).*

End of the International mission report

6. Assessment of Business Enabling Environment (Institutional, Regulatory and Supporting Environment)

6.1. What is 'Business Enabling Environment'?

Business Enabling Environments (BEE) are defined as sets of policies, institutions, support services and other conditions that collectively improve the competitiveness of a sector and its value creation abilities (Christy et al. (2009). A business-enabling environment is a critical determinant of positive impacts in value chain development projects. It is also considered as a fundamental step towards the design of policies and strategies for value chain development creating the conditions for fisheries sector to gain a competitive advantage in global markets as well. So, an analysis of BEE is integral to value chain analysis with particular reference to comprehensive development marine fisheries of Cambodia.

What are the key issues of Business Enabling Environments?

1. Institutional Environment
2. Regulatory Environment (official controls) and
3. Supporting Environments (Infrastructure, finance, business promotion services, etc)

6.2. Institutional Environment

6.2.1. Fishery Administration (FiA)- its role- organization

FiA is under the Ministry of Agriculture, Forestry and Fisheries (MAFF) and has the following mandate:

- To prepare fishery resource inventories, assess potential and follow-up the development of fishery resources and aquaculture;
- Enact laws, regulations and orders for fishery protection and improvement and the management of fishery resource exploitation and monitor their implementation;
- Prepare plans for management of fishery zones, fishery conservation and set up fishery resource development policies and measures to ensure environmental protection;
- Conduct scientific research on fishery and aquaculture and document the findings;
- Inspect and manage all activities of fishery resource exploitation and aquaculture;

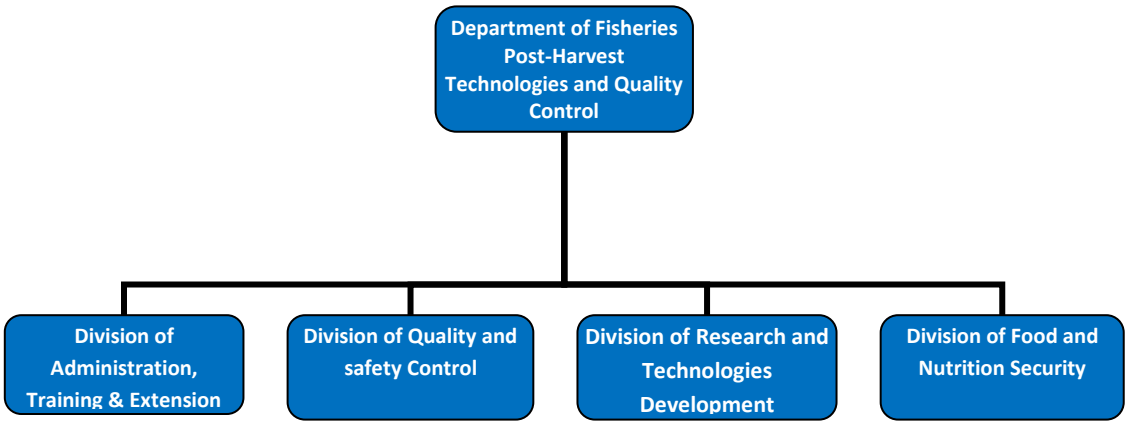
- Support and encourage any person who initiates research on fishery resource protection and/or promotes aquaculture;

6.2.2. Institutional structure of FiA

At the provincial level Fisheries Administration Cantonment (FiAC) under the FiA, are responsible for promoting, overseeing and regulating the development of fisheries in each province.

6.2.3. Department of Fisheries Post-Harvest Technologies and Quality Control (DFPTQ)

Organogram of DFPTQ



The DFPTQ claims to be competent authority for the overall control of fish and fishery products guaranteeing the quality and safety.

6.3. Policy and Regulatory Framework

6.3.1. Regulatory framework for food safety and control

Food safety and quality in Cambodia is a multi-ministerial responsibility. There are six (6) key ministries involved in food safety and food quality: (1) Ministry of Agriculture, Forestry and Fishery (MAFF), (2) Ministry of Commerce (MOC), through the General Department of Import and Export Inspection and Fraud Repression (CAMCONTROL), (3) Ministry of Industry and Handicraft (MIH),[1] (4) Ministry of Health (MOH), (6) Ministry of Tourism and (5) Ministry of Economy and Finance (MEF). The first four Ministries are the most directly involved in food regulatory framework whereas the others hold a secondary role.

Ministry of Agriculture, Forestry and Fishery (MAFF)

MAFF has jurisdiction over the primary production and primary processing for fishery products and the responsibility of food safety has been given to Department of Fishery Administration through Department of Post-Harvest Technologies and Quality Control (DPFTQ)

Ministry of Commerce (MOC)

MOC, through CAMCONTROL, plays a key role as leading agency for safety and quality of products and services based on the Law on the Management of Quality and Safety of Products and Services (LMQSPS), 2000. Its role on import/export control and market surveillance is detailed in number of subsequent implementing regulations.

Ministry of Industry and Handicraft (MIH)

MIH, formerly known as MIME, has jurisdiction over the secondary processing of fisheries which includes issuing licenses to manufactories, inspecting factories and verifying compliance to standards. Under a Law on Administration of Factory and Handicrafts, MIH's roles include the food safety inspections. Moreover, inspectors of Institute of Standards of Cambodia (ISC) have the power and authority to grant and withdraw

[1] MIH was previously known as Ministry of Industry, Mines and Energy (MIME).

products licenses. ISC and its personnel are also in charge of regulating management systems, including GMP/HACCP food quality control systems certification.

Ministry of Health (MOH)

MOH has the duty to control and monitor food safety, particularly issuing compulsory certificates of hygiene

Ministry of Tourism (MOT)

MOT has duties to control food at hotels, restaurants and food shops in order to ensure the safety of food for national and international tourists.

Ministry of Economy and Finance (MEF)

MEF, through General Department of Customs and Excise (GDCE), has jurisdiction over food import and food export only and not at any other stages of the food supply chain. GDCE is the leading agency at the border and rely on other governmental agencies to supply sufficient information to implement risk-based management of incoming or outgoing food products

6.3.2. Regulatory framework for food safety and official control in fisheries

Prakas No. 386 BRK/KSK/B on procedure of entitle of Fisheries Administration

Article 1: The Fisheries Administration is a Government authority, under the MAFF, responsible for the management of fisheries and fishery resources based on the National Fishery Policies and this law as following:

- Administration task such as administrative management, organizing all fishery activities, and community fishery development.
- Technical task such as scientific research, conservation, development of fishery economy and technology, and technology relevant to fisheries, along with the promotion of aquaculture
- Law enforcement such as inspection, monitoring, surveillance and controlling of all fishery activities as being a judiciary police

http://www.fia.gov.kh/english/index.php?page=organization accessed on 17 June 2015

Mandate of Marine Fisheries Administration Inspectorate

- Be responsible, implement, manage and supervise Fisheries Administration Sangkat in the form of administrative hierarchy and technique within its territory such as;

- Formulate strategic management plan and fishery resource protection for its implementation;
- Supervise, monitor and coordinate all kinds of Fishery Administrative Sangkat's implementation
- Inspect, survey, prevent and protect illegal fishing activities;
- Arrange documents of illegal fishing cases within its territory;
- Check the licenses of fishery exploitation, aquaculture, establishment of selling-buying, stocking places, fish processing location, quality, hygiene and freight in of fish and fish product

Accessed on 17/6/2015: http://www.fia.gov.kh/english/index.php?page=marine_fai

Law on Fisheries- 2006

Article 32: All types of fishing exploitation in the inland and marine fishery domains, except subsistence fishing, shall have:

- To get fishing license
- To pay tax and fishing fees to the state
- To follow the regulations stipulated in the fishing license

Article 36: The license for the establishment of middle-scale location for buying, selling, stocking or processing fish or fishery products shall be issued by the competent Fisheries Administration

Article 37: The license for establishing fish landing as a location for collecting, distributing, trading fishery products shall be issued by the competent Fisheries Administration.

Article 64: Commercial transportation of fishery products in the Kingdom of Cambodia shall need a license and be under the inspection of Fisheries Administration

Overlapping of responsibilities

Since each of the above five ministries has legally recognized duties and responsibilities over food safety and quality established by their respective laws and regulations, there are overlapping areas in the performance of their duties and responsibilities. This has negative impact on the effectiveness of the implementation of food safety and quality control system in the whole food supply chain. In 2010, the relevant ministries have agreed on an Inter-Ministerial Prakas (IMP) on the Implementation and Institutional Arrangements of Food Safety Based on the Farm to Table Approach**.** This IMP:

a) Defines the mandates and responsibilities of various ministries in the area of food safety based on the farm to table approach;

b) Sets up institutional arrangement and implementation among different ministries at all stages of the food chain from primary production at farm to final consumption; and
c) Provides the mandates to relevant authorities to develop and implement the policies, standards, procedures, guidelines within the scopes of their responsibilities.

As per Article 12: MAFF shall be the sole responsible agency and lead coordination to promote effective and efficient implementation of the following tasks related to food and food business at primary production and processing:

- Prepare policy and legal framework on food safety at primary production and processing
- Monitor and inspect food and food business at the place of primary production and processing
- implement verification program and issuing official health and quality certificates for export of food that are fishery products, processed fishery products, animal products and other agricultural products in a raw or primary processed form

As per Article 15: MIME shall be the sole responsible agency and lead coordination to promote effective and efficient implementation of the following tasks related to food and food business at secondary processing

- Preparation of policy and legal framework on food safety and food standards
- Monitor and inspect food and food business by factory and handicraft
- Prepare and implement programs promoting compliance to food safety requirements.
- Implement verification programs and issuing quality assurance certificates for export of secondary processed food products

Definitions of primary and secondary processing as per above Prakas are given as below:

- **Primary processing**: refers to agricultural products not changing the nature of the product itself, such as grinding, cleaning; husking; peeling, cutting and slicing; threshing and winnowing; animal slaughter; gutting, skinning, drying, boning and filleting; preservation by traditional means and other technologies
- **Secondary processing**: means production or transforming by further processing beyond the primary stage, such as grinding, purifying, sterilizing, mixing, cooking etc. that are carried out in the factory and handicrafts units

As per the recently held International Expert mission of Mr. Helder Silva (UNIDO 2015), the report concludes as below after thorough review of existing legislative framework for food safety: *Law on Fishery, 2006 does not leave any indication to provide MAFF and FiA in particular, as Competent Authority (CA).*

*Inter-Ministerial Prakas No. 868 on The Implementation And Institutional arrangements Of Food Safety Based On The Farm To Table: When crossing the full information and respective definitions, the understanding is that any small facility with simple chill storage and/or freezing equipment will fall under the criteria of having an SME establishment irrespective of the type of processing activity carried out in the facility will be under the supervision control and certificate issuance from MIME. From above remember that ISC is institution of MIME and has already designated attributions of conformity assessment and certification on food safety. Although this piece of legislation has the objective to bring guidance on the Implementation and institutional arrangements of Food Safety based on the Farm to Table, in fact it just turns the role of the involved ministries are different from what they claim. Hence, it turns out that the matter of designation of CA for fish and fishery products (FFP) exports falls now more under the scope of MIME than of MAFF, although it is not mentioned Health Export Certification under the task of MIME. In relation of hygiene controls it is not however clear who would in fact be responsible (*Reproduced from the above said expert mission report)

6.3.3. Institutional Capacity of FiA for official control

As per the current international requirements, exporting countries must have a competent authority which is responsible for official controls throughout the production chain. The Authorities must be empowered, structured and resourced to implement effective inspection and guarantee credible official controls (EU DG Sante, 2015). The CA must also guarantee that the relevant hygiene and public health requirements are met particularly on the structure of vessels, landing sites, processing establishments and on operational processes. In the case of aquaculture products, a residue control plan on heavy metals, contaminants, residues of pesticides and veterinary drugs must be in place to verify compliance with requirements. The CA shall provide the necessary guarantee and obliges to carry out official controls, regular inspections and take corrective action, when necessary.

In the current assessment, a thorough review of structure and function of the CA has been made. International expert mission reports were also reviewed and used here.

a. Human resource capacity for official controls

As per the findings of the assessment, the CA has limited human resource for monitoring, control and surveillance as part of official control. The Department has four divisions with too many tasks (6.2). The details of the manpower are in following table:

Table: 24. Human Resource at DFPTQ, FiA

Education	Male	Female	Total
PhD	2	-	2
Masters	9	2	11
Bachelor	3	3	6
Total			19

b. Laboratory testing capacity

Laboratory testing capacity is an important element of quality infrastructure to verify the compliance of fish and fishery products to the requirements. The testing is a verification tool for certification. In current situation of the sector, the country needs laboratories with capacity to test relevant microbiological parameters for food and water, chemical tests such as histamine for fish/sauce, chemical tests for water and residue tests for products. These laboratories are required to meet the requirements of ISO 17025 through accreditation.

Currently there are 8 (eight) testing laboratories in the country. They are:

1. CAMCONTROL Testing Laboratory (MOC),
2. Industrial Laboratory Center of Cambodia (MIH),
3. National Agriculture Laboratory (MAFF),
4. National Health Products Quality Control Centre (MOH),
5. Feed Quality Control Laboratory (MAFF),
6. National Veterinary Research Institute (MAFF),
7. Metrology Laboratory (MIME), and
8. Environmental Laboratory (MOE)

Other than the above government-operated laboratories, there are few private laboratories, including Pasteur laboratory in the country but none of them are accredited.

The present study recorded with high appreciation that Industrial Laboratory Center of Cambodia (ILCC) is the only laboratory which can provide considerable laboratory support to fisheries sector in a competent manner. This laboratory has very good testing facilities, implemented Good Laboratory Practices and accredited for ISO 17025.

The present study also found that the DFPTQ of FiA is using private laboratory (non-accredited) for testing of the FFP samples for certification rather than government owned and accredited ILCC.

c. Support services for official control

In addition to legislation, human resources and laboratory testing facilities, the competent authority needs to have sufficient guidelines and protocols for effective implementation of official control programs. These documents do not only help in inspection and verification, but also used as resource guides for the enterprises and training tools for the trainers.

The present study observed that the FiA (DFPTQ) has following guidelines and procedures/ policies drafted by the previous projects including TDSP. Except few, many are still waiting for approval. They are:

- Manual on Good Hygienic Practice (GHP) for fishing boats and fish landing sites in small scale fisheries
- Draft technical guideline on Good Manufacturing Practice (GMP)
- Draft technical guideline on Hazard Analysis and Critical Control Points (HACCP)
- Draft procedures to certify quality and safety of fish and fishery products (Quality Seal)
- Draft of sub-degree on hygiene of fish and fishery products
- Draft proclamation on fishery inspection
- Draft of guideline for importing countries requirements
- Draft proclamation on banned chemicals and limitation of chemical substance in aquaculture
- A draft of guideline on the standard SOP for health certification and Quarantine measures for the responsible movement of live food finish
- A draft of products standards (Fish past, Dry fish, quick frozen shrimp, and shrimp)

d. Financial resources

Financial resource is one of the main requirements of the competent authority for demonstrating effective execution of official control protocols. The financial resource is required for inspection services, training to own staff, training to enterprises, and procurement of tools and expertise.

The study noticed that there are financial constraints for carrying out effective implementation of official control operations and capacity building

6.3.4. Current level of control by FiA (regional provinces) at all levels of supply chain

As per the information collected from provincial FiA offices, it was learnt that they do carry out visits to fisheries establishments such as landing centers, fishing vessels, processing establishments for the 'general' purpose, not for the purpose of inspection or official control related to food safety requirements (See table 25). It was also learnt that, the inspectors/officers do not possess any checklists or guidelines for doing so. Moreover, it was learnt that the local provincial offices of FiA have limited manpower and have major mandate of controlling illegal fishing and conservation related activities. This was verified at the establishment level where no such documents existed on the inspection and monitoring of such facilities.

Table: 25. Fisheries operations controlled by Provincial offices

	Kompot	Koh Kong	Preah Sihanuok
Fishing vessels- registration/licensing	yes	Yes	Yes
Fishing operations- mesh size regulation	Yes	Yes	Yes
Landing centers	Yes	Yes	Yes
Ice factories	No	No	No
Dry shrimp operation	Yes	Yes	Yes
Traders	Yes	Yes	Yes
Fish/shrimp processing factories	Yes	Yes	Yes
Others: Community of Fisheries, Conservation, Fishing boundary, and other processing (steam fish)	Yes	Yes	Yes

6.4. Supporting Business Enabling Environments

For the best use of marine fisheries potential in an efficient and sustainable way, there should be conducive and supporting enabling environments. They also encourage continued growth and competitiveness of value chain. The findings of the current study are:

- Infrastructure
    - Landing and berthing facilities with adequate supplementary facilities like freshwater, ice plants, chilled storages, workshops, repair facilities, and net mending sheds are very essential. In addition, availability of electricity is also crucial.

- Access to road and communication

- Many of the landing centers in the remote areas are having limited access to road. This leads to post-harvest losses and additional cost.

- Hygiene facilities
  - Basic amenities such as toilet, potable water supply, and sanitation are found to be lacking in most or all of the landing centers

- Availability of cold storages
  - There are no functioning cold storages available along the coastal provinces. The actors such as traders, fishers always demanded the establishment of such cold stores for stable market and prevention of post-harvest losses

- Access to Finance
  - Access to credit is a major constraint in the marine fisheries value chain. Due to the inherent risk and the lack of collateral, small-scale enterprises are often unable to access financial services. Hence, informal credit markets play a significant role

- Ease of administrative procedures
  - Time - the documentation takes quite a long time
  - Fees - the formal fees are quite high for a small and medium scale enterprises in the current market situation
  - Informal amount- these invisible fees are paid at many instances and purposes

- Skills development or training centers
  - There are no major training centers or programs offered for enterprises, neither by the government nor by any agencies. However, there are some projects run by FiA and other donor agencies who have offered training programs to limited number of enterprises.

6.5. Export facilitation process

Currently every exporter or importer needs a license and permits for each shipment. Under the current export-import control, traders are additionally required to obtain the import-export permit license (import-export quota) from MAFF. Traders/exporters have to apply for the permit for transportation of fish and fishery products from FiA. Applicants need to be registered companies. Every export consignment must accompany a health certificate issued by FiA. The procedure for requesting a health certificate is as follows: A request form is submitted with following attachments - export permit, taxation registration, transport certificate, certificate of

origin, packing list and invoice and a letter in which the company pledges that it will not include any other goods in the shipment than for which it has the license. Sampling and testing requires one week, sometimes 3 days and after receiving the test result, the health certificate is issued in one day.

A general list of documentations for export of fish and fishery commodities is given in Table # 26 taken from STDF (2014) report.

Table: 26. Document requirements for export of fisheries products

Document requirements for export of fisheries products	MAFF and FiA	Camcontrol HQ and border	Other
Pre-requirements (annual license)			
Copy of certificate of company registration MOC	-	-	x (MOC)
Copy of certificate of taxation MEF	-	-	x (MEF)
Copy of certificate of warehouse, issued by local authority	x	-	
Certificate of export license with quota (1 year) (MAFF)	x	-	
Requirements for each shipment			
Copy of certificate of export license with quota	x	x	
Invoice	x	x	
Packing list	x	x	
List of goods specification	x	x	
Certificate of testing (Pasteur)	x	-	
Certificate of health (FiA)	x	x	
Bill of lading	-	x	
Certificate of quantity (Camcontrol)	-	x	
Certificate or origin		x	
Visual check	x	-	
Paper check	x	xx	

Source: STDF 2014

High cost and long lead time are involved in formal trade which might erode profitability and competitiveness of the products which might lead to informal trade. The team came across a few cases where formal exporters planning to give up because of high costs. The large amount of informal trade in Cambodia is at least in part result of the high transaction cost of formal trade.

7. Value Chain Dynamics and Entry Points for Upgrading

7.1. Constraints and key drivers for value chain development

The following constraints were identified based on thorough evaluation of the existing practices and legal framework being enforced in the sector.

7.1.1. Demand-Side Constraints

Food safety compliance

The biggest challenge faced by producers and processors from Cambodia is their lack of capacity and finance to meet stringent quality and safety standards imposed on fish products in importing markets- particularly the neighboring markets or ASEAN markets or EU markets. Quality infrastructure of the country is also quite poor in making the products competitive.

EU ban of import of products from Cambodia

EU has banned import of both inland and marine fish and fishery products of Cambodia since last few years due to poor food safety conditions in marine sector and lack of aquaculture residue control plans for inland/aquaculture fishes. Recent EU laws relating to illegal, unreported and unregulated (IUU) fishing that prevent fish products obtained in uncertified fishing vessels from entering the international market provide additional regulatory burdens. US regulations again need processors to implement HACCP in their process

Public-Sector challenges

Establishing Competent Authority needs sound legislative frameworks guaranteeing food quality and safety systems governing the fish and fishery products. Due to weak capacity of Competent Authority in the country, Cambodia has lost the opportunity for dialogue with trading partners or markets. Establishing a sound CA needs a high cost for building efficient quality infrastructure.

Private-Sector Challenges

In order to meet the food hygiene and safety systems including HACCP requires huge investments. With the fact that most of the processors in Cambodia are small to medium level with limited access to finance, the situation becomes more precarious. Almost all the processing establishments need to rebuild the infrastructure to meet the food safety standards to expand their markets. There are few processors who are likely to meet the minimum standards in their existing structures need to invest on implementing hygiene and food safety requirements.

7.1.2. Supply-Side Constraints

Infrastructure (at private sector)

The existing infrastructure at landing centers, ice factories, processing centers and fishing vessels are poor and do not meet the minimum requirements in terms of hygiene and safety standards. A huge investment is required on technology, infrastructure and knowledge. This has resulted in poor competitiveness and market access.

Transportation

Transportation system used for fish and fishery products from production or landing centers to processing or market centers is deficient or inefficient leading to post-harvest quality loss. This is mainly due to either lack of good condition road or use of inefficient means of transportation or lack of cold stores. This is a major constraint to both exports as well as for domestic marketing.

Access to and use of ice

Equally important is the lack of access to ice at landing centers and cold storage facilities at landing areas in Cambodia severely limits the ability of small and medium enterprises to participate in distribution chains that supply to markets.

Electricity Costs

Intermittent electricity supply and the subsequent costs to operate generators to cover for the power shortages make up a significant share of operating costs for small and medium size firms in Cambodia making processing operations less efficient.

Access to Finance

As reported before, small and medium enterprises have limited access to finance. This limits their ability to handle more products, expand their businesses and upgrading their operations.

7.1.3. Governance constraints

Regulatory framework

This topic has been elaborately covered in the earlier parts of this report; hence no repetition is made here. Due to multiple agencies controlling food safety or claiming it as their area of jurisdiction, existence of a single and efficient Competent Authority is in question. CA needs to be backed by solid regulatory framework authorizing it to enforce its power to implement official controls across the whole value chain from primary production/fishing to export. This is unfortunately not the case in the fisheries sector.

Official control of fish and fishery products

Purpose of the official control system of the CA is to verify the compliance with legislation on fish and fishery products through inspection or audits of establishments, fishing vessels, distribution centers, landing centers and markets, ice plants, and means of transport. It also focuses on implementation of good manufacturing practice (GMP), good hygiene practice (GHP), good aquaculture practices (GAP) and HACCP. Currently none of these official control systems are in place to meet the food safety requirements, which makes the products less competitive hindering market access.

Laboratory accreditation and Certification

Certification of any products for its safety depends on the efficient implementation official control protocols duly verified by testing samples at accredited laboratories. Cambodia has an accredited laboratory (ILCC) which can perform most of the required microbiological and some of the relevant chemical tests for fish and fishery products and water respectively. However, CA currently relies on testing at non-accredited laboratories compromising the reliability of the test results.

7.1.4. Resource and communication constraints

Overfishing and illegal fishing

Illegal fishing by foreign vessels in Cambodian waters is a common complaint from fishermen and officials of the country, as observed during the current study. In addition to this, there exists illegal selling of fishes by Cambodian vessels either to Vietnam and Thailand vessels or directly landing in foreign ports. This has resulted in shortage of raw materials and unstable supply of raw materials in the country.

Innovation capabilities

Current range of products being processed from marine fishery resources is quite narrow due to lack of knowledge on advanced handling/processing technology, infrastructure and poor market access. Product innovation needs good knowledge on market requirements, value addition and product diversification.

Skills and knowledge constraints

Value addition skills and, in particular, adequate access to the knowledge and technologies are needed to meet rising sanitary standards, making the products competitive. This is the major constraint observed during the current study through interviews at various levels of value chain particularly with small holders.

Horizontal and vertical linkage among stakeholders

Effective development of value chain needs better mechanisms in place to encourage dialogues and communications between and within stakeholder groups. This will lead to explore wider opportunities in product development, product diversification and market development. There are some producer associations who work independently from other stakeholder groups. Effective associations are non-existent which hinders dialogue capacity.

7.2. Possible entry points for inclusive value chain development interventions

Based on the value chain assessment study and discussing the various issues and constraints/opportunities, the team has identified following entry points for possible interventions for upgrading the value chain.

Entry Points for the Value Chain Development

Government	• Legal and regulatory reforms authorizing MAFF for control of food safety for fishery products along whole value chain • Enforcing resource management- prevent illegal fishing • Identification and designation of Competent Authority • Financial support to Competent Authority
Competent Authority	• Strengthening of human resource- number and quality • Approval of guidelines on GMP, GHP and HACCP • Approval of Quality Seal and inspection manual • Establishing official control systems and enforcement • Capacity development and education within CA • Education and awareness among actors along value chain
Producers/actors	• Implementing food safety systems in their operations • Building and strengthening cooperatives and producer associations • Access to finance, markets, technology, information • Creation of opportunities for diversification and newer markets • Longer term contracts with processors to better share risks
Processors	• Implementing food safety systems in their operations • Moving from Informal to formal markets • New market entry strategies • Entering into longer term contract arrangements with suppliers
Donor agencies	• Long term support for capacity development of value chain • Support to inclusive and sustainable development of fisheries sector • Avoidance of overlapping programs

8. Roadmap for Inclusive Value Chain Development

As per Strategic Planning Framework for Fisheries (SPF 2010 to 2019), post-harvest quality, standards, processes and procedures are core to the achievement of real improvements in fisheries trade (both national and international). The key targets planned in this SPF document are the following:

1. At least 80% of fish processors and 80% of fish produced comply with quality and safety assurance regulations and standards by the end of 2019
2. Co-operative associations are providing established and functioning channels to access finance and markets by the end of 2019
3. Interventions at the community level leading to product and quality improvements and better market access are implemented on a nationwide basis by the end of 2019.

In this strategy, FiA also commits to develop a full range of standards and guidelines to help improve processing, quality, packaging and safety and will implement formal registration and inspection processes, designed to facilitate trade by providing quality assurance, and removing unnecessary administrative burden on large or small businesses.

To support and compliment the above strategies, the results of the current value chain assessment of marine fisheries and its upgrading strategies are very important for Cambodia for improving competitiveness of the fishery products for better market access, thus increasing the contribution of the fishery sector to the economy, food and nutrition security. The main purpose of this value chain development roadmap is to create an environment for transition from **informality to formality** and to make it a priority policy agenda. The roadmap can be considered as action matrix for future value chain development.

This value chain assessment identified various constraints and opportunities which can act as stepping stone for future interventions for enhancing a competitiveness of the fisheries industry. After thorough understanding of these constraints and opportunities in the value chain, roadmap for upgrading and development marine fisheries value chain is developed. The roadmap focuses on following elements:

- Fishery resource management
- Meeting compliance requirements
- Creating enabling environment
- Establishing vertical and horizontal linkages
- Product and process upgrading

Roadmap for value chain development

i. Manage marine fisheries resource sustainably

The marine fisheries resource shall be effectively and sustainably utilized through proper management of fishing operations and enforcement of regulations, particularly on control of foreign fishing vessels and mesh size regulations to reduce catching by-catch.

ii. Prevent illegal fishing through intensifying surveillance and regional cooperation

Provincial governance shall be strengthened to oversee fishing operations in the deep sea and prevent illegal fishing. This can be done through regional cooperation with neighboring countries sharing common resources. Cambodia does not have good knowledge of marine fishery resource date on stocks and are unable to prevent illegal fishing. Controlling over-fishing is a huge problem for any country and especially daunting for fishery administration with limited capacities and funding.

iii. Develop infrastructure along the value chain

Infrastructure along the value chain like landing centers, ice factories, roads, public health facilities, electricity, and cold stores shall be developed to improve the post-harvest handling and to avoid post-harvest losses in terms of quantity, quality and safety

iv. Strengthen regulatory framework harmonized with global food safety requirements

The legal framework shall identify a single food safety governing body or organization as Competent Authority and clarify the role and responsibilities with sufficient authority to enforce and implement food safety requirements from farm to fork. This shall avoid overlapping mandates between institutions.

v. Establish and strengthen of Competent Authority

The CA shall have sufficient human, technical and financial resources to implement the food safety programs across the value chain. The CA shall also have its representations in regional centers along the coastal provinces as well as in inland centers. Piloting in one or two provinces is advised.

vi. Establish official control protocols and enforcement

Official control protocols are keys for implementing and enforcing food safety requirements. Currently, a transitional modality has been developed which is called “Quality Seal” meeting the minimum requirements of food safety. Implementation of this in pilot scale would develop skills among the CA personnel and create awareness among other stakeholders

vii. Develop capacity of Competent Authority

Capacity of the CA shall be developed in terms of manpower, guidelines, policies, protocols, checklists/tools, trainers and training resources. In addition, identify and designate laboratories which can efficiently serve the fisheries sector in microbiological and chemical testing. This would support the requirement of certification.

viii. Strengthen provincial fisheries offices for official control and enforcement

Provincial government offices shall have fish inspection wings supervised or controlled directly by Competent Authority so as to have effective control along the value chain. They shall also be strengthened through additional manpower

ix. Implement traceability through registration of actors

Actors along the value chain including fishing vessels, landing centers, ice factories, processing centers shall be brought under registration process so as to facilitate traceability which is a major requirement of the importing markets.

x. Improve food safety awareness and skills of producers and processors

Food safety skills and knowledge of the actors need to be developed through better communication and awareness program. Donor agencies and development partners may include such activity in their programs. This will improve the productivity and competitiveness.

xi. Promote product diversification and identify new markets

Promote enterprise development through modernization of handling and processing facilities for better productivity, value addition and product diversification which will create newer markets. Producers need to be motivated to increase their focus on markets and marketing particularly to the countries in the region.

xii. Improve dialogue between producers and policy makers

Stabilizing the business enabling environment is required through dialogues between producers, policy makers and supporting institutions. This will facilitate dialogue and bargaining capacity of the producers and improving businesses

xiii. Liberalize business documentation systems

Reforms on reduced documentation and multi-agency system shall be taken up. Cost and fees of such registrations, processing, etc. shall be considered to drive the enterprises to formality.

9. Conclusion

Fisheries in general has great potential in Cambodia due to its contribution to national economy, employment and food security. The current study provides an overview of the actual and potential role of marine fisheries in domestic and world market. When compared to other countries in the region, fisheries in general in Cambodia is still underdeveloped but it shows considerable promise for growth. Currently the marine fishery is almost entirely artisanal and traditional with no major domestic processing and exports. Further, foreign fishing vessels fishing in national waters do not land their catch in the country. There is an immediate need for all of this to change to develop its infrastructure and business enabling environments

Cambodia's fish exports make up a relatively small proportion of overall production and it is quite behind the neighboring countries like Vietnam and Thailand in the global market. This is mainly due to country's poor institutional climate, lack of infrastructure and limited value addition. Even though the government has strengthened its regulatory mechanisms, it needs further reforms for effective enforcement of quality and safety standards.

To achieve the goal of becoming an exporter of fish to the ASEAN and European Union, reforms are necessary in legal framework and governance of fisheries along with more investment in infrastructure. Cambodia needs a strong and sound legal framework for the fisheries industry and institutional mechanisms for oversight of sanitary control at all stages of production, including capture, handling, processing, and marketing. In addition, Cambodia must develop and implement a national strategy to control IUU fishing. This requires maintenance of registration of national and foreign ships authorized to fish in Cambodia. With the current ban by EU for exports from Cambodia, the priority therefore is to establish a sound Competent Authority with legal support for covering the whole value chain of fisheries. In addition, additional resources and technical capacity for the Fisheries Administration are required, in addition to training and infrastructure, along the value chain.

Role of development partners and commitment and coordination from the Ministries concerned are crucial requirement for effective implementation of roadmap for value chain development. There should be strong coordination among the various groups like producers, traders, processors, policymakers, law enforcing agencies, researchers, and other relevant agencies to achieve this objective.

Annex I

References

Christy, R., Mabaya, E., Wilson, N., Mutambatsere, E. & Mhlanga, N, 2009. Enabling environments for competitive agro-industries. In C. Da Silva et al., In: Agro-industries for development, pp. 136–185. Wallingford, FAO & UNIDO

EU DG Sante, 2015. The Food Safety website of DG Health & Consumer Protection http://ec.europa.eu/food/index_en.htm

FAO, 2011. National Fishery Sector Overview

FAO, 2012. FAO Year Book- Fishery and Aquaculture Statistics

FiA, 2007. Marine fisheries resource management potential of Cambodia

FiA , 2009. Fishing for the future - The strategic planning framework for fisheries (2010-2019). Fisheries Administration, Ministry of Agriculture, Forestry and Fisheries: Phnom Penh, Cambodia, 2011

FiA, 2012. Fisheries Administration, MARDEC Strategic Plan 2012

FiA, 2014. Annual Report: Statistics of Marine Fishing vessels

FiA, 2015. Presentation on Current Status of Fisheries Post –Harvest Sector of Quality and Safety Control of Fish and Fisheries Products, Sihanouk Ville (Dr. Chamnan)

IDRC, 2010 (International Development Research Centre). A Handbook for Value Chain Research, IRDC, Ottawa

IFReDI (Inland Fisheries Research and Development Institute), 2013. Food and nutrition security vulnerability to mainstream hydropower dam development in Cambodia. IFReDI, Fisheries Administration, Phnom Penh, Cambodia. 44 pp

IMF (International Monetary Fund), 2009. Cambodia: Statistical Appendix. IMF Country Report No. 09/48. International Monetary Fund: Washington D.C. 26 pp

Inter-Ministerial Prakas No. 868 dated 22 October 2010 on the Implementation and Institutional Arrangements of Food Safety Based on the Farm to Table Approach

Pradhan et al, 2012. Engaging Government in Inclusive value chain development. www.ideorg.org/IDE/Doc/Download.aspx?docid=1073

Sandelowski, M, 1995. Sample size in qualitative research. Research in Nursing and Health, 18, 179-183.

SPF, 2014. Strategic Planning Framework for Fisheries 2010-2019. Ministry of Agriculture, Forestry and Fisheries

STDF, 2014. Implementing SPS measures to facilitate safe trade in Cambodia. Country study conducted for the Standards and Trade Development Facility (STDF)

UNIDO, 2013. Supporting the Development of the Cambodian Fisheries Sector for Increased Value Added, International Expert mission report, Nov 1 to 13, 2013

UNIDO, 2015, Assessment of Cambodian Standards on Fish and Fishery Products and Foods, International Expert Mission report, July 2015

World Bank, 2015. Doing Business 2015, Economy Profile Cambodia. Comparing Business Regulations for domestic firms in 189 Economies

Annex II

List of Respondents

No	Name	Sex	Province	Telephone contact	Organization/Remark
Private Sector					
1	Neak Sen	M	Kompot	092 983895	Fishing vessel
2	Sos Saleng	M	Kompot	N/A	Fishing vessel
3	Sok Musal	M	Kompot	012 562686	Fishing vessel
4	Los Mas	M	Kompot	033 6604411	Fishing vessel
5	Mat Sane	M	Kompot	N/A	Fishing vessel
6	Smane Bokary	M	Kompot	097 7714485	Fishing vessel
7	Sae Mat Min	M	Kompot	N/A	Fishing vessel
8	Ly Roath	M	Kompot	N/A	Fishing vessel
9	Ou Moeth	M	Kompot	N/A	Fishing vessel
10	Mat No	M	Kompot	N/A	Fishing vessel
11	Hut Kom Ruo	M	Kompot	N/A	Fishing vessel
12	Les Sak	M	Kompot	071 6826898	Fishing vessel
13	Dot Mey	M	Kompot	010 585160	Fishing vessel
14	Best Sary	M	Kompot	N/A	Fishing vessel
15	Ar Sya	F	Kompot	017 658761	Fishing vessel
16	Ay Yob	M	Kompot	N/A	Fishing vessel
17	Van Ey Sae	M	Kompot	087 920632	Fishing vessel
18	Ly Ra Sat	M	Kompot	097 2339666	Fishing vessel
19	Sae Ey	M	Kompot	071 2855335	Fishing vessel
20	Yus Sos	M	Kompot	N/A	Fishing vessel
21	Yorn San	M	Kompot	N/A	Fishing vessel
22	Mat Yan	M	Kompot	N/A	Fishing vessel
23	Ly Ny	M	Kompot	N/A	Fishing vessel
24	Phal	M	Kompot	N/A	Fishing vessel
25	Ung	M	Kompot	N/A	Fishing vessel
26	Sos Phy Sei	M	Kompot	N/A	Fishing vessel
27	Um Sothearith	M	Preah Sihanouk	096 9752182	Fishing vessel
28	Chu Pov	M	Preah Sihanouk	N/A	Fishing vessel
29	Khat Mit	M	Preah Sihanouk	N/A	Fishing vessel

No	Name	Sex	Province	Telephone contact	Organization/Remark
30	Lon Len	M	Preah Sihanouk	070 845497	Fishing vessel
31	Ly Cheng	M	Preah Sihanouk	016 388382	Fishing vessel
32	Neang Sopheap	M	Preah Sihanouk	081 820071	Fishing vessel
33	Bun Chhorn	M	Preah Sihanouk	097 7155773	Fishing vessel
34	Kao Phally	M	Preah Sihanouk	093 638424	Fishing vessel
35	Soeun Vy	M	Preah Sihanouk	071 7326151	Fishing vessel
36	Run Mey	M	Preah Sihanouk	N/A	Fishing vessel
37	Noeng Non	M	Preah Sihanouk	N/A	Fishing vessel
38	Hie Ra Voeun	M	Preah Sihanouk	088 6458165	Fishing vessel
39	Lom Chok	M	Preah Sihanouk	N/A	Fishing vessel
40	Man Sokha	M	Koh kong	088 5180593	Fishing vessel
41	Pang Somaly	M	Koh kong	088 3444499	Fishing vessel
42	Sim Ry	M	Koh kong	N/A	Fishing vessel
43	Mat Ab Ros	M	Koh kong	097 9169510	Fishing vessel
44	Ju Ly	M	Koh kong	096 1819459	Fishing vessel
45	Sa Rech	M	Koh kong	086 866318	Fishing vessel
46	Mak Vanthy	F	Preah Sihanouk	012 866376 097 9988810	Dry shrimp processor
47	Chin Samnang	M	Preah Sihanouk	012 866376 097 9988810	Dry shrimp processor
48	Nuon Somaly	F	Kampot	012 775162	Dry shrimp processor
49	Sok Chea	M	Kampot	092 301833	Dry shrimp processor
50	Ta Ang	F	Kampot	011 456745	Dry shrimp processor
51	Kim Ratana	F	Kampot	012 281719	Fish sauce processor
52	Lim Leng	M	Kampot	012 921578	Fish sauce processor
53	Ngov Heng	M	Kampot	012 272223	Fish sauce processor
54	Lim Heng (U Heng)	M	Kampot	011 751712	Fish sauce processor
55	Song Sopheap	M	Kampot	012 680353	Steam fish processor
56	Nut Sam On	M	Preah Sihanouk	016 737390	Steam fish processor
57	Sam Vann	M	Preah Sihanouk	070 908345	Steam fish processor
58	Lim Ngea	M	Preah Sihanouk	011 554144	Crab peeler
59	Kim Thy	M	Kompot	097 6666631	Crab peeler
60	Ky Sav Lik	F	Preah Sihanouk	071 6066400 016 717860	Crab peeler
61	Pouk Vanna	F	Koh Kong	011 470052	Crab peeler
62	Ly Ane	M	Preah Sihanouk	011 409929	Fish ball processor
64	A Tykas	F	Kampot	016 752371	Collector
65	Sam Yas	F	Kampot	092 811298	Collector

No	Name	Sex	Province	Telephone contact	Organization/Remark
66	Tha Nit	F	Kampot	096 5123031, 092763869	Collector
67	Leng Eng	M	Kampot	012 444110	Collector
68	Lat Sokkhea	F	Preah Sihanouk	011 888141	Collector
69	Srey Tuoch	F	Preah Sihanouk	016 427979 011 427979	Collector
70	Ey Boeb	F	Preah Sihanouk	016 605656 (0 OR 5)	Collector
71	Che Vet	F	Preah Sihanouk	011 464638	Collector
72	Srey Pov	F	Preah Sihanouk	099 454574	Collector
73	Eng Meng Chuo (crab collector)	F	Preah Sihanouk	012 424321	Collector
74	Phay Peng Heng	M	Koh kong	088 6767679	Collector
75	Sieng Sane	M	Koh kong	012 670613	Collector
76	Chea Srey La	F	Koh kong	071 9262925	Collector
77	Maryiane	F	Koh kong	016 237109	Collector
78	Bouy Borin	F	Preah Sihanouk	016 825917	Landing center
80	Sam Yas	F	Kampot	092 811298	Wholesaler
81	Gnor Choeu	M	Kampot	N/A	Wholesaler
82	Mr. Tit hot (buy kdam from VN)	M	Kampot	012226615 012995514	Wholesaler
83	Morm Phally (whosaler to PP)	F	Preah Sihanouk	012 372007	Wholesaler
84	Maryiane	F	Koh Kong	016 237109	Wholesaler
85	Sale Rany	M	Koh Kong	097 2542777	Wholesaler
86	Che Srey	F	Koh Kong	097 9489870	Wholesaler
87	Vong Sokha	M	Phnom Penh	097 3864445	Wholesaler
88	Thy Mouy Sim	F	Phnom Penh	097 7444438 012 515325	Wholesaler
90	Che Ly	F	Phnom Penh	077 879098	Wholesaler
91	Chhoem Thunny	M	Phnom Penh	097 3059777	Wholesaler
92	Chhieng Bros	M	Phnom Penh	088 8782887	Wholesaler
93	A Tykas	F	Kampot	016 752371	Retailer
94	Tha Nit	F	Kampot	096 5123031, 092763869	Retailer
95	Dy Na	F	Kampot	017 839 765	Retailer
96	Long Vat	F	Kampot	016 905270 097 353 8016	Retailer
97	Che It	F	Kampot	N/A	Retailer
98	Vontha	F	Preah Sihanouk	015 903334	Retailer
99	Yeay Kare	F	Preah Sihanouk	015 457457	Retailer

No	Name	Sex	Province	Telephone contact	Organization/Remark
100	Hieng Vannak	F	Preah Sihanouk	092 313148	Retailer
101	Pov/Sok Heng	F	Preah Sihanouk	016 847311	Retailer
102	Ny	F	Preah Sihanouk	097 5327429	Retailer
103	Cha Los Saros	F	Koh kong	N/A	Retailer
104	Mey Sok	F	Koh kong	097 7798945	Retailer
105	Ly So Ben	F	Koh kong	015 211209	Retailer
106	Hien Chan Thorn	F	Koh kong	017 236989	Retailer
107	Pen Kim Srieng	F	Koh kong	097 4782326	Retailer
108	Vong Sokha	M	Phnom Penh	097 3864445	Retailer
109	Makara	M	Phnom Penh	077 703307	Retailer
110	Phea	F	Phnom Penh	086 663691	Retailer
111	Dy	M	Phnom Penh	012 377702	Retailer
112	Som Kosal	M	Kampot	012 273034	Exporter
113	Ke Kiev	M	Kampot	012 523869	Exporter
114	Thou Ty	M	Kampot	088 8363117	Exporter
115	Chhor Kim Thuy	M	Kampot		Exporter
116	Lim Ngea	M	Preah Sihanouk	011 554144	Exporter
117	Ky Sav Lik	F	Preah Sihanouk	071 6066400	Exporter
118	Nam Vuoch	F	Preah Sihanouk	061 686611 016 724131	Exporter
119	Lay Ky	F	Preah Sihanouk	097 7747722 097 8875096	Exporter
120	Pheap (San Wash)	F	Phnom Penh	015 999286	Exporter
121	Sal Rany	M	Koh Kong	097 2542777	Exporter
122	ChSrey	F	Koh Kong	097 9489870	Exporter
123	Sok Van/Kim Hong	M	Koh Kong	069 532253 015 585125	Exporter
124	Pouk Vanna	F	Koh Kong	011 470052	Exporter
125	Han Lyna (Ice factory)	M	Kampot	N/A	Ice factory
126	Chhor Kimthuy	M	Kampot	097 6666631	Ice factory
127	Mr. Nop Sopheap	M	Preah Sihanouk	016 765398	Ice factory
128	Ice factory 66	M	Preah Sihanouk	012 603603	Ice factory
129	Pich Nil	M	Preah Sihanouk	016 765398	Ice factory
130	Sok Heng	M	Koh Kong	016 823456	Ice factory
131	Chin Samnang	M	Preah Sihanouk	012 866376 097 9988810	Dry shrimp association
132	Som	M	Preah Sihanouk	017 620783	Dry shrimp association
133	Sam Vann	M	Preah Sihanouk	070 908345	Steam fish association
134	Chea Thou	M	Preah Sihanouk	097 7743939	Steam fish association

No	Name	Sex	Province	Telephone contact	Organization/Remark
135	Chhom Vancy	M	Preah Sihanouk	012 635304	Steam fish association
136	Nuon Somaly	F	Kampot	012 775162	Dry shrimp association
137	Sok Chea	M	Kampot	092 301833	Dry shrimp association
138	Biv Tang	F	Koh Kong	016 202333	Fishing vessel association
139	Che Mouy	F	Koh Kong	016 309243	Fishing vessel association
140	Consumer 1	F	Phnom Penh	012 667372	Consumer
141	Consumer 2	F	Phnom Penh	015 933825	Consumer
142	Consumer 3	M	Phnom Penh	097 9848081	Consumer
143	Consumer 4	F	Phnom Penh	097 2113446	Consumer
144	Consumer 5	F	Phnom Penh	070 492734	Consumer
145	Consumer 6	F	Phnom Penh	015 330336	Consumer
146	Consumer 7	F	Phnom Penh	077 688739	Consumer
147	Consumer 8	F	Phnom Penh	012 691553	Consumer
148	Consumer 9	F	Phnom Penh	012 828736	Consumer
149	Consumer 10	F	Phnom Penh	092 761197	Consumer
150	Consumer 11	F	Phnom Penh	077 686978	Consumer
151	Consumer 12	F	Phnom Penh	017 705691	Consumer
152	Consumer 13	F	Phnom Penh	012 787639	Consumer
153	Consumer 14	F	Phnom Penh	023 222076	Consumer
154	Consumer 15	F	Phom Penh	017 214180	Consumer
155	Consumer 16	M	Phom Penh	095 333166	Consumer
156	Consumer 17	F	Phnom Penh	N/A	Consumer
157	Consumer 18	F	Phnom Penh	012 788173	Consumer
158	Consumer 19	F	Phnom Penh	N/A	Consumer
159	Consumer 20	M	Phnom Penh	017 589350	Consumer
160	Consumer 21	F	Phnom Penh	012 644649	Consumer
161	Consumer 22	F	Phnom Penh	099 272 756	Consumer
162	Consumer 23	F	Phnom Penh	012 773583	Consumer
163	Consumer 24	F	Phom Penh	092 626278	Consumer
Government officials					
164	Eng Cheasan	M	Phnom Penh	NA	Director General, Fisheries Administration
165	Chhoun Chamnan	M	Phnom Penh	017353363	Director, Department of Post-harvest Technology and Quality Control, FiA
166	Ing Try	M	Phnom Penh	012995665	Deputy Director General, FiA
167	Sar Sorin	M	Kampot	012932909	Chief of Kampot Fishery Cantonment, FiA
168	Lang Kiry	M	Koh Kong	012683377	Chief of Koh Kong Fishery

No	Name	Sex	Province	Telephone contact	Organization/Remark
					Cantonment, FiA
169	Nen Chamroeun	M	Preah Sihanouk	016777312	Chief of Preah Sihanouk Fishery Cantonment, FiA
170	You Mab	M	Phnom Penh	089767686	Director of Private Sector Development, MoC
171	Mao Thora	M	Phnom Penh	NA	Secretary of State, MoC
172	Tek Reth Kamrang	F	Phnom Penh	NA	Secretary of State, MoC
173	Chhieng Pich	M	Phnom Penh	092629993	Director of Department of International Cooperation, MoC
174	In Sambo	M	Phnom Penh	012249141	Director of Industrial Laboratory Center of Cambodia, MIH
Development Partners/NGO/Association/Others					
175	Niklas Mattson	M	Phnom Pen	917333492	Fisheries Sector Expert
176	Georges Dehoux	M	Phnom Penh	NA	EU Attaché
177	Chum Soborith	M	Phnom Penh	012750678	Young Entrepreneur Association of Cambodia
178	Pech Bolen	M	Phnom Penh	NA	Young Entrepreneur Association of Cambodia
179	Toyama Haruko	F	Phnom Penh	NA	JICA
180	Ide Naoko	F	Phnom Penh	NA	JICA
181	Chong Dowon	M	Phnom Penh	012820493	Kotra

Annex III

Proceedings of Focus Group Discussion

Focus Group Discussion Workshop on Marine Fishery Value Chain

Venue: Moon Julie Hotel, Preah Sihanouk province

Date: 24-25 June 2015

Background

The focus group discussion is held on 24-25 June 2015 as part of value chain assessment which is one output of the Marine Fishery component of Cambodia Export Diversification and Expansion Program II.

The purpose of the FGD is to present and validate the preliminary findings of the marine fishery value chain study to relevant stakeholders in order to gather further inputs from them. The preliminary findings are based on series of interviews with the relevant stakeholders along the value chain as a result of field assessment in coastal provinces (i.e. Kampot, Preah Siahnouk, and Koh Kong) during the month of May, 2015.

The purpose of the value chain study is to gather information on current status of the marine fisheries sector of Cambodia to identify the weaknesses of the sector and to determine the sectoral needs in terms of human resource capacity, value addition, market development, market diversification and product diversification. These studies will also help in designing future interventions across the sector.

Participants

The focus group discussion involved 51 participants from different part of marine fishery value chain, namely fishermen, traders, processors, association, and government.

No	Type of Participant	Total
1	Fishmen	7
2	Processor	10
3	Trader	7
4	Association	5

5	Government Officer	15
6	Project Team	7
Grand Total		**51**

Agenda of the FGD

The event started with welcome remark of Head of UNIDO's operation in Cambodia and representative of Director General of the Fishery Administration. It then proceeded with series of presentations on preliminary findings of marine fishery value chain study. After the presentation, all participants were split into groups to discuss on specific topics. Findings and recommendation made by the group are presented in later section of the current report. On the last part of the event, series of presentations on various topics were made by government officials to better inform participants, especially those from private sector, about regulations pertaining to control of business operation in fishery sector. Detailed agenda of the event is presented below.

ATE/DAY	TIME	PROGRAM	PARTICIPANTS/ responsible
24-June	11:30 – 12:00	Registration	All participants
	12:00 - 13:00	Lunch	All participants
	13:15 - 13:25	Welcome remark of UNIDO's representative	Narin Sok, Head of Operation, UNIDO
	13:30 - 13:50	Presentation of Marine Fishery Project	Kang Sin, Project Coordinator
	13:55 - 15:35	Value Chain Study: objective, scope, and methodology	Dr. Shetty Seetharama Thombathu, International Consultant
		Preliminary results of value chain assessment:	
		a. Current structure of value chain and role of each stakeholder groups	Chheun Sarik, National Consultant
		b. Current marketing structure and demands for marine fishes	Keo Chenda, National Consultant
		c. Current status of business enabling environments for value chain development	Keo Chenda, National Consultant
	15:40- 16:00	Coffee break	
	16:00 to 16:45	Group exercise/discussion on value chain development strategies and solutions	All participants
	16:50-17:35	Group Presentations and discussions	Group representative

ATE/DAY	TIME	PROGRAM	PARTICIPANTS/ responsible
	17:40- 18:00	Summary of feedbacks and recommendations	Dr. Shetty Seetharama Thombathu / National Consult team
	18:20-19:20	Dinner	
25-June	8:00-8:30	Registration	
	8:30-8:50	Role of sector association: view of private sector	Mr. Pech Bolene, Vice President of YEAC
	8:50-9:05	Coffee break	
	9:05 – 09:55	Current status of control mechanism on registration and licensing for fishing vessels, landing centers, traders, processors, exporters and other stakeholders	Chief of Provincial Cantonments
	9:55-10:15	Current status of official control mechanism on harvest and post-harvest activities (fishing, landing, trading, processing, testing, certification, export)	Dr. Chhoun Chamnan, Head of DFPTQ
	10:15 – 10:50	Discussion on control mechanisms for Value Chain and strategies for Development	All participants
	10:50 - 11:00	Closing Remarks	Narin Sok/ Dr. Chamnan Chhoun

Findings and recommendations

The discussion has pointed out different issues in the marine fishery sector and has proposed solution as summarized below:

- Lack of capacity to comply with export and import requirements among exporters; majority of exports are therefore done informally. Export facilitation manual needs to be developed and disseminated among exporters, particularly small-scale ones. Export rules and regulations might need to be further simplified

- Lack of consumer pressure on producers/processors to improve their fishery products quality. A simplified quality scheme needs to be developed and put for implementation

- Lack of technical know-how to comply with food safety requirements among producers/processors. Provide training on food safety to producers/processors to upgrade their knowledge

- Input materials (e.g. ice, fuel...) are relatively expensive compared to neighboring countries.

- Institutional capacity will need to be further enhanced to enforce relevant legal framework to promote safety and quality of fishery products.

- Inadequate weather information still post risk of accident to fishermen. Weather forecast and broadcasting needs to be improve so that fisherman are better informed

- High production cost due to insufficient infrastructures (roads, electricity, refrigeration facilities) increase the price of products

- Remoteness/long distance restrict business operator to apply for transport permit.

- Inability to access low interest loans. Policy supporting microbusiness should be developed to ease of access to finance.

- Lack of market information limits access to larger buyers.

Conclusion:

The FGD participants validated the findings of the assessment presented in the program

List of attendees from the three target provinces is presented in table below.

No	Name	Institution
Phnom Penh		
1	Lim Amrin	Ministry of Commerce
2	Kong Putheara	Ministry of Commerce
3	Pech Bolen	Young Entrepreneur Association of Cambodia
4	Soth Sothearak	Young Entrepreneur Association of Cambodia
5	Chong Howov	Kotra
6	Chhoun Chamnan	Fishery Administration
7	Yos Chanthana	UNIDO
8	Lao Sophea	Fishery Administration
9	Our Lang	Fishery Administration
10	Samrith Sambo	Fishery Administration
11	Kong Sovannasay	Fishery Administration
12	T.S. Shetty	UNIDO

No	Name	Institution
13	Chea Socheat	Ministry of Commerce
14	Hao Arn	Ministry of Commerce
15	Moun Chanheak	Ministry of Commerce
16	Sok Narin	UNIDO
17	Sin Kang	UNIDO
18	Keo Chenda	UNIDO
19	Chheun Sarik	UNIDO
20	Chea Samapheavy	UNIDO
Kampot		
21	Tuy Dek	Fishery community
22	Cheng Sopha	Processor association
23	Sem Sam soem	Processor
24	Dullos Sak Yas	Fisherman
25	Nak Sen	Fisherman
26	Sok Ny	Fisherman
27	Sok Sam El	Fisherman
28	Chan Sitha	Fish sauce Processor
29	Song Sopheap	Steam Fish Processor
30	Thong In	Crab meat processor
31	Sor Sorin	Provincial FiA
32	Vin Seyla	Provincial FiA
Koh Kong		
33	Lang Kiri	Provincial FiA
34	Chhaem Pov	Trader
35	Ngeav Hour	Trader
36	Trem Tang	Trader
37	Los Salesh	Fisherman
38	Yer Yam Ry	Fisherman
39	Ny Yham	Trader
40	Ang Ty	Trader
41	Chhun Theng	Steam Fish Processor
42	Chea Prok	Fisherman
43	Thong Sean	Dry Shrimp Processor
Preah Sihanouk		
44	Chen Samnang	Dry Shrimp Processor
45	Lao Sru	Dry Shrimp Processor
46	Bouy Rin	Trader/Landsite Owner
47	Sin Satharoth	Provincial FiA
48	Nuth Sam Ol	Steam Fish Processor
49	Khen Saravuth	Provincial FiA
50	Prak Chinh	Dry Shrimp Processor

No	Name	Institution
51	Eng Kim Chou	Crab Seller

Annex: IV

Marine Fisheries Value Chain Survey Questionnaires

1. FISHING VESSELS

Name: ……	**Contact info/Tel: ……..……...**
Address: ……..……..	**Date: …….**

1. What is the length (ft or meter) and capacity (HP) of your fishing vessel?
   .....
2. Do you have fish hold? ☐ **Yes** ☐ **No**
   If so, capacity of fish hold: .....
3. Do you take ice for your fishing trip? ☐ **Yes** ☐ **No**
   If so, from where? .....
4. Where do you go for fishing? At what depth?
   .....
5. What is the common location of fishing? How many hours of travel to fishing ground?
   .....
6. How many days of fishing in one trip? Day/day-night/2 day/ etc
   .....
7. Are you owner of the fishing vessel? ☐ **Yes** ☐ **No**
8. With your experience, do you feel that the fish resources are diminishing/ reducing? Did you see the resource to catch is sustained?
   .....
   .....

9. What is the type of net you use? (trawler/gill net/traps/ etc)
   .....
10. Specification of net- mesh size, length, width (if possible)
    .....
11. Are you registered or do you have license? ☐ **Yes** ☐ **No**
    - If yes, why do you think it's important?
      .....
    - If no, why do you think it's not important?
      .....

12. Did you have any training or how did you learn the fishing? ☐ **Yes** ☐ **No**

13. Did you take any financial assistance for this vessel? ☐ **Yes** ☐ **No**

14. Did you take any loan or advance from anyone? ☐ **Yes** ☐ **No**

15. To whom do you sell the fish/shrimp? Factory/retailer/agent/collector etc
    .....
    .....
16. Why do you sell to them? do you have any agreement? Advance?
    .....
    .....
17. Do you ever collaborate with other fishers to sell?
    .....
    .....
18. Did you know, what is end using/processing of that product?
    .....
    .....
19. What are your buyer preferences on quality characteristic? What did you do to satisfy them?
    .....
    .....
20. You got any complaint from your buyers? Did you know how to address it? Did you try? If not, why?
    .....
    .....
21. How much catch do you get per fishing trip or per day, and per season?

22. What do you see as your main needs or opportunities to upgrade your business?

.....
.....

23. What type of transport do you use for distribution? (Skip if selling done at landing site)
.....
.....

24. Cost of transportation for marketing? (Skip if selling done at landing site)
.....
.....

25. How long have you been in this business?.....
.....

26. What do you know about the marketing channel?.....
.....

27. What is the biggest challenge facing you in your fishing? .....
.....

28. What could be solutions to the problems/challenges? .....
.....

29. Do you find any poaching in deep sea? ☐ **Yes** ☐ **No**
Who are they? .....

30. Any problem with marketing: .....
.....

31. What your suggestion to solve this problem? .....
.....

Food safety knowledge

32. Did you have any training in the past? ☐ Yes ☐ No
If so, please give details: .....

33. Do you have any hygiene/hand-washing/public health facilities in your fishing vessel?

34. How many people working in your fishing vessel? Men?_____ Women? _____

35. Any other remarks or information? .....

2. FISH LANDING CENTERS

Name: ……	**Contact info: ……...**
Address: ……..……..	**Date: ……**

1. What is the capacity of your fish landing center (number of boats per day)?
   .....
   .....
2. What kind of service do you provide?
   .....
3. How do you charge them for landing their boats?.....
   .....
4. Do you supply ice for their fishing trip? ☐ **Yes** ☐ **No**
   If so, from where do you get the ice from?
   .....
5. Do you need license/registration from FiA (or other institution) to operate your landing site? (if no, skip question 6) ☐ **Yes** ☐ **No**

6. Do you have all the required license or permit from FiA (or other institution)?
   ☐ **Yes** ☐ **No** If yes, how much is the cost? If not, why did you not take license?
   .....
7. Where did/can you register/ obtain license from?
   .....
8. Do you think the importance good quality water? ☐ **Yes** ☐ **No**
   What is the source of the water?
   .....
9. Do you have facility for personal hygiene- hand wash/toilet in your landing center?
   ☐ **Yes** ☐ **No**

10. Are you owner of the fishing vessel?
    ☐ **Yes** ☐ **No**

11. What are your customer and end market preferences to assure quality characteristic? What did you do to satisfy them?
    .....
12. What do you see as your main needs or opportunities to upgrade your business?
    .....
13. With your experience, do you feel that the fish resources are diminishing/ reducing?
    .....
14. Are you yourself collector of fishery product? ☐ **Yes** ☐ **No**

    If yes, do you give any loan or advance to fishing vessels? .....

15. How long have you been in this business?.....

16. What is the biggest challenge facing you in your fish business?.....
    .....
17. What are the solutions?
    .....
18. Food safety knowledge? Did you have any training in the past? ☐ **Yes** ☐ **No**
    If so, please give details:
    .....
19. Do you think training on food safety and hygiene in your business area essential?
    ☐ **Yes** ☐ **No**

20. Do you need training on food safety and hygiene (Are you ready)?
    ☐ **Yes** ☐ **No**

21. Any other remarks or information?.....
    .....

3. TRADER/COLLECTOR

Name: ……...	**Contact info/Tel: ...……...**
Address: ……..……..	**Date: ……...**

1. Where do you get your supplies from?
   ☐ From farm ☐ From fishing vessels ☐ Both farm and fishing vessels

2. Why do you get your shrimps from them? Why not from others? Any advance (payment) or contract.....
3. When do you get your supplies (time of the day)? ....
4. Did you do any quality check when you buy? How to do? How the price is different?
   .....
5. What are the species and how much quantity of each species do you buy in a day?
   .....
6. Do you use ice? ☐ **Yes** ☐ **No**
   If YES, quantity: …… kg/kg fishery product; Value: …….
   Source of ice (factory name, contact, and address if known):……..
   If NO, why: …..…..……..……...

7. To whom do you supply/sell your fish/shrimps? Local market/factory/bigger trader/Phnom Penh market or other market? …….....

8. Do you know what your buyer(s) do with fish/shrimp they buy from you? Export, process, retail? .....

9. Why do you sell your fish/shrimp to them (answered option)? Why not to others? Is there agreement/contract?.....
   .....
10. What are your buyer preferences on quality characteristic? What did you do to satisfy them?.....
    .....

11. What is the average price you buy per kg of fish/shrimp? and which price do you sell? % profit?.....
12. .....
13. Did you ever receive any complaint from your buyers? How did you address it? If not, why?.....
14. What do you see as your main needs or opportunities to upgrade your business?.....
    .....
15. Distance from farm/landing center/buying place to selling place? What type of transport do you use for distribution? .....
16. Cost of transportation for marketing? .....
17. How long have you been a fish trader/collector? .....
18. What are the challenges you face in your business/job?
    .....
19. Do prices vary over the year? ☐ **Yes** ☐ **No**
    What are the reasons for this variation in price? .....
20. Any problem with marketing (challenges):
    .....
21. What your suggestion to solve this problem? ----------
    .....
22. Do you need license from FiA (or other institution) to run your business?
    ☐ Yes: …….. ☐ No (if no, skip questions 23 & 24)
23. Do you have license or permit from FiA (or other institution)?
    ☐ Yes: …….. ☐ No
24. If yes, how much is the cost? If not, why did you not take the license/permit?
    .....
25. Do you ever collaborate with other collector or trader to sell or is there any association of traders? ☐ **Yes** ☐ **No**
    - If **YES**, are you part of it? Do you think such associations help your dialogue capacity (or your business)? .....
    - If NO, do you think such associations WILL improve your dialogue capacity (or your business)?.....

26. <u>How much do you know food safety and hygiene</u>? Did you have any training in the past? If so, please give details.....
    .....
27. Do you employ people? If so, how many? How many men and women?
    Total: …… No. of men …….. No. of women ……..

28. Any other remarks or information?
    .....

4. PROCESSORS/MANUFACTURERS

Name of Company/Owner: ……	**Contact info: ……...**
Address: ……..……..…	**Date: ……..……...**

1. Where do you get your raw material from?
   ☐ **From collectors** ☐ **From fishing vessels** ☐ **Both**
   Give more details- in terms of %
   .....
   .....
2. Why do you get your raw material from them? Why not from others? Any advance (payment) or contract?
   .....
   .....
3. Did you do any quality check when you buy? How to do? What are the quality characteristic do you need? .....

4. .When do you get your supplies (time of the day)?.....

5. How much quantity of raw material do you buy in a day or a year?

	Type of raw material						
Quantity (kg or Ton per day, and price per kg)							
Quantity (Ton per year, and price per kg)							

6. Do you use ice to cover raw material while waiting for processing to start?
   ☐ Yes ☐ No

If Yes, source of ice (factory name, contact, and address if known):
If no, why not: ……...

7. What is your processing capacity in terms of quantity of raw material per day or per month? Capacity of final product?.....

8. What is your production yield?

	Production yield by type of raw material						
Kg of product/kg raw material							

9. To whom do you supply your product? Local market/bigger trader/Phnom Penh market/other market?.....
.....
10. Why do you sell your product to them (answered option)? Why not to others? Agreement/contract?.....
.....
11. Do you know what your buyer(s) do with the product they buy from you? Export, process, repack, retail? ☐ No ☐ Yes, ...

12. What are your buyer preferences in terms of quality characteristic?
.....
13. Did you ever receive any complaint from your customers? How did you address it?
.....
14. Do you label your product? If no, why?
.....
15. What is the price of raw material (fish/shrimp)? What is selling price of your product? % profit or % value addition?
.....
16. How many workers do you employ? How many men and how many women? How much they earn per month?
.....
17. How long have you been in this business?.....
.....
18. What are the challenges you face in your business? .....
.....
19. What in your work would you like to see different in order to make your business better off?
.....

20. Do you face any problem with marketing? What your suggestion to solve this problem?
    .....
    .....
21. Do you need license from FiA (or other institution) to run your business? (if no, skip question 23) ☐ Yes ☐ No
22. Do you have license or permit from FiA (or other institution)? ☐ Yes ☐ No
    If yes, how much is the cost? If not, why did you not take license?
    .....
23. Is there any association of processor? ☐ Yes ☐ No
    If yes, are you part of the association? do you think it helps your business?
    .....
    If no, do you think such associations WILL improve your dialogue capacity (or your business)?

    Food safety/Hygiene knowledge
24. Did you have any training in the past? ☐ Yes ☐ No
    If so, please give details:
    .....
    .....
25. Do you need such awareness training for 3-4 hours? ☐ Yes ☐ No

26. Any other information you want to share?
    .....
    .....

5. ICE FACTORIES

Name: ……	**Mobile no.……...**
Address: ……..……..	**Date: ……...**

I. General Information

1. Year of establishment:.....
2. No. of staff (permanent/casual): .....
3. Production capacity (ton/day): .....

II. Infrastructure

1. Roof/Ceiling/Walls/Floors/Windows- hygienic and easily washable? ☐ **Yes** ☐ **No**
2. Doors and windows preclude (prevent) entry of pests and animals? ☐ **Yes** ☐ **No**
3. Animal control fencing around the ice factory? ☐ **Yes** ☐ **No**
4. Sanitary/toilet facilities for workers (present or not)? ☐ **Yes** ☐ **No**

III. Source & quality of Water

1. Water source- municipal/underground/etc

.....

.....

2. Water treatment process? Chlorination/UV/etc

.....

.....

3. Testing of water- did you ever do the testing of water and ice? ☐ **Yes** ☐ **No**

If YES, When?.....

Where.....

IV. Sanitation and Hygiene

1. Detergent used in the surroundings. ☐ **Yes** ☐ **No**

2. Disinfectant used. ☐ **Yes** ☐ **No**

V. Description of ice manufacturing cans

1. Size of can: Kg/block: .....
2. Can material- iron/steel/galvanized iron/etc: .....
3. Condition of ice-cans (rusted?): .....
4. Condition of ice handling materials: .....

VI. Production related information

1. Production capacity (can/day): .....
2. Peak production season: .....

VII. Marketing related information

1. Production price/block: .....
2. Major marketing area:
   .....
3. Annual operating costs: .....
4. Annual sale: .....
5. Who are your buyers? .....
6. Do you have any contract with your buyers? ☐ **Yes** ☐ **No**

VIII. Transportation of ice

1. Transported by: .....
2. Time required reaching from factory to landing center/depots/landing centers:
   .....
3. Distance from ice factory to landing center/depots/landing centers:

IX. Linkage with other agencies

1. Existence of any ice factory associations? ☐ **Yes** ☐ **No**
   .....
2. Cooperation/linkage with FiA/Government departments/ministries/ others.
   .....
   .....
3. Linkage with depots, fishermen, processing industries etc.
   .....

X. Official Control

1. Linkage with competent authorities (FiA) and Public health officers.
   ☐ **Yes** ☐ **No**
2. Aware of FiA rules? ☐ **Yes** ☐ **No**

3. Are registered? If so, with whom? ☐ **Yes** ☐ **No**
4. Are you licensed? If so, with whom? ☐ **Yes** ☐ **No**
5. Does local FiA officials or any other carry out inspection? ☐ **Yes** ☐ **No**
   If so, how often? **.....**

XI. Food safety knowledge awareness

1. Awareness of workers about sanitation & hygiene of ice factories (%)
   .....
2. Educational status of ice factory staffs
   .....

XII. Training

1. Any training received? ☐ **Yes** ☐ **No**
2. Types of training?**.....**
3. Training duration (days): **.....**
4. Training organized by
   a. Govt. Department with name: **.....**
   b. Non-govt. agencies with name: **.....**
5. Training duration min-max (days): **.....**
6. Is training necessary? ☐ **Yes** ☐ **No**
7. Are you ready to participate in training? ☐ **Yes** ☐ **No**

XIII. Record keeping information

1. Maintain records on the followings? ☐ **Yes** ☐ **No**
2. Source of water: **.....**
3. Water quality: **.....**
4. Detergent used: **.....**
5. Disinfectant used: **.....**
6. Chemicals used: **.....**
7. Sanitation & hygiene: **.....**

XIV. Problems & support

1. Most critical problems in ice making operation/business.
   .....
2. What are your solutions?
   .....

XV. Any other information:

6. ASSOCIATIONS

Name: ……...	**Contact info: ..……...**
Address: ……..……..	**Date: ……...**

I. Formation of association

1. Objective of the association: ……
   ……
2. Who organized the formation of this association? When was the association formed?
   ……
   ……
3. How do you organize & manage funds?
   ……
   ……
4. Organizational structure- who are the members?
   ……
   ……
5. How many members?
   ……
   ……
6. Permanent office with address.
   ……
   ……

II. Linkage with other agencies

1. Cooperation/linkage with GOC and other NGOs.
   ……
   ……
2. Communication with relevant agencies for common interest.
   ……

3. Linkage with other associations or private sector organizations or business operators.
   .....
4. Linkage with FiA? ☐ **Yes** ☐ **No**

   .....

III. Training

1. Training received. ☐ **Yes** ☐ **No**
2. Types of training
   .....
   .....
3. Training organized by
   a. Government Department with name
      .....
   b. Non-govt. agencies with name
      .....
4. Training duration min-max (days)
   .....
5. Is training necessary for you or your members? ☐ **Yes** ☐ **No**

IV. Knowledge

1. Awareness of members about food safety & quality assurance (%)
   .....
2. Does your association get any cooperation from fisheries office, cooperative office or social welfare office? ☐ **Yes** ☐ **No**
3. Does association play any role for the development of the marketing system?
   ☐ **Yes** ☐ **No**
4. Are you working on reducing marketing chain (middlemen) through your association
   - If yes, how? .....

5. Are Associations helpful for the general development of the sector? ☐ **Yes** ☐ **No**

7. CONSUMERS

Sex: M/F	Contact info/Tel: ……..
Address: ……..	Date: ……..

1. Income ☐ <500 US$/month ☐ 500 – 1000 US$/month ☐ > 1000 US$/month

2. Where do you buy your marine fishery products?
   .....

3. Do you know the source or history of those products? .....

4. Do you buy the fish from a specific buyer every time? Why not from others? .....

5. What are criteria you use when selecting
   a. **Fresh unpacked** fishery products?

   b. **Fresh packed** fishery products

6. Do you find fish and fishery products sold in the markets always covered with ice and chilled?
   .....
   .....

7. Are you ready to buy a product of high or superior quality (with quality label/brand like ISO 22000, or HACCP certified) at a higher price, when similar products without brand/label are available at cheaper price? Why?
   .....
   .....

8. Are you aware of the fact that fish and fishery products may carry serious health hazards such as pathogens, allergens and harmful chemicals (when improperly handled)? Please explain

   .....
   .....

9. Did you ever compare the quality of fish you buy from landing centers and the fish you buy from markets? What's the difference? Why do you think so?

   .....

10. To what extent are you satisfied with the fish you purchase from markets (in terms of quality and safety)?

    Select any one: Very satisfied/ Satisfied/ Not satisfied/ No idea

11. What do you think about the effectiveness of hygiene and sanitation in the market area?

    Select one answer: ☐ Very effective ☐ Effective ☐ Not effective ☐ No idea

12. Do you have any other problem or issues you think of while buying the products?

    .....

13. As a seafood consumer, how much do you know food safety practices among fishermen, wholesaler and retailers?

    ... .

14. Any other remarks or information? .....

8. FIA OFFICE OR OFFICER

Name: ……	Mobile no……..
Address: ……..	Date: ……...

I. General

1. Name and address of the local/provincial fisheries office or officer.
   .....

II. FiA provincial office

1. How many staff members/officers in this province? .....
2. Male/female? .....
3. How many are involved in field level **control** operations? .....
4. Do you think manpower capacity is enough for control? If no, specify .....

III. Official control

1. What are the fisheries operations controlled by this office in this province or location
   a. Fishing vessels- registration/licensing
   b. Fishing operations- mesh size regulation
   c. Landing centers
   d. Ice factories
   e. Dry shrimp operations
   f. Traders
   g. Fish/shrimp processing factories
   h. Others

2. How many of the above operations are operating in your province?
   .....
   .....

IV. Educational qualification/competence of officers

1. What are the educational qualifications of your officers?

   .....

   .....

2. Are they trained on official control (food safety/hygiene/quality control?)

   .....

   .....

3. How often are they trained?

   .....

V. Training

1. Training received?
2. Types of training.

   .....

3. Training organized by
   a. Govt. Department with name: .....
   b. Non-govt. agencies with name: .....
4. Training duration min-max (days): .....
5. Do you have any training on food safety and hygiene? ☐ **Yes** ☐ **No**
6. Is such training necessary? ☐ **Yes** ☐ **No**

VI. Awareness programs/training-visibility materials

1. Does <u>your office</u> conduct awareness programs to the beneficiaries?
   ☐ **Yes** ☐ **No**
2. Pls specify the number and nature of such awareness programs/program topics.

   .....

3. Did <u>you</u> ever conduct training programs to beneficiaries? ☐ **Yes** ☐ **No**

4. Pls specify the number and nature of such training programs.

   .....

VII. Financial situation

1. Does your office have enough financial capacity for conducting frequent awareness/ training programs to beneficiaries?
   ☐ **Yes** ☐ **No**
2. Do you have enough financial capacity to print visibility/information materials?
   ☐ **Yes** ☐ **No**

VIII. Any other information

Annex V

Case Studies

Insufficient export enabling environment

"Having been in seafood business for two generations down from my grandfather, a medium scale seafood processing enterprise, I see lot of challenges lying ahead of us, especially with regard to access to international markets". The enterprise insists that enabling factors such as energy price and legal procedures for export need to be improved.

Currently, the enterprise produces semi-finished crab meat and exports to its only buyer in Vietnam. With financial support from its international buyer, the company has managed to get 2-year export license through broker (which costs about 20,000 USD) from the Ministry of Agriculture, Forestry and Fisheries for its past exports. However, the company thinks that it will be cost saving for them not to renew the license and begin informal export. "I would prefer doing informal export as the formal procedures are too complicated and expensive. Even having gone through official procedures, I would eventually still have to pay no-receipt fees", said the enterprise owner. One of the root causes is the lack of precise official export procedures available to exporters. They therefore rely solely on verbal instructions from officials which are often misleading and results in no-receipt payment. An interview with a frozen shrimp processor and exporter also pointed to the same issue. The company needed to frustratingly and confusingly go back and forth to different government institutions to get all necessary documents needed for export.

All these seem to suggest that enabling environment for formal export remains unfavorable for exporters, particularly small and medium ones.

Absence of Quality Scheme

Marine fishery products quality infrastructure in Cambodia remains far behind that in its neighboring countries, especially Vietnam and Thailand. Although there is growing concern over safety of the products, consumers have no means to identify safe product, but to rely on their visual judgement which generally fails to detect chemical hazards and sometimes biological ones.

From the supply side, knowledge in good handling practice is still limited. In addition, there is little incentive to upgrade product quality. "It will make no price difference to have sufficient ice to preserve fishery product quality. Sufficient ice only means additional cost for us", claimed a group of fishermen in Kampot province. This is consistent with what raised during a focus group discussion on the marine fishery value chain. The group pointed out that a quality scheme should be put in place to guarantee better price for producers and better quality for consumers. "I am willing to pay additional price for chemical-free products", said a participant during the discussion. "People are talking about formalin residue here and there. As a consumer, it really scares me", continued the participant.

It is clear that a quality assurance scheme serving as driving force is needed to bring about benefits of both consumers and producers in the country.

Importance of cold chain in dry shrimp processing

Though processors have been performing dry shrimp business for decades, access to reliable buyers with stable price has been very limited. *"The buyers offer lower price for my dry shrimp in peak processing season……however, I need to sell to them…..because I didn't have revolving capital and especially the cold chain to preserve my products until the off-season to obtain better price"*, said Mr. Chin Samnang, a dry shrimp processor in Sihanouk province.

Cold chain is one of the most critical requirements to guarantee the quality of the fresh or processed fishery products. Preservation of quality and safety of fish and fishery products from the fishing boat and artisanal or small scale processors to the points of retail, wholesale and until it reaches the consumer is a priority. During peak processing season, most of the dry shrimp processors are bound to sell their products for the lack of infrastructure such as cold chain. Usually the dry shrimps have good demand during the off-seasons when fresh shrimps are not available in plenty in the market. But processors are not able to take benefit of the market.

"I use cold storage to increase shelf-life of my dry shrimp until the buyers provide better price in off-processing season.. ….. And I make profit…..But other processors didn't invest", said Ms. Mak Vanthy a dry shrimp processor in Sihanouk province.

Since she invested on cold storage, Ms. Mak Vanthy is able to store her processed products for longer period not only for waiting until better price from wholesale in off-processing season, but also for retail sale to get a better profit.

Why fishing vessels in Koh Kong unload in Thailand?

Mr. Mit Sokha has been fishing in Koh Kong province for most of his life. Fishing of marine fishery products is the most important source of income for his family. However, being unable to access stable market in his province, Sokha decided to informally land his fishing vessel in Thailand.

"Informal unloading of my catch in Thailand has offered me more economic advantages. I can access to ice and fuel at lower price, better boat-workshop facilities and undiscriminating market demand', claimed Mr. Sokha. However, he thinks that the access to local market in his province has been safe for him if the market demand is stable and has access to supporting services. Caroline Lesser and Evdokia Moisé Leeman (OECD Trade Policy, 2009) have consistently raised that in the longer run, the informal cross-border trade is likely to have negative economic and developmental effects, which might further marginalize national and provincial economies.

These type of small scale businesses are "informal" in the sense that they are mostly: unregistered and unrecorded in official statistics and thus not recognized, supported or regulated by the government; they have little or no access to organized markets or credit institutions; The high cost of doing business, lack of infrastructure and stable domestic markets are discouraging these enterprises from becoming formal.

For that reason, a simplified and liberalized trade facilitation measures are required to curb informal trade leading to formal trade.

ANNEX VI

Proceedings of Final Validation Workshop

Final Validation Workshop on Marine Fishery Value Chain and Roadmap for development

Venue: UNDP Conference room

Date: 28 Aug 2015

Background

The final validation workshop was held on 28 Aug 2015 as part of the marine fisheries value chain assessment.

The purpose of the value chain study is to gather information on current status of the marine fisheries sector of Cambodia to identify the weaknesses of the sector and to determine the sectoral needs in terms of human resource capacity, value addition, market development, market diversification and product diversification. These studies will also help in designing future interventions across the sector.

Objective:

The purpose of the workshop was for getting final endorsement to the findings and report thereof from all the stakeholders concerned. The final draft of the value chain assessment and roadmap for development was presented with all the data collected.

Participants

The workshop was attended by officials of various Ministries (MAFF, MOC, MIH), development partners, EU, private business operators, processors, fishermen, collectors, business association, etc.

Agenda of the workshop

The event started with welcome remarks from Mr. Karl Schebesta, Project Manager of UNIDO HQs and Dr. Dr. Chhoun Chamnan, Director of Department of Fisheries Post-Harvest Technology and Quality Control, FiA of MAFF. Both of them spoke on the importance of the study on marine fisheries value chain in view of its contribution to national economy through

improved trade competitiveness. Core team member, Mr. Thor Sereywath, Director of Department of Planning and International Cooperation, FiA of MAFF was also present on the occasion.

A detailed presentation on the findings of the value chain assessment and the roadmap for development was made. There was an active participation of members in the discussion on the value chain development. The agenda was as shown below:

Time	Program	Participants
8:30 – 9:00	Registration	All participants
9:00 – 9:10	Welcome remarks	Mr. Karl Schebesta, Project Manager Dr. Chhoun Chamnan, Director of DFPTQ
9:10 – 9:20	Marine fishery value chain assessment: background information	Mr. Kang Sin, National Project Coordinator
9:20 – 10:20	Marine fishery value chain assessment and roadmap for value chain development	Dr. Shetty TS Technical Advisor
10:20 – 11:00	Q & A	All Participants
11:00 – 11:15	Wrap up	Dr. Shetty TS
11:15 – 11:25	Closing remarks	Mr. Sok Narin, Head Operation, UNIDO
	Lunch	All Participants

Findings and recommendations

The discussion has pointed out some additions required in the report as well as some recommendations for future development:

Inputs for the report

Report reference	Comments	
2.1.2 Per capita consumption rate	There are reports of higher per capita consumption in Cambodia even up to 62 kg/year	Report updated
3.5.5 Validation workshop	Validation works shop and its recommendations to be added in the final report	Report updated at 3.5.5 and in the Annex VI
6.3.1.	Ministry of Tourism has also has responsibility of food safety in restaurants	Report updated
8. Point # 1	Resource conservation- activity needs to be specified	Specific activity (mesh size regulations) has

		been included

Recommendations

Participants of the workshop unanimously made following recommendations and feedback:

- Immediate approval of the Cambodia Quality Seal document and certification of the Cambodian fish and fishery products so that the private processors can access better market opportunities
- Participants appreciated the value chain assessment report for its exclusive data collection, analysis and holistic approach in value chain development roadmap
- Inclusion of value chain development roadmap as sectoral development policy on top national priority of the Government
- Need for firm commitment of all the concerned stakeholders, both public and private, for meeting the value chain development roadmap
- Value chain development and food safety shall also be a national priority for domestic consumers in addition to export market
- Institutional capacity building along with required regulatory reforms avoiding multi-ministerial responsibilities are required for effective implementation of official controls across the fisheries value chain
- Effective implementation of the objectives of the CEDEP II- Marine Fisheries project needs firm ownership of the concerned ministries and private enterprises

Conclusion:

The workshop unanimously agreed and validated the report on the findings of the value chain assessment and roadmap for development

List of participants

No	Name	Position	Organization
1	Karl Schebesta	Program Manager & Unit Chief	UNIDO HQs, Vienna
2	Dr. Chhoun Chamnan	Director/ core team	DFPTQ, FiA
3	Mr. Thor Sereywath	Director/ core team	Department of Planning and International Cooperation, FiA
4	Mr. Thay Somony	Director	Department of Aquaculture Development, FiA
5	Mr. Chea Tharith	Deputy Director	Marine Fisheries Research and Development Institute, FiA
6	Mr. Lim Chansopheak	Official	Private Sector Department, MoC
7	Mr. Moeun Rattanak	Official	Department of Planning, Trade, and Statistics Information, MoC
8	Mr. Ngoun Chanheak	Official	Department of Export-Import, MoC
9	Mr. Year Bunna	Deputy Director General	General Department of SME, MIH
10	Mr. Seng Pisey	Official	National Productivity Centre of Cambodia, MIH
11	Dr. Georges Dehoux	EU Attaché	Cooperation Sector
12	Dr. Niklas Mattson	Fisheries Sector Expert	EU/FiA
13	Mr. Chhorn Visith	ED	YEAC
14	Mr. Kea Kimsan	Private sector	Home Foods
15	Mr. Lang Kiri	Chief of Fishery Cantonment	Koh Kong Province
16	Ms. Nuo Chhai	Fish sauce processor	Koh Kong Province
17	Mr. Heav Lanh	Representative of Fishermen association	Koh Kong Province
18	Mr. Nhiv Lanh	Representative of Fishermen association	Koh Kong Province
19	Vann Chanda	Private Sector- Ngov Heng fish sauce	Kampot Province
20	Mr. Khin Saravut	Representative of Fishery Cantonment	Preah Sihanouk Province

No	Name	Position	Organization
21	Mr. Chin Samnang	Representative of Dried shrimp association	Preah Sihanouk Province
22	Mr. Mey Chhun	Fishermen	Preah Sihanouk Province
23	Ms. Tan Ou	Dried shrimp processor	Preah Sihanouk Province
24	Narin Sok	HUO	UNIDO
25	Kang Sin	NPC	UNIDO
26	Sreyukem Hong	Marketing expert	UNIDO
27	Dr. Shetty Seetharama Thombathu	Technical Advisor	UNIDO
28	Chenda Keo	National consultant	UNIDO
29	Sarik Chheun	National consultant	UNIDO
30	Chanthana Yus	National Consultant	UNIDO