PROGRAM ON RESPONSIBLE BUSINESS

International Labour Organization

Value chain analysis and competitiveness strategy:

Marine Capture Fisheries

Myeik and Yangon - Myanmar

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First published 2015

ILO Cataloguing in Publication Data

Value chain analysis and competitiveness strategy: marine capture fisheries: Myeik and Yangon, Myanmar / International Labour Organization, ILO Liaison Officer for Myanmar. - Yangon: ILO, 2015

ISBN: 9789221300311; 9789221300328 (web pdf)

ILO Liaison Officer for Myanmar

value chains / fishery development / input output analysis / small scale industry / fishery worker / fishery policy / exclusive economic zone / regional level / Myanmar

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ACRONYMS

AEC	ASEAN Economic Community
ASEAN	Association of Southeast Asian Nations
BDS	Business Development Services
BRDs	Bycatch Reduction Devices
CBM	Central Bank of Myanmar
CMP	Cutting, Manufacturing, Packaging
DANIDA	Danish International Development Agency
DOF	Department of Fisheries
FADs	Fish Aggregating Devices
FDA-DOH	Food and Drugs Administration - Department of Health
FGD	Focus Group Discussion
FIND	Financial Inclusion for National Development
EEZ	Exclusive Economic Zone
GMP	Good Manufacturing Practices
EU	European Union
GSP	Generalized System of Preferences
ILO	International Labour Organization
ISO	International Organization for Standardization
JTEDs	Juvenile and Trash Excluder Devices
KII	Key Informant Interview
MADB	Myanmar Agriculture Development Bank
MEB	Myanmar Economic Bank
MFF	Myanmar Fisheries Federation
MDRI-CESD	Myanmar Development Resource Institute - Centre for Economic and Social Development
MLFDB	Myanmar Livestock and Fisheries Development Bank
OSH	Occupational Safety and Health
SEAFDEC	Southeast Asian Fisheries Development Center
TEDs	Turtle Excluder Devices
UNCDF	United Nations Capital Development Fund
VCA	Value Chain Analysis
WHO	World Health Organization
YCDC	Yangon City Development Committee

EXECUTIVE SUMMARY

Based on data from the Food and Agriculture Organization (FAO), world fishery production in 2012 was at 158 million MT. Marine capture fisheries accounted for 50% of the global production or 79.7 million MT. Myanmar was the 10th highest producer of marine capture fisheries in 2012. Between 2003 and 2012, marine catch in Myanmar increased by 121%, which was the highest among the 18 major producing countries.

The Marine Capture Fisheries VCA is focused on Myeik Township (Tanintharyi Region) and Yangon, which are the key production and marketing hubs of marine capture fisheries. Marine capture fisheries play an important role in the lives of the people and economy of Myanmar primarily through employment and foreign exchange earnings. While freshwater fish is geared primarily for the domestic market, a greater percentage of the marine catch is sold to the export market. According to a 2013 report from the Asian Development Bank Institute (ADBI) on Sustainable Fisheries Management and International Trade in Southeast Asia and the Pacific Region, the marine capture fishery subsector in Myanmar provides employment to about 1,408,000 workers of which 16% are full-time, 18% part-time and the rest occasional fishers. Men are traditionally involved in fishing and wholesale trading while women are engaged in processing and vending in local markets.

The following are the four key value chains in the Myeik and Yangon marine capture fisheries subsector:

a) Fresh Fish/Chilled Fish for Thailand-Myanmar Border Trade: This is the most dominant chain in Myeik. It is estimated that about 70% to 75% of the total fisheries production in Myeik is sold via the Myeik – Thailand border trade. Both inshore and offshore fishing vessels are active participants in this chain. Catch from inshore vessels that meet export standards are either brought to traders in the villages or to floating jetties. The jetties purchase from both traders and fishers. Offshore vessels bring their catch directly to the border. Jetties and offshore vessels deal with Thai brokers and/or representatives of Thai processing and trading companies. Participation of women in this chain is minimal and mostly confined to administrative work.

b) Local Fish Retail Market: Marine fish for local market are sourced primarily from inshore fishing vessels. Artisanal fishers or the inshore vessels can sell either to traders or directly to vendors especially in areas outside of Yangon. Offshore vessels that cater to the local market are those owned by jetties operating auction markets. The jetties sell to wholesalers who, in turn, sell to vendors. Majority of the households buy fish from the wet market.

c) Processed Fish for Export Market: Processors in Yangon procure their fish raw materials from the jetties especially those that have already achieved European Union certification. About 2 of the 5 processing companies in Myeik prefer to have the processing done in their Yangon plant to save on electricity cost. Myeik processors without their own vessels work with a pool of traders who consolidate the catch from the inshore vessels. It is also possible for inshore vessels to deliver directly to Myeik processors.

d) Processed Fish for the Domestic Market: This channel constitutes of small family or women-owned business enterprises with low technologies of processing. Main products consist of dried fish, dried shrimps, fish paste, and fish sauce which do not require freezing process.

Myanmar's fishery sector has been the fourth largest contributor to the gross domestic product and also the fourth largest source of foreign exchange earnings in the past five years. Based on 2011 data, captured marine fish species comprised 55% of the export volume. The exports of shrimps and prawns, which consisted mainly of wild caught marine species, accounted for 6% of the total export volume.

Most of Myanmar's export sales are via the border trade for the regional market. To cope

up with electricity constraints, exporters dispose their stocks at the shortest time possible and with very minimal value addition by selling chilled fish to auction markets and agents at the Thailand, China, and Bangladesh borders.

China is the biggest buyer of Myanmar fish in terms of export value. Myanmar is among the top 3 suppliers of China for the following products: crabs, sole (except fillet), crustaceans, and eel. Myanmar's export volume to China increased by 48% between the period 2009 and 2013. Over the same period, average price per kilo of fish increased by 28%. Thailand is the top destination of Myanmar's marine seafood exports. However, statistics indicate that purchase price is also the lowest among the top export markets of Myanmar. While average export price per kilo for fish shipped to China was at US$ 2.41, the average buying price of Thailand was only US$ 1.02 per kilogram. Thailand primarily buys chilled fish from Myanmar.

The EU removed its Generalized System of Preferences (GSP) status of Myanmar in 1997, after accusations of forced labour. In 2009, the EU banned all Myanmar seafood imports. Imports of wild seafood were re-approved in 2010, while farmed products remain prohibited. The EU reinstated GSP tariff preferences on 19 July 2013, with retroactive application as of 13 June 2012. Myanmar exports to the EU increased in 2013 amounting to €223 million with fisheries products accounting for 8%.

In the domestic market, Myanmar households generally prefer freshwater fish to marine fish. According to FAO 2006 survey, fish account for about 22% of protein intake of Myanmar households. Based on the 2006 annual per capita fish consumption of 21.02 kilograms, inland or freshwater species represented 31.5% while marine species accounted for 23.5%. Fish paste (made of marine and freshwater fish) comprised 45% of consumption. In the domestic market, marine water fish is more saleable as dried fish than fresh. Fish paste and dried prawns or shrimps are the most commonly consumed products.

To enable the marine capture fisheries subsector to provide gainful employment of both women and men and/or improve existing jobs into decent work opportunities, it has to achieve higher levels of competitiveness in terms of price, quality, and regularity of supply. The main challenge for the industry is to evolve to a globally competitive, technologically appropriate yet sustainable production that will: (i) increase exports and expand markets; (ii) increase value addition within Myanmar; (iii) create a stronger internal or domestic market; and (iv) reduce vulnerabilities to economic globalization and climate change.

The table below summarizes the key priority constraints, opportunities, and proposed interventions in the Yangon and Myeik marine capture fisheries subsector.

Summary of Key Constraints, Opportunities, and Interventions	
Constraints and Opportunities	Proposed Interventions
Input Provision	
Constraints Weak compliance to food safety standards and good labour practices in ice distribution and retail Dominance of workers that have had no access to proper training on occupational safety and health (OSH) and hygienic handling of ice **Opportunity** Improvement of skills and work conditions in ice distribution can contribute to reducing cross contamination, wastage, and improvement of chilling efficiency	Development of capacity of ice plants to provide training to their retailers on proper ice handling and OSH to ensure that ice supplied to fishers and intermediaries meet food safety and quality standards
Constraints Existing boat builders lack the skills and exposure to improved, upgraded, and eco-friendly boat and gear design Lack of understanding among fishing vessel owners on cost benefits of investing in improved/upgraded fishing gear and craft; risk aversion, and limited purchasing capacity (capacity to pay upfront) **Opportunity** Improvement and proper maintenance of fishing vessels and modification of gears can contribute to fuel efficiency, sea safety, and reducing overexploitation of inshore resources.	Improvement of access of fishing vessel owners to safe and efficient boats appropriate for trips further off the shore and longer periods at sea through skills upgrading of boat builders Improvement of access to more efficient and selective types of fishing gears through skills upgrading of gear suppliers
Fishing	
Constraints Lack of access among fishers to services and resources that will enable them to adopt sustainable and climate smart fishing technologies Low appreciation of the benefits of complying with sustainable fishing practices/ Lack of business or enterprise management skills among fishers **Opportunity** Sustainable fishing practices can help improve resilience to climate change resulting in overall increase in productivity and better market access. Global buyers are increasingly sourcing only from suppliers certified to be sustainable. Traders and exporters have the strongest commercial incentive to ensure sustainable supply of fish to maintain operations at a profitable level.	Development of local capacity to provide services that will enable fishers to adopt sustainable and climate smart fishing technologies and manage their fishing operations as sustainable businesses

Summary of Key Constraints, Opportunities, and Interventions	
Constraints and Opportunities	Proposed Interventions
Fishing	
Constraints Shortage of skilled crews Lack of know-how on deep sea fishing Lack of training services for vessel crews **Opportunity** Improvement of working conditions and addressing sea safety issues will help in attracting people to take on employment on fishing vessels Availability of trained/skilled crew will reduce time and costs spent by companies for on-the-job training; reduce risks of accidents; improve productivity and potentially improve the adoption of sustainable fishing practices Deep sea fishing has the potential to be one of the driving forces in the country's marine fisheries and can avert declining nearshore marine resources Pursuit of deep sea fishing can help stabilize income of workers especially in the face of prolonged closed season and reduction of licenses.	Development of supply and demand for services aimed at improving technical and sea safety competencies of fishing crews and greening of fishing operations
Trading	
Constraints Weak compliance to food safety and quality standards among upstream players Low appreciation among upstream players on the benefits of safe handling of fish Lack of access to services and resources that will enable them to comply with food safety standards Lack of price incentives for meeting market requirements (including quality) stifles improvements in practices of producers and of marketing methods **Opportunity** Chain wide compliance to international food safety and quality standards will enable the industry to penetrate more discriminating markets Improving the ability of fishers and traders to comply with food safety standards can potentially increase supply for export marketing	Enhancement of capacity of traders/jetties in Myeik to act as mentors on food safety and OSH to their suppliers. Upgrading of fish transportation system from landing site to intermediaries Upgrading of capacity of market administration of wholesale fish markets in Yangon to deliver training or mentoring on food safety and OSH to wholesalers and their workers.

Summary of Key Constraints, Opportunities, and Interventions	
Constraints and Opportunities	Proposed Interventions
Processing	
Constraints High production cost due to low labour productivity and unstable power supply Lack of access to services that will help enterprises especially processing companies to improve productivity **Opportunity** Improved productivity can have a positive impact on the price competitiveness of processed fish products in the international market	Development of local capacity to commercially deliver productivity improvement programs/services to enterprises in the marine fisheries subsector with priority given to the processing companies
Retail Distribution	
Constraints Marine fish except hilsa is perceived of lower quality than freshwater fish Lack of know-how on proper fish handling and display **Opportunity** Clean and sanitary merchandising of marine fish can significantly help reduce postharvest losses and build consumers' confidence	Improvement of access of vendors to services that would enable them to adopt better marketing practices parallel to ensuring that there are sufficient market-based incentives to facilitate upgrading
Enabling Environment	
Constraints Lack of a unified understanding and implementation measures on how fisheries should be managed responsibly, and how fishing operations and trading should be conducted. Weak supply chain collaboration and governance **Opportunity** The Marine Fisheries Law, Code of Conduct for Responsible Fisheries, and the Fishing Convention can provide solid basis for the development of codes of good practice that are consistent with and support the goals of the marine fisheries subsector. A strong and effective Public-Private Partnership will provide the platform to promote changes, innovation and compliance to a Code of Conduct for Responsible Fisheries in Myanmar (with Myeik as the pilot area).	Improvement of supply chain governance and coordination between public and private stakeholders through the development of a Code of Conduct
Constraints Weak capacity of existing associations to either access or provide expanded and diversified technical, marketing, and advocacy services to their members. **Opportunity** Presence of strong associations can help enterprises and workers to effectively and pro-actively respond to changing market requirements and environmental conditions	Strengthening of capacity of local/regional associations to provide market driven services and articulate the needs of members and the industry

Section 1
INTRODUCTION

A. Background information

The Value Chain Analysis (VCA) on the freshwater capture fisheries was conducted to inform the strategy of Component 2 of the DANIDA funded Program on Responsible Business in Myanmar. Component 2, which is being implemented by the International Labour Organization (ILO), aims to support the creation of decent work opportunities for men and women working in Myanmar's fishery and garment industries.

The value chain study on the fishery sector involved three phases, namely:

Phase 1 of the VCA Study, conducted between 15 December 2014 to 16 January 2015, included a desk review of previous studies undertaken on Myanmar fishery sector, data collection and preparatory work prior to the first planned field assessment.

Phase 2 of the VCA was conducted between 13 January to 4 February 2015 involved the shortlisting of seven subsectors within the Myanmar fish industry based on perceived market opportunities and scale of production and undertaking a rapid assessment of each of these subsectors in preparation for the prioritization and further analysis of two subsectors.

Phase 3 of the VCA study was conducted between 16 February 2015 to 6 March 2015 involved further analysis into the two selected subsectors, along with the identification of the types of service provision and interventions the ILO could undertake in supporting the growth and the creation of decent jobs in the industry.

Based on the desk review undertaken in Phase 1 of existing data and reports from the Department of Fisheries (DOF)[1] and development programs[2] as well as interviews and meetings with industry players and representatives from MFF and DOF, the following subsectors were identified for consideration:

- Rohu/Carp
- Tilapia
- Sea bass
- Mud crab
- Prawn and shrimps (cultured)
- Freshwater capture fisheries
- Marine capture fisheries

The shortlisting of subsectors for consideration was primarily based on perceived market opportunities and scale of existing production. Figure 1 shows the relative attractiveness of the seven shortlisted subsectors.

The subsector selection criteria were set to meet the ILO's Program on Responsible Business objective of promoting inclusive and sustainable growth by addressing factors that hinder the adoption of responsible business practices, job generation and implementation of decent work conditions sensitized towards men and women working in the industry. The following selection criteria were established:

- Size and Scale of subsector
- Market Demand and Growth Potential
- Employment Generation
- Upgrading Potential

[1] DOF Fishery Statistics 2013 and 2014
[2] LIFT Program, WorldFish/MyFish, CBI Reports, IDE Discussion Paper, various FAO studies, reports from DOF, MFF, USAID, Dr. Edwards, NAG, and other fishery experts and organizations

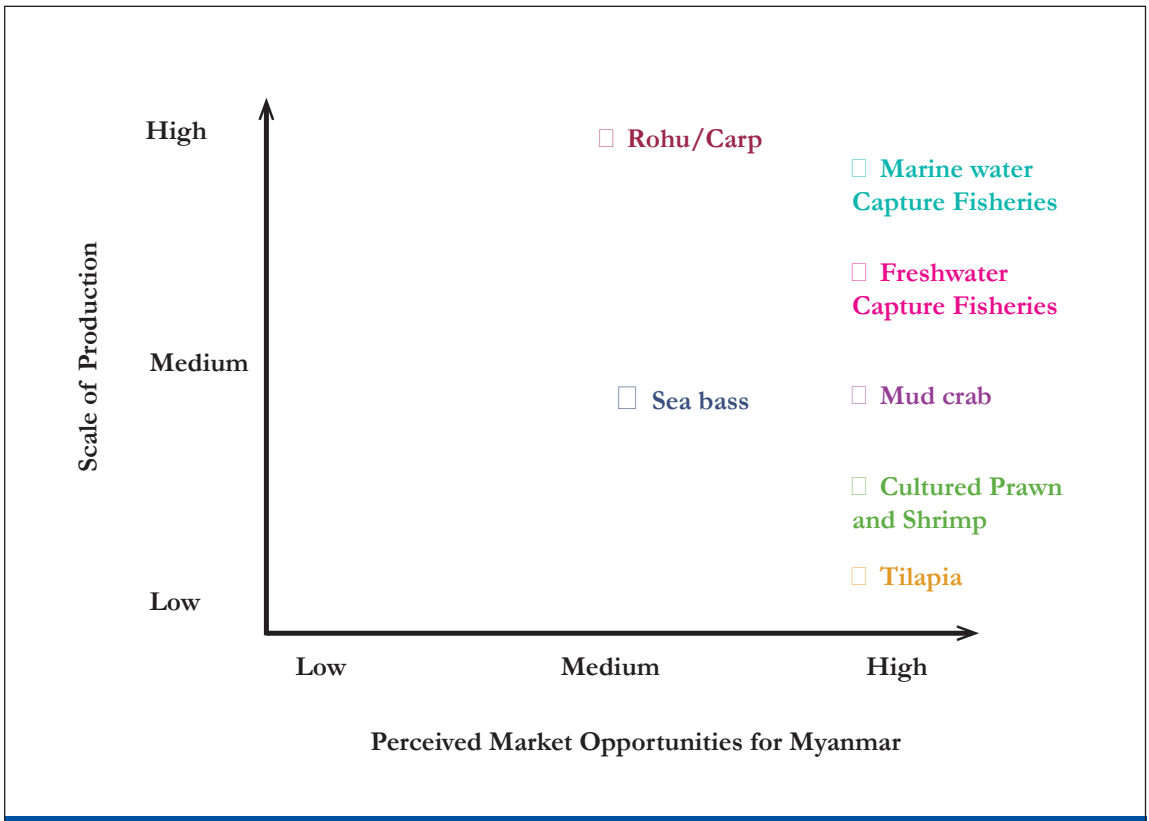


Figure 1. Relative Attractiveness of the Seven Shortlisted Subsectors

In the prioritization of the subsectors, the program also took into consideration those chains where women are already involved and would benefit from the development of the chain with increased income, better work conditions, and skills development.

Each of the criteria was considered to be equally important for the selection of subsectors and, as such, no weight was attributed to the criteria. The ranking and prioritization of the subsectors was undertaken through a participatory approach in which representatives from the industry, MFF, DOF, and labour unions were invited to participate in a half day workshop held on 26 January 2015. During the workshop, ranking and prioritization of the sub sectors was conducted in which participants weighed the shortlisted subsectors against each criterion. Marine capture fisheries, freshwater capture fisheries, shrimps and prawn emerged as the top three priority subsectors. Further meetings with various development programs and industry stakeholders suggest that the ILO Responsible Business Program may be in a better position to respond to the constraints and opportunities in the marine and freshwater capture fisheries than in the prawn and shrimps subsector, where main issues revolve around the white spot disease control and mitigation and improvement of hatchery operations.

The value chain analyses for Marine Capture Fisheries and Freshwater Capture Fisheries have been prepared as stand-alone documents. This Marine Capture Fishery VCA is focused in Myeik Township (Tanintharyi Region) and Yangon. Myanmar has a long coastline of nearly 3 000 km. It can be divided into three coastal regions: the Rakhine Coastal Region (from the mouth of the Naaf River to Mawtin Point, about 740 km in length), the Ayeyarwady Delta and the Gulf of Moattama (Martaban) Coastal Region (from the Mawtin Point to the Gulf of Moattama, about 460 km in length) and the Tanintharyi Coastal Region (from the Gulf of Moattama to the mouth of the Pakchan River, about 1 200 km in length) in the Bay of Bengal and in the Andaman Sea. Although production is dispersed, fish landing sites or jetties are concentrated in Yangon and Myeik.

B. Objectives of the value chain analysis

The overarching objective the value chain study is to understand and identify the systemic factors and conditions under which the marine capture fishery subsector can achieve higher levels of competitiveness with the aim of facilitating the gainful employment of both women and men and/or improving existing jobs into decent work opportunities that are also gender sensitive. Key objectives of the value chain study are to:

a) Provide an in-depth understanding of the range of factors and relationships that affect performance of the marine capture fisheries subsector, including end markets, support markets, labour, enabling environment and coordination/cooperation among firms

b) Provide an understanding of how the nature and structure of the marine capture fishery value chain affect labour and work conditions

c) Identify in a participatory process the systemic chain level issues that hinder or promote the industry's competitiveness in general and the gainful and decent participation and employment of women and men in particular

d) Under a participatory process, identify and prioritize interventions needed to overcome bottlenecks throughout the chain that would foster value chain competitiveness and generation/promotion of decent work opportunities.

e) Identify and explore how to catalyze private and public sector stakeholders in the marine capture fisheries subsector to collaborate for improved industry performance

C. Methodology and approach

An initial desk study was conducted to collect and summarize information from currently available reports and studies. It provided guidance to issues that needed to be the focus of the field research. It should, however, be noted that government statistics on capture fisheries have often been questioned by the industry and there is a consensus among the private sector players of the need to upgrade methods of statistical collection to ensure its reliability. The VCA research team exerted all efforts possible to countercheck and triangulate secondary data with primary data or, at the least, present the different perceptions and opinions of players and stakeholders.

The field work component of Phase 2 and Phase 3 was conducted using qualitative research techniques particularly key informant interviews (KII), small group meetings, and focus group discussions (FGD). Key informants and participants to the meetings and FGDs consisted of farmers, fishers, traders, processors, service providers, and representatives from the Myanmar Fishery Federation (MFF), Department of Fisheries (within the Ministry of Livestock, Fisheries and Rural Development), and development programs. Key informant interviews were used for collecting data on individuals' perspectives, experiences, and quantitative data. Meetings and focus group discussions were effective in generating broad overviews of issues of concerns to the groups or subgroups represented and in the triangulation/vetting of information obtained from the interviews. Key informants and participants consisted of players and stakeholders of the fisheries sector in Yangon and Myeik Township (Tanintharyi Region).

A Stakeholder Consultation Meeting was conducted in Myeik on 24 February 2015. Participants discussed, commented upon, and validated the findings of the VCA. The participants then identified and prioritized key issues facing the industry and suggested possible course of action.

Figure 2. Stakeholders Consultation in Myeik

Constraints and interventions were further elaborated based on iterative and inductive analysis of responses during the KII, FGD, and Stakeholders Consultation primarily from the following perspectives:

- Context of key informants and stakeholders consultation workshop participants
- Third party observations (e.g., government agencies, providers, development programs) were important for suggesting important issues to explore and for substantiating the results of the company interviews
- Experiences of other countries such as Thailand, Philippines, Vietnam, etc.
- Past assessment studies of the Myanmar fisheries industry

Section 2
OVERVIEW OF THE INDUSTRY

A. Production trends

Based on data from the Food and Agriculture Organization (FAO), world fisheries production in 2012 was at 158 million MT. Marine capture fisheries accounted for 50% of the global production or 79.7 million MT. About 76.2% of the production came from 18 countries with China as the top producer. Marine capture production in Japan and Thailand decreased by 22% and 39%, respectively. Japan and Thailand are among the main markets of fish products from Myanmar. Japan has been decreasing its fishing fleet since 1980 and the destruction of fishing vessels and infrastructure in 2011 due to tsunami also contributed to the decline in production. Decrease in Thailand's production was primarily attributed to depletion of marine resources due to overfishing and environmental degradation especially in the Gulf of Thailand and the cessation of fishing operations by Thai vessels in Indonesian waters since 2008.

Myanmar was the world's 10th highest producer of marine capture fisheries in 2012. Between 2003 and 2012, marine catches in Myanmar increased by 121%, which was the highest among the 18 major producing countries. There is an increasing concern among stakeholders on the need to ensure sustainable production. The last marine fishery resources surveys were undertaken during the years 1980 to 1983 and estimated that a biomass about 1.0 million MT of pelagic fish and 0.8 million MT of demersal fish existed in Myanmar waters. Out of this total biomass, 0.5 million MT of pelagic fish and 0.55 million MT of demersal fish (totaling 1.05 million MT of marine fish) were estimated as the Maximum Sustainable Yield (MSY). (BOBLME)

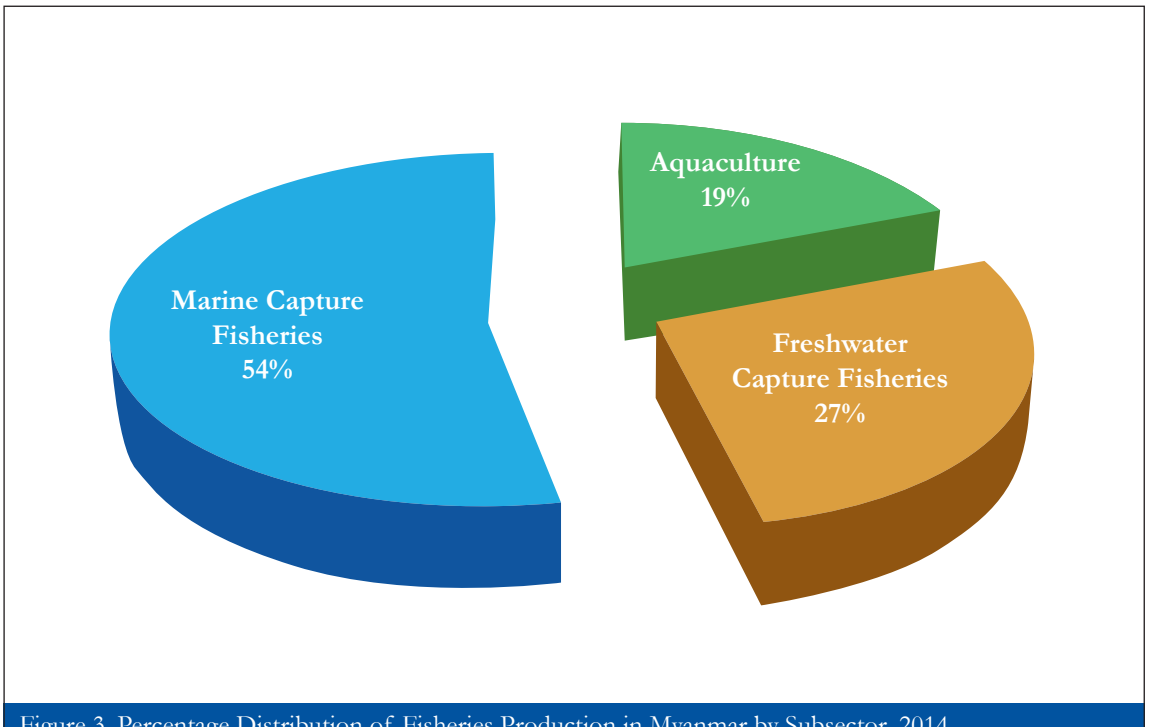


Figure 3. Percentage Distribution of Fisheries Production in Myanmar by Subsector, 2014

Table 1. Major Producer Countries of Marine Capture Fisheries

Rank	Country	Production Volume (MT)			Variation (%)	
		2003	2011	2012	2012/13	2012/11
1	China	12,212,188	13,536,409	13,869,604	13.6	2.4
2	Indonesia	4,275,115	5,332,862	5,240,247	27.0	1.7
3	USA	4,912,627	5,131,087	5,107,559	4.0	0.5
4	Peru	6,053,120	8,211,716	4,807,923	-20.6	41.5
5	Russian Federation	3,090,798	4,005,737	4,068,850	31.6	1.6
6	Japan	4,626,904	3,741,222	3,611,384	-21.9	-3.5
7	India	2,954,796	3,250,099	3,402,405	15.1	4.7
8	Chile	3,612,048	3,063,467	2,752,881	-28.8	-16.0
9	Vietnam	1,647,133	2,308,200	2,418,700	46.8	4.8
10	Myanmar	1,053,720	2,169,820	2,332,790	121.4	7.5
11	Norway	2,548,353	2,281,856	2,149,802	-15.6	-5.8
12	Philippines	2,033,325	2,171,327	2,127,046	4.6	-2.0
13	Republic of Korea	1,649,061	1,737,870	1,660,165	0.7	-4.5
14	Thailand	2,651,223	1,610,418	1,612,073	-39.2	0.1
15	Malaysia	1,283,256	1,373,105	1,472,239	14.7	7.2
16	Mexico	1,257,699	1,452,970	1,467,790	16.7	1.0
17	Iceland	1,986,314	1,138,274	1,449,452	-27.0	27.3
18	Morocco	916,988	949,881	1,158,474	26.3	22
Total 18 major countries		54,764,668	63,466,320	60,709,384	3.3	-4.3
World Total		79,674,875	82,609,926	79,705,910	0.0	-3.5
% Share		73.8	76.8	76.2		

Source: The State of World Fisheries and Aquaculture, FAO, 2014

Based on DOF statistics, fishery production in Myanmar increased from 4,478.21 thousand MT in 2012 to 5,047.53 thousand MT in 2014. Marine capture fisheries accounted for 54% of fish production in Myanmar.

Between 2012 and 2014, marine capture fisheries production registered the highest percentage increase at 16% over the same period. Catch from marine waters increased from 2.33 million MT in 2012 to 2.70 MT in 2014. Assuming that the 2014 production data covered area up to 200-meter depth from the coast, it would seem that Myanmar has encroached into its MSY of 1.05 million MT.

Table 2. Fisheries Production in Myanmar, 2012 to 2014

Ecosystem	Production Volume (in Thousand MT)			% Change 2014/12
	2012	2013	2014	
Aquaculture	898.96	929.38	964.26	7%
Freshwater (Capture)	1,246.46	1,302.97	1,381.03	11%
Marine (Capture)	2,332.79	2,483.80	2,702.24	16%
Total	4,478.21	4,716.15	5,047.53	13%

Source: Department of Fisheries

B. Product description

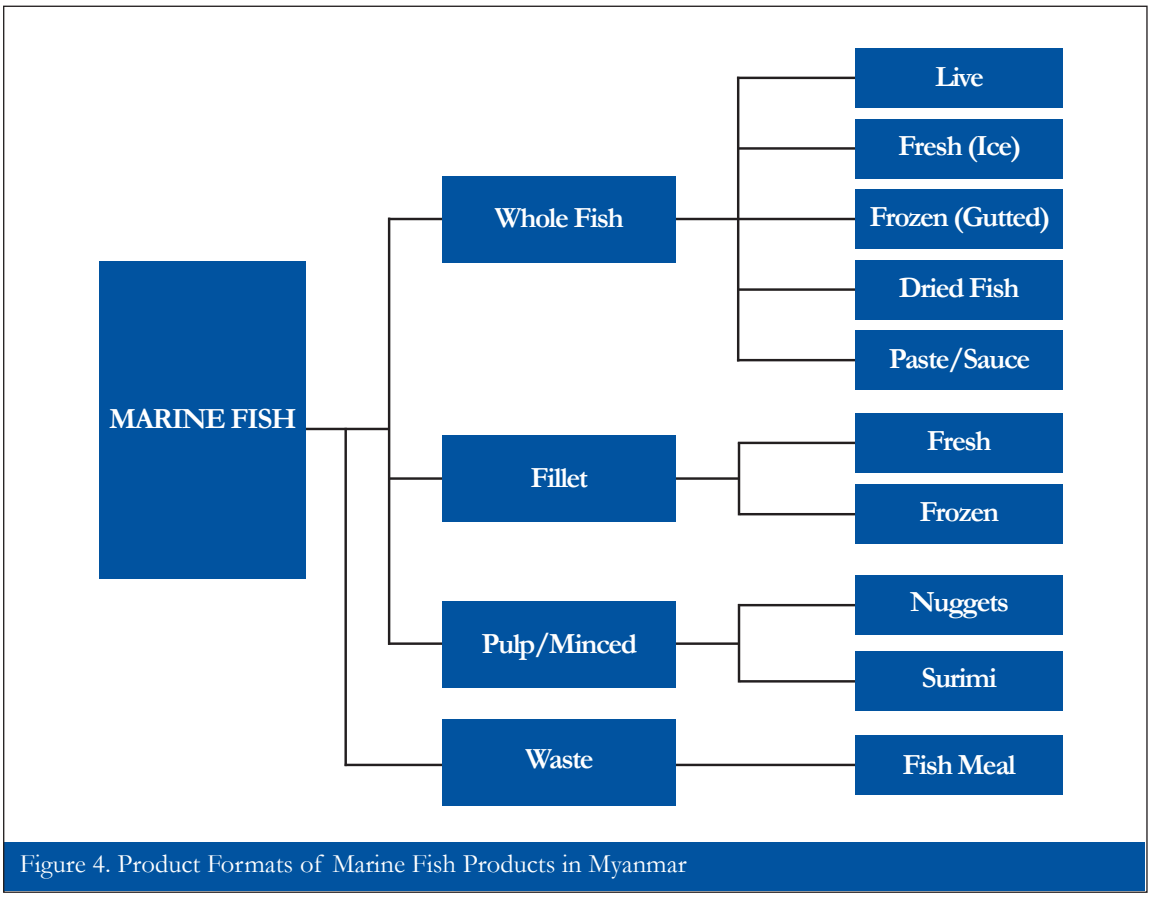


Figure 4. Product Formats of Marine Fish Products in Myanmar

Marine capture fisheries refer all types of harvesting of naturally occurring living resources in marine environments. Past surveys have recorded more than 442 species of fish, prawn, shrimp and lobster in the Myanmar EEZ including deep-sea (beyond 200 fathoms) areas. Out of 442 species recorded, 80 species are considered commercially important. These include sixty-three species of fishes, five species of prawn and shrimp, two species of lobster, three species of shark, three species of ray, one species of squid. Some of the most commercially important species of demersal and pelagic fishes in Myanmar are the sea catfish, trevally/scad, herring/shad/sardines, snapper, goatfish, sea eel/pike conger, threadfin bream, threadfin, grunt/javelin fish, croaker/drum, mackerel, grouper/sea bass, pomfret, lizard fish, hair tail/ribbon fish. Hilsa shad is the most economically important marine capture fishery product. It is the top marine export and also popular in the local market. The list of top commercially important fish species are presented in Annex 1.

Large pelagic fish species such as Swordfish (Xiphiasgladius), YellowfinTuna (Thunnusalbacares), Striped marlin (Tetrapturusaudax), and Sailfish (Istiophorusplatypus) are also said to be abundant in Myanmar offshore waters. These species are relatively still under exploited due to lack of technology and skilled crews. All of the tuna catch by foreign long line fishing vessels in 2010/2011 were landed in foreign ports in Phuket-Thailand, Penang – Malaysia, and Japan.

The most common product formats in which fish are traded in Myanmar are fresh, chilled, frozen, and processed. Processed products consist of fillets, surimi, dried fish, and fish paste and sauce. In Myeik, about 90% of the fish catch is sold fresh with the Thailand border trade as the main market. The Tanintharyi Region is a major supplier of raw materials for the fish processing companies in Thailand and other neighboring countries.

Figure 5. Fresh Fish on ice bound for the auction market at the Thailand-Myanmar border.

Fish sauce, or Ngan pya ye in Myanmar, is one of the basic ingredients in Myanmar cooking. It is used in nearly all Myanmar dishes. It is often used as a marinade for fish and meat. It is also often mixed with fresh-cut or dried chili and used as a condiment. Ngan pya ye has a rich and translucent reddish golden brown color. The basic ingredients of Ngan pya ye are fish (freshwater or marine and sometimes squid), water, and salt. Since fish sauce is fermented, it does not require refrigeration and is best stored in a cool, dark place.

Another similar product is the fish paste or Ngapi. There are two types of fish paste, namely, the Ngapi seinsar or Hmyin Ngapi and Ngapi yae gyo. The Ngapi seinsar is usually made of marine shrimp (preferably the small planktonic types or day old stage shrimps called Gway in Myanmar) which give a better natural pink color to the product. The Ngapi yae gyo is made of small anchovy (Nga par ni) and some marine fish species such as sole fish, elongate ilisha, and sardines. When stored anaerobically in the tubs or earthenware pots, the product is said to keep for about 2 years.

Given the general preference for freshwater fish among Myanmar households, saltwater or marine fish species are generally priced lower than freshwater fish. As such, a greater percentage of marine water fish that do not pass export market standards are usually processed and sold as dried fish.

Fish paste and dried fish are mostly produced in coastal regions in Rakhine state and Tanintharyi region. Fish paste from Dawei produced by smallholders though fetch premium price for their superior quality.

Surimi is an intermediate product made from minced fish meat that has been washed, refined, and mixed with cryo-protectants. Surimi, a

Figure 6. Dried Fish and Shrimp in Local Market

refined form of minced fish meat, is the raw material used in making a wide range of finished products such as imitation crab meat, fish ham, fish sausage, and other seafood analogs. The pulp can also be made into breaded sticks and nuggets. The surimi production in Myanmar is primarily based on the demersal species such as the Threadfish bream, Goatfish, Croaker, Big eye, and the Lizardfish. These species are the most suitable for processing export quality surimi.

Section 3
NATURE AND STRUCTURE OF THE INDUSTRY
A. Value chain mapping

Marine capture fisheries play an important role in the lives of the people and economy of Myanmar primarily through employment and foreign exchange earnings. While freshwater fish is geared primarily for the domestic market, a greater percentage of the marine catch is sold to the export market based on assessment of industry players interviewed. According to a 2013 report from the Asian Development Bank Institute (ADBI) on Sustainable Fisheries Management and International Trade in Southeast Asia and the Pacific Region, the marine capture fisheries subsector in Myanmar provides employment to about 1,408,000 workers of which 16% are full-time, 18% part-time, and the rest occasional fishers. Men are traditionally involved in fishing and wholesale trading while women are engaged in processing and vending in local markets.

The main players of the fisheries marketing system are the suppliers of ice, fishing materials, and vessels, fishers, marketing intermediaries including jetty operators, exporters, and processors. The following are the key value chains in Myeik and Yangon marine capture fishery subsector:

1. Fresh/Chilled fish for Thailand – Myanmar border trade

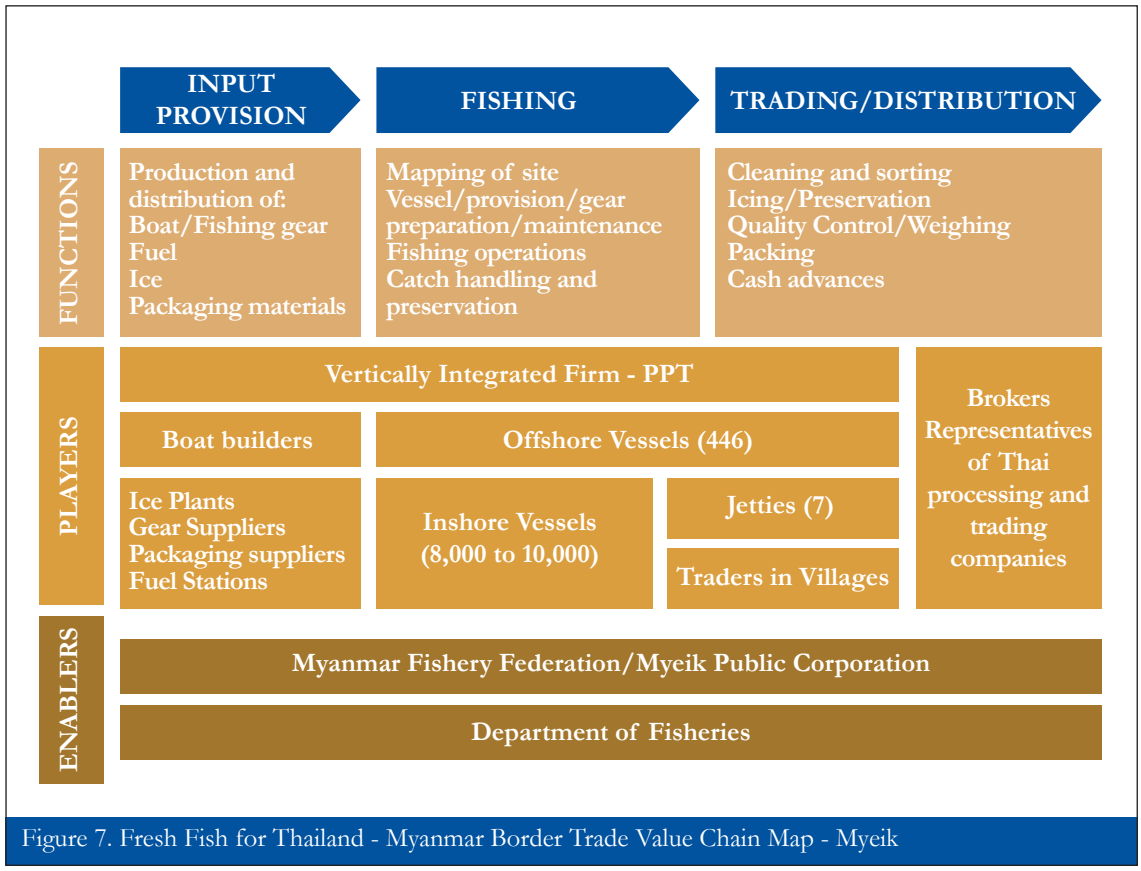


Figure 7. Fresh Fish for Thailand - Myanmar Border Trade Value Chain Map - Myeik

This is the most dominant chain in Myeik. It is estimated that about 70% to 75% of the total fishery production in Myeik are sold via the Myeik – Thailand border trade. According to a presentation made by the Ministry of Commerce, border trade between Myeik and Thailand in 2012-13 was at US$ 125 million with seafood as one of the major export products.

Both inshore and offshore fishing vessels are active participants in this chain. Catch from inshore vessels that meet export standards are either brought to traders in the villages or to floating jetties. The jetties purchase from both traders and fishers. It usually takes jetties two to three days to consolidate enough volume for shipping to the Thai border. Offshore vessels bring their catch directly to the border. Jetties and offshore vessels deal with Thai brokers and/or representatives of Thai processing and trading companies. Participation of women in this chain is minimal and mostly confined to administrative work.

2. Local fish retail market

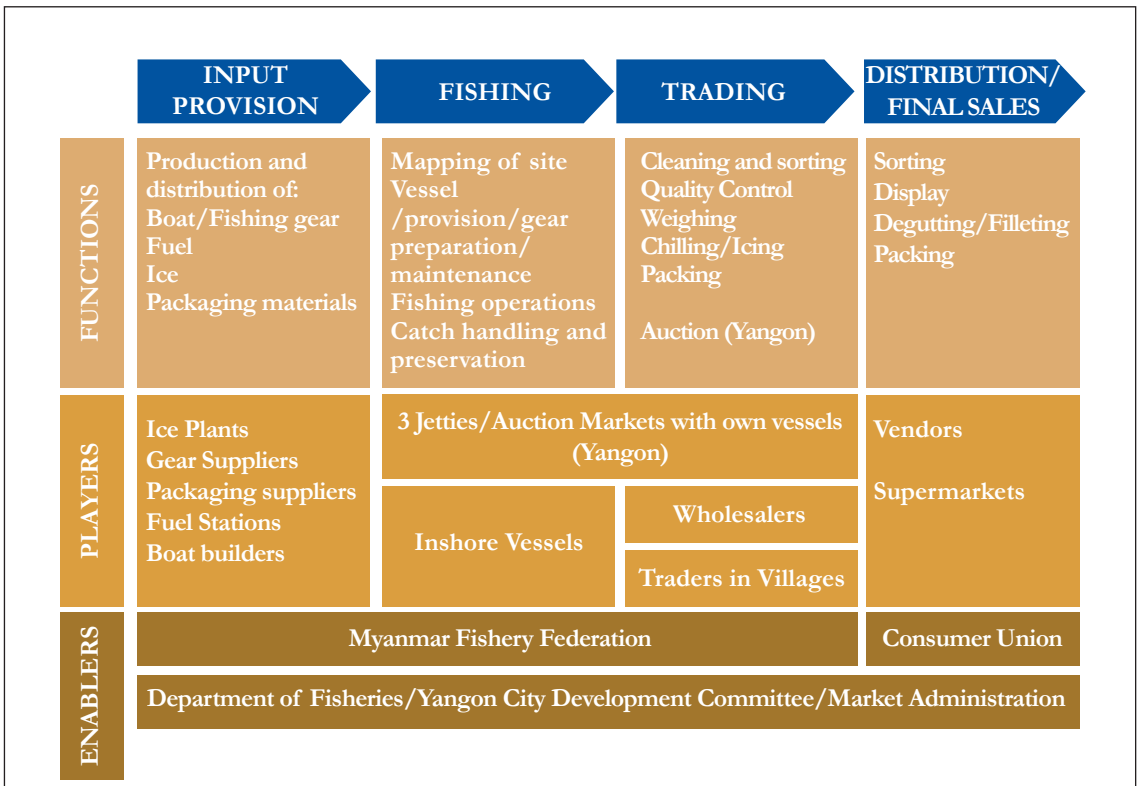


Figure 8. Local Fish Retail Market Value Chain

Marine fish for local market are sourced primarily from inshore fishing vessels. Artisanal fishers or the inshore vessels can sell either to traders or directly to vendors especially in areas outside of Yangon. Offshore vessels that cater to the local market are those owned by jetties operating auction markets. The jetties sell to wholesalers who, in turn, sell to vendors. Majority of the households buy fish from the wet market.

3. Processed fish for export market

Processors in Yangon procure their fish raw materials from the jetties especially those that have already achieved European Union certification. In many cases, Yangon exporters prefer to work with wholesalers or brokers rather than participating in the auction themselves. About 2 of the 5 processing companies in Myeik prefer to have the processing done in their Yangon plant to save on electricity cost. Myeik processors without their own vessels work with a pool of traders who consolidate the catch from the inshore vessels. It is also possible for inshore vessels to deliver directly to Myeik processors.

Women play a significant role in this chain as workers of processing plants. They also assist fishers in the sorting and packing of fish for delivery to jetties and land-based traders.

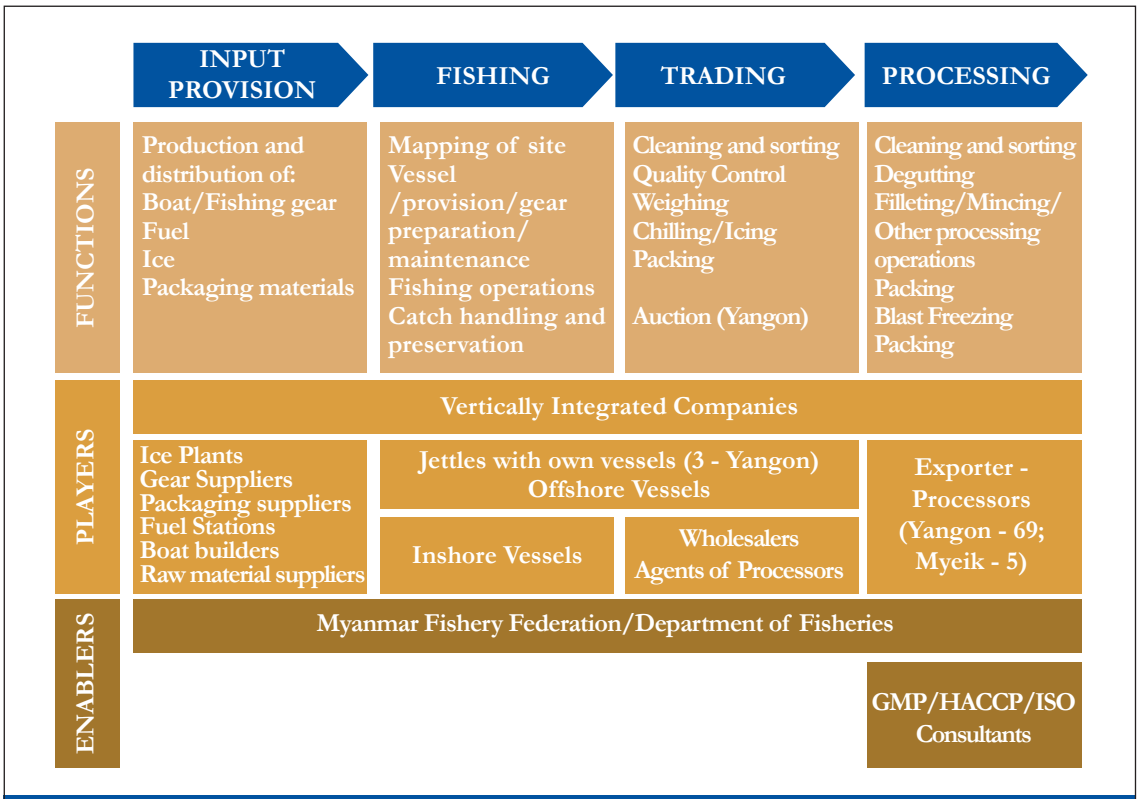


Figure 9. Processed Fish for Export Value Chain Map

4. Processed fish for the domestic market

This channel is made up of small family or women-owned business enterprises with low technologies of processing. The businesses are located close to the landing site and areas around the fishing zones. Main products consist of dried fish, dried shrimps, fish paste, and fish sauce which do not require freezing process. The processors generally buy their raw materials from inshore vessels. In many cases, these micro and small processors also have their own inshore fishing vessels. In Yangon, processors for the local market usually get their fish supply from wholesalers or from vendors in the wet market. Products from artisanal processors are sold mainly by vendors in the wet market.

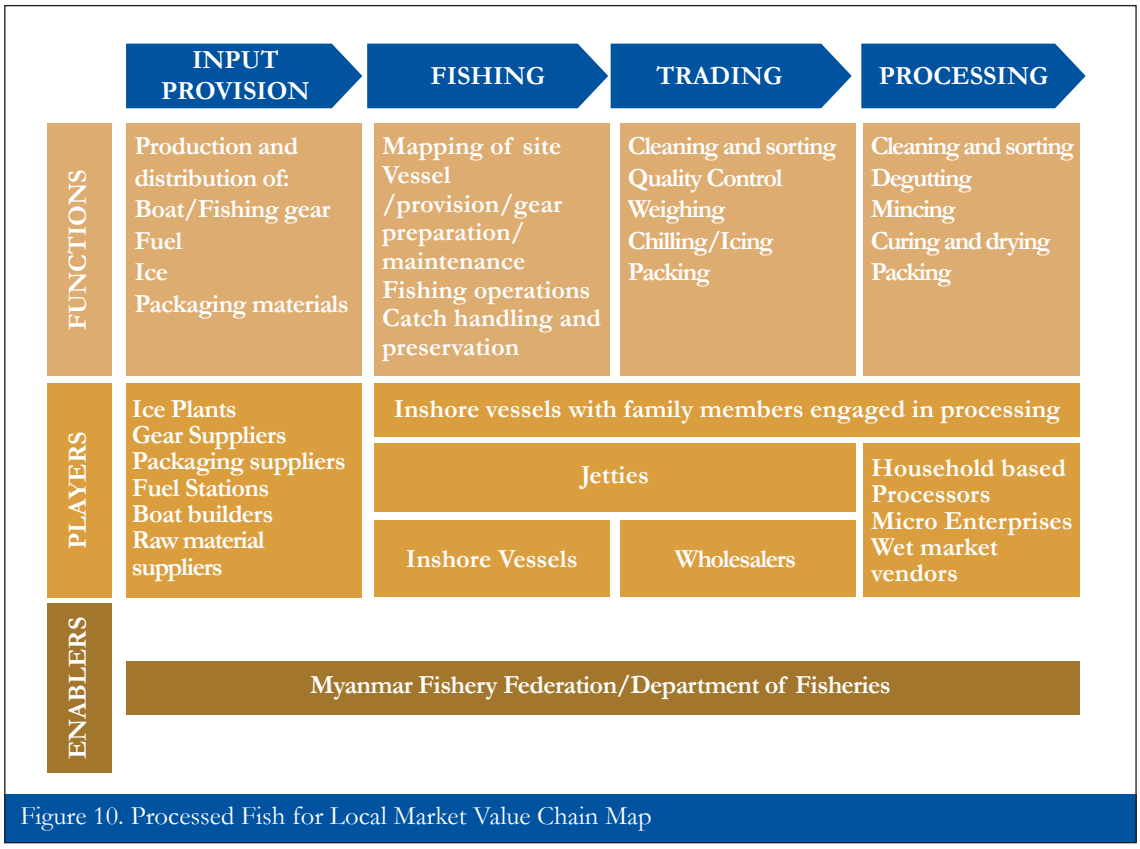


Figure 10. Processed Fish for Local Market Value Chain Map

B. Key players and functions

1. Input provision

Fishing vessels

Boats are bought from boat building yards and from small enterprises specialized in construction of small fishing vessels. Engines are bought separately from retailers. Some fishers build their own boats with the assistance of hired labour and carpenters. Fishers without their own boats work as crews or join owners of fishing boats under a profit-sharing scheme.

An expanded and extended dugout is still a very prominent vessel among traditional fishers at the coast of Myanmar, whether as a small fishing boat or as underbody for larger ships. Myanmar has a long tradition of boat building. Boat builders are skilled craftsmen but generally lack the technical know-how to improve overall design and standards of construction to improve safety at sea, welfare of crews, reduce vessel maintenance, and increase vessel longevity.

Many of the artisanal fishers are only able to procure small fishing vessels that are capable of limited safe operations close to the coast. Upgrading of boats and engines is also something that fishers cannot readily afford or pay upfront. This, to some extent, may have put undue pressure on already overfished areas within the near shore. On the other hand, during the recent years, small fishing vessels are sailing farther from the shore on prolonged fishing trips (e.g., 3 days) to improve their catch and income. In many cases, their crafts have not been designed for such trips and often lack basic safety equipment and appropriate accommodation facilities. Consequently, the crews' safety and welfare are compromised.

Figure 11. Typical Inshore Fishing Vessels

Figure 12. Fishing Net Wholesalers in Downtown - Yangon

Fishing gear

Fishing gear available in the market are for small pelagic and demersal fish species. Gear and equipment for deep sea fishing are not available as these have been traditionally the domain of foreign vessels. Most of the fishing gear materials in the Myanmar market are imported from Thailand by wholesalers based in Yangon and Pathein. The wholesalers sell to distributors in the townships whose main clientele are village retailers. Small fishers buy from retailers while companies with fleet of offshore vessels buy from wholesalers. Price of fishing gear is affected by fluctuations in the exchange rate and the seasonal demand.

Wholesalers sell both materials and ready to use fishing gear. A wholesaler usually has a small manufacturing plant with 5 to 10 workers specialized in the production of different nets. Companies with fleet of inshore and offshore vessels generally prefer ready-to-use nets while artisanal fishers assemble the net themselves with the help of household members or hired labour. Traders and jetties oftentimes provide the fishing gear or extend credit to artisanal fishers to enable them to buy their gear. Payment is deducted from deliveries.

The large diversity of target species in capture fisheries and their wide distribution requires a variety of fishing gear and methods for efficient harvest and stable income throughout the year. Many of the artisanal fishers use only one or two gear due to financial constraints and the lack of skills and know-how to use other gear. Many of the gear available in the market also lack the technical innovation that would allow greater and more appropriate selectivity of catch to reduce negative impacts on the environment.

Figure 13. Ice Retailer in Wholesale Trading Area

Ice

Table 3 shows the indicative number of cold storage facilities and ice plants in Yangon and Tanintharyi. The most commonly utilized type of ice in fresh fish handling is the block ice. A block of ice of about 300 pounds is sold at 3,000 kyats (US$ 3).

Ice is readily available in fish trading areas. The typical practice in many of the wholesale trading places is to grind the block ice onsite before being utilized to chill fish. Retail selling of ice usually takes place in open areas and make-shift sheds. Aside from potentially high melting rate due to sun exposure, the ice blocks are vulnerable to contamination which can affect fish quality. In many cases, ice blocks are pulled over a concrete surface on which people walk and manually lifted to an unprotected ice crusher. The box of crushed ice is then delivered to the stalls by workers using carts or by carrying over their shoulder or back. Protective clothing and equipment used by workers include boots and gloves. A worker earns about 4000 kyats (US$ 4) per day.

Table 3. Breakdown of Ice Plants in Myanmar

	Number of Ice Plants	Capacity of Ice Plant (MT/Day)
Yangon	106	236,406
Tanintharyi	48	25,356
Rakhine	39	456
Ayeyarwady	70	869
Mon	29	528
Mandalay	7	30
Shan	2	320
Total	301	6.785.80

Source: Department of Fisheries

Figure 14. Inshore Fisherfolk with his Gear

2. Fishing practices

Fishers are people who earn their living by exploiting marine resources and/or who own fishing vessels in order to exploit them. Marine fishers comprised 44% of the total number of fishers and fish farmers in Myanmar. Of the 1,397,000 marine fishers in 2013, about 16% were dependent solely on fishing for income while 66% were engaged in fishing occasionally.

Table 4. Number of Coastal Fishers in Myanmar, 2008 to 2013

Type based on time spent on fishing	Number of Fishers					% Change 2013/08
	2008-09	2009-10	2010-11	2011-12	2012-13	
Full-time Fishers	250,000	219,430	220,000	223,000	230,000	-8%
Part-time Fishers	270,000	250,000	251,000	254,000	251,000	-7%
Occasional Fishers	930,000	915,000	916,000	921,000	916,000	-2%
Total	1,450,000	1,384,430	1,387,000	1,398,000	1,397,000	-4%

Source: Department of Fisheries

Number of fishers decreased from 1,450,000 in 2008 to 1,397,000 in 2012 -13. Based on statistics from the Department of Fisheries, number of full-time fishers had the highest percentage decrease at 8% followed by part-time fishers. Interviews and focus group discussions also indicate that number of fishers exiting the sector appears to be higher than number of new entrants. Exit from fishery is primarily due to declining catch and, consequently, income that is almost always not enough to sustain basic needs. Based on anecdotal stories gathered from the communities visited, fishers who have exited fishing may be categorized as follows: a) relatively new to fishery and with low investment capacity; and b) households and/ or fishers that have multiplicity of additional occupations and are not solely dependent on fishing --- where fishers are the sole source of income in a household, they tend to continue fishing regardless of declining catch. Interviews, however, also indicate that where there is a strong cultural affinity to fishing, expansion of household income stream seems to be more likely to subsidize continued fishing.

Marine fishery is composed of the inshore and offshore fisheries. Classification is primarily based on fishing ground and vessel. Basic differences between the two types of fisheries are presented in Table 5.

Table 5. Profile of Inshore and Offshore Fisheries

Parameters	Inshore Fishery	Offshore Fishery
Fishing Ground	Ayeyarwady and Taninthayi: Within 10 nautical miles from shore Rakhine: Within 5 nautical miles from shore	Outer limit of inshore fishing zone to EEZ
Fishing Vessel	Not more than 30 feet long Engine power of less than 25 HP	More than 30 feet long Engine power of more than 25 HP
	Traditional design and construction	
Number of Crews per Vessel	3 to 5	10 to 20
Duration per fishing trip	1 to 3 days	One month to three months
Source: Department of Fisheries		

An inshore fishing operation usually takes 1 to 3 days but the bigger inshore vessels stay at the sea for 15 to 20 days. A typical fishing trip for an inshore fishing vessel usually involves 3 to 5 crews. The coastal populations are traditional sea-faring people with the basic skills for a working life at sea. Skills of majority of the fishers are confined to traditional fishing methods.

Payment of crews may either be in the form of a monthly salary or a share in the net proceeds of the catch depending on the contractual relationship between owner and crews. Average monthly salary of a crew ranges from 80,000 to 100,000 kyats (US$ 80 to 100). Food during the fishing trip is provided by the owner of the vessels. During the recent years, many inshore fishing vessel owners find it more difficult to sustain the monthly salary for crews given the unpredictability of catch.

The sharing of net proceeds of catch is usually the scheme practiced by inshore fishing vessel owners who hire crews by the trip, although often they have informal long-term agreements that loosely tie them to a vessel. The sharing system involves the division of the proceeds of the catch between owner and crew, after operational expenses have been deducted. For example, if there were 4 crews (with owner of gears and boat as one of the crews) involved in the fishing operations, net proceeds of catch will be divided by 6 with owner getting 3 shares --- 1 share as owner, another share to cover depreciation/ repair and maintenance, and another share as crew. In a way, the system of sharing reflects the relative values placed on labour and invested capital. On another hand, the share system also means that crew members share financial risk with owners.

A fishing enterprise may own from one to thirty offshore vessels. Days at sea range from 30 to 90 days. At-sea transshipment by carrier vessels allows offshore vessels to continue fishing for long periods of time without costly runs into port to offload fish when their holds are full. Carrier vessels also often provide other services to offshore fleets, such as bringing food, water, new crews, and spare fishing gear and engine parts.

An offshore vessel above 80 tons employs 10 to 15 workers. Vessels that are bigger than 80 tons employ 20 to 25 workers. Monthly salary of a junior crew ranges from US$ 80 to 120. A captain earns about US$ 150 to 250 per month. Work hours on board fishing vessels can range from 6 to 12 hours depending on gears and catch opportunity. Crew members may be either contractual or permanent employees. Aside from the monthly salary, the crew also receive performance bonus if they reach the target catch. Fishing vessel crews are paid their monthly salary even when on shore. Insurance is also provided. In case of accident or death, the beneficiaries get an amount of up to approximately US$ 1,000.

Figure 15. Offshore Fishing Vessels

Figure 16. Onshore and Offshore Work of Fisherfolks

According to owners of offshore fishing vessels, there is a shortage of skilled workers. The captain usually handles the recruitment of crews. A new crew undergoes on-the-job training. To supplement knowledge of crew, owners provide reading materials and magazines on offshore fishing and sea safety.

Fishers, whether in offshore and inshore fishing vessels, work onshore and at sea. On shore, they unload the catch from the previous trip, repair and clean nets and other gears, clean the vessel, buy supplies, and load gear, ice, and supplies for the next trip. At sea, they navigate the vessel, maintain the boat, engine, and gear, prepare meals, set out and retrieve the gear, and load the catch into the hold.

Small fishing boats comprised 90% of the 29,025 registered fishing vessels in Myanmar. In 2014, about 48% of the 26,179 small fishing boats were motorized. Of the 2,846 offshore vessels in 2014, about 95% were locally owned. Many of the vessels particularly the small boats do not have life jackets or rafts. The boats though carry improvised safety gears such as plastic containers and drums and used tires. Radio equipment is rarely available in small fishing vessels. Accommodation quarters tend also to be very cramped.

The number of licensed fishing vessels in Myanmar decreased from 33,047 in 2009 to 29,025 in 2013. Possible reasons for the decline were: a) existing vessels were too old or damaged beyond repair and licenses were not renewed by DOF; fishing enterprises can only repair fishery damaged boats but are not allowed to build new boats for fishing; and b) exit from fishing especially among inshore fishers and/or reduction of number of boats deployed to save on cost. As can be seen in Table 6, the decrease in locally owned boats was among inshore vessels. The number of small fishing boats decreased by 15% in 2013 compared to 2009 figures. The percentage decrease in non-motorized boats was higher than in powered small fishing boats. Fishers who felt that they cannot compete with bigger and powerful boats opted to explore land based jobs.

Between 2009 and 2013, the number of foreign vessels decreased by 61%. In April 2014, the Myanmar government banned foreign fishing vessels from its waters as one of the measures to ease overfishing. Foreign fishing boats have been

allowed to purchase permits to fish in Myanmar waters since 1989.

Locally owned offshore vessels increased from 1,814 in 2009 to 2,693 in 2013. The government also asked large fishing companies to reduce their fishing operations by 35% during the months of April and May, which coincides with the reproductive season for key economically important species. For 2015, the ban will be for three months (June to August). The Myanmar Marine Fisheries Association has applied for permission to continue fishing at 50% during the close season. A 100% suspension of fishing operations would affect thousands of workers not just the crews but all across the chain.

Table 6. Breakdown of Fishing Vessels by Type of Fishery, 2009 to 2013

Type of Vessels	Number of Fishing Vessels					% Change 2013/09
	2009-10	2010-11	2011-12	2012-13	2013-14	
Inshore Boats	30,842	29,371	27,751	24,914	26,179	-15%
Powered Boat	13,788	13,823	12,288	12,157	12,456	-10%
Non-Powered Boat	17,054	15,548	15,463	12,757	13,723	-20%
Offshore Fishing Vessel	2,205	2,592	2,843	2,863	2,846	29%
National	1,814	2,196	2,598	2,724	2,693	48%
Foreign	391	396	245	139	153	-61%
Total	33,047	31,963	30,594	27,777	29,025	-12%

Source: Department of Fisheries, 2014

The banning of foreign boats and reduced operations of commercial fishing fleets provide some relief to small fishers. According to news reports, foreign boats catch 100 times more fish than the local vessels primarily because the latter have access to modern fishing technology. Industry players estimate that about 70% of the marine fishery production comes from offshore fishing vessels.

Likewise, artisanal fishers sometimes lost their nets when large vessels pass through them cutting through their nets as they sail by.

Generally, local fishing vessels do not go farther than the 50 meter depth line zone due to limitations posed by engine capacities and fishing equipment/gears. The most common types of fishing gears are the bottom trawl, purse seine, drift net, long line, stick held falling net, and traps. Based on license acquisition, the bottom trawl net is the top fishing gear. High catch rates are mainly recorded using trawl, purse seine, gillnet, and stick-held falling net. In Myeik, most of the fishers use trawl net, stick held falling net, and the purse seine.

Table 7. Breakdown of Fishing Gear Licenses Issued in Taninthayi, 2009 to 2013

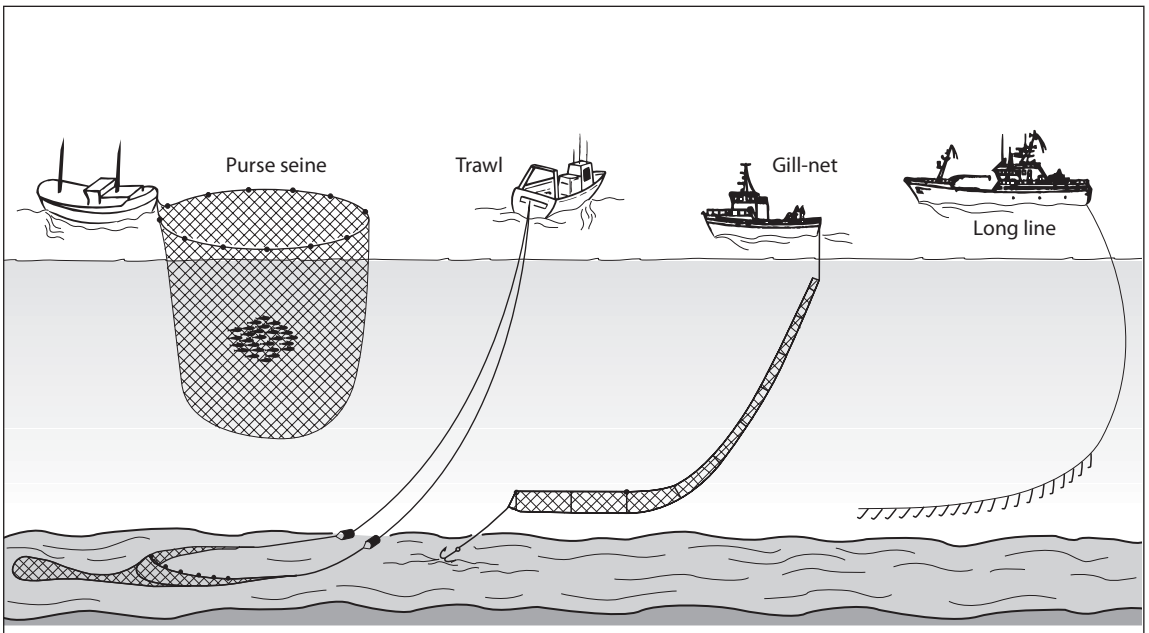
Fishing Gears	Number of Licenses					% Change 2013/09
	2009-10	2010-11	2011-12	2012-13	2013-14	
Trawl nets	480	512	542	564	563	17%
Purse seine	100	88	187	201	216	116%
Drift net	2				3	50%
Long line	0		15	32	26	
Stick held falling net	35	29	302	356	345	886%
Trap	66	66	60	64	104	58%
Total	683	695	1,106	1,217	1,257	84%

Source: Department of Fisheries, 2014

Table 7 shows the breakdown of fishing gear licenses issued in Taninthayi. In 2013, about 45% of the fishing gears issued was for trawl nets. Majority of the licensed trawlers are based in Myeik. Stick held falling net comprised 27% of the licenses. Based on DOF statistics, the number of licenses for fishing gears issued by Taninthayi in 2013 was 84% higher than in 2009. Licenses for stick held falling net registered the highest percentage increase followed by purse seine. Based on interviews, growing popularity of stick held fishing net is primarily attributed to two factors: a) increase in squid population; and b) it can be set using anchored at sea bamboo raft with no engine power. The increase in number of fishing gears is a coping strategy of fishers to cope with declining catch. Majority of fishers interviewed believed that access to a range of fishing gears can significantly increase their income. Many fishers attempt to mask declining stocks with increases in effort, changing fishing grounds (going farther from the shore), and investing in more efficient but not necessarily eco-friendly gears.

The bottom trawl net is the main gear for demersal fish species and the penaied shrimp. Bottom trawling is when fishers use big nets that are dragged along the seafloor, scooping up anything in its path. Each trawler may tow from one to four nets. The use of more than one net improves the rate of catch and, consequently, fuel efficiency. The mouth opening or spread of the trawl depends on the number of nets used. The higher the number of nets, the smaller will be the individual spread. In essence, the critical components to trawl fishery are the mesh size, the trawl wings, use of gear attachments to reduce bycatch, and the tow time. Based on past studies, the catch per unit effort (CPUE) in Myanmar decreased from 300 to 350 kilos per hour/haul in 1975 to 80 to 100 kilograms per hour/haul in 2007. In line with efforts to conserve Myanmar's fish resources, the government increased the mesh size for prawn trawl nets to 1.5 inch (38 mm) and finfish trawl nets to 2.5 inches (63.5 mm) last September 2010. Smaller meshes retain more fish and shrimp, including juvenile shrimp and trash fish. It is, however, difficult to exclude small bycatch finfishes with size selectivity by mesh size regulation because of the similar sizes between prawns and bycatch finfishes.

Number of hours spent in towing varies depending on the target species and objectives of fishing crew members. Fishers targeting shrimp and seeking to minimize bycatch usually tow for not more than one hour. Vessels aiming for more fish and smaller size shrimp species tow for about four hours. Longer tows add to catch volume in the net but, at the same time, reduce gear selectivity. The yield is large but there are many non-targeted species including juvenile fish that are also caught up in the process. Longer tow hours does not automatically translate to high income for fishing crews as catch composition may consist of higher percentage of fish species and sizes that command low price and/or not fit for human consumption.

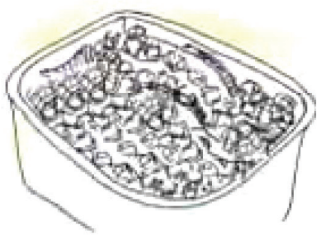


Source: Misund, et al, Fish Capture Devices in Industrial and Artisanal Fisheries and Their influence on Management

Figure 17. Some of the Common Fishing Gears in Marine Fishery in Myanmar

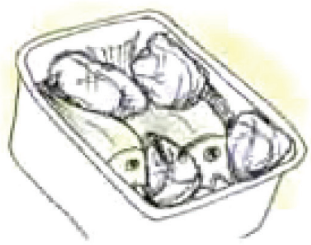
Various devices to reduce bycatch such as Juvenile and Trash Excluder Devices (JTEDs), Bycatch Reduction Devices (BRDs), and Turtle Excluder Devices (TEDs) have been introduced in Myanmar by organizations such as the Southeast Asian Fisheries Development Center (SEAFDEC). No data, however, is available on the extent that these devices have been adopted by Myanmar fishers. For many of the fishers, each and every fish caught has a commercial value and, in essence, catches are all utilized. Fish that are not suited for human consumption are sold to fish meal producers. Undersize fish including juveniles are processed into dried fish, fish paste, and fish sauce. Utilization of bycatch and discard is economically beneficial in the short to medium term, but, on the other hand, it undermines fisheries management and imperils sustainability of both livelihoods and the ecosystem.

According to stories from the fishers interviewed by the team, the use of purse seine nets in Myanmar started in the late 1990s. There are two main types of purse seine nets used by Myanmar fishers, namely: i) fish purse seine for catching pelagic fishes such as the hilsa/scad, mackerel, and sardine species; and ii) anchovy purse seine which is more popular in the Rakhine State. Purse seine operation during the day is usually conducted using a single boat. When the fish school is located by the skipper or leader of the fishing crew through observation of the turbid waters caused by the fish school, the crew rows the vessel towards the fish school and the net is dropped around the fish school. At night, fishers usually use a light boat to aggregate fish before net shooting by the seine boat. Fishing vessels generally cast their nets once or twice per night. Fishing ground of small purse seine is about five nautical miles from shore (about 1.5 hour travel time). The Department of Fisheries does not allow the use of purse seine net less than 3.5 inch mesh size to minimize risks of catching juvenile fish. The fish purse seine nets are generally operated in a traditional manner, without fish aggregating devices (FADs) except for the light.

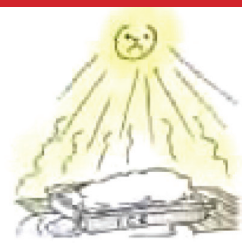


INSUFFICIENT ICE

USE OF DIRTY ICE WHICH CAN ADD BACTERIA AND DIRT



LARGE CHUNKS OF ICE WHICH CAN BRUISE FISH AND DON'T CHILL WELL



EXPOSURE TO SUN > WASTE OF ICE, FISH, AND MONEY

Source: Ward, et al, SmartFish Working Papers

Figure 18. Some of Icing Practices that Contribute to Fish Quality Deterioration and Loss of Income

The most common holding container for fish catch is plastic ice box. Fishers usually bring with them blocks of ice at the start of the fishing trip. For offshore vessels, ice is replenished by the carrier vessel. Block ice melts slowly and contains less water at the time it is crushed. In many cases, the ice box is exposed to the sun which can result in increased ice consumption or inadequate use of ice. Poor fish handling such as throwing or dropping the fish into the ice box can bruise the fish which can then cause contamination. Bruised fish generally command a low price. Some of the common failings in hygiene that can result in germs being passed on to the fish and its contamination, are failure to wear clean, protective clothing, non-washing of hands before handling fish, and the use of plastic barrels that have not been thoroughly disinfected and cleaned.

3. Trading

Fishers in Myeik, who catch sufficient volume of fish to cover transportation costs, sell directly to processors and jetties. Women or the wives of fishers are usually involved in the packing and delivery of the catch. Fishers selling to export oriented enterprises have better fish handling and packing practices than those selling to the local market. Catch intended for the local markets are usually delivered in plastic crates wrapped in plastic bags with crushed ice. Provision of stainless tables for sorting will help in improving efficiency and compliance to food safety standards. Processors or the jetty owners generally provide advice to their suppliers on proper handling.

Fishers may also sell directly to vendors in the local market. Fish are usually landed in open air landing sites. The landing sites generally do not have sufficient facilities that would allow fish to be handled hygienically, safely, and efficiently. Fishers normally do not invest in ice at this stage. As such, unloading and delivery have to be done swiftly. Fish catch are immediately loaded into carts lined with tarpaulin and transported via motorcycles with side carts.

The following are the key intermediaries in the Myanmar fish marketing system:

Figure 19. Sorting, Grading, and Delivery of Catch at an Exporter-Processor's Jetty in Myeik

Figure 20. Mode of Transportation Fish Catch from Landing Site to Local Market - Myeik

a) Traders/Fish collector at the village

The fish collectors earn their living from purchasing and collecting fish from small fishers. When catch is small, fishers sell their products directly to households in the village or to the fish collector to save on travel and transportation costs. Sale of fish has to be done as quickly as possible to avoid quality deterioration and to save on ice cost. Sales to fish collectors are usually conducted in small landing sites, which almost always have rudimentary facilities.

Fish collectors sometimes receive financing from owners of jetties/consolidators for the cross-border trade and processors. The financing from buyers is used to provide cash advances to fishers to cover daily food needs or purchase and/or repair fishing gears. The cash advances are repaid in installments deducted from catch sales.

b) Consolidators for Thailand-border trade/owners of floating jetties

The Myeik consolidators of fish for the Thailand-Border Trade operate by direct contact with the fishers or by buying from village level fish collectors. The consolidators have floating jetties which make them readily accessible to small fishers and traders. The consolidators provide credit and cash advances to their suppliers.

The enterprise employs around 10 to 20 workers. A worker in a jetty earns about US$ 3 to 5 per day. The workers are also provided accommodation within the floating jetty. Work in the jetty depends on arrival of catch. Main tasks of workers involve receiving and quality control, cleaning, sorting, grading, weighing, and packing of fish. Workers learn the trade from peers and senior staff of the enterprise. Senior workers and the owners also provide guidance to their suppliers on fish handling based on norms and standards known to them and from their cross-border trade experiences.

The jetties rely on ice and ice boxes to retain quality and freshness of fish. Each fish is usually packed in a plastic bag to improve chilling. It is crucial that all deliveries are immediately iced and stored in the ice boxes within one to two hours after delivery. The fish are held in the jetty for two to three days prior to sending to Thailand border

Figure 21. Floating Jetties in Myeik

via carrier vessels. The consolidators or the jetty owners usually have established relationship with brokers and agents at the Thailand – Myanmar borders.

c) Jetties operating auction markets (Yangon)

Although production is dispersed, fish landing sites or jetties are concentrated in Yangon and Myeik. Private jetties provide fishing port and marketing services to their members. Shwe Zi Yaw Hein (SZYH), for instance, caters to about 186 vessels owned by their members. The company has about 285 workers in the jetty and an average of 20 to 30 workers per vessel. Jetty workers, consisting of both male and female, earn 3,000 to 5,000 kyats per day (US$ 3 to 5) and are provided with free lunch once a week. SZYH is among the three jetties that have already received EU certification.

Anawar Fisheries Holding Co., Ltd. operates the Nyanung Dan Jetty. The company has about 200 fishing boat members with majority of the vessels with gross tonnage of around 100 MT. About 95% of the boats use bottom trawl nets. About 10% of total landing of this port is surimi raw material. A jetty owned by U Ah War in Kyimyindine Sanpya Wholesale Fish Market serves about 80 boats.

The fish landed in the above jetties are auctioned per product per boat. The companies are continuously upgrading practices so as to be compliant with Good Manufacturing Practices (GMP) and the Hazard Analysis & Critical Control Points (HACCP).

Exporters or their agents source most of their raw materials from these jetties. Other buyers of the jetties include wholesalers who, in turn, distribute the fish products to vendors, supermarkets, hotels, and restaurants in various states and regions in Myanmar.

Figure 22. Operations at EU certified Jetty

d) Wholesalers (Yangon)/ Wholesale market

Wholesalers range from micro to medium scale enterprises. It would seem that workers of wholesale fish companies are not yet that knowledgeable on Good Manufacturing Practices (GMP) and proper fish handling. This gap can potentially undermine the efforts of private jetty operators and exporters to comply with international food safety standards. The more progressive wholesale companies are those dealing with exporters and hotels.

Sometime in 2012, the Yangon City Development Committee (YCDC) opened the Shwe Pa Dauk wholesale market in Hlaingg Township. The market is a joint venture between Tauk Htun Construction Company and YCDC. The establishment of the market was aimed at encouraging wholesalers to upgrade their practices to international standards and to provide sellers and buyers a convenient place for trading and negotiations.

The market has 432 stalls with dimensions of 18 feet x 11 feet. A bare stall cost about US$ 30,000, which is payable in installment for a period of three years. With the installment payment terms, anticipation of eventual transfer of fish trading in new venue, and promise of full blast marketing campaign, more than 50% of the stalls have already been sold as of February 2015. Only about 50 stalls though are in operation. Many of the stall owners prefer to concentrate in their old space in the Sanpya Wholesale Fish Market as there are only few customers in Shwe Pa Dauk. The Sanpya Wholesale Fish Market has about 200 shops and 400 to 500 sellers. Players estimate that about 4,000 to 5,000 MT fish are sold every week. According to one marine fish wholesaler, he is able to sell more than 1,600 kilograms of fish or an equivalent of 2 million kyats (US$2,000) from midnight to 5 am.

At the wholesale market, porters unload the fish from the truck or boat carrying about 100 to 200 kilogram boxes on their shoulders if no carts are available. Some workers are permanent

(employees of wholesalers, transport companies, and the Central Inland Freight Handling Committee/Inland Transport Department of MOLES) and some are independent. On a busy day, an independent porter earns about 8,000 kyats (US$ 8). A porter is paid approximately 800 kyats per trip. There are some female workers in wholesale fish markets. They are usually in-charge of selling the fish or doing some intermediate processing.

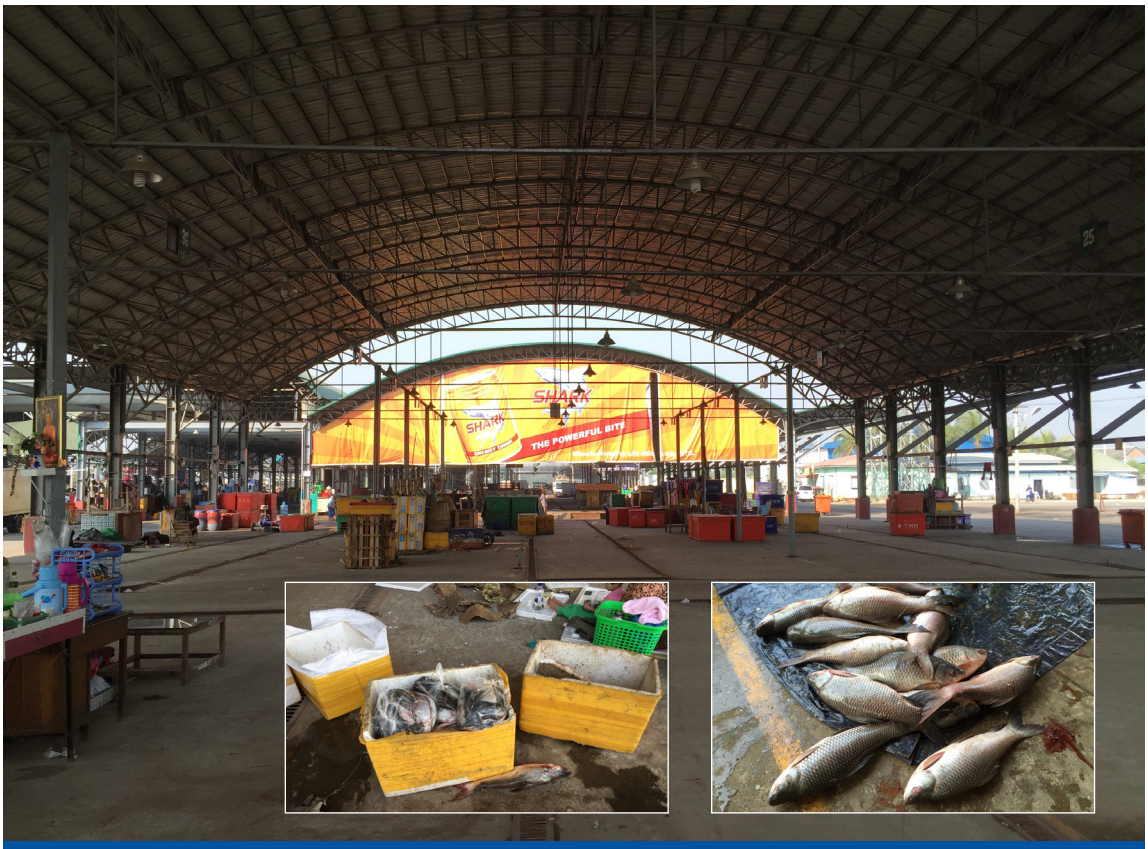


Figure 23. Wholesale Fish Market

e) Retailers/Vendors in Wet Market

The retailers and vendors are the last link of intermediaries in the chain before the consumer. Public markets currently hold a significant share of the retail trade of fresh fish, fermented and dried fishery products. Retail marketing of fish is a traditional role of many women from lower socio-economic background.

Range of activities in fish retail vending includes weighing, gutting, cleaning or cutting a whole fish to the desired size or product form. Cleaning, gutting, and slicing are marketing tools employed by vendors to maintain the loyalty of regular clients and attract new customers.

Vendors pay 1 to 2 million kyats (US$ 1,000 to 2,000) per stall. The stalls can be paid in installments for a period of up to 3 years. Likewise, they also have to pay the monthly tax and fees for security and cleaning.

Icing and repacking of fish are done in any available space. Sanitary standard operation procedures are not in place. Behavior and practices of vendors and their helpers are generally governed by informal norms, which, in many cases, demonstrate the lack of know-how and emphasis on basic food safety and quality standards.

Typical Stall inside the Market

Figure 24. Fish Vendors in Wet Market

4. Processors

According to a 2010 report from SEAFDEC on GMP adoption in ASEAN, Myanmar has about 496 registered food processing companies in Myanmar. Interviews with stakeholders indicated that there are about 116 processing companies that are primarily producing for the export market with majority exporting to China. According to the CBI report on Myanmar Seafood Export, fourteen companies (13 in Yangon; 1 in Ayeyarwady Region) have permit to export to European Union countries as of 2013. Five to 10 companies are in the process of applying for EU certification. In Myeik, there are 5 export oriented processing companies.

Marine fish are processed using traditional and modern technologies. Most of the traditionally processed fish are consumed locally. Micro and small-scale processing establishments are generally household-based or operate in make-shift production areas. Processing can also take place in trading areas such as wet markets and wholesale fish centers. The products processed in micro and small-scale processing establishments include minced fish, fish paste, fermented fish, fish sauce, sun-dried and salted-dried fish, and smoked fish. The enterprises employ about 10 to 15 workers. In some cases, workers also help in trading activities.

News reports in February 2015 indicated that dried fish and fermented fish companies are having difficulties in getting workers due to migration. Many of the workers migrated to neighboring countries like Thailand and Malaysia based on promises of higher paying jobs. The lack of workers has led to an increase in the average wage from 3,000 kyats to 8,000 kyats per day. Consequently, fish paste prices have increased from 1,000 kyats per viss to 2,000 –

Figure 25. Micro Scale Food Processing

2,500 per viss. Similarly, the price of dried fish increased from 8,000 – 10,000 kyats to 15,000 – 18,000 kyats per viss.

Export oriented processing companies produce intermediate products such as frozen whole fish and fillets, surimi, and dried fish/shrimps. The companies employ from 150 to 2,000 (multi-product) workers. Factory workers earn an average of 3,000 to 5,000 kyats per day. Companies like Ocean Harvest in Yangon and Pyi Phyo Tun Co., Ltd (PPT) in Myeik provide housing to workers. Ocean Harvest also provides free meals and healthcare for its employees. Labour in processing companies is dominated by female workers.

Many of the export oriented processing companies are operating at 50% of their production capacity due to lack of supply of fish. About five companies are said to have diversified into cutting, manufacturing, packaging (CMP) operations to promote better utilization of their facilities and workers. Companies though are having difficulties in competing with Thailand and Vietnam which generally are able to offer lower prices. A study conducted by McKinsey Global Institute in 2010 showed that while wages are relatively low in Myanmar, labour productivity is also low. On average, a worker in Myanmar adds only US$ 1,500 of economic value in a year of work, around 70% less than the average of seven other Asian countries. Companies are also faced with increasing cost of diesel, which is needed for the back-up generators given the intermittent supply of electricity in the country.

Many of the companies are working towards upgrading their infrastructure, processes, and products to comply with international standards. The problem though is that many of their suppliers are not yet compliant with export market requirements and are lagging behind in productivity.

Figure 26. Export Processing Company

C. Nature of interfirm relationships

1. Horizontal relationship

Among private sector players, the main unifying body and driver of development initiatives in the fishery industry is the Myanmar Fisheries Federation (MFF). The creation of MFF was driven mainly by two factors:

- Pressure on Myanmar during the period of its accession to ASEAN to increase the representation of civil society in local and national administration
- Government policy to develop a market economy by encouraging private enterprise

Sectoral associations under the umbrella of the federation are the following:

- Myanmar Shrimp Association
- Myanmar Fish Farmers Association
- Myanmar Fishery Products Processors and Exporters Association
- Myanmar Aqua Feed Association
- Myanmar Marine Fisheries Association
- Myanmar Freshwater Capture Fisheries Association
- Myanmar Crab Entrepreneurs Association
- Eel Entrepreneurs Association
- Ornamental Fish Entrepreneurs Association

The following regional and state associations were also formed under the umbrella of the federation with the main objectives of facilitating the development of the fishery industry and promoting cooperation between and among fishery enterprises:

- Yangon Region Fisheries Federation
- Bago Region Fisheries Federation
- Ayeyarwady Region Fisheries Federation
- Mon State Fisheries Federation
- Kayin State Fisheries Federation
- Mandalay Region Fisheries Federation
- Rakhine State Fisheries Federation
- Taninthayi Region Fisheries Federation
- Sagaing Region Fisheries Federation
- Kayah State Fisheries Federation
- Kachin State Fisheries Federation
- Shan State Fisheries Federation
- Magway Region Fisheries Federation

As of August 31, 2013, the federation had 33,535 members. Support services provided to members include the following:

- Support applications of members to DOF to undertake fisheries and aquaculture activities
- Support loan application to Global Treasure Bank (formerly Livestock and Fisheries Bank)
- Policy advocacy/ Serve as the unified voice of the fisheries industry
- Facilitate access of members to training, technology, and resources to grow their businesses
- Expand and strengthen the marketing network of members and the fisheries industry as a whole
- Promote camaraderie and fellowship among and between the fishery enterprises

Among the inshore fishers though, horizontal collaboration is still weak. Each fisher tends to work in isolation. Selling takes place at the individual level with few opportunities for price transparency and bargaining. Based on interviews conducted with fishers, majority felt that it would be difficult to undertake collective entrepreneurial activities and they have had no experience in working together as a means of strengthening their own businesses and improving collective bargaining position.

Among traders, horizontal relationships are informal and cooperation it seems is geared towards ensuring control of buying price of fish. There seems to be also an informal allocation of sourcing areas among traders to ensure availability and reduce competition.

Public markets usually have an association or market committee. This body is mainly dealing with stall issues. Entrepreneurial efforts to improve fish quality and food safety are lacking or weak.

2. Vertical relationship and supply chain governance

Fresh fish trade is adapted to 'large volume-small margin' operations which imply that most endemic losses in production and market chains are simply built into the economic systems. Profitability of operations is established over a number of cycles of operation rather than on the basis of individual cycles, with enough slack built into the system to withstand occasional losses at the markets.

Generally, each fish seller has her/his own set of regular customers or serves a particular area. While prices between fishers and intermediaries are almost always dictated by the latter, transactions between vendors and end consumers transactions are oftentimes never complete without haggling for long periods before finally settling upon a price. Quality control is done visually and based on local norms.

Marketing relationships between intermediaries or processors and fishers are informal and characterized by the concept of personalized economic relations. The preferred supplier-buyer relations proliferated in efforts to find ways to minimize risks and vulnerabilities to opportunistic behavior and cheating (for both trader and fisher). The depth of each relationship differs but, over time, repetitive transactions with the same person lead to the development of trust. On both sides, there is reduced search, negotiation, and monitoring costs because the supplier lives up to the norms and values of reciprocity and comes close to becoming part of the family mindset. The bonds between people engaged in exchange are determined by informal rules or social institutions and serve to enforce the terms of the exchange.

The preferred supplier-buyer relationships are often strengthened by the provision of credit. Intermediaries are the main sources of loans/cash advances. Fishers who sell their catch on a regular basis to one particular buyer are able to call on that buyer not only for loans for boats and gear but also for family emergencies, an "in-kind" (basic food commodities from store owned by traders) and cash advances when catch is zero or very low. Since buyer knows the regular value of catch landed by a fisher to whom he/she extends the loan, the buyer is in a position to collect on their debts. If the catch is poor, no deduction is made from the proceeds to repay the principal of the loan. The extension of loans is a way for buyers to ensure loyalty of suppliers and, consequently, their supply. However, price paid to fishers with debts is sometimes lower than prevailing market price to cover "cost of money" (interest rates). In a sense, buyers exert monopsonistic control over prices paid to fishers with debts. On the other hand, this informal credit mechanism enables fishers to continue operations even after a period of poor fishing.

Cooperation among intermediaries (e.g., agreeing on which price to buy the fresh fish) is common and leads to a kind of monopolistic buying behavior. The prices are usually influenced by the cross-border auction trade and serve as reference point for their own procurement. Market-based governance or arm's length transaction is dominant in the domestic market. Formal cooperation and documentation or paper transactions among players are rarely practiced since the entire operation is based more on trust and mutual understanding than on formal business practices.

In the border trade, offshore vessels and the consolidators/floating jetty owners are usually "price takers". Although Myanmar vessels and consolidators supply bulk of the fish in the border trade, brokers and buyers take advantage of the fact that fish are perishable and Myanmar sellers would most likely want to dispose of their goods as soon as possible since cost of cold storage would be very high. A broker gets a fixed commission of 4% to 5% based on the selling price of the owner of fish stocks.

3. Gender

Women and men in traditional coastal communities have sharply defined roles. Fishing is almost always a male domain. Women's most prominent role is in processing and marketing. Oftentimes, women help their husbands in the sorting and packing of fish especially if these are to be delivered to export oriented enterprises.

In fish processing, more than 60% of the workforce appear to be women. Female workers in processing plants are away from their homes for longer periods during the day making it more difficult for them to fulfill their domestic roles. Work hours are sometimes governed by deliveries made by fishers and traders. Given the perishability of fish and the high cost of electricity, it is imperative that fish are processed in the shortest time possible.

Most house-based and small processing enterprises are managed and operated by women. Retail marketing is dominated by women while wholesale trading is usually managed by men although women help in the manning of the stalls.

Because women and men do different tasks, they have different knowledge from their experience. Men are generally more knowledgeable on yields and seasonal variations in catch while women are more conscious on price and market fluctuations. By combining both women's and men's knowledge, it may be possible that higher benefit and more sustainable use of natural resources can be realized.

D. Price and cost structure

1. Input provision

Table 8. Indicative Costs and Returns Per Fishing Trip of an Inshore Vessel

Assumptions
Number of Days at Sea: 15

Particulars	Unit	Quantity	Unit Price (Kyat)	Total Amount (Kyat)	% Share to Total Expenses
Materials					
Ice	kg	6,500	132	858,000	54%
Fuel	liters	200	600	120,000	8%
Labour					
Food	person days	60	3,000	180,000	11%
Labour	person	4	50,000	200,000	13%
Cigarettes/betel nut	person	4	7,500	30,000	2%
Maintenance and Depreciation					
Depreciation	Share/trip			210,000	13%
Total Expenses				**1,598,000**	**100%**

Income of Inshore Fishing Vessel Owner per Fishing Trip	
Average Catch per Fishing Trip	700 kilograms
Production Cost/Kilo	2,283 Kyats
Unit Price/Kilo	2,800 Kyats
Gross Sales	1,960,000 Kyats
Net Income (before tax)	362,000 Kyats
Profit Margin	18%
Input – Output Ratio	1.23

Source: Interviews

Costs involved in fishing operations include fixed and variable costs. Fixed costs include the depreciation costs of fishing gears and the vessel. Adequate investment and re-investment in fishing gears and crafts is required to sustain optimal levels of output in fishing. Thus, the higher the levels of capital input employed, the higher production is likely to be.

Total variable costs in a fishing operation depend essentially on the fishing effort. Ice is the major expenditure item accounting for 54% of the total costs per fishing trip. When cash is tight, fishers reduce the volume of ice.

Labour and food expenses comprise 26% of the expenses. Fishing is labour intensive and every activity in the business, from going to sea, mending of gears and crafts, unloading the catch to marketing require an adequate amount human effort. Fish catch is also dependent on the skill of the fisher.

In a 15 day trip, volume of catch can range from 600 to 800 kilos. Fishers usually get a mix of high value and low value species. Generally, 50% to 60% of catch consist of species with price ranging from 1,000 to 4,000 kyats per kilo. At an average price of 2,800 kyats, gross profit per kilo of fish is about 518 kyats or a profit margin of 18%.

2. Relative financial position of players

Table 9. Relative Financial Position of Players: One kilo of Freshwater Fish Sold in Wet Market

Players	Cost			Profit			Margin	
	Total Unit Cost	Added Unit Cost	% Added Unit Cost	Unit Price	Unit Profit	% Profit	Unit Margin	% to Price
Fisher	2,283	2,283	89%	2,800	517	70%	2,800	85%
Floating Jetty	3,080	280	11%	3,300	220	30%	500	15%
Total		**2,563**			**737**		**3,300**	

Source: KII

Total cost to produce and sell one kilo of fish at the cross border trade is about 2,563 kyats. About 89% of the total expenses represents fishing costs. Jetty's costs, which comprise 11% of the cost, involve primarily ice, labour, transportation, and the commission of the broker who handled the actual selling.

The total profit earned by the chain per kilo of fish is 737 kyats. Fisher has the highest percentage share of the profit at 70%. However, fisher's percentage share of the profit is lower than his/her percentage contribution to added cost. The jetty gets a profit of 220 kyats per kilo of fish which is about 30% of the total profit. The trader's share of the profit is higher than his/her percentage contribution to total costs. The relative financial position analysis indicates there is a need to improve productivity and efficiency of fishers. Improvement in productivity will also help fishers in coping with price fluctuation.

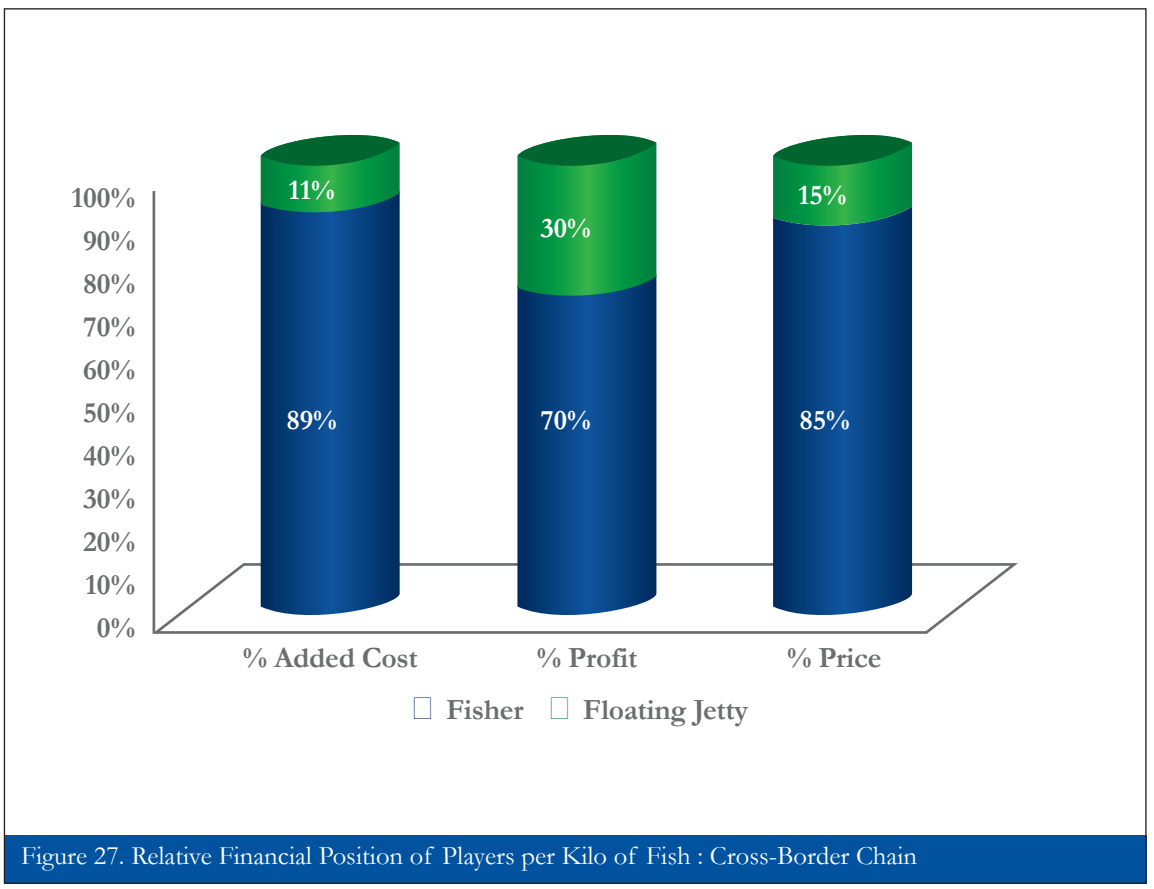


Figure 27. Relative Financial Position of Players per Kilo of Fish : Cross-Border Chain

Section 4
MARKET TRENDS

A. Export market

Myanmar's fisheries sector has been the fourth largest contributor to the gross domestic product and also the fourth largest source of foreign exchange earnings in the past five years. Based on 2011 data, captured marine fish species comprised 55% of the export volume. The exports of shrimps and prawns, which consisted mainly of wild caught marine species, accounted for 6% of the total export volume.

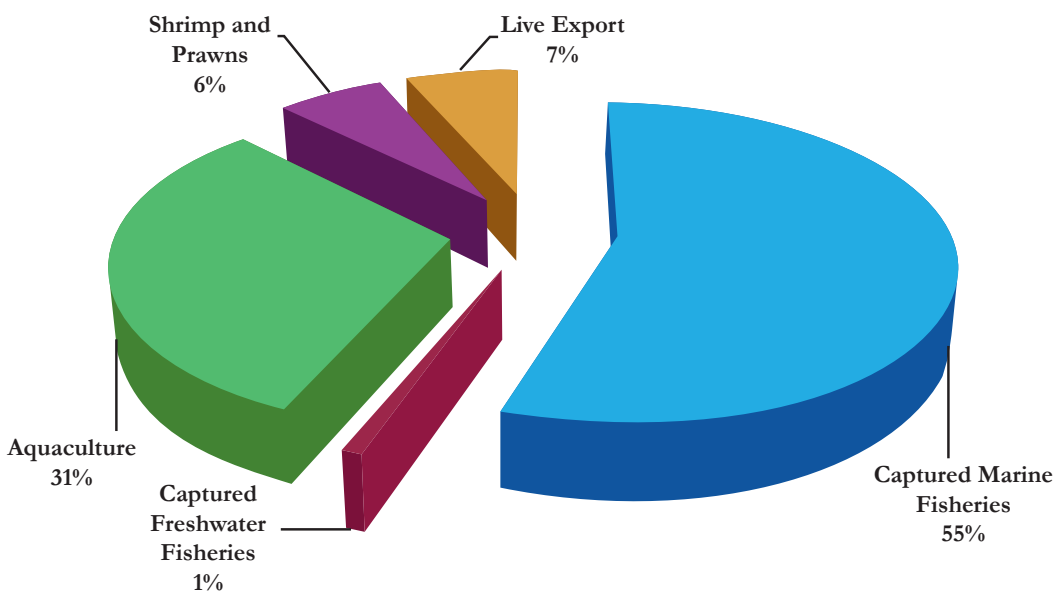


Figure 28. Breakdown of 2011 Fisheries Export Volume by Subsector

In 2013, Myanmar exported a total of 345,000 MT of fish and fishery products to 32 countries with value of US$ 536.27 million. Exported volume was about 7% of the total 2013 fishery production. Most of Myanmar's export sales are via border trade for the regional market. To cope with electricity constraints, exporters dispose of their stocks at the shortest time possible and with very minimal value addition by selling chilled fish to auction markets and agents at the Thailand, China, and Bangladesh borders. The Myeik Public Corporation is in the process of finalizing a trade agreement with the Thai authorities from Mawtaung to sell directly to Mahachai in Samut Sakhon, one of Thailand's biggest seafood markets. Direct sales to Mahachai will only require 8 hours overland trip while selling via brokers and agents in Ranong takes about 45 hours boat trip via Yanaung.

Among the marine fish species, hilsa is the top export product of Myanmar. In 2009, Myanmar exported 16,744 MT with a value of US$ 29.14 million. Export volume, however, has been declining during the recent years. In 2013, export volume went down to 10,909.87 MT. The global hilsa catch is reported to be 75% from Bangladesh water, 15% from Myanmar, 5% from India and 5% from other countries such as Thailand and Iran. Bangladesh used to be the major supplier of hilsa in India. However, during the recent years, Bangladesh has put a ban on hilsa exports. In 2014, fish importers in India were increasingly sourcing from Myanmar.

Table 10. Export Volume of Top Marine Species Exported by Myanmar			
Captured Marine Species	**Export Volume (MT)**		**% Change**
	2012	**2013**	**2013/2012**
Hilsa	12,324.89	10,909.87	-11%
Ribbonfish	12,716.17	9,547.20	-25%
White Shrimp	3,023.75	2,605.13	-14%
Pink Shrimp	9,461.55	9,838.92	4%
Tiger Prawn	4,044.76	3,382.56	-16%
Source: Department of Fisheries			

As can be seen from Table 10, export volume of key captured marine products except for the pink shrimp significantly decreased in 2013 over 2012 figures. Industry players attribute the decrease in export to declining supply of marine products and the high cost of production and, consequently, higher prices vis-à-vis other seafood exporting countries. For shrimps and prawns not frozen, for example, Myanmar has the highest price per kilogram among its neighboring shrimp exporting countries.

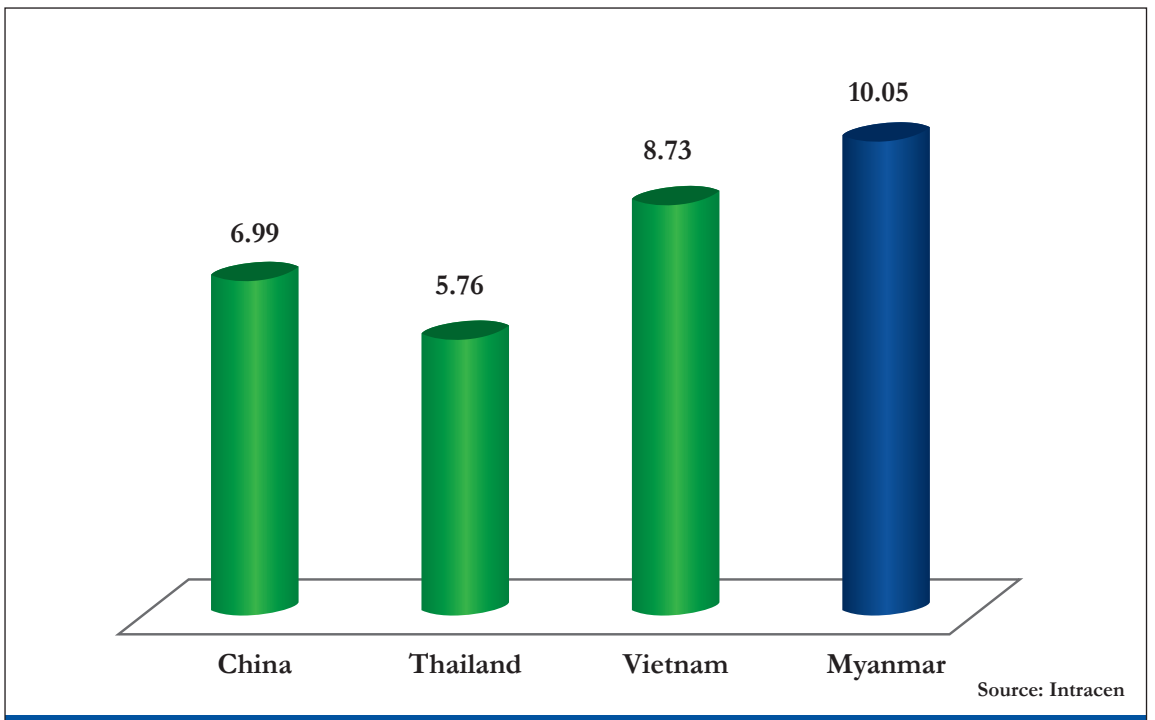


Figure 29. Price per Kilogram of Shrimps and Prawns, Not Frozen (US$/kg): Myanmar Vis-à-vis Other Exporting Countries, 2013

There are three main markets that dominate the global fish trade, namely: the European Union, Japan, and the United States. The three countries account for about 75% of the global imports of fish and fish products. China also plays an increasingly important role as both a fish importer and exporter.

These markets dominate international fish trade in terms of prices as well as market access requirements, including those related to safety and quality specifications.

Table 11. Main Export Destinations of Captured Marine Fisheries from Myanmar

Importing Countries	2009-2010	2013 - 2014	% Change
China			
Value (US$ '000)	105,076.00	199,290.00	90%
Volume (MT)	55,991.33	82,665.93	48%
Price per Kilogram (US$)	1.88	2.41	28%
Thailand			
Value (US$ '000)	99,229.00	128,980.00	30%
Volume (MT)	122,817.59	126,645.54	3%
Price per Kilogram (US$)	0.81	1.02	26%
Malaysia			
Value (US$ '000)	36,127.00	35,285.00	-2%
Volume (MT)	21,351.10	16,459.55	-23%
Price per Kilogram (US$)	1.69	2.14	27%
Singapore			
Value (US$ '000)	96,257.00	25,220.00	-74%
Volume (MT)	46,424.56	20,086.00	-57%
Price per Kilogram (US$)	2.07	1.26	-39%
Japan			
Value (US$ '000)	16,908.00	23,511.00	39%
Volume (MT)	6,215.54	6,490.00	4%
Price per Kilogram (US$)	2.72	3.62	33%
Source: Department of Fisheries			

China is the biggest buyer of Myanmar fish in terms of export value. Myanmar is among the top 3 suppliers of China for the following products: crabs, sole (except fillet), crustaceans, and eel. Myanmar's export volume to China increased by 48% between the period 2009 and 2013. Over the same period, average price per kilo of fish increased by 28%. Market reports indicate that rising incomes are creating demand for premium seafood products, both domestic and imported, providing a new opportunity for exporters of premium seafood. According to an industry report prepared by Rabobank International dated October 2012, seafood represents 5.4% of food expenditure for the lowest income groups, but increases to 7.5% for the highest income groups. This consumption pattern is attributable to a switch to premium species as incomes increase. For instance, the highest 10 percent income group in China consumes more than seven times the volume of shrimp compared to the lowest income group.

China became the third-largest fish-importing country by value in 2011 after Japan and the United States. Part of the fish import is raw material to be re-exported after processing. Freshwater cultured products, such as carp, shrimp and prawns, are popular for home consumption and in restaurants due to their affordability. Seawater aquatic products, including yellow croaker, ribbonfish and squid continue to be favorites in Northern China. Imported seawater products popular in China's domestic markets include cod, squid, plaice, and mackerel. Processed shellfish/shrimp/prawns and tilapia fillets are increasingly popular among city consumers with busy lifestyles. High-value imported seafood (such as lobster, geoducks, salmon, and crab) is widely used by hotels and restaurants for high-end consumers.

Qingdao and Dalian are the two largest arrival ports for aquatic products. Well-established

facilities, including processing factories in Qingdao and Dalian, solidify their status as the largest seafood import hubs in China. Aside from the processed-for-export pattern in the North, South China remains the dominant high value imported seafood product consumption center. With the highest incomes in China, passion for seafood dishes, and the presence of a large number of seafood importers, distributors and supporting logistic and storage infrastructure, South China is the main destination for high value seafood.

Seafood is one of the most highly regulated imported food categories in China – especially for live product. In line with China's move to improve quality of fish imports, China's Administration for Quality Supervision, Inspection and Quarantine panel required that all marine-product exports to China must be subjected to inspection before leaving Myanmar to ensure that they match the same import regulations the EU imposes. If fish exports to China are not inspected before they leave Myanmar, the products will not be allowed entry into China. Dried fish and prawn, eel, and soft crab though can still be exported to China without prior inspection.

Thailand is the top destination of Myanmar's marine seafood exports. However, statistics indicate that purchase price is also the lowest among the top export markets of Myanmar. While average export price per kilo for fish shipped to China was at US$ 2.41, the average buying price of Thailand was only at US$ 1.02 per kilogram. Thailand primarily buys chilled fish from Myanmar.

On average, Thai consumers consume around 30 kilograms of fish per year. Table 11 presents the annual per capita consumption of key commodity groups under the marine capture fishery and the preferred species.

Table 12. Annual Per Capita Marine Fish Consumption in Thailand and Preferred Species

Commodity Group	Annual Per Capita Consumption (kg)	Preferred Species
Pelagic fish	9.2 kg	mackerels, anchovy, sardines, tuna and tuna like species
Mollusc/Cephalopods	2.6 kg/1.5	squid, cuttlefish, bivalves
Crustaceans	1.0 kg	Vannamei shrimp, other shrimps, crabs, lobsters
Demersal fish	0.9 kg	threadfins bream, pomfret, groupers, flat fish (halibut, sole), ribbon fish.

Source: FAO/InfoFish

Thailand has one of the world's largest seafood processing industries. According to past market research, domestic landings can supply only around 40-50% of raw materials needed by the processing industry, while the rest (50-60%) has to come from imports. The main commodity groups imported as raw materials are:

- Fresh and frozen tuna
- Fresh and frozen fish (whole) such as mackerels, sardines, salmon, pomfret, ribbonfish, croaker, etc.
- Frozen squid, cuttlefish, octopus
- Frozen shrimp
- Fresh, frozen cockles

Singapore is highly dependent on imports for its food supply, including seafood. In 2011, about 78% of its fish supply was imported. Frozen fish comprised the largest import category in 2011 vis-à-vis fresh/chilled, live, and dried, salted, in brine, or smoked seafood. According to the UK Trade and Investment Report on Singapore (January 2013), the shift in preference from chilled fish to frozen fish was brought about by the following factors: a) advances in freezing technology whereby the freshness and quality of frozen fish are almost similar to that of fresh and chilled seafood; b) the increasingly fast-paced Singaporean lifestyles that make frozen fish a more convenient option; and c) the lower costs of frozen products. Between the period

2009 and 2013, the volume of fish exported by Myanmar to Singapore decreased by 57%. Myanmar generally face difficulties in producing competitively priced frozen fish products due to poor power supply which makes it imperative for companies to use diesel powered generators.

Malaysia's market for imported fish and seafood is sizeable and represents about 18% of total fish and seafood consumption. Myanmar is among its key suppliers of crab and lobster. Fish and seafood do not fall into the halal area of the market, unless they are processed products that contain other ingredients, inputs and additives.

Shrimp and surimi exports are mainly oriented towards Japan. Japan is one of the biggest importers in the world. Limiting to edible seafood, self-sufficiency rate is 59% and Japan relies over 40% on import. Japan's top seafood imports are shrimps, tuna, salmon, and trout.

The EU removed its Generalized System of Preferences (GSP) status of Myanmar in 1997, after accusations of forced labour. And in 2009, the EU banned all Myanmar seafood imports. Imports of wild seafood were re-approved in 2010, while farmed products remain prohibited. The EU reinstated GSP tariff preferences on 19 July 2013, with retroactive application as of 13 June 2012. Myanmar exports to the EU increased in 2013 amounting to €223 million with fisheries products accounting for 8%.

There are currently fourteen (14) EU approved processing companies in Myanmar. The companies, however, are not able to significantly expand their sales to the EU market due to market access and competitiveness issues. The supply chains of these companies particularly the upstream players are not compliant with EU food safety and quality standards. The processors also face stiff competition from Chinese and Bangladeshi buyers in terms of sourcing raw materials. Since these buyers enjoy subsidies from their respective governments, they are able to offer a higher price for the fish than local exporters. Processing cost in China and Bangladesh is also lower than Myanmar.

B. Domestic market

Since the majority of the households in Myanmar live along the four big rivers and in delta regions, the freshwater fish from the inland capture fisheries is a mainstay not only in the daily diet but also in trade. Myanmar households generally prefer freshwater fish to marine fish. According to FAO 2006 survey, fish account for about 22% of protein intake of Myanmar households. Based on the 2006 annual per capita fish consumption of 21.02 kilograms, inland or freshwater species represented 31.5% while marine species accounted for 23.5%. Fish paste (made of marine and freshwater fish) comprised 45% of consumption. Urban households eat more fresh fish than the rural populace. Dried fish are more accessible to rural households especially those in the dry zone than fresh fish.

Marine water fish is more saleable as dried fish than fresh. Fish paste and dried prawns or shrimps are the most commonly consumed products. Hilsa is the most consumed marine species. Except for hilsa, price of marine fish is 60% to 75% lower than freshwater fish. Imported shrimps from Thailand are cheaper than local catch.

Section 5
SUPPORT MARKET
A. Financial services

1. The banking sector of Myanmar is made up of 4 state-owned banks and 21 semi-government and private banks. Based on the LIFT Study conducted in 2012 and the 2013 USAID funded study conducted by the Michigan State University and the Myanmar Development Resource Institute - Centre for Economic and Social Development (MDRI-CESD), only about 10% to 20% of the total population have access to formal financial services.

Table 13. Banks in Myanmar, 2014

State-Owned Banks	Semi-Government Banks	Private Banks
Myanmar Agricultural Development Bank (under Ministry of Agriculture)	Co-operative Bank (controlled by Ministry of Cooperatives)	Asia Green Development Bank (controlled by Htoo Group)
Myanmar Economic Bank (under Ministry of Finance)	Innwa Bank (controlled by Myanmar Economic Corporation, affiliated to Ministry of Defense)	Asia Yangon Bank (controlled by U Myo Paing)
Myanmar Foreign Trade Bank (under Ministry of Finance)	Microfinance Bank (controlled by Ministry of Cooperatives)	Ayeyarwady Bank (controlled by Max Myanmar Group)
Myanmar Investment and Commercial Bank (under Ministry of Finance)	Myanmar Citizen Bank (controlled by Ministry of Commerce)	First Private Bank (controlled by Public Ltd. Company)
	Myanmar Construction and Housing Development Bank (controlled by Ministry of Construction)	Global Treasure Bank (controlled by Livestock and Fisheries Associations)
	Myawaddy Bank (controlled by Union of Myanmar Economic Holding, affiliated to Ministry of Defense)	Kanbawza Bank (controlled by KBZ Group)
	Small and Medium Industrial Development Bank (controlled by Ministry of Industry)	Myanmar Apex Bank (controlled by Eden Group)
	Yadanabon Bank (controlled by Mandalay City Development Committee)	Myanmar Oriental Bank (controlled by 25 shareholders, Kyi Kyi Than being the major shareholder)

Table 13. Banks in Myanmar, 2014		
State-Owned Banks	**Semi-Government Banks**	**Private Banks**
	Yangon City Bank (controlled by Yangon City Development Committee)	Tun Foundation Bank (controlled by MGS Beverages Co., Ltd.)
		United Amara Bank (controlled by IGE Company)
		Yoma Bank (controlled by FMI Group)
	Banks that project can potentially work with to address constraints on access to financial services	
Source: GIZ 2013		

The Myanmar Economic Bank (MEB) is the country's largest bank in terms of outreach. MEB provides subsidized loans to other banks in order to enable them to serve specific target groups. The bank also facilitates and support trade activities in border areas.

The Myanmar Agriculture Development Bank (MADB) is the official financial services provider for rural enterprises. The bank offers a semblance of value chain financing with a focus on the rice sector. The types of loans extended by the bank can be divided into three categories: crop production loans, term loans, and development loans. Seasonal crop production loans cover major crops such as rice, groundnut, sesame, mustard, long cotton, jute, maize, sugar cane, and beans and pulses. The loans for the livestock and fisheries sector fall under the crop production loan. Crop production loans do not require collateral other than the collective liability of borrowers. Borrowers though must have saving deposits with the bank. To date, most of the borrowers in the fisheries sector are aquaculture enterprises. Term loans are extended to tea and coffee plantations. Development loans, on the other hand, are for the purchase of water pump sets, power tillers and tractors.

The Global Treasure Bank, which was formerly known as the Myanmar Livestock and Fisheries Development Bank (MLFDB), is a private bank operating within the framework of the Ministry of Livestock and Fisheries. It disburses loans to fish breeders, fish farmers, aquaculture entrepreneurs, and fishers, both inland and marine. Borrowers can be individuals as well as collective liability groups. Most of the bank's borrowers are aquaculture enterprises.

Generally, banks face the following challenges in providing finance to fishers and small enterprises in the fisheries sector:

a) High cost of funds to provide rural credit especially if the credits are uncollateralized

b) Challenges of verifying cash-flow records, credit history or financial capacity of small enterprises for banks to evaluate and mitigate lending risks

c) Nil or negligible cost benefit appeal to fund fragmented, small-holder and widely dispersed fishing businesses instead of other formal, well organized and more profitable businesses.

d) Lack of formal marketing contracts and collaterals to guarantee repayment

i) Limited understanding of the fishing sector to guide the development of financial products appropriate to the needs and cash flow of players

2. The UNDP Human Development Initiative has significantly contributed to the development of microfinance operations in Myanmar. In November 2011, the government adopted a new Microfinance Law. The new microfinance bill imposes maximum interest rate of 2.5% and minimum interest rate of 1.25% for micro savings (GIZ 2013). The bill also allows local and foreign investors to establish fully privately owned microfinance institutions (MFIs) and paved for the legalization of microfinance providers that were operating without any legal framework. The bill, however, has been pointed out by microfinance experts to contain the following flaws, which can undermine the development of a robust and vibrant market for financial services:

   - Low capital requirements for MFIs which led to the proliferation of small, weak, and undercapitalized providers. Between November 2011 and September 2013, a total of 166 organizations were granted licenses to operate a microfinance operations
   - Supervision is fragmented. Banks are under the supervision of the Central Bank of Myanmar (CBM), and cooperatives operating in the microfinance sector are under the control of the Ministry of Cooperatives. MFIs are supervised by the Microfinance Supervisory Enterprise, which also provides microcredit itself (Duflos et al. 2013).
   - Funding remains a key challenge for MFIs since they cannot tap re-financing from local and foreign financial institutions under the current rules and regulations. According to the United Nations Capital Development Fund (UNCDF), the demand for microfinance in Myanmar in 2013 was around USD 1 billion. The Microfinance Supervisory Enterprise reported in October 2013 that the total loan portfolio of the 116 licensed MFIs amounted to only USD 118 million. The financing gap is hence still wide with less than one-fifth of the potential loan market tapped (GIZ 2013).

There are a few MFIs who are working with fishing enterprises but current outreach is generally limited. LIFT, a multi-donor trust fund, provides funding to several MFIs. It works with the World Bank on the Financial Inclusion for National Development (FIND) project which will primarily support the Microfinance Supervisory Enterprise through capacity building for microfinance supervision, training of staff to perform supervisory functions, and financial literacy and awareness. It is also working with UNCDF on the MicroLead project, and on the Making Access Possible diagnostic of Myanmar.

Table 14. MFIs with some Links to the Fisheries Sector

MFI	Estimated No. of Borrowers	Aggregate Loan Porfolio	Geographic Coverage	Lending Methodology
PACT (UNDP)	400,000	$55,000,000	Ayeyarwady Delta, Dry Zone	Peer Group Lending
PACT (non-UNDP)	50,000	$2,000,000	Magway	Peer Group Lending
Save the Children/Dawn	20,000	$500,000	Yangon Division	Peer Group Lending
World Vision	10,000	$1,000,000	Yangon, Mandalay, Ayeyarwady	Peer Group Lending
Groupe de Recherche et d'Échanges Technologiques (GRET)	5,500	$500,000	Chin State	Village Credit

Source: 2013 USAID funded study on Rural Finance/ Michigan State University and MDRI-CESD

3. Pawnshops are among the more popular and accessible sources of credit among low-income individuals in the fishery sector. There are about 1,874 private owned pawnshops registered with the local government and 184 state-owned pawnshops. Collateral includes gold, jewelry, watches, and clothing. The loan value is usually equivalent to 50% to 65% of the forced-sale value of the item. For gold collateral, the loan can amount to up to two-thirds of the market value, and the monthly interest is set at 2-3% flat. For all other collaterals, the loan amount granted will be about 50% of the forced sale value of the item and the monthly interest rate is 15%.

   In Yangon, where license fee ranges from 5 to 20 million kyats, the repayment period is fixed by YCDC at four months and 10 days. In rural areas, the repayment period varies and license fee to operate a pawn shop ranges between 300,000 and 500,000 kyats.

4. For many of the resource poor small fishing vessel owners, the most accessible sources of production (e.g., for purchase and/or repair of gears and craft, operating capital especially after several days of low catch), consumption, and emergency loans (family member or when owner/crew gets sick) are the informal money lenders. Loans are available fast and when needed and mostly without the onerous collateral requirements of formal institutions. However, interest rate ranges from 5% to 20% and primarily depends on trust and social capital.

5. Fishing boat crews and workers in fishing enterprises generally depend on cash advances from employers to cope with emergency needs or to leave to their family while they are at sea. This undermines their bargaining position and puts them in a vicious cycle of debt. On the other hand, owners with limited capital carry the burden of providing credit which further constrains his/her ability to re-invest in the business.

6. Credit services flow from the downstream players who are at the top of the value chain to the upstream actors who are in lower rung. This has led to the dominance of "Patron-Client Relation" within the economy. The trader provides credit without any records and collaterals. Lending is normally for emergency purposes and for daily expenses when catch is low. Against these loans, the fishers pledge the first right over the catch to the trader. Many of the fishers are trying to escape the "sweet prison" by avoiding loans. Without loans, fishers can search for options to get a better price for their catch such as selling these themselves directly to households.
   The primary concern of traders is to secure regular and adequate supply of fish to satisfy their clientele and to ensure economies of scale. Some traders responded by investing in fishing assets and have these operated by fishers on a sharing basis. Others provide loans as a means of procuring fishes at competitive prices.

7. Based on various reports on financial inclusion in Myanmar, peer savings groups appear to be an informal financial tool although it seems to be not yet a practice among fishing communities. Peer savings networks are usually comprised of people from similar social networks, financial strata, and occupation. Table 15 presents some examples of peer saving groups in Myanmar documented by Proximity Designs in their report entitled Afford One, Eat Two.

Table 15. Examples of Peer Savings Groups in Myanmar

Group Type	No. of Members	Shares	Duration	Amount per Deposit Collection	Collection Frequency	Collection Process
Lashio Market Vendors	20	24	24 months	3,000 kyats (US$ 3)	Daily	Group Leader visits each market stall between 2pm and 4:30pm daily
Kalaw Street Vendors	60	93	15 months	5,000 kyats (US$ 5)	Every 5 days	During market day, (every 5th day) the group leader visits each shareholding vendor between 10am and 12 noon
Monywa Tuk Tuk Drivers	18	18	16.8 months	10,000 kyats (US$ 10)	Weekly	Group leader, who is also a tuk tuk driver, collects savings from member drivers every week at a convenient time for him.

Source: Afford One, Eat Two/Proximity Designs

B. Non-financial services

Players in the marine capture fishery industry access business development services through the following means:

1. **Informal:** Information, knowledge and advice are made available to fishers and other VC actors through social relationships. This could include information and advice on price, market and technology trends through social networks or mediation through traditional cultural mechanisms. An example of this is the informal on-the-job training provided by parents to their sons and daughters. The weakness though is that "elders" in the community are not generally aware of emerging good practices. On the other hand, they are very much knowledgeable on indigenous practices which are generally low-cost and environment friendly. Strengthening the capacity of recognized experts in the area would enrich the informal learning system.

2. **Embedded:** Services are provided within a buying or selling transaction, whereby the costs of the service provision form part of the overall cost calculation of the supplier, while the service user does not have to pay for service delivery. Embedded services are an added feature to the main business transaction.

   Example
   Fish Collection Center: Technical advice and guidance provided to fish suppliers on proper fish handling

3. **Fee-based services:** Services offered to enterprises as distinct services for which they pay a fee. Individuals and organizations offering services related to food safety and quality standards and occupational health and safety to fish processors/exporters in Myanmar are presented in Table 15. Processors and exporters though are more inclined to pay for services that will enable them to comply with EU and US export market requirements.

   According to the Business Development Services Market Assessment conducted by ILO in 2014, there are 5 to 6 private sector service providers in the area of entrepreneurship and small business management training services. Two of the training institutes, Myanmar Human Resources Management Institute and the Business Capacity Building Centre have recently started to offer Entrepreneurship and SME Management courses targeting medium-scale enterprises and youths seeking wage employment in the SME sector. The Centre for Vocational Training, ADRA, World Vision, and Mercy Corps also provide management training. Some microfinance providers offer training on basic book-keeping and financial literacy as part of their micro credit programs (ILO BDS Market Assessment).

Table 16. List of Identified Providers of Services related to Food Safety and Quality Standards and Occupational Health and Safety in Myanmar

Individual/Organization	Services
GlobalGroup Myanmar No. 146, 1st Floor, 47th Street, Botataung Township, Yangon, Myanmar	- ISO 9001 Quality Management Training & Assessment - ISO 22000 Food Safety Training & Assessment - Hazard Analysis Critical Control Points (HACCP) Training & Assessment - ISO 14001 Environmental Management Training and Assessment - OHSAS 18001 Occupational Health & Safety Training and Assessment - Good Manufacturing Practice (GMP) Training and Assessment
U Thein Htut	- ISO 9001 Quality Management Training & Assessment - Hazard Analysis Critical Control Points (HACCP) Training & Assessment - Good Manufacturing Practice (GMP) Training & Assessment
Advantages Co., Ltd.	- Good Manufacturing Practice (GMP) Training & Assessment

4. **Stand-alone Free Services:** These are generally provided by government agencies. The services are generally provided for free.

   ### Department of Fisheries (DOF)

   The DOF is responsible for the development of fishery sector and has the following key responsibilities:

   - Conservation and rehabilitation of fishery resources
   - Promotion of fisheries researches and surveys
   - Collection and compilation of fishery statistics and information
   - Extension services
   - Supervision of fishery sectors
   - Sustainability of fishery resources

Extension services which consist primarily of training are extended by the following training centers established by DOF:

- Gyogone Institute of Fishing Technology (Yangon Region)
- Pyapon Fisheries Training Center (Ayeyarwady Region)
- Upper Myanmar Fisheries Training Center (Sagaing Region)

In 2013-2014, forty fishery training courses were conducted on four topics, namely: Aquaculture, Fisheries Management, English and Computer Literacy, and China/ASEAN Market Access Requirements. The training had a total of 1206 participants.

Access to technical assistance and capacity building support for both DOF staff and players in the fishery sector is facilitated through partnerships with international development projects and programs.

Table 17. Training Courses Conducted by DOF Training Centers, 2013 - 2014

Course Title	No. of Sessions	No. of Participants	Geographic Areas Conducted
Aquaculture	33	944	Sagaing, Pyapon, Hlawgha
Fisheries Management	3	90	Gyogone, Sagaing, Pyapon
English and Computer Literacy	2	23	Gyogone, Sagaing
China/ASEAN Market Access Requirements	2	149	Gyogone

Source: Department of Fisheries

Table 18. Development Projects/Programs Implemented in Partnership with DOF

Project/Program	Funding Agency	Period	Area
Sustainable Small Scale Fisheries and Aquaculture Livelihood in Coastal Mangrove Ecosystem	FAO	June 2009 to 2014	Ayeyarwady Division
Small Scale Aquaculture Extension for Promotion of Livelihood of Rural Communities in Myanmar	JICA	2014 to 2018	Central Dry Zone
Bay of Bengal Large Marine Ecosystem Program (BOBLME)	World Bank, SIDA, NOAA, GEF, Norad	2010 to 2014	Coastal region of BOBLME member countries
Ayeyarwady Dolphin Research and Protected Area Management Plan	WCS	2007 to 2017	Areas along Ayeyarwady River in Mandalay and Sagaing Regions

Table 18. Development Projects/Programs Implemented in Partnership with DOF

Project/Program	Funding Agency	Period	Area
Capacity Building to Improve Market Access for Fish and Fishery Products	FAO	March 2012 to July 2014	Yangon Region
Improving Research and Development of Myanmar's Inland and Coastal Fisheries	ACIAR/World Fish Center	Dec 2012 to Nov 2016	Ayeyarwady Delta and Central Dry Zone
Chemical and Drug Residues in Fish and Fish Products in Southeast Asia	SEAFDEC/ Japanese Trust Fund	2013 to 2017	Tanintharyi Region and Rakhine State

Source: Department of Fisheries

Southeast Asian Fisheries Development Center (SEAFDEC)

The Southeast Asian Fisheries Development Center (SEAFDEC) is an autonomous inter-governmental body established in 1967. The mandate of SEAFDEC as endorsed by the 41st Meeting of the SEAFDEC Council is "to develop and manage the fisheries potential of the region by rational utilization of the resources for providing food security and safety to the people and alleviating poverty through transfer of new technologies, research and information dissemination activities".

SEAFDEC comprises 11 Member Countries: Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. The Center operates through the Secretariat located in Thailand and has four Technical Departments, namely: the Training Department (TD); the Marine Fisheries Research Department (MFRD); the Aquaculture Department (AQD); the Marine Fishery Resources Development and Management Department (MFRDMD); and the Inland Fishery Resources Development and Management Department (IFRDMD).

SEAFDEC conducts a wide range of training from technical aspects of fishing, fish handling, and sea safety for fishing vessels. Most of the training conducted by SEAFDEC in Myanmar was directed towards building the capacity of DOF to support the fishing sector.

Myanmar Consumers Union

The Myanmar Consumers Union is a non-profit organization and a member of Consumer International. The organization has been conducting awareness campaign on food safety during the recent years. The campaigns and training are conducted by volunteers.

Food and Drug Administration (FDA)/Department of Health

The FDA has been conducting training on food safety and Good Manufacturing Practices for various food establishments. Outreach, however, is limited due to resource constraints.

As can be seen above, government agencies take a lead role in the delivery of services. Historical experiences indicate that many of the publicly-funded support services experience pronounced financial constraints and inability to increase depth and breadth of outreach. It is common for service delivery to become dependent on external aid or government funding and to collapse when funding dries up.

Aside from the need to scale up access to extension services and resources needed to facilitate chain wide upgrading, it is equally important to facilitate the greater adoption of improved production and post-harvest practices among all players and workers in the chain. Demand for non-financial services does not exist in a form ready to be tapped. This implies the need to stimulate demand and acquisition of business development services and the subsequent application of new knowledge and skills gained in their day-to-day operations. Whether services are embedded or fee-based or even free, enterprises are more receptive to services with immediate impact on income. Resource poor enterprises are generally very risk adverse resulting in low buy-in and low level of new technology and practices. It is, therefore, recommended that design and delivery of services should be linked with marketing/ market access and players' cash-flow schedules/ cycles, and demonstrations should be done to orient them on the benefits of technology vis-à-vis income generation potentials.

Section 6
ENABLING ENVIRONMENT

Below are the key issues that promote and/or hinder the development of the marine capture fishery industry:

1. The Marine Fisheries Law, promulgated on 25 April 1990, is the primary legislation in the Union of Myanmar which governs the marine fisheries. In 1993, an amendment was enacted on the Myanmar Marine Fisheries Law. Marine fisheries are mainly managed through input controls, such as licensing schemes, with spatial, temporal, and gear restrictions.

   Given that it has been 22 years since the law was amended, it is recommended that a review of the Marine Fisheries Law be undertaken to incorporate modern principles of responsible fisheries as enshrined in FAO Code of Conduct for Responsible Fisheries and the provisions in the Fishing Convention. There is also a lack of detailed implementation measures.

2. The demand for sustainable seafood is rising in developed countries like the United States and European Union. The imperative of moving towards more sustainable fishing practices that respect local ecosystems within broader landscapes is also increasingly becoming important in the light of climate change and pressure among consumers for buyers to be more accountable for social and environment responsibilities. To ensure that compliance to standards and market access requirements does not exclude micro and small businesses, reform in the delivery of extension services to facilitate compliance will require the adoption of a multi-provider model and market-based delivery mechanisms including partnerships with lead firms. Access to financial services and improved infrastructure are also important in complying with standards and sustainable production as a whole.

3. In a move to prevent further decline of fish stocks, the Ministry of Livestock and Fisheries has cut by 25% the number of boats issued licenses for the monsoon fishing season. Likewise, the length of season has also been cut down from 90 to 45 days. These measures will benefit the industry in the medium to long term but can also potentially negatively affect income of fishers and workers in processing factories and dockyards/jetties which are comprised mainly of women. The move of the government to ban foreign fishing vessels and build capacity of local fishing enterprises to exploit in a sustainable manner the marine resources in deep waters can potentially avert displacement of crews and workers.

4. The Minimum Wage Act was passed in 2013, but to date, the minimum wage has not yet be been defined. The Act permits sector or industry minimum wages but it does not presuppose that approach. It could also be a single minimum wage, a metropolitan and rural minimum wage and other combination. According to the Act, the Myanmar government can implement a minimum wage index for different industries, which would be updated every two years.

   Myanmar has a range of laws related to labour; however, many of the laws are fragmented and outdated. While some are still applicable, the Government has commenced a reform program to update these laws to reflect changes in economic and work conditions in Myanmar. Positive improvements in work conditions can translate to increased productivity and, consequently, improved market competitiveness.

5. According to an article in a Guide to Doing Business in Myanmar (Volume 5/2013), employee turnover, especially at the entry level, is quite high in Myanmar. Pay is low and these positions require long hours of work. In an effort to reduce turnover, some companies in the fishing sector have begun offering long term employee recognition program and meal and transportation subsidies including training programs.

The lack of vocational schools and providers in both the public and private sectors that offer training for food handlers, workers in processing plants, and fishing vessel crews has contributed to the shortage of skilled workers and the marginalization of the labour force. Apprenticeship program seems to be also not a practice among companies and educational establishments. Since many of the working age population lack the necessary skills, they often have to start at the lowest rung of the employment ladder. Companies undertake the responsibility of training their workers.

Table 19. Average Monthly Pay of Workers in Myanmar, 2013

Position	Average Monthly Pay (US$)
Unskilled Labour (no experience)	70 - 120
Unskilled Labour (with experience)	120 - 320
Office Staff (no experience)	120 - 320
Office Staff (with experience)	200 – 500

Source: Sai Tip, The Labor Market in Myanmar (Guide to Doing Business in Myanmar (Volume 5/2013)

6. The Association of Southeast Asian Nations (ASEAN) and its six trading partners are targeting to sign this year the Regional Comprehensive Economic Partnership (RCEP), a free trade agreement that is expected to further open up new and bigger markets for local businesses. The end-goal of ASEAN economic integration is the full realization of an ASEAN Economic Community (AEC), wherein the region will be transformed "into a single market and production base, a highly competitive region, a region of equitable economic development, and a region fully integrated into the global economy." As such, when the AEC commences, it can be expected that the economies will aggressively open up given that barriers to trade – both tariff and non-tariff -- will be eliminated. Economies will be liberalized to achieve the goal of ASEAN becoming a single market and production base. On the other hand, this will increase competition among marine producing countries in the ASEAN region. This implies more than ever the need to improve price and market competitiveness of the marine fisheries sector in Myanmar.

Section 7
COMPETITIVENESS DIRECTIONS

A. Constraints and opportunities

To enable the marine capture fisheries subsector to provide gainful employment to both women and men and/or improve existing jobs into decent work opportunities, it has to achieve higher levels of competitiveness in terms of price, quality, and regularity of supply. The main challenge for the industry is to evolve to a globally competitive, technologically appropriate yet sustainable production that will:

- Increase exports and expand markets
- Increase value addition within Myanmar
- Create a stronger internal or domestic market
- Reduce vulnerabilities to economic globalization and climate change

The overarching marine capture fishery competitiveness framework is shaped by the following broad and mutually reinforcing needs:

a) The development of inclusive value chains which would entail strengthening of capacities of small enterprises in particular to move up the commercial and market integration ladder and the establishment of enabling mechanisms that will enable exporters and integrators to source from small fishers.

b) Upgrading of infrastructure and labour force and the establishment of systems to lower cost of transactions, facilitate chain wide compliance to quality and food safety standards, and ensure that incentives are available for increased quality and productivity.

c) Promotion of rational and sustainable use of marine resources while ensuring compatibility between social, economic, technical, and environmental objectives including making the sustainable exploitation of the high seas possible to reduce the pressure on the continental shelf that seems to be already overexploited.

The specific constraints and opportunities to improving the competitiveness of the marine capture fisheries subsector are described in Table 20.

Table 20. Constraints and Opportunities

Opportunity	Constraint
Input Provision	
Improvement of skills and work conditions in ice distribution and retailing can contribute to reducing cross contamination, wastage, and improvement of chilling efficiency	Weak compliance to food safety standards and good labour practices in ice distribution and retail Dominance of workers that have had no access to proper training on OSH and hygienic handling of ice
Because ice comprises the major costs of a fishing business, a well-performing and cost-effective ice distribution and retail regime is an important consideration in making fishing operations and trading viable. Poor working conditions and unhygienic handling of ice can result in contamination, wastage and high production costs that negatively impact income generation capacities of players and workers. Unsafe ice will offset the preservative effect of the ice and can result to accelerated deterioration of fish quality. Poor working conditions negatively affect productivity. Likewise, it poses risk hazards to workers and the public in general.	

Table 20. Constraints and Opportunities	
Opportunity	**Constraint**
Input Provision	
Improvement and proper maintenance of fishing vessels and modification of gears can contribute to fuel efficiency, sea safety, and in reducing overexploitation of inshore resources. SEAFDEC can be tapped to provide training of trainers in member countries	Existing boat builders lack the skills and exposure to improved, upgraded, and eco-friendly boat and gear design Lack of understanding among fishing vessel owners on cost benefits of investing in improved/ upgraded fishing gear and craft; risk aversion, and limited purchasing capacity
There seems to have been no systematic fleet/vessel replacement or upgrading program in Myanmar. Although some efforts have been made to improve vessel design and boat construction in progressive dockyards in Myanmar, it is not clear if these have been done with the objective of improving safety at sea and fuel efficiency or to simply improve fishing vessels' sea-worthiness so that fishers can travel further offshore. Generally, most of the fishing vessels are of traditional designs which were meant for day trips and nearshore fishing. With the recent trend among fishers to go further and stay longer at sea due to depleting coastal resources, there is a need to design safer and more comfortable fishing vessels and gears. Access to affordable and safer vessels and gears may also help in encouraging fishers to move away from exploiting inshore resources and target more the offshore pelagic resources. Lack of available credit to fishers and lack of exposure among boat builders and gear suppliers on modern technology are major constraints to fisheries development. Lack of credit and technical know-how inhibits access to proper (safe) fishing vessels, engines, fishing gears, and basic safety equipment that would help save lives at sea.	
Fishing	
Sustainable fishing practices can help improve resilience to climate change resulting to overall increase in productivity and better market access. A balanced approach to marine resource use and development based on sound scientific knowledge and enterprise management know-how can optimize the socio-economic benefits of fishing Global buyers are increasingly sourcing only from suppliers certified to be sustainable. This can potentially provide incentives to adopt good practices. Traders and exporters have the strongest commercial incentive to ensure sustainable supply of fish to maintain operations at a profitable level.	Lack of access among fishers to services and resources that will enable them to adopt sustainable and climate smart fishing technologies Low appreciation on benefits of complying with sustainable fishing practices/ Lack of business or enterprise management skills among fishers
In the past, fishers used to catch about 30 viss per net. During the recent years, they are only able to take in only about 20 viss per net and the fishes are smaller. Unsustainable practices harm the ecology of the ocean, while also reducing the long-term potential of fish stocks to provide food and jobs for the future. Climate change impacts contribute to endangering the livelihoods of fishers and workers in the fisheries sectors and make them more vulnerable to climate-related hazards.	

Table 20. Constraints and Opportunities

Opportunity	Constraint
Fishing	
Fishers and vessel crews are very knowledgeable in the mechanical aspects of fishing. However, they lack knowledge in the more scientific and developmental aspects of fishing. The lack of scientific know-how results to low productivity and environmental degradation. Current services/service delivery modalities lack the depth and breadth of outreach. There is a lack of on-site providers to help fishers to improve their fishing practices. Many of the fishers lack the necessary skills and knowledge to manage their fishing operations as businesses. This lack of a business orientation can be attributed to the fact that many coastal villagers are not self-driven entrepreneurs. Although not all are born to become entrepreneurs, acquisition of basic business management skills and the development of an entrepreneurial mindset among the fishers will improve operations and profitability of fishing without compromising sustainability of marine resources. The marine fisheries industry in Myanmar has achieved some level of economic success that now must be safeguarded by creating a sustainable development approach that reaches both small enterprises and large operators. Avoiding and managing climate risk is a prerequisite for the industry to continue its upward trajectory. Healthy ecosystems are prerequisites for healthy fishing operations. In the medium term, non-compliance to sustainable fishing practices may exclude the participation of the industry in global value chains.	
Improvement of working conditions and addressing sea safety issues will help in attracting people to take on employment on fishing vessels Availability of trained/skilled crew will reduce time and costs spent by companies for on-the-job training; reduce risks of accidents; improve productivity and potentially improve the adoption of sustainable fishing practices Deep sea fishing has the potential to be one of the driving forces in the country's marine fishery and can avert declining nearshore marine resources Pursuit of deep sea fishing can help stabilize income of workers especially in the face of prolonged closed season and reduction of licenses. Planned expansion to deep sea fishing can provide job opportunities	Shortage of skilled crews Lack of know-how on deep sea fishing Lack of training services for vessel crews (basic and upgrading; deep sea fishing)
Many fishers today are going deeper or increasing their range without the right know-how. Most of the crew recruits acquired the skills through on-the-job training. Likewise, many fishers gained their knowledge on navigation from elders or family members. Simple repair work is always carried out by the boat owner or the fishing crew themselves based on know-how gained from experience. Furthermore, there is a lack of traditional knowledge on offshore and deep sea fishing and implementation of occupational safety and health.	

Table 19. Constraints and Opportunities

Opportunity	Constraint
Fishing	
The risks in fishing operations can be reduced when a qualified, well trained crew operates a well -designed, equipped and maintained vessel in accordance with established rules and procedures. The lack of training services for crews has made recruitment a difficult and expensive process. Without sufficient numbers of skilled personnel, the development of the Myanmar marine fishery will be seriously curtailed. Results from fishery resources surveys and experimental fishing indicate that Myanmar is rich in some commercially important big pelagic species such as tuna, swordfish, deep-sea lobster, and deep-sea shrimp. During the past years, these fishery resources were only being exploited by foreign vessels with little benefits to the Myanmar economy. Since for many years, only foreign fishing vessels were allowed by the government to operate in deep waters, the industry does not have access to appropriate vessels, gears, and technologies and crews trained in deep-sea fishing. Expansion to deep-sea fishing may contribute to sustainable resource management and allow the recovery of inshore resources. Likewise, this can help in smoothing operations of dockyards and processing plants and allow them to operate whole year round without resorting to labour cuts during closed season.	
Trading	
Chain wide compliance to international food safety and quality standards will enable the industry to penetrate more discriminating markets such as the European Union and United States as well as sustain and increase shares in the Chinese market Improving the ability of fishers and traders to comply with food safety standards can potentially increase supply for export marketing	Weak compliance to food safety and quality standards among upstream players Low appreciation among upstream players on the benefits of safe handling of fish Lack of access to services and resources that will enable them to comply with food safety standards Lack of price incentives for meeting market requirements (including quality) stifles improvements in practices of producers and of marketing methods
There has been an increased implementation of GMP and HACCP in processing plants especially among exporters. However, in many cases, these standards are not applied at the level of fishers/ fishing crews, jetties, and traders. For fishery products to pass the international food safety and quality standards, food safety compliance should start right at the time of harvest. The future of fish exports from Myanmar to developed countries will depend mainly on compliance with food safety standards, sustainable fishing, and other technical measures that are being made progressively more stringent by the major fish importing developed countries. Failing to meet these requirements can mean that fish can be banned from entering that market and a ban can mean that many people will lose business and jobs as a consequence. The lack of compliance to food safety standards among fishers and intermediaries can also mean being unable to participate in value chains that cater to markets outside of their localities. Aside from the lack of know-how on food safety among fishers and intermediaries and their workers, absence of appropriate landing sites with basic facilities (shade, stainless sorting table and containers, etc.) also poses constraints in proper/safe handling of fish. Similarly, the lack of appropriate transportation facility also contributes to unhygienic handling of fish.	

Table 19. Constraints and Opportunities

Opportunity	Constraint
Trading	
The "all-in" procurement (flat price regardless of quality) practiced by some intermediaries also do not provide sufficient incentives for players to upgrade practices and comply with food safety and quality standards. This practice contributes to the deterioration of quality of fish in two primary ways. First, it eliminates the possibility of using quality as a competitive strategy. Secondly, it fails to send price signals to players along the supply chain. Proper price signals would encourage production of quality fish.	
Processing	
Improved productivity can have a positive impact on the price competitiveness of processed fish products in the international market	High production cost due to low labour productivity and unstable power supply Lack of access to services that will help enterprises especially processing companies to improve productivity
Given the high cost of power supply (due to dependence on generators), a short-term measure that fish processing companies can do to improve its price competitiveness is to significantly improve its productivity. Based on the 2013 McKinsey Global Institute Report, a worker in Myanmar adds only an average of US$ 1,500 of economic value in a year of work. Output per worker is only 70% of that in Vietnam in 2010, 20% of that in China and Thailand, and less than 15% of that in Malaysia. Myanmar's labour costs are comparatively low compared to Thailand and Vietnam, giving the country an opportunity to boost output in labour-intensive manufacturing sectors such as fish processing.	
Retail Distribution	
Clean and sanitary merchandising of marine fish can significantly help reduce postharvest losses and build consumers' confidence	Marine fish except hilsa is perceived of lower quality than freshwater fish Lack of know-how on proper fish handling and display Weak demand for marine fish vis-à-vis freshwater fish
Many consumers in Myanmar believe that marine fish can cause allergy and other ailments. Vendors generally handle and display freshwater fish with more care than marine fish. Current merchandising practices accelerate product deterioration and offer little assurance of food safety. Unsold inventories in the afternoon are sold at discounted prices. The consumer places a high level of trust in the retailer. He/she has the tendency to transfer the responsibility of some of his/her consumption decisions to the retailers. Fish is generally considered as a healthy product by Myanmar consumers. Communication on marine fishery products should project the efforts made to guarantee their "healthiness" to the consumers. Clean, attractive, and sanitary stalls can give consumers another means of inferring experience and credence characteristics of marine products. Likewise, a more attractive presentation can boost perceived value of fish in general. Weak demand for marine fish outside of coastal areas has forced down the unit price. With low prices, fishers rely on volume to earn some profit. Fishers act on price fluctuations by increasing the intensity of their fishing which in the end compromises their own productivity and income generation potential. Vendors, on the other hand, suffer from low profit margin and, consequently, low returns from their labour and meager capital. Likewise, poor working conditions pose health hazards to vendors, workers in the market, and the general public.	

Table 19. Constraints and Opportunities

Opportunity	Constraint
Enabling Environment	
The Marine Fisheries Law, Code of Conduct for Responsible Fisheries, and the Fishing Convention can provide solid basis for the development of codes of good practice that are consistent with and support the goals of the marine fisheries subsector. A strong and effective Public-Private Partnership will provide the platform to promote changes, innovation and compliance to a Code of Conduct for Responsible Fisheries in Myanmar (with Myeik as the pilot area).	Lack of a unified understanding and implementation measures on how fisheries should be managed responsibly, and how fishing operations and trading should be conducted. Weak supply chain collaboration and governance
Many of the competitiveness, social, and environmental issues stem from the lack of and/or weak implementation of policies. Likewise, many trust issues stem from varying interpretations and uneven implementation of standards, rules, and regulations. Effectiveness of collaboration among and between industry stakeholders and their consequent collective adherence to standards and regulations depend to a great extent on whether they view themselves as having shared goals and mutual interests.	
Enabling Environment	
Fishers in the same village know each other quite well and have had experiences of working together. Such 'natural–social constituents' can be harnessed to get them to work together Cooperation and collaboration among individual fishers can improve their bargaining position both in marketing of catch and procurement of inputs	Weak capacity among small fishing vessel owners to organize themselves into structured groups/ Lack of experiences in formal organizational setting Lack of trust and cooperation between and among fishers
Fishers in the same village tend to help each other but there has been little initiatives to exploit opportunities with respect to bargaining power, access to credit and postharvest facilities, economies of scale, etc. The smallholders are often constrained by their lack of a strong organization that could give them the bargaining power they require to interact on equal terms with other, larger and stronger market intermediaries.	
Presence of strong associations can help enterprises and workers to effectively and pro-actively respond to changing market requirements and environmental conditions	Weak capacity of existing associations to either access or provide expanded and diversified technical, marketing, and advocacy services to their members.
Loosely integrated internal structures of existing associations are less capable of creating production and marketing systems that work efficiently and can uphold a process of upgrading both for enterprises and workers.	

B. Intervention strategies and approaches

Drawing on findings from the end markets, value chain analysis and the focal points of action identified by industry players and stakeholders, below are the proposed intervention strategies and approaches to improve market competitiveness of the marine capture fisheries industry while simultaneously addressing constraints to decent work conditions and assuring the sustainability of marine resources.

Inputs

1. **Development of capacity of ice plants to provide training to their retailers on proper ice handling and OSH to ensure that ice supplied to fishers and intermediaries meet food safety and quality standards**

   a) Training of ice plants on proper ice handling and OSH including assistance in formulating their capacity building program for their ice retailers. It is proposed that project provides an orientation to all interested ice plants in Yangon and Myeik on proper ice handling and occupational safety but piloting of the capacity building program for retailers in Year 1 will be done with 3 to 5 companies.

   b) Development of training video materials and posters that ice plants can provide to their retailers. Program may provide initial supply of training materials and posters but subsequent replication should be borne by ice companies. Ice plants may also ask their retailers to pay for the materials at cost.

   c) Development of a recognition system (e.g. badges with ice plant branding) to signify that retailers have complied with the standards. It is suggested that the Consumer Union and Food and Drug Administration/Department of Health, MFF, and DOF be involved in the development and implementation of the recognition system. The recognition system can be supported with a tri-media campaign to create awareness among consumers and the ice supply chain.

   d) Assistance to 3 retailers to upgrade their stalls which can then be used as models. Program assistance may be in the form of counterpart funding for small equipment and protective gears for workers. It is proposed that stalls to be used as models should be located within the proximity of Wholesale Fish Market.

2. **Improvement of access of fishing vessel owners to safe and efficient boats appropriate for trips further off the shore and longer periods at sea through skills upgrading of boat builders**

   a) Conduct training and orientation on best practices in fishing vessel construction and design. Training will be directed primarily to boat builders and DOF staff involved in inspection and licensing of fishing vessels. This may be conducted in collaboration with SEAFDEC, FAO, and ILO Thailand.

   b) Assistance in the development of design of inshore and offshore fishing vessels. Program support will primarily be directed towards the development and dissemination of the designs to boat builders. Technical assistance can potentially be provided by FAO, SEAFDEC, and ILO Thailand.

   c) Assistance in the development of one prototype of an inshore fishing vessel which will also be used during hands-on training sessions on sea safety and occupational health and safety. Support may be in the form of counterpart funding.

   d) Promotion campaign directed to fishing vessel owners to upgrade their boats. This may be conducted in collaboration with DOF and radio stations.

   e) Assistance to financial institutions (e.g., Myeik Public Corporation, Global Treasure Bank) in coming up with financial products that will enable fishing vessel owners to invest in upgraded boats.

3. **Improvement of access to more efficient and selective types of fishing gears through skills upgrading of gear suppliers and fabricators**

   a) Orientation of gear fabricators especially women and recognized expert fishers in Myeik on more efficient and selective types of gears including presentation by suppliers of gear materials of their products and potential wholesale marketing arrangements.

   b) Village wide competitions in the development of more efficient and selective types of gears. Each entry should be made by both women and men. It is proposed that project provide the materials for the completion. Winning designs may be disseminated via posters and tarpaulins in strategic locations (e.g., landing sites, monasteries, fish collection centers).

   c) Assistance to financial institutions and gear material suppliers including their retailers in the development of financing schemes aligned to cash flow of small fishing vessel owners. Project may also want to explore the Peer Savings Group mechanism particularly for materials that are not too expensive.

   d) Explore the possibility of setting up a village-based enterprise managed by women which will specialize in the retail selling of gear materials, fabrication and repair of nets.

Fishing

4. **Development of local capacity to provide services that will enable fishers to adopt sustainable and climate smart fishing technologies and manage their fishing operations as sustainable businesses**

   a) Formation of learning networks comprised of fishers and village traders and the development of learning facilitators. The facilitators will be selected based on interest, experience, and leadership qualities. Facilitators will receive in-depth training on sustainable fishing, climate smart fishing technologies, sea safety, collective bargaining, and sustainable enterprise management. It is also suggested that both husband and wife participate in the learning networks. Project support will consist of the following:

      - Adaptation of existing modules to Myanmar context and incorporation of behavior change interventions
      - Development of training system
      - Set of gears for hands-on training and which the group members may use on a rotating basis with portion of the catch allocated to cover costs (e.g., supplies, handouts, token for facilitators, etc.)
      - Training of facilitators
      - Organizational development support particularly during start-up phase

   b) Conduct of community level campaign on sustainable fishing and dissemination of success stories to evoke the desired behavior. This may be done in partnership with DOF, MFF, township administrators, and monasteries.

5. **Development of supply and demand for services aimed at improving technical and sea safety competencies of fishing crews and greening of fishing operations**

   The training program could form part of the services of MFF in Myeik. Potential trainers will be the retired skippers and captains as well as owners of fishing vessels and DOF staff. Target clients would consist of existing fishing crews and those who are interested to become a crew. At the minimum, the training should cover the following: sea survival, firefighting and prevention, first aid, health and safety, navigation, sustainable fishing operations, safety and management, and proper fish handling. A training course on deep-sea fishing will lay the groundwork for the planned expansion to deep-sea fishing.
   Assistance from the project may include:

a) Adaptation of training modules to Myanmar context and development of training system
b) Training of trainers/facilitators
c) Marketing campaign including radio plugging on sea safety
d) Support in the development and implementation of operations manual for the MFF Myeik Training Center
e) Development of a recognition system for fishing vessels that are fully manned by crews who have undergone training in collaboration with MFF and DOF

Trading

6. Improvement of access to services that would enable upstream players to meet food safety and occupational safety and health standards (OSH)

a) Enhancement of capacity of traders/ jetties in Myeik to act as mentors on food safety and OSH to their suppliers. This will primarily involve the following:

- Training of key staff of intermediaries and/or the owners on food safety and OSH
- Technical support in implementing food safety and OSH in their own operations to serve as models to suppliers
- Participatory development/adaptation of training modules
- Development of training system including counterpart funding for small equipment needed to carry out demonstration on proper handling and OSH to suppliers

b) Upgrading of fish transportation system from landing site to intermediaries. To facilitate the upgrading of sidecars, project may want to consider the following:

- Support the development of appropriate low cost carriers or sidecars that are more cost efficient and meet food and road safety standards by providing technical assistance to fabricators
- Work with financial institutions and fabricators in the development of financial products and payment schemes aligned to cash flow of fish transport operators

c) Upgrading of capacity of market administration of wholesale fish markets in Yangon to deliver training or mentoring on food safety and OSH to wholesalers and their workers. This would entail the following:

- Training of key staff on food safety and OSH to achieve competencies that will enable them to provide guidance to stall owners and their workers on how to comply with standards
- Assistance to YCDC in the development of low cost implementation measures to facilitate compliance to food safety and OSH
- Development of video materials on food safety and OSH which can be shown during lull hours or before opening of the market complemented with "how-to" posters
- Assistance in set-up of model stall (low cost) that market administration can use in the conduct of short demonstration sessions
- Tri-media dissemination of success stories

Retail distribution

7. Improvement of access of vendors especially women to services that would enable them to adopt better marketing practices parallel to ensuring that there are sufficient market-based incentives to facilitate upgrading

a) Training and development of a pool of providers consisting of progressive vendors/traders, market administration or market committee, and the Myanmar Consumer Union.

b) Adaptation of the existing training modules on the following topics to Myanmar context:

- Food safety and quality (vending and intermediate processing);
- Visual merchandising;
- Enterprise/financial management
- Occupational safety and health.

c) Development and operationalization of delivery and financial viability schemes. The following are the possible payment schemes to cover training costs (token/fees to trainers, supplies):

- Cost of training (token/honorarium to trainers, supplies) bundled in stall payment for new entrants or payment for utilities for existing vendors
- Minimal upfront fee + cost of training covered from mark-ups --- sale of packaging materials, apron, hair net, tables, etc.

d) Upgrading of stalls/tables. This would involve the following interventions:

- Assistance to fabricators in the design and development of low-cost tables and stalls that are visually appealing and compliant with food safety and OSH standards
- To facilitate acquisition of upgraded stalls, the project may explore the following options: (i) Promote partnerships between companies that normally provide signage and tents as part of their marketing campaign (e.g., Oppo, Telenor, Coca-Cola, Myanmar Beer, etc.) and market administration; (ii) Forge linkages with banks and financial institutions; and (iii) Promote peer savings groups to facilitate purchase or upgrading of existing tables
- Set-up of a model stall which will also be the venue for training

e) Development of recognition system involving consumers and government agencies. This may be in a form of competitions (e.g., quarterly competition where consumers vote for "Clean and Safe Stall"). The recognition system should be supported with awareness campaign on food safety and OSH.

f) Support to the conduct of a semi-annual or annual consumer feedback survey. The consumer feedback survey can serve a two-fold purpose: i) as basis for iterative planning; and ii) provide motivation for fish retailers to pursue and sustain upgrading. This may be done via a Dot Survey. It is simple but effective data collection method in which a limited number of questions are posted on an easel or board and consumers indicate their responses using colorful labels/dots. Results should be analyzed together with the retailers and other stakeholders. Positive results may be disseminated to the media to encourage other industry players to enroll in the upgrading initiative.

g) Conduct of marketing campaign to improve consumer attitude and perception towards marine fish and, in the near future, big pelagic species such as tuna. In Yangon, the campaign may be conducted in collaboration with the YCDC, Consumer Union, Department of Health, DOF, and MFF. Campaign may consist of activities such as:

- Enlisting the support of medium and high end restaurants to highlight/feature marine fish based dishes with a focus on those that are not yet overfished

- Encourage culinary writers/gurus to attest on superior taste of marine fish
- Testimonials from health authorities and doctors on healthy features of marine fish
- Marine Fish Recipe/Culinary competitions that would showcase versatility of various fish species (especially those that are not yet overfished) and allow sampling.
- Seek the support of newspapers/radio/TV to feature recipes using marine species that are not yet overfished

Processing

8. Development of local capacity to commercially deliver productivity improvement program and related services to enterprises in the marine fishery subsector with priority given to the processing companies

a) Training of providers and customization of modules to fishery and Myanmar contexts

b) Technical assistance to MFF (with MFF Myeik as the pilot) in the deployment and operationalization of productivity improvement program and related services

c) Conduct of marketing campaign to stimulate demand for improvement program and related services

Enabling environment/Interfirm relationship

9. Improvement of supply chain governance and coordination between public and private stakeholders

a) Participatory development of a Code of Conduct and its implementation measures to facilitate harmonized implementation of standards and regulations related to quality, food safety, decent work conditions, and marine resource use. Project assistance may consist of the following:

- Technical assistance in the drafting and finalization of Code of Conduct
- Organization of workshops and consultations to gather inputs and generate feedback
- Support in getting the formal adoption of the code by industry stakeholders

b) Conduct of campaign to disseminate salient points of the Code to all stakeholders. This may be done through forums and media publicity.

c) Creation of an inter-institutional platform to strengthen knowledge sharing and coordinated actions including regular review of the Code of Conduct. Participants may include MFF, representatives of marine fishery related associations, township/region/state administration, donor agencies involved in marine fishery related development programs, DOF and other government agencies involved in the industry.

10. Strengthening of capacity of local/regional associations to provide market driven services and articulate the needs of members and the industry

It is recommended that pilot interventions be made with MFF Myeik. Range of assistance under this strategy may include:

a) Organizational development (OD) support: Main objective is to guide the associations in strengthening internal and internal infrastructure and organizational elements needed to achieve the economic and social performance objectives that underlie the viability of collective groups. The organizational development intervention should also ensure that gender is mainstreamed in the organization.

b) Technical assistance in setting up their business development center or training services for enterprises and workers including the development of a business plan and hands-on training during the start-up phase.

c) Technical support in the design and implementation of operation guidelines and manual, quality standards, and performance monitoring system aligned to responsible business practices.

d) Capacity building in areas that would require strengthening based on findings during the OD process

C. Proposed Action Plan

Table 21 describes the proposed sequencing of interventions and action plan designed to guide the project on the scope of interventions that can be potentially implemented in Year 1.

Table 21. Proposed Action Plan

Proposed Intervention	2015									2016
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Development of capacity of ice plants to provide training to their retailers and distributors on proper ice handling and OSH (Myeik and Yangon)										
Preparation of orientation design and materials										
Orientation on proper handling of ice and OSH to all interested ice plants in Yangon and Myeik										
Selection of ice plants for piloting of retail and distribution capacity building program										
Development of video training materials and posters										
Mentoring of ice plants during start-up of capacity building program										
Development and implementation of recognition system										
Assistance to 3 retailers in upgrading stalls to serve as models										
Dissemination of success stories										
Scaling up										
Improvement of access of fishing vessel owners to safe and efficient boats appropriate for trips further off the shore and longer periods at sea (Myeik)										
Training on best practices in fishing vessel construction and design										
Assistance in the development of design of inshore and offshore fishing vessels and its dissemination to boat builders										
Selection of builder to work with in development of inshore vessel prototype/ Support to prototype development										
Development and implementation of promotion campaign to encourage boat owners to upgrade their vessel/s										
Development of financial products to facilitate upgrading										

Table 21. Proposed Action Plan										
Proposed Intervention	**2015**									**2016**
	Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
Improvement of access to more efficient and selective types of fishing gears (Myeik)										
Preliminary meeting and briefing/negotiations with gear suppliers										
Orientation of gear fabricators and fishers on more efficient and selective types of gears / presentation by suppliers of gear materials of their products										
Village wide competitions in the development of more efficient and selective types of gears.										
Dissemination of winning designs										
Development of financial products										
Explore the possibility of setting up a village-based enterprise managed by women which will specialize in the retail selling of gear materials, fabrication and repair of nets										
Development of local capacity to provide services that will enable fishers to adopt sustainable and climate smart fishing technologies and manage their fishing operations as sustainable businesses (Myeik)										
Selection of 2 to 3 pilot groups (fishers should have at least 3 crews)										
Organizational development support to selected groups										
Selection of learning facilitators										
Participatory development/adaptation of modules with learning facilitators										
Training of learning facilitators										
Mentoring during start-up implementation of learning sessions with pilot groups										
Development and implementation of campaign on sustainable fishing										
Scaling up										

Table 21. Proposed Action Plan										
Proposed Intervention	**2015**									**2016**
	Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
Development of supply and demand for services aimed at improving technical and sea safety competencies of fishing crews (Myeik)										
Identification and selection of trainors/facilitators										
Participatory development/adaptation of training modules including development of training system										
Training of trainors/facilitators										
Support to MFF in development of operations manual for their training center										
Mentoring during start-up implementation of training services										
Development of radio plugging and coordination with radio stations										
Development and conduct of marketing campaign										
Development and implementation of recognition system										
Expansion in Yangon										
Improvement of access to services that would enable upstream players to meet food safety and OSH (Myeik and Yangon)										
Myeik Jetties/Traders										
Training of key staff of intermediaries and/or the owners on food safety and OSH										
Selection of jetties/traders that project will work with										
Technical support in implementing food safety and OSH in their own operations										
Participatory development and/or adaptation of modules including development of training system										
Mentoring during start-up implementation										
Dissemination of success stories										
Expansion in Yangon										
Wholesale Market: Yangon										

Table 21. Proposed Action Plan										
Proposed Intervention	**2015**									**2016**
	Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
Improvement of access to services that would enable upstream players to meet food safety and OSH (Myeik and Yangon)										
Training of key staff (wholesale market) on food safety and OSH										
Assistance to YCDC in the development of low cost implementation measures to facilitate compliance to food safety and OSH										
Development of video materials on food safety and OSH which can be shown during lull hours or before opening of the market complemented with "how-to" posters										
Support to market administration/YCDC in development and implementation of video training and short demonstration session including set-up of model stall										
Tri-media dissemination of success stories										
Upgrading of Transportation System: Myeik										
Selection and identification of sidecar fabricators that project can work with										
Development of design and prototype										
Forge linkages with financial services providers										
Improvement of access to services that would enable upstream players to meet food safety and OSH (Myeik and Yangon)										
Identification and selection of potential providers										
Adaptation of the existing training modules and development of training system										
Training of providers										
Assistance to fabricators in the design and development of low-cost tables and stalls that are visually appealing and compliant with food safety and OSH standards										
Development of schemes to facilitate stall upgrading										
Set-up of model stall										
Mentoring during start-up implementation of training										
Development and implementation of recognition system										
Conduct of a semi-annual or annual consumer feedback survey										
Conduct of marketing campaign										
Scaling up/Replication										

Table 21. Proposed Action Plan										
Proposed Intervention	**2015**									**2016**
	Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
Development of local capacity to commercially deliver productivity improvement services to enterprises in the fishing sector (Myeik and Yangon)										
Identification and selection of providers (Myeik)										
Customization of modules to fishery and Myanmar contexts										
Training of providers (Myeik)										
Assistance to MFF (with MFF Myeik as the pilot) in the deployment and operationalization of services										
Conduct of marketing campaign to stimulate demand for services										
Assistance to MFF Yangon/Head Office in deployment and operationalization of productivity improvement services in other regions										
Improvement of supply chain goverance and coordination between public and private stakeholders										
Preliminary draft of Code of Conduct/Adaptation of existing codes to Myanmar context										
Sensitization Workshop (inputs and feedback)										
Consultation Meeting with Stakeholders										
Presentation and secure approval of Code of Conduct (Myeik)										
Campaign to disseminate salient points of the Code to all stakeholders										
Creation of an inter-institutional platform to strengthen knowledge sharing and coordinated actions										
Strengthening of capacity of local/regional associations to provide market driven services and articulate the needs of members and the industry										
Organizational development support										
Set-up of business development center or training services										
Operation guidelines and manual/performance monitoring system										
Capacity building in areas that would require strengthening										

Annex 1
COMMERCIALLY IMPORTANT FISH SPECIES IN MYANMAR

Selected Commercially Important Species of Demersal and Pelagic Fishes in Myanmar		
Scientific Name	Common Name	Local Name
ARRIDAE	**Sea Catfish**	
Arius caelatus	Engraved catfish	Nga-Yaung
A.maculates	Spotted catfish	Nga-Yaung
A.thalassinus	Giant catfish	Nga-Yaung
A.venosus	Veined catfish	Nga-Yaung
Osteogeneosus militaris	Soldier catfish	Nga-Yaung
CARANGIDAE	**Trevally / Scad**	
A. Alectic indicus	Threadfin trevally	Byar-san-wike
Alepes djeddaba	Djeddaba trevally	Pann-zinn
Alepes melanoptera	Black fin trevally	Pann-zinn
Atropus atropus	Kuweh trevally	Nga-da-ma
Carangoides chrysophrys	Long nose cavalla	Zar-gyann
C. ciliarius	Long nose cavalla	Zar-gyann
C. ferdau	Ferdau's cavalla	Zar-gyann
C. malabaricus	Malabar's cavalla	Waing-phyu-gyi
Caranx ignobilis	Yellow fin jack	Zar-gyann
C. sexfasciatus	Dusky jack	Zar-gyann
Decapterus macrosoma	Layang scad	Pann-zinn
D. maruadsi	Round scad	Pann-zinn
Gnathanodon speciosus	Golden toothless trevally	Ka-la-ngu
Megalaspis cordyla	Hard tail scad	Pyi-daw-tha
Scomberoides commersonianus	Talang queen fish	Nga-let-war
Selaroides leptolepsis	Yellow stripe trevally	Myet-san-kje
Seriolina nigrofasciata	Black banded trevally	Nga-thaw-but
LUPEIDAE	**Herring/Shad/Sardinet**	
Anodontostoma chacunda	Chacunda gizzard shad	Nga-wun-pu
Dussmieria acuta	Rainbow sardine	Nga-kyaw-nyo
Tenualosa ilisha	Hilsa shad	Nga-tha-lauk
Hilsa ilisha	Elongate ilisha	Zinn-byar
Opisthopterus tardoore	Tardoore	Nga-par-shar
Sardinella gibbosa	Gold stripe sardinella	Nga-kone-nyo

Selected Commercially Important Species of Demersal and Pelagic Fishes in Myanmar		
Scientific Name	Common Name	Local Name
LUTJANIDAE	**Snapper**	
B. Aprion virescens	Green job fish	Nga-ba-yin
Lutjanus argentimaculatus	Mangrove red snapper	Nag-par-ni
L.johni	John's snapper	Nag-par-ni
L.malabaricus	Malabar red snapper	Nga-ba-yin
L.russelli	Russell's snapper	Nga-ba-yin
L.sanguineus	Blood red snapper	Nga-ba-yin
L.sebae	Emperor red snapper	Nga-ba-yin
L.vitta	Brownstripe red snapper	Nga-ba-yin
Pristipomoides typus	Sharp toothed snapper	Nga-ba-yin
MULLIDAE	**Goat Fish**	
Parapeneus heptacanthus	Spotted Golden goat fish	Kyo-war
Upeneus moluccensis	Golden band goat fish	Kyo-war
U.sulphuresu	Yellow goat fish	Kyo-war
U.vittatus	Yellow stripe goat fish	Kyo-war
MURANESOCIDAE	**Sea eel / Plke Conger**	
C. Congresox talabon	Yellow pike conger	Nga-shwe
Congresox talabonoides	Indian pike conger	Nga-shwe
NEMIPTERIDAE	**Threadfish bream**	
Nemipterus dalagoae	Dalagoa threadfin bream	Shwe-nga
N.japonicus	Japanese threadfin bream	Shwe-nga
N.nematophorus	Double whip threadfin bream	Shwe-nga
N.tolu	Notched threadfin bream	Shwe-nga
POLYNEMIDAE	**Threadfish**	
D. Eleutheronema tetradactylum	Four finger threadfin	Zayaw-gyi
Polynemus indicus	Indian threadfin	Ka-ku-yan
P.sextarius	Black spot threadfin	Zayaw
POMADASYIDAE	**Grunt / Javelin Fish**	
E. Pomadasys hasta	Lined silver grunt	Gone-gyi
Pomadasys maculatus	Blotched grunt	Gone-pyauk

Selected Commercially Important Species of Demersal and Pelagic Fishes in Myanmar		
Scientific Name	Common Name	Local Name
SCIAENIDAE	**Croaker / Drum**	
Chrysochir aureus	Reeve's croaker	Thin-war
Otolithes rubber	Tiger toothed croaker	Thin-phyu
Otolithoides biauritus	Bronze croaker	Nat-ka-daw-gyi
Panna microdon	Penna croaker	Nat-ka-daw
Pennahia macrophthalmus	Big eye croaker	Gaung-pwa
P.macrocephalus	Big head pennah croaker	Gaung-pwa
Prontonebia diacanthus	Spotted croaker	Ka-tha-myin
Pterotolithus maculates	Blotched tiger toothed	Nat-ka-daw
SERRANIDAE	**Grouper / Seabass**	
Epinephelus bleekeri	Bleeker's grouper	Kyauk-nag
Epinephelus tauvina	Greasy grouper	Kyauk-nag
STROMATEIDAE	**Pomfret**	
F. Pampus argenteus	Silver pomfret	Nga-moke-phyu
SYNODONTIDAE	**Lizard Fish**	
G. Saurida micropectoralis	Short fin lizard fish	Nga-pa-lway
Saurida tumbil	Greater lizard fish	Nga-pa-lway
Saurida undosquamis	Brush toothed lizard fish	Nga-pa-lway
TRICHIURIDAE	**Hair Tail / Ribbon Fish**	
Trichieurus lepturus	Small head hair tail	Nga-da-gon
Source: Sustainable Management of The Bay of Bengal Large Marine Ecosystem		

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ISBN: 9789221300311