

ASSESSMENT ON MARKETING CHAIN OF FISHERY PRODUCTS IN TAUNGGOKE TOWNSHIP

Nwe Yin Min¹, Swe Yi Khaing², Zin Mar Win³, Zin Win Phyu⁴

Abstract

This paper evaluates the marketing chain of fishery products in Taunggoke Township, located in the southern part of Rakhine State, which benefits from its coastal location. Fishing is one of the primary economic activities in Myanmar, and local residents earn their livelihoods from this industry, with various fishery products from Taunggoke flowing to other regions of the country. Both fishermen and traders rely on fishery activities for their income. The main products produced in the area include dried fish, ngapi (fish paste), salted fish, shrimp, and crabs. The objectives of this paper are to examine types of fishery products produced in Taunggoke Township, to explore fishery product sent from Taunggoke Township, to investigate marketing chain and flow of fishery products in Taunggoke Township and to predict future prospect on fishery product production of Taunggoke Township. A situational analysis and SWOT analysis were conducted to assess fish production areas. This study utilized primary data collected through field observations, interviews, and semi-structured questionnaires.

Keywords: fishery products, fishery, types of fishery products, marketing chain, production

Introduction

Fish is a major source of food for millions of people on the world. Food derived fishes has high nutritional value as it is rich in protein, fat, mineral, vitamins, etc (Tacon, 2008). Seafood including fishes can make a significant contribution to the nutrient needs and consumption per capita is high in several European countries. The increasing scientific evidence shows its importance of sea food in a healthy diet (Nunes & Batista, 2003).

Both fishery and aquaculture have social implications as more than 37 million people are directly involved in it, and more than 200 million people seek direct and indirect income from fish production (FAO, 2003). Improving the productivity of fisheries and aquaculture is vital to reducing hunger and poverty for millions in the developing world (FAO, 2017).

In 2016-2017, the contribution of fisheries sector to the Rakhine State's GDP represents about 12% of the total GDP (Report on Rakhine State Investment Opportunity Survey-2019). Fish consumption is high and fish trade, nowadays, and it is of very high economic importance.

Taunggoke Township is one of the fishery product producing areas. The nearness to the sea is locational advantage supporting local economy. Fishery producing dried fish, ngapi (fish paste) & salted fish is the second most important economic activity after agriculture. Fishes are mostly consumed fresh locally, but high quality fishes and dried fishes are sent to Yangon. Poor quality and unsold fish are processed into dried fish, ngapi (fish paste), salted fish and animal feeds. Fish and prawn are mostly sent to Sanpya Fish Market, main wholesale fish market in Yangon, and also sent to Pyay Township (Bago Region) and Mandalay Region. The dried fishes are also sent to central Myanmar. Therefore, Taunggoke Township is selected as study area to be presented from geographical point of view.

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Research Questions

What are types of fishery products produced in Taunggoke Township?

How are fishery products sent through marketing chain?

Aim and Objectives

The main aim of this paper is to study market chain of fishery products in Taunggoke Township.

Objectives

Objectives of the paper are as follows:

- to examine types of fishery products produced in Taunggoke Township
- to explore fishery product sent from Taunggoke Township
- to investigate marketing chain and flow of fishery products in Taunggoke Township
- to predict future prospect on fishery product production of Taunggoke Township

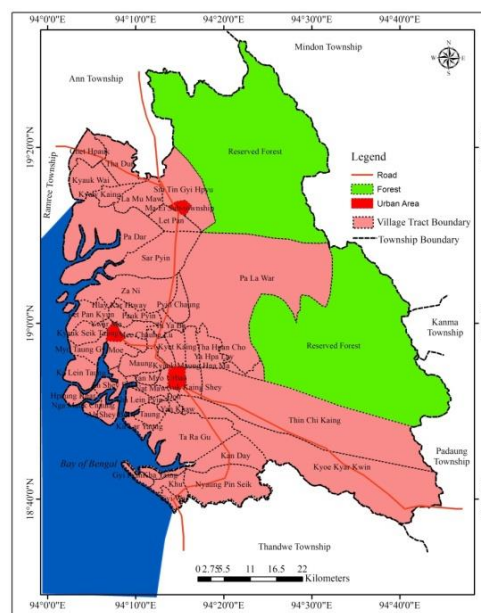
Background of the Study Area

Taunggoke Township is one of the townships of Rakhine State. It is flanked by the Bay of Bangal in the western coastal strip of Myanmar. The township lies between north lat. $18^{\circ} 38' 00''$ and $19^{\circ} 20' 00''$ and east long. between $93^{\circ} 59' 00''$ and $94^{\circ} 18' 00''$. The area of Taunggoke Township is 5328.25 sq. km (2057.25 sq. miles) including eight wards as well as 53 village tracts (Zin Mar Win, 2021).

Coastal village tracts such as Letpanyun, Kyaukseiktaung, Myotaung, Kaleintaung, Ngamaukchaung, Ahsheybet, Kularyaung, Gyibyin, Gyiwa, Hpaungkhar and Kayaing are close to the sea and the elevation is only about 6 metres (18 feet) above sea-level. The inhabitants of these village tracts earn their living mainly on fishery and agriculture.

Sources of Data and Methodology

The research work uses primary and secondary data in Taunggoke Township. Before collecting data concerned with fishing product, the information related to fishery sector was firstly acquired from internet website source, journals, and foreign research papers. The necessary primary data were acquired through field survey and interviews and group discussion. To get primary data concerning fishing product, types of products marketing flow, etc structured



Source: Settlement and Land Records Department, Taunggoke Township.

Figure 1. Location of Taunggoke Township

interviews were done with 30 Fish pond owners in seven village tracts. Five village tracts: Ahsheybet Village Tract (above 400 hectares), Hpaungkar (between 300 and 400 hectares), Myotaung and Kaleintaung village tracts (between 101 and 200 hectares) and Khayaing Village Tract (below 100 hectares) were selected by using stratified sampling. Secondary data were derived from General Administrative Office of Taunggoke Township. Fishery data were collected from Department of Fishery. Situational analysis was used to market chain of fishing product in Taunggoke Township.

Results and Findings

Situational analysis on Present Fishing Industry of Taunggoke Township

Fishes and Shrimp Ponds in the Study Area

Currently shrimp culture is being carried out at commercial scale in Rakhine State including Taunggoke Township (Department of Fisheries, 2021).

In 2000, Taunggoke Township had only 4 fish and shrimp ponds, which increased to 7 by 2010 and then surged to 94 ponds by 2022. This growth of 90 ponds from 2000 to 2022 can be attributed to the rising population and limited job opportunities during the COVID-19 pandemic.

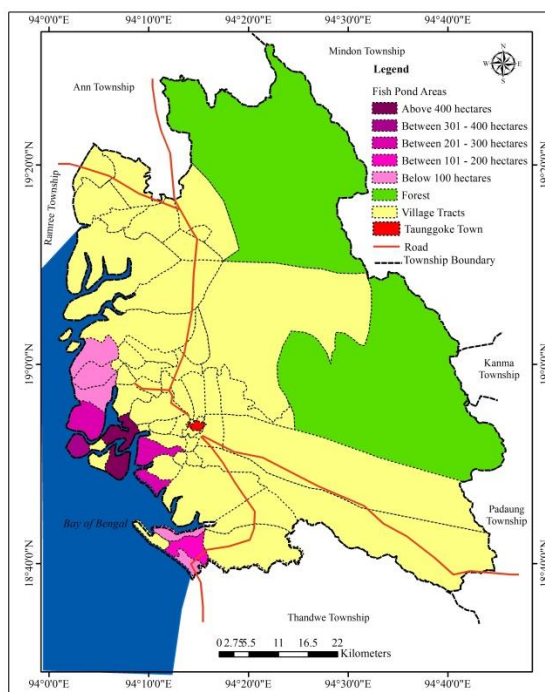
Table 1. Distribution of Fish and Shrimp Ponds in the Study Area(2000, 2010 and 2022)

Village Tract Name	2000*		2010*		2022	
	pond	hectares	pond	hectares	pond	hectares
1. Thaleinpyin	1	20	1	14	8	178
2. Kularyaung	1	14	1	8	11	137
3. Ahsheybet	1	28	2	26	35	462
4. Kaleintaung	1	12	1	12	12	177
5. Hpaungkhar	-	-	2	40	19	333
6. Kyaukseiktaung	-	-	-	-	3	38
7. Khayaing	-	-	-	-	1	12
8. Myotaung	-	-	-	-	1	81
9. Letpanyun	-	-	-	-	2	30
10. Khu	-	-	-	-	2	126
11. Gyiwa	-	-	-	-	1	16
Total	4	74	7	100	94	1590

Source: *Khin Myo Htay, 2021.

Department of Fishery, Taunggoke Township

Eleven village tracts in Taunggoke have obtained licenses from the Taunggoke Fishery Department, collectively managing 94 fish, shrimp, and crab ponds. Ahsheybet Village Tract has the highest number of these ponds, with 35 covering 402 hectares, followed by Hpaungkhar Village Tract with 19 ponds across 332 hectares. The other village tracts each occupy less than 300 hectares.



Source: Table 1.

Figure 2. Area of Fishes and Shrimp Ponds in Taunggoke Township

The village tracts selected for detailed study are Ashebet, Hpaungkhar, Kalaintaung, Khayaing and Myotaung.

According to fiddle investigation, the villages of Ashebet village tract started raising fish and shrimp since 8 years ago. The mangrove forest of the area was turned into fish and shrimp ponds and established the depot buying and selling fish, shrimps and crabs 4 years ago. The area of the ponds was 100 acres (40.46 hectares). The fish, shrimp and crabs are caught with the rising tidal water. There are 6 entrances through water can pass. Four regular workers are employed and each has to be paid one lakh kyats per month including food and shelter. If they can catch one kilo of crabs, they get 1000 kyats. The most aquatic species caught are sea peach, *Mugil cephalus* (Kabilu), *Penaeus merguensis* (Pa zun phyu), *Penaeus monodon* (Tiger pa zun) and crabs. The amount of catch is high from May to December. About 200 viss of Tiger shrimp are caught per month in average.

After two years, the catch amount has decreased due to the degradation of the ecosystem. Now there are 6 ponds that come and sell at the depot. The price difference is 10000 kyats with Yangon market. Every day one tub (75 viss) of the products is sent to Kyimyintdaing Fish Market at Yangon City. The amount of fish catch is high in the period from 12th, 13th day of waxing moon to 5th day of waning moon in the Myanmar months. The price depends on the size of fish and crab. The problems are the lowering of natural breeding and the high cost of labour.

The cost of sanding a Tub of fish from the village to the jetty of motorized boat or own boat.

Table 2. Cost of Sanding a Tub of Fish from the Village to the Jetty

General Sanding Costs	Prices (ks)
Motorized jetty, car gate	3000
Tub	10000
Freight receipt cost	10000
Ice cost	(2500 × 4 begs) 10000
Total Cost	33000

Source: semi structure interviews

Fishery Products

The primary fishery products from Taunggoke Township include saltwater fish, dried saltwater fish, shrimp, dried shrimp, crab, freshwater fish, sea snails, mussels, jellyfish, and stone fish.

Crab

Crab farming is prevalent in all coastal village tracts, with crabs primarily exported to China via Mandalay. This seasonal activity peaks around the Chinese New Year. Although crabs are a high-value product, they are delicate and perishable, which can lead to losses if transit takes three to four days. The price of crabs varies based on their size.

Shrimp

Shrimp is the main catch for small-scale fishermen in Taunggoke Township. Collectors purchase dried shrimp at a fixed price but resell it at different prices depending on size. For chilled shrimp, grading occurs at the village level based on size and at the township level based on weight. Chilled shrimp represent the area's highest value product.

Dried Shrimp

Dried shrimp catches are seasonal, peaking from May to August. Processing involves sorting, drying, and shelling, with women typically handling processing while men focus on fishing. Product quality and size significantly influence pricing, which ranges from 4,000 to 7,000 MMK per viss, depending on quality.

Fish Paste (Ngapi)

In the Khayaing and Myotaung village tracts, shrimp paste (myin) has been produced for 15 years. Myin fish are caught using nets from the 13th waxing day to the 6th waxing day during spring tides, yielding about 3 viss daily. After sun-drying for a day, the fish are pounded with salt and water. Raw shrimp paste sells for 7,000 MMK per viss, while processed shrimp paste can reach 15,000 MMK per viss.

Jellyfish (Yakhu)

The consumption of jellyfish began in Yanbye Town in 1993 and started in Taunggoke about ten years ago. Jellyfish are harvested from March to July, mixed with salt and alum, and sent to Yangon before being exported to Japan. Three companies are involved in this trade, and jellyfish can yield around 30 tons annually. In 2022, jellyfish were priced at 150 kyats per unit, with local prices around 6,000 kyats per viss. They are exported to Thailand via Myeik and Dawei, where the price reaches 86 baht (approximately 85 kyats per bahts).



Source: Interview and Field Survey, (17.12.22) **Plate 1.** Crab caught in Khayiang Village Tract



Source: Interview and Field Survey, (17.12.22) **Plate 2.** Spiny lobster (Kyauk Pa Zun) in Khayaing Village Tract

Dried Fish

The daily catch averages about 50 viss, primarily consisting of Nga sit sali and *Otolithies ruber* (Nga poke thin). Approximately 4 viss of fresh fish can yield 1 viss of dried fish, with fresh seali fish priced at 2,500 kyats per viss and dried fish at 10,000 kyats. Small dried fish for chicken feed are priced at 7,300 kyats per viss and are shipped to Pyay City. Pricing for assorted fish varies from 2,000 to 2,500 kyats based on size. Ten years ago, these fish were sent to the Shwe Rakhine depot in Pay City, but now they are primarily sold in Taunggoke due to decreased catches. Fishing is prohibited from March to October, during which time fishermen cultivate chili.



Source: Interview and Field Survey, (7.1.23)

Plate 3. Dry Fish Production in Ashebat village tract

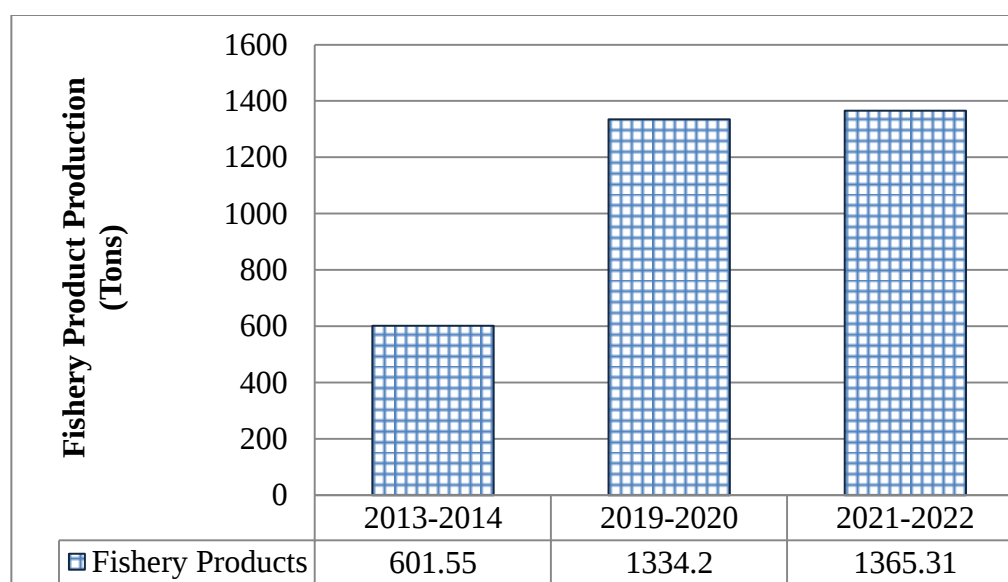
Fishery Product Production

Fishing operations typically occur from May to August, with the highest catches from the 13th waxing day to the 4th waning day of each month. The number of fishermen has increased, utilizing various fishing nets. However, per capita fish catches have declined due to water pollution, rising fisherman numbers, and illegal fishing during closed seasons. To prevent fish extinction, financial support should be provided to fishermen during prohibited fishing periods.

Table 3. Fishery Products Production of Taunggoke Township (2013-14, 2019-20 and 2021-22)

No	Fishery Products	2013-2014	2019-2020	2021-2022
1	Saltwater Fishes	58.77	292.24	286.88
2	Saltwater Dry Fish	13.63	0	48.62
3	Saltwater Prawn	42.16	210.39	238.45
4	Saltwater Dry Prawn	5.70	9.92	7.58
5	Crab	386.36	578.71	490.84
6	Freshwater Fish	2.60	4.01	1.99
7	Kyauk Pa zun Sein	8.83	5.30	3.28
8	Mussel	22.40	100.06	24.71
9	Jelly Fish	0	4.0	168.05
10	Nga Kyet Tike	0.96	3.09	3.96
11	King Pa Zun	0	1.31	0.97
12	Ba Le Crab	60.14	98.17	53.98
13	Vara Crab	0	26.17	35.43
14	Nga Tauk Tu	0	0.83	0
15	Tele Baung	0	0	0.57
	Total	601.55	1334.2	1365.31

Source: Department of Fishery, Taunggoke Township

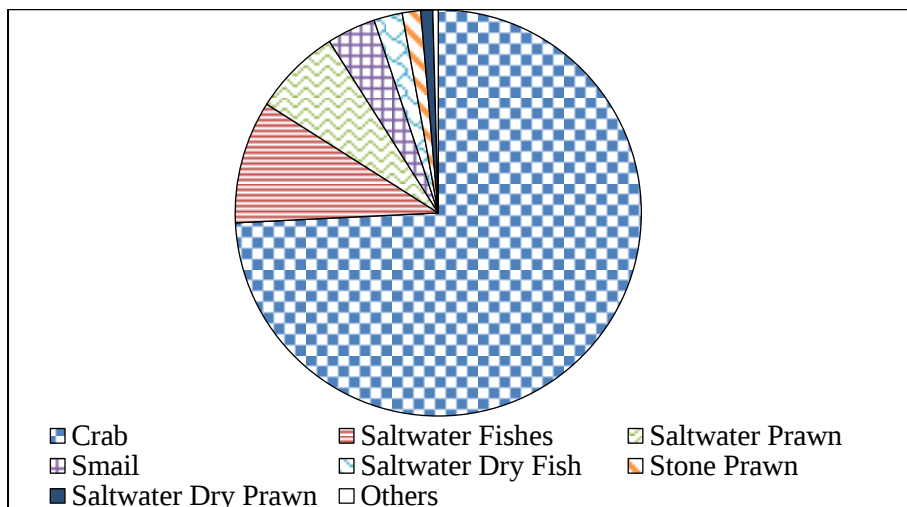


Source: based on Table 3

Figure 3. Fishery Products Production of Taunggoke Township (2013-14, 2019-20 and 2021-22)

In Taunggoke Township, amount of fishery product production increased gradually. In 2013-14, amount of fishery product produced in the area was 601.55 tons and it increased to 1334.2 tons in 2019-20 distinctly. Again, it increased to 1365.31 tons in 2021-22. It unfolds that fishery sector supports the GPD of Taunggoke Town and economy of local people.

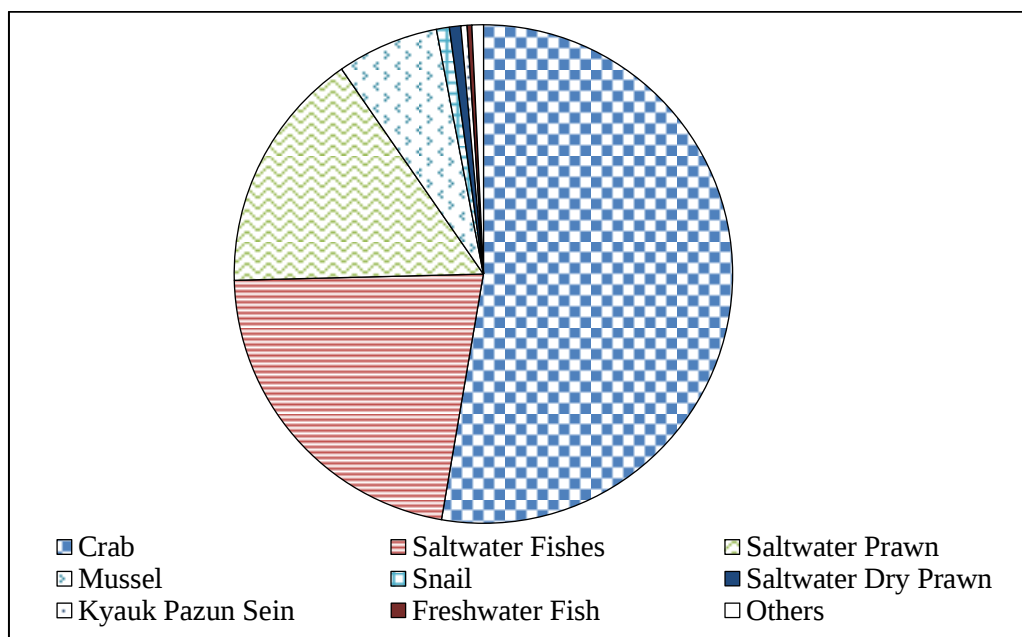
In 2013-14, crab ranks first with total production of 386.36 tons and salt water fishes ranked second with 58.77 tons and salt water prawn third with 42.16 tons. Taunggoke Township has locational advantage because it possesses coastal area supporting salt water fishery. Salt water fishery products also include saltwater dry fish, saltwater prawn, saltwater dry prawn, freshwater fish, mussel, snails, etc.



Source: based on Table 3.

Figure 4. Fishery Products Production of Taunggoke Township (2013-14)

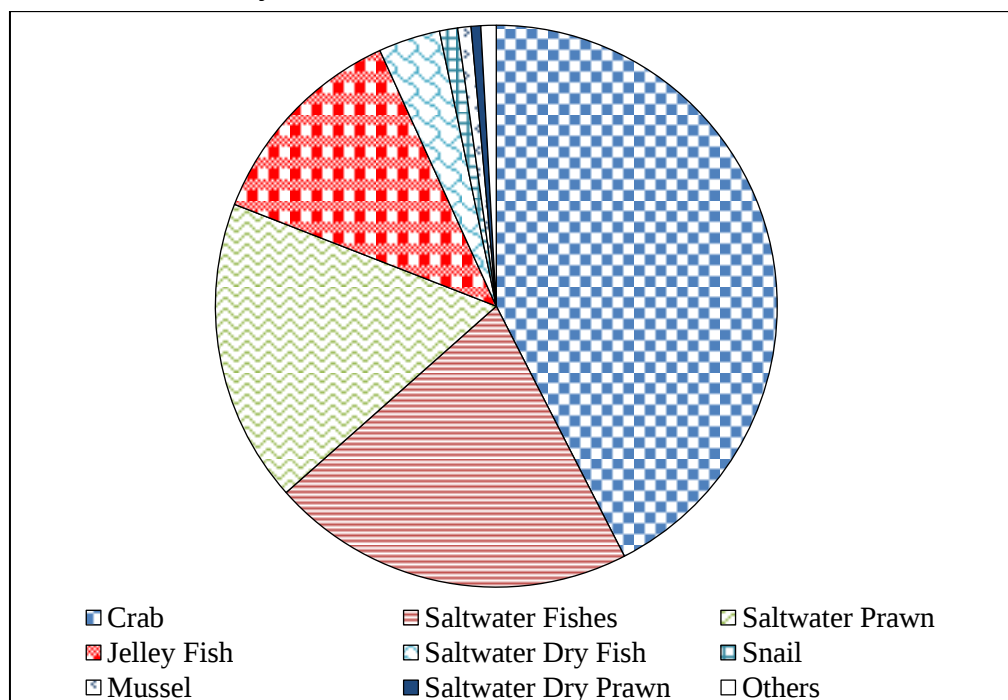
In 2019-20, crab ranks first with total production of 578.71 tons and salt water fishes ranked second with 292.24 tons and salt water prawn third with 210.39 tons. Fishery product production increased distinctly in the area due to better equipment used in fishing.



Source: based on Table 3.

Figure 5. Fishery Products Production of Taunggoke Township (2019-20)

In 2021-22, crab ranks first with total production of 490.84 tons and salt water fishes ranked second with 286.88 tons and salt water prawn third with 238.45 tons. Fishery product production increased distinctly in the area.



Source: based on Table 3.

Figure 6. Fishery Products Production of Taunggoke Township (2021-22)

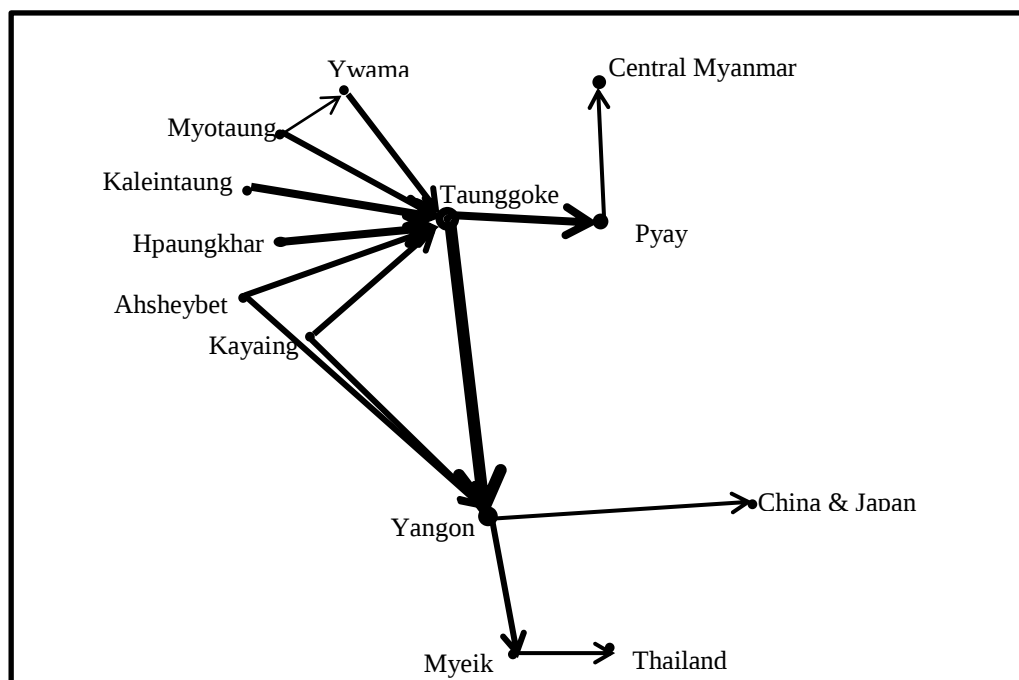
Depot for Fish, Shrimp, and Crab

Khayaing Village Tract has operated a fish, shrimp, and crab depot for 20 years. Fish sent from Taunggoke include *Lates calcarifer* (Ka Ka Dit), *Leptomelanosoma indicum* (Ka Ku Yan), Vara Crab, *Cloridopsis scorpio* (King Pa Zun), and *Spiny lobster* (Kyauk Pa Zun). Prices vary by size, with past products shipped to Yangon now sold locally in Taunggoke. Prices at the village depot start at 50,000 MMK per viss, increasing to 65,000 MMK at the Taunggoke depot and 75,000 MMK in Yangon. For example, the price of *Formio niger* (Ohne Nga Moke) is 6,000 MMK in the village, 7,000 MMK at the Taunggoke depot, and 10,000 MMK in Yangon. Prices for *Lates calcarifer* (Ka Ka Dit) are 10,000 MMK in the village, 12,000 MMK at the Taunggoke depot, and 18,000 MMK in Yangon. Occasionally, exporters to Yangon incur losses due to sudden price drops. *Cloridopsis scorpio* (King Pa Zun), and *Spiny lobster* (Kyauk Pa Zun) are caught during spring tides and are shipped alive to China by plane. Sending shrimp during the laying season from June to September can lead to legal issues.

Fishery Product Flows

According to interviews, 20% from **Myotaung Village Tract** is delivered to the village itself and Ywama Village Tract, while 80% is transported to traders in **Taunggoke**. From **Ahsheybet and Kayaing village tracts**, 20% is sold to local traders, 60% is transported to **Taunggoke**, and 20% is directly transported to **Yangon**. From **Kaleintaung and Hpaungkha village tracts**, the products are transported directly to **Taunggoke**. From Taungkok, 30% is

further transported to **Pyay**, and then Pyay to reaching Central Myanmar, 70% is transported to **Yangon**. From Yangon, the products are exported to **Myeik** and **Dawei**, and from there to **Thailand**, as well as by air to **China and Japan**.



Source: semi structure interviews

Figure 7. Flows of Fishery Product in Taunggoke Township

Fish Market Chain

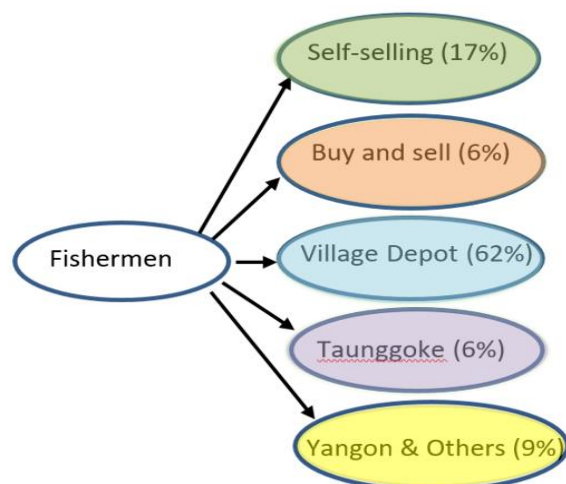
According to responses from semi-structured interviews, fish catches and other aquatic animals are sold at the village fish depot, generating approximately 300,000 kyats per day, although this drops to around 80,000 kyats during the summer. If a fisherman fails to earn at least 100,000 kyats in a day, they face potential losses. The price difference between the village fish depot and Taunggoke Town is 1,000 kyats per viss. Selling at the Taunggoke depot saves time and reduces fuel costs.

At the village depot, fish are priced at 6,000 kyats per viss, while they are sold at 7,000 kyats in Taunggoke. Some depot owners provide advance payments to fishermen, who then sell their catches to the depot. Fishermen who go out daily have the opportunity to sell their fish at the depot. Fishing is prohibited from March to June, but many fishermen continue to catch fish during this period as catches tend to be higher.

The price for Vara crab is 10,000 kyats per viss at the village depot and 15,000 kyats at Taunggoke. Typically, a fisherman catches only one or two crabs per day, making the village depot the preferred selling point to avoid the costs of gasoline and time. Daily fish catches can average around 19 viss on some days but may drop to just one viss on others.

If the catch is low, fish are sold at the local village depot; if the catch is high, they are sent to the Ywama depot. The price of fish in the village ranges from 500 to 600 kyats per 10 tickles, compared to 700 to 800 kyats at Ywama. Ka ka dit is priced higher, at 700 to 800 kyats in the village and 1,000 kyats at Ywama. It takes about 10 minutes by motorboat to reach Thanlwe

Ywama. In the past, each fisherman caught about 10 viss per day, but this has now decreased to around 5 viss.

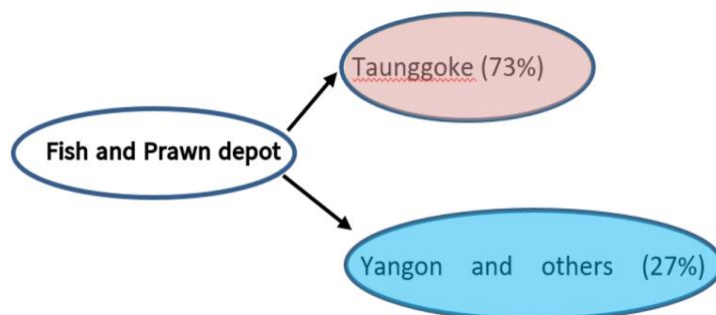


Fishermen sold 17% of the fish and fish product themselves in the nearby villages. Only 6% of the fishes and fish products are sold to local venders and then, they sell nearby villages. Only 62% of the fishes and fish products are sent to depots in the villages and 6% to depots of Taunggoke Township and 9% to depot of Yangon and other townships within Myanmar.

Source: semi structure interviews

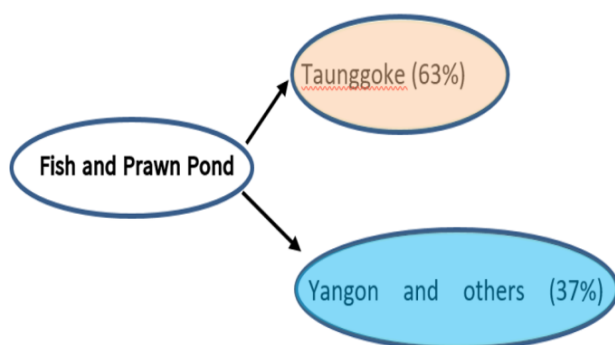
Figure 8. Marketing chain of fisherman

Fish and Prawn depots sent 73 percent of the fishes to Taunggoke Town and 27 percent to Yangon Region, a major market and a high demand area.



Source: semi structure interviews

Figure 9. Marketing chain of fish and prawn depots



Fish and Prawn Pond owners also sent 63 percent of the fishes to Taunggoke Town because of nearness and 37 percent to Yangon Region, a major market and a high demand area.

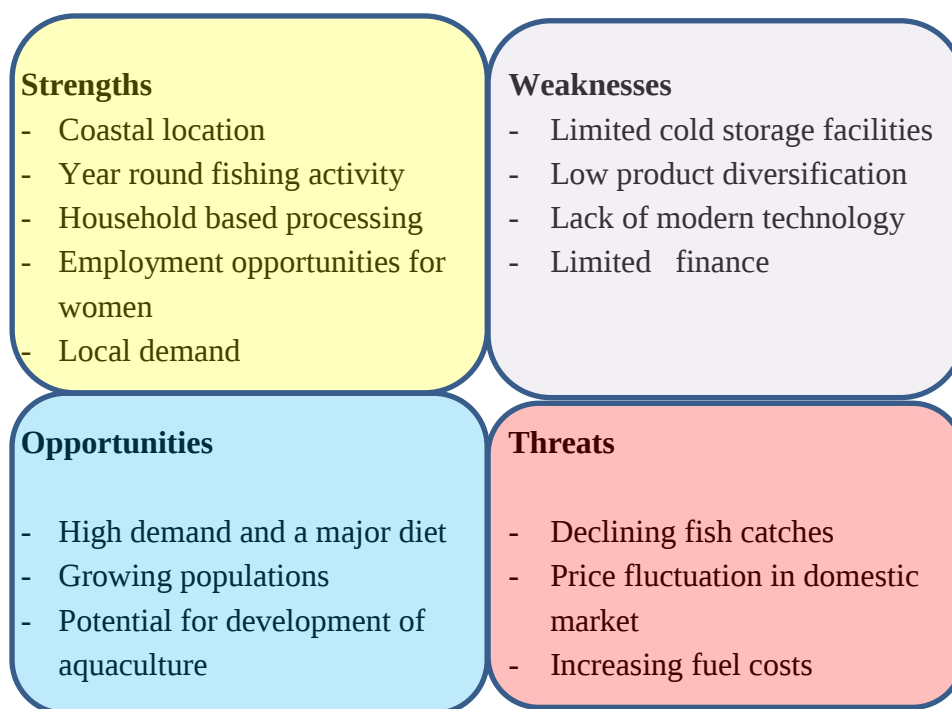
Source: semi structure interviews

Figure 10. Marketing chain of fish and prawn pond

Harland (1996) defined a supply chain as a network of retailers, distributors, transporters, storage facilities, and suppliers involved in the production, delivery, and sale of a product to consumers. In Taunggoke Township's fishery sector, however, the supply chain consists of only three key players: fishermen, traders (depot owners), and market areas (destination points). Interviews revealed that the marketing chain begins with the fishermen, who send their catch to local depots in villages and towns, and ultimately to other towns in Myanmar and China.

Fishermen face challenges such as inadequate investment for storage and transportation, compounded by insufficient electricity for proper fish storage. They typically sell their catch to depots owned by local traders or traders from other regions who have the necessary capital for fish trading. According to the interviews, local traders and those from other areas reap the most significant benefits in this fishery sector.

SWOT Analysis on Marketing Chain of Fishery Products



Strengths are as follows:

- Coastal location and rich inland water resources provide abundant fish supply.
- Year-round fishing activities ensure a steady flow of products to markets.
- Household-based fish processing (drying, salting, fermenting) adds value and creates income opportunities.
- Employment opportunities for women in processing, trading, and retail strengthen livelihoods.
- Local demand for fish is strong since it is a staple food in Myanmar's diet.

Weaknesses are as follows:

- Limited cold storage and ice-making facilities reduce product quality.
- Low product diversification (mostly fresh, dried, or salted fish) limits access to high-value markets.
- Fish product making skills are not well-developed within communities.
- Lack of modern technology in processing, packaging, and preservation weakens competitiveness.
- Limited access to finance for small-scale fishers and traders restricts investment in better equipment.

Opportunities are as follows:

- High domestic demand as fish is a major source of protein.
- Growing populations create demand for value-added fish products.
- Potential for development of aquaculture and sustainable fishing practices to meet market demand.

Threats are as follows:

- Declining fish catches due to overfishing, pollution, and habitat loss.
- Price fluctuations in domestic markets create uncertainty for producers and traders.
- Increasing fuel costs affect sending fish products and price of products

Conclusion

The fisheries in Taunggoke Township provide food, job opportunities, and income for local residents. Various species of fish are caught along the coastline, and there are also fish and prawn ponds in the area. The study area produces a diverse range of fish and fish products, including saltwater fish, prawns, crabs, mussels, and snails. However, fishermen's incomes are generally low, and the benefits of fishery activities primarily favor traders with substantial capital investments. Fishermen receive minimal returns due to inadequate storage facilities stemming from low investment levels. As a result, local fishermen often sell their catches to nearby village and town depots.

Most raw fish are sent to Yangon and abroad, while the production of value-added products is limited by a lack of technology for processing fish. Factors such as post-harvest losses, high transportation costs, and inadequate access to local and international markets hinder the production of value-added products in Taunggoke Township.

Effective management of the fishery sector is essential for both ecological and economic improvement for local communities. Management must involve collaboration among community organizations, fishermen, buyers, and brokers. Price regulation is also necessary to help bridge the income gap between local fishermen and traders.

To enhance the fishery sector in Taunggoke Township, further research is needed on environmental conservation, the socioeconomic status of fishermen, value-added products, price fluctuation and market demand.

Acknowledgement

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