

**SUPPLY CHAIN ANALYSIS OF SELECTED MARINE DRIED FISH
VARIETIES IN MATARA DISTRICT**

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IN MATARA DISTRICT**

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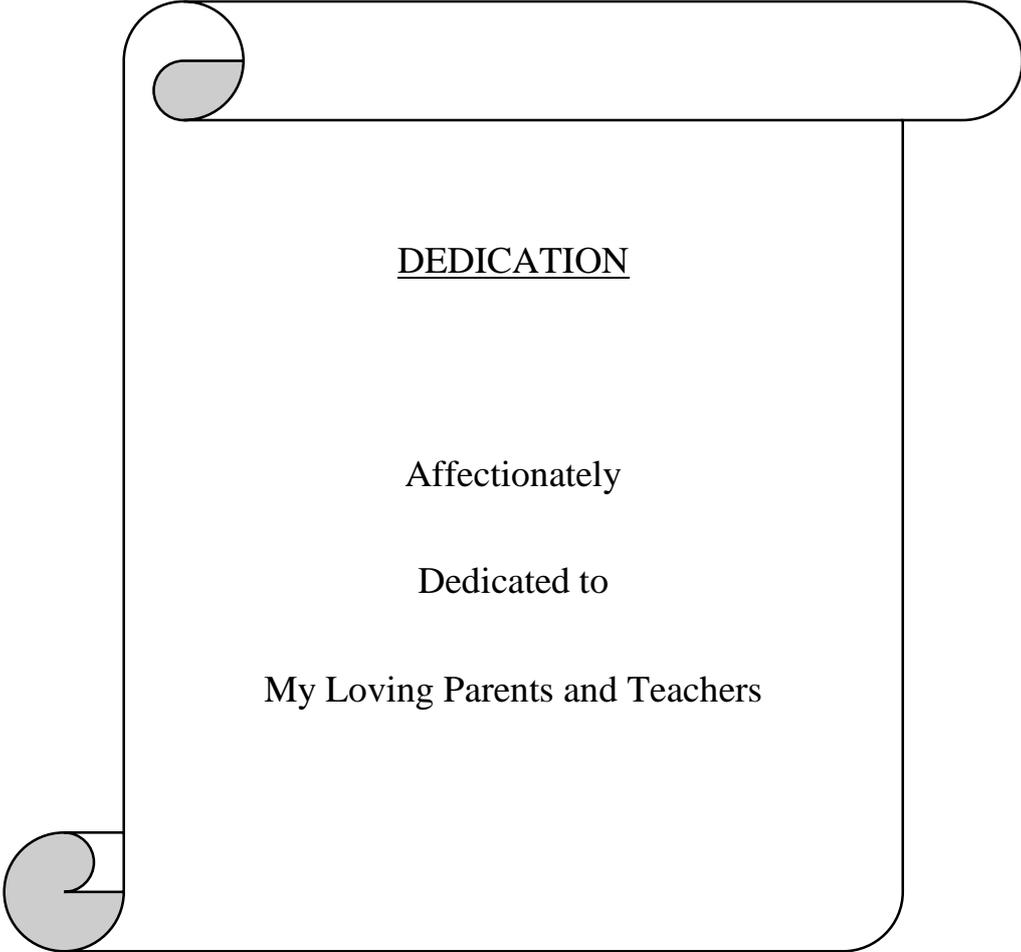
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DEDICATION

Affectionately

Dedicated to

My Loving Parents and Teachers

ABSTRACT

Marine dried fish processing is one of the main occupations in fishing communities in Matara district. It can be broadly developed as a major part of Sri Lankan economy. This study was analyzed the supply chains of selected marine dried fish varieties in Matara district. Although dried fish industry is more significant, there is no any research have been done about this sector in Matara district. On this background, this research was attempted to assess the supply chains of selected marine dried fish industry with main three objectives as identify the major dried fish supply chain/s in Matara district, analyze the market margin at different nodes in major dried fish supply chains and suggest pragmatic solutions for the major problems in each node of supply chains. To understand the marketing structure, a survey was conducted amongst the dried fish vendors and producers. Total sample size of the study was 100 comprising of 50 dried fish processors and 50 dried fish vendors (10 marketing agents, 20 wholesalers and 20 retailers). Snowball sampling technique was used for the selection of sample. Two structured questionnaires were used to collect primary data. Secondary data was collected by using readily available sources as journals, newspapers, books and websites etc. Data were presented by using descriptive methods. Data analysis revealed that there are major seven types of dried fish varieties are produced in Matara district and three major supply chains can be identified. Producer, wholesaler, retailer, marketing agent and consumer acts as linkages. The study revealed that marketing margins for all selected dried fish varieties were relatively higher in consumer markets. Intermediaries of the market faced various problems like inadequate capital, natural calamities, lack of scientific knowledge and technology, price instability, lack of transport facilities and higher transport cost, lack of inadequate storage facilities and lack of marketing information etc. The study concluded that, although dried fish producers and vendors face many problems, the engagement with this sector is beneficial.

Keywords: Dried fish, Supply chain, Sri Lanka, Matara district, Market margin

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LIST OF ABBREVIATIONS

NARA	-National Aquatic Resources Research and Development Agency
HARTI	-Hector Kobbekaduwa Agrarian Research and Training Institute
FAO	-Food and Agriculture Organization of United Nations
Mt	-Metric tons
MFARD	-Ministry of Fisheries and Aquatic Resources Development
EEZ	-Exclusive Economic Zone
Rs.	-Rupees
GDP	-Gross Domestic Product
Kg	-Kilogram
g	-gram
EEZ	-Exclusive Economic Zone
Mn	-Million

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CHAPTER 1

INTRODUCTION

1.1 Fish and fisheries products in Sri Lanka

Fish and fisheries products are consumed as food all over Sri Lanka. They are the cheapest source of protein as a solution for the malnutrition problem. The Sri Lankan per capita fish and fisheries products consumption per annum was 28kg in 2014 (FAO,2014).

Export of fish and fishery products is significantly important because it brings foreign currencies to the country. In 2015, Sri Lanka has exported 17461Mt of fish and fishery products and main fishery export products include tuna, fresh chilled and frozen form, shrimps, prawns, crabs and lobsters. As well as Sri Lanka is the major fish importer in the Southern Asian region. Dried fish, Sprats, Maldiva fish, canned fish and edible fish are the major imported fish and fishery products to the country to fulfill the demand (NARA,2015).

1.2 The marine dried fish industry in Sri Lanka

The Sri Lankan fisheries sector constitutes three major sub-sectors viz. coastal fisheries, offshore fisheries and inland aquaculture and it is mainly depends on marine fisheries (NARA,2015). Marine fishery sector contributes 87 percent to the total fish production of the country (MFARD, 2015). In 2015, the total fish production was 520,190 Mt and marine fish production was 452,890 Mt (NARA, 2015).

1.2.1 Dried fish production

The total dried fish demand of the country is fulfilled through local production and imports. According to data of the Ministry of fisheries and aquatic resources development statistics unit, the local dried fish production was 57,450Mt in 2015. About 70 percent of the local dried fish production of the country comes from Northern and Eastern provinces (NARA, 2012). Sprats, Keeramin, Salaya, Hurulla, Thalapath, Paraw, Seer, Katta, Koduwa, Anjila, Balaya, Mora/Keelan and Anguluwa are mostly used to produce marine dried fish in Sri Lanka (NARA, 2015).

1.2.2 Dried fish consumption

Most of the inland dwellers in Sri Lanka fulfill their protein requirement by consuming dried fish due to lack of fresh fish for their consumption and its' delicious flavor. As an example in 2014, 79.2 percent estate people were consumed dried fish in Sri Lanka. According to the data of 2012/2013 household income and expenditure survey report of the Department of Census and Statistics, the average monthly dried fish consumption per person was 1.16 Kg (Department of Census and Statistics, 2014).

1.2.3 Dried fish imports

Sri Lanka is one of the main fish and fishery products importing countries in the South Asian Region. Due to the low level of domestic production of dried fish and sprats in the country, Sri Lanka has to import a substantial amount of dried fish and sprats annually from India, Indonesia, Thailand, Pakistan, Maldives and China etc. (NARA, 2015).

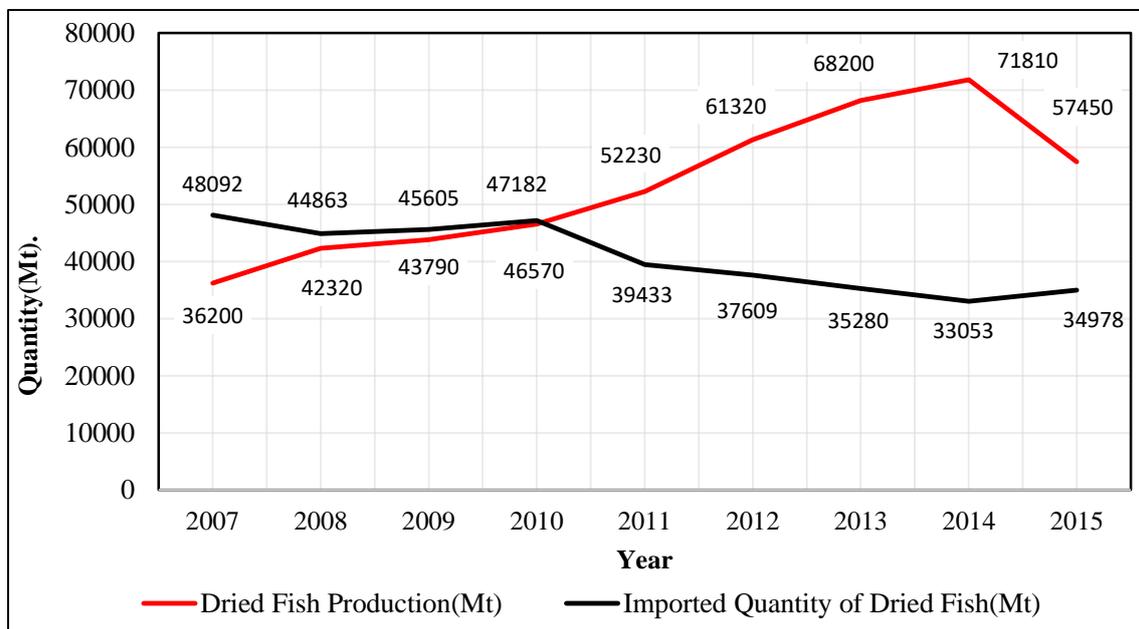


Figure 1.1 Dried Fish Production and Imported Quantity (Mt)

1.2.4 Dried fish prices

Dried fish products move from the producers to the final consumers through supply chains in the market. Different intermediaries like wholesalers and retailers etc. involved that process. The major share of dried fish marketing in Sri Lanka is handled by the private sector. When consider the Annual average prices of dried fish, can see the price fluctuation. (HARTI,2016).

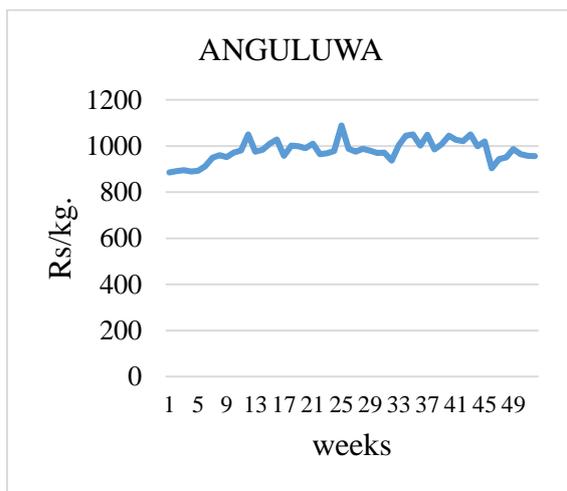


Figure 1.2 Price distribution of dried Anguluwa in 2016

Source: HARTI (2016)

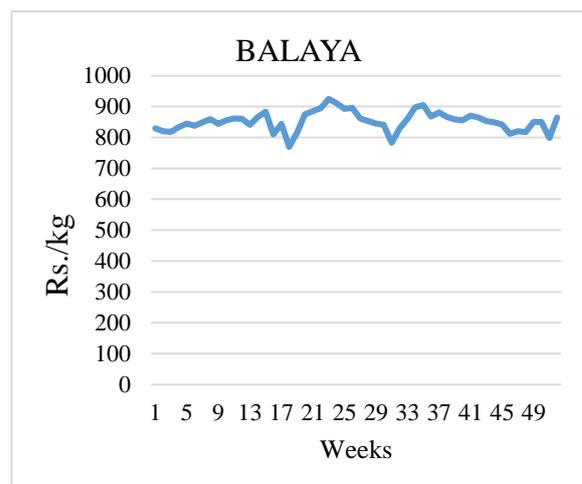


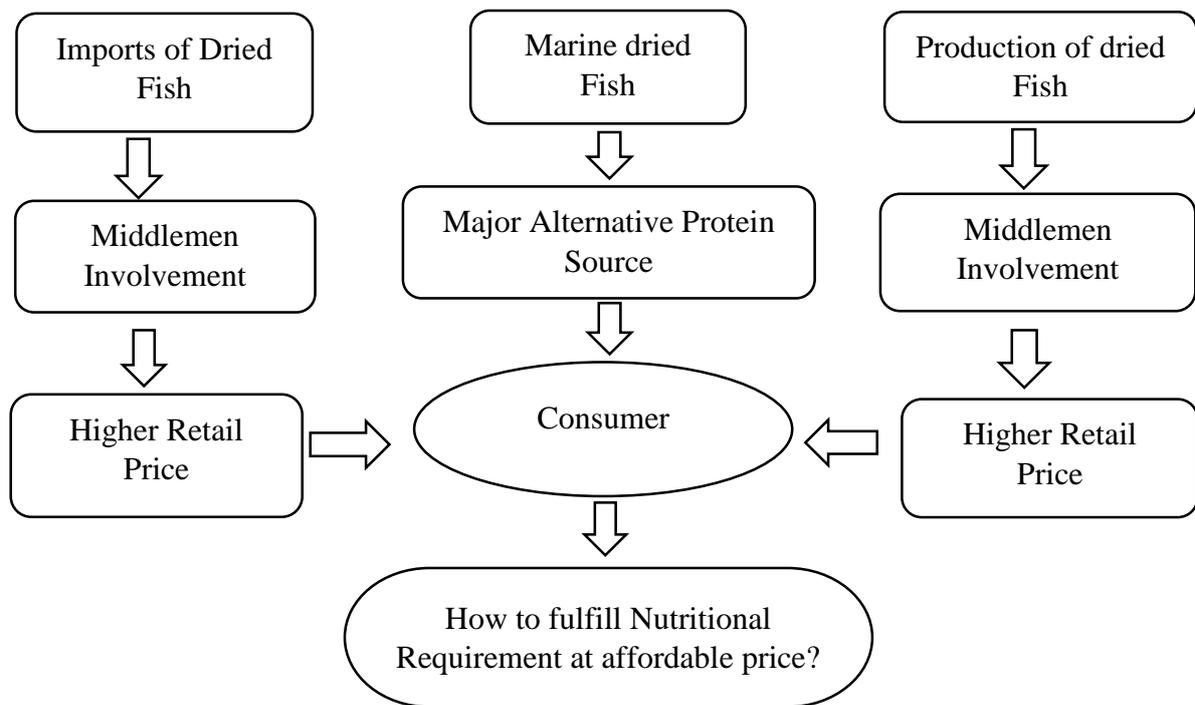
Figure 1.3 Price distribution of dried Balaya in 2016

Source: HARTI (2016)

Figure 1.2 and Figure 1.3 shows the price movements of dried fish in Colombo wholesale market in 2016. These fluctuations are often referred to as a sawtooth pattern, as prices show regular sharp rises and falls. In some of the weeks of the year, the price declined due to the more supply of dried fish. Due to higher supply and lower demand dried fishes, the prices of dried fish become lower. On the other hand, because of lower production, the price of dried fish was the highest in April and May. Another reason for higher price prevailed in the months of April to July was that the demand remained higher in those months. Sometimes, availability of substitute products of dried fish like fresh fish, meat etc. was responsible for fluctuation of the price of dried fish (HARTI,2016).

1.3 Problem statement

Marine dried fish processing is one of the main occupations in some kind of fishing communities in Sri Lanka. It can be broadly developed as a major part of Sri Lankan economy. The Considerable amount of marine fishers (men and women) was engaged with this sector within the coastal belt. Especially women in fishing families were engaged in the dried fish processing in home scale and many widows and their families are living in poverty. They engaged with fishing related jobs such as sorting caught fish and making dried fish. As well as some poor fishing families do not have enough money to purchase boats for their own utilization. That kind of peoples tries to do dried fish processing for income generation. But, it is not well established organized industry until now also. It is very poor attention paid sector. Producers cost is relatively high because they need to buy raw materials for making dried fish like fresh fish, salt etc. at higher market prices. As well as they need to pay money for electricity, water, labor wages, transportation costs etc. By bearing that kind of costs, they produce their products to earn income. But when we consider the current supply chains of dried fish in Sri Lanka, the profit of the producer was low. Because nowadays can see the higher number of middlemen involvement to the marketing channel of dried fish. Therefore, need to find out the supply chain of dried fish, problems and possible remedies for them to uplift this sector and protect the both dried fish consumers as well as producers. Because most of the inland dwellers like estates fulfill their protein requirement by consuming dried fish as an animal protein source because of the non-availability of fresh fish for consumption within that areas. But the consumer has to depend seasonal price fluctuations of dried fish throughout the year.



On this background, this research attempted to assess the marine dried fish industry in Sri Lanka with the following objectives.

1.4 Objectives

1. To identify the major dried fish supply chain/s in Matara district
2. To analyze market margin at different nodes in major dried fish supply chains
3. To suggest pragmatic solutions for the major problems in each node of supply chains

1.5 Significance of the study

The research aimed to analyze the price behavior of selected dried fish varieties in Matara district. Because it was paid a very poor attention and still it was at the primitive stage. The input of this research will feed into further researches at large scale. At present, there are no reliable policies for this sector. Thus, the finding of this study will benefit to the teachers, students, undergraduates and researchers etc. As well as, this research is a great importance to marketers and policymakers to help them formulate programs and policies related to the dried fish production and marketing.

CHAPTER 2

LITERATURE REVIEW

2.1 World Fisheries

Fishing Industry defined as “any industrial activity that engaged in taking, culturing, processing, preserving, storing, transporting, marketing or selling fish and fish products”(FAO, 2014).

Fishing is one of the world's great industry because fish is a very important source of food for a rapidly growing population in the world. Fish products fulfill 53 percent of the animal protein. Fish as the cheapest source of protein as a solution for the malnutrition problem in the world. It also provided livelihoods and earnings for the fishing communities. Food and Agriculture Organization estimated 58 million people in 2012 were engaged in fish production in the Asia (FAO, 2014).

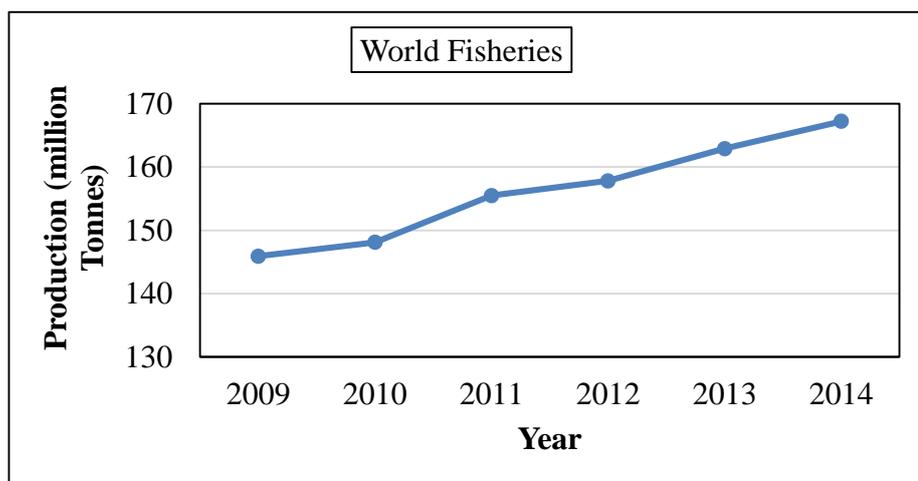


Figure 2.1 World fish production

Source: FAO (2014)

In 2014, global fish production has been growing and has reported 167.2 million tons of production and capture fish production contributed 56 percent of the global fish production. China is the number one among the capture fish production in the world and Sri Lanka was in 33rd in the world capture fish production and also 3rd in the South Asian region (MFARD, 2015). The per capita fish consumption per annum in Japan - 62kg, China- 35.1kg, Sri Lanka- 28kg, Bangladesh- 27kg, India -6 kg (FAO, 2014).

2.2 Fishery industry in Sri Lanka

Fish and fishery products are most important agricultural commodities in Sri Lanka and provide a significant contribution to the food security and economic development to the country from ancient time. It plays a vital role with respect to delivery of direct and indirect employment opportunities for 560,000 and livelihood for more than 2.7 million coastal communities, generation of income and foreign exchange earnings for the rural and urban people in the country (MFARD, 2015). Most of the women are involved in the activities of net repairing, net mending, sorting of catches, selling fishery products, dried fish production and collection of seashells (Thivviyan and Jayakody, 2017).

Fishery sector also provides more than 60 percent of animal protein requirement of people in Sri Lanka. To ensure that the Sri Lankan population enjoys an acceptable nutrition intake it is required to maintain a protein requirement level through a per capita fish consumption of 22Kg per year. In 2015, according to the ministry of fisheries performance report the per capita fish consumption of the country has achieved about 44.6g/day (MFARD, 2015).

Sri Lankans are fish eaters than meat eaters. Sri Lankans seafood plate averagely contained 45 percent of large marine fish, 38 percent of small marine fish, 16 percent of fresh water and 1 percent of aquaculture fish. In Sri Lanka, preference for fish depends on the income level of the consumers, such as the fish basket of upper and middle-class consumers preferred to consume higher valued and large pelagic species while lower class consumers wish to consume low value and small species. Fish preferences among Sri Lankan consumers are differed according to the region. As an example, consumers of south prefer large pelagic species (blood fish). In contrast, consumers of north and east prefer high demand for rockfish and shore seine varieties. (Jayantha and Hideki,2006).

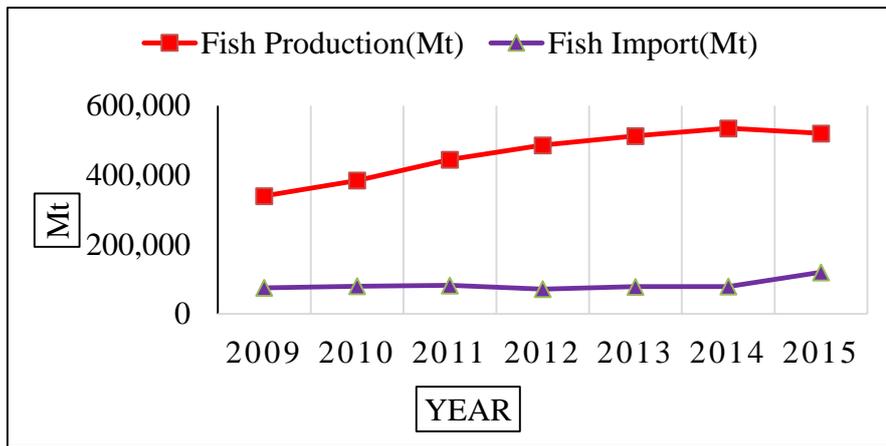


Figure 2.2 The fish production and import quantities

Source: Ministry of fishery yearbook (2012)

The increasing tendency of fish production in all fishery sub-sectors is obvious after 2005 in Sri Lanka. The highest yield over the past ten years was recorded in 2014, while lowest yield was recorded in 2005 due to the Tsunami devastation. The entire fish production of the country was 520,190 Mt in 2015. With the excess demand for fish and fishery products, Sri Lanka had to import 115,693 Mt of fish and fishery products in 2015 (NARA, 2015).

Export of fish and fishery products is crucially important because it brings foreign currencies to the country. In 2015, Sri Lanka has 17461Mt of fish and fishery products were exported and earned Rs.24716Mn. The European Union, East Asian countries, North American countries and South Asian countries are main destinations for fish and fishery products in Sri Lanka. Sri Lanka's main fishery export products include tuna, fresh chilled and frozen form, shrimps and prawns, crabs and lobsters (MFARD, 2015).

Local supply chains of fish marketing were included in assembler, commission agent, and retailer. Export supply chains from agent, processor, and exporter. Fish market in Paliyagoda is the largest wholesale and retail fish market in Sri Lanka. There are a number of wholesale and retail fish markets in the coastal belt based on fishery harbors. On the other hand, thousands of retailers are engaged in distribution and marketing of fish in the country. In

addition to those private industrialists, the Ceylon fisheries cooperation is involving in fish marketing and distribution (NARA, 2012).

Price of fish mainly governed by quantity supplied and quantity demanded at the market. In addition to that consumers' perception and purchasing power are critical in price formation of fish at the market (NARA, 2015).

2.3 An overview of marine fisheries sector in Sri Lanka

The Sri Lankan marine fisheries sector constitutes two major sub-sectors viz. Coastal Fisheries, Offshore/Deep Sea Fisheries. The marine resource base of Sri Lanka has an Exclusive Economic Zone (EEZ) of 517,000 sq. km with rich in different fish species (NARA, 2015).

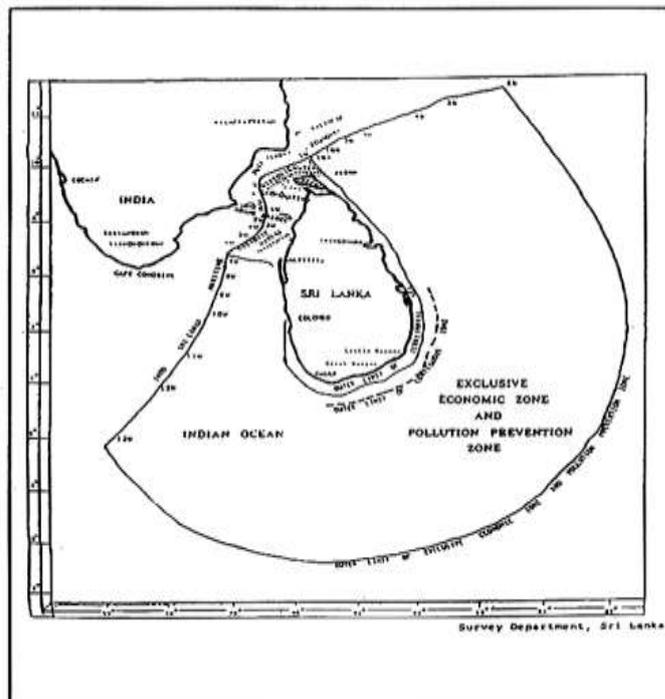


Figure 2.3 The Exclusive Economic Zone (EEZ) in Sri Lanka

Source: googlemap.com

About 610 species of coastal fish have been reported from Sri Lankan waters, of which the most common species caught as large fish Balaya, Tuna, Kelawalla, Mora, Thalapath, Thora, Gal malu, Para. As medium fish Kumbalawa and as small fish Salaya, Hurulla etc.

Marine fish is the most important category compared to inland fish in Sri Lanka. The contribution of the marine fisheries was around 86 percent. The coastal fish production contributes 53 percent of the total fish production, while offshore/deep Sea fishery contribution is around 33 percent (MFARD,2004).

Marine fish production was 452,890 Mt. Although there are 15 fisheries districts Tangalle and Galle together contributes 27 percent to the total marine fish production of the country. In addition to that Puttalam, Negombo, Matara, Chilaw and Kalutara districts are also contributed a considerable proportion to the total marine fish production of the country in sequence (NARA,2015).

The marine fish marketing network is well established and expanded throughout the country. The main components of domestic fish marketing system are the central wholesale market at Colombo. The economic status of a marine fishing family living in Sri Lanka may not be constant. It fluctuates with the season, climatic condition, fishing effort and investment in fishing gear. The people who involved in fishing activities can broadly be categorized as fishing craft owners, labors, auctioneers, retailers and dry fish producers. The monthly income of a person may differ according to the occupation. (MFARD,2004).

2.4 Food security and fish consumption in Sri Lanka

Food security is the availability of food, primarily carbohydrates and proteins for human intake in abundant amounts. The population of Sri Lanka is more than 20 million. A significant proportion of the population falls below the consumption poverty line. Today, over 40 percent of Sri Lankan children suffer from severe malnutrition and over 70 percent

of adults are poorly nourished. Lysine and methionine are limited amino acids found in traditional rice-based diet in Sri Lanka (FAO,2014)

Fish is the cheapest and healthiest animal protein of the Sri Lankans. Fish is a rich source of amino acids, omega-3 polyunsaturated fatty acids, fat-soluble vitamins (A, D and E), water-soluble vitamins (B complex) and minerals like calcium, phosphorus, iron, iodine and selenium. Fish consumption among Sri Lankans was higher compared to other South Asians (MFARD,2004).

To ensure that the Sri Lankan population enjoys an acceptable nutrition intake it is required to maintain a protein requirement level through a per capita fish consumption of 22Kg per year. The Per capita fish consumption is 44.6 g/day in 2015 (MFARD, 2015).

The NARA report stated that 42 percent and 43.5 percent of rural and urban sub-sector households have consumed in the range of 1-2000 g of fresh fish per week in Sri Lanka (NARA, 2006).

2.5 Dried fish production and consumption in Sri Lanka

Drying of marine fish is very common in the entire coastal areas in Sri Lanka and it is an important source of protein. The nutritional quality of dried fish is high. Sometimes it retains higher quality standards compared to fresh fish as per unit weight (Faruque *et al*,2012). Therefore, it is considered as the poor man's protein (Atapattu, 2013).

Some regions in Sri Lankan Coastal belt that have seen a continued increase in the number of households with a widow. Many of the local women lost their husbands to Sri Lanka's prolonged civil war and the 2004 Indian Ocean Tsunami. It goes against local traditions for a woman to fish in place of her husband. This means that job opportunities for these women are very limited, and as a consequence, many widows and their families are living in poverty. They engaged with fishery sector such as sorting caught fish and making dried fish etc.

(Japan's Official Development Assistance White Paper,2014). Traditional home scale technique is mainly performed for dried fish production by women as an extra source of income (Atapattu, 2013).

Fish is very susceptible to the growth of food poisoning bacteria which are abundant on the skin, gills and in the digestive tract. Therefore, perishable is occurring as soon as fish dies. For example, most fish become inedible within 12 hours at tropical temperatures. The natural process by which organic matter is broken down and enters into the nitrogen cycle, fish flesh is quickly affected, digested and spoiled. Ferments also contribute to the dissolution and oxidation and are an additional process of deterioration. Therefore, methods of preservation to prevent these processes have become essential to the utilization of fish. (Payra *et al*, 2016). Simple drying in the sun would have been one of the oldest methods of preservation. In order to prevent the growth of spoilage bacteria, the method of salt curing is employed. Salting alone will never completely stop the spoilage of fish. That is why salt fish are dried (Beatty *et al*, 1957).

The traditional drying and salting method of preserving fish continues to be very popular today simply because it produces such great flavor, long shelf life and more expected quality attributes of consumers. For centuries salted fish was a basic food in Sri Lanka as it was less expensive than meat and other protein sources (Payra *et al*,2016).

The total dried fish demand of the country is fulfilled through local production and imports. More than 60 percent of dried fish demand is fulfilled through imports while the rest from local production. Main dried fish species produced in Sri Lanka, are Katta, Balaya, Keeramin, Seer, and Maduwa. Trincomalee, Mannar, Kalpitiya, Matara, Jaffna are the main districts which are produced marine dried fish (NARA,2014). About 70 percent of the local dried fish production of the country comes from Northern and Eastern provinces. Among dried fish, Sprats are the major consumable dried fish product in Sri Lanka. In detail 6,171Mt

of dried fish and 19,139 Mt of Sprats have been imported in 2015. Jaffna and Mannar are the main districts which are produced sprats priority. Sprats are produced by drying with or without salt. Southern and Northern coastal areas produce the higher quantity of Maldivian fish in Sri Lanka (MFARD,2015).

2.6 Marketing of dried fish in Sri Lanka

The marketing and distribution of income are important aspects in improving the socio-economic conditions of fishing communities (Atapattu,2013). More than thousands of fishing communities around the coastal belt in Sri Lanka were actively involved in the production and marketing of dried fish and they have maintained their livelihoods and uplift the socio-economic status. These dried fishes have demand both in the domestic and international market (Payra et al, 2016). The major share of dried fish marketing in Sri Lanka is handled by the private sector (MFARD,2015).

A supply chain is simply the path of a product as it moves from the producers to the final consumers. In other words, it is the sequence of intermediaries and the marketers through which goods pass from producers to consumers. Supply chains are important in evaluating marketing system because they indicate how the various market participants are organized to accomplish the movement of a product from the producer to the final consumers. The marketing system was functioned through a set of intermediaries carrying out useful commercial purposes in a chain creation from producers to the final consumer (Daily News, 2012). Peoples who involved in the dried fish supply chain add relatively some value and make the profit (Faruque et al,2012).

The different types of fish species were used to produce the dried fish products which are harvested by the fishermen in the coastal region. The demandable few marine fishes are sold at the high price in the local market in fresh condition and some species were dried and transported to the domestic market as well as abroad. (Payra *et al*,2016).

Dried fish processors purchase raw fish from fish landing centers and brought to their own processing/drying plants (Farugue *et al*,2012).Some fishermen produced dried fish in their fishing vessel, immediately after catching the fish in the sea (Payra *et al*,2016). They had to perform different activities in processing plants to make ready for sale. Item wise cost of drying included loading and unloading, transportation, wage and salaries of labor and use of processing materials (Farugue *et al*, 2012).The producer has more bargaining power and markets them (Jayantha and Hideki,2006).

Wholesalers are have used the services of commission agents to buy dried fish from dried fish processors. Some wholesalers act as retailer also. They buy dried fish directly from the processors and sell to retailers and consumers (Latif *et al*,2014).

Retailers are those who buy dried fishes from wholesalers and sell them to ultimate consumers. The function of retailers is to obtain supplies and display them in forms and at times which is convenient for consumers. Commission agent sells the dried fish to whole sellers and retailers. Primarily commission agent takes commission during the transaction of dried fish (Faruque *et al*,2012).The retailers reported that they collected dried fish products from wholesalers and retail them within 5-7 days (Hasan *et al.* ,2016).

These species ultimately come to the retail markets and ensure a steady supply of the dried fish throughout the year (Madugu and Edward,2011). Several species of coastal and marine dried fish were commonly available in the market (Faruque *et al*,2012).

There are differences in accessibility of dried fish species from market to market might be due to the irregular supply of the products or the retailers did not purchase a particular dried fish products because of their higher price as well as less market demand to the consumers (Madugu and Edward,2011).

The marketing price is the result of the interaction of supply and demand forces as it sets at the point where the price asked by sellers equal that offered by buyers (Daily News, 2012).

Throughout the year, traders and processors' incomes fluctuate for diverse reasons. In low fish catch periods when traders and processors were unable to obtain sufficient supplies to trade (Gonga,1999).

Price of fish is mainly governed by quantity supplied and quantity demanded at the market. In addition to that consumers' perception and purchasing power are critical in price formation of fish at the market (NARA,2015). Average daily selling of sun-dried fish products in the retail markets varied from market to market (Hasan *et al.*,2016),

There is a long marketing chain observed for fresh and processed fish all over the country. Intermediaries involved in dried fish marketing. Dried fish marketing costs include expenses such as rental of the marketplace, electricity, transport and labor, etc (Farugue *et al*, 2012). Therefore, ultimately increases the price of the fish products. As a result, the consumers buy the products at a higher price (Madugu and Edward,2011).

The involvement of a large number of middlemen and commission agents in the marketing channel sometimes reduce the benefit of the producers of dried fish (Madugu and Edward,2011). The price of dried marine fish depends on the size, availability, quality of the species, transport, labor and season. During peak season price was lower than the lean season (Faruque *et al*, 2012).

2.7 Supply chain and marketing margin analysis

A market is generally believed to be a point or avenue for buying and selling, a place where demand and supply forces interact. The goods and services exchange through supply chains in the market. The supply chain is simply the path of a product moves from the producers to the final consumers. In other words, it is the sequence of intermediaries and the marketers through which goods pass from producers to consumers. Supply chains are important in evaluating marketing system because they indicate how the various market participants are

organized to accomplish the movement of a product from the producer to the final consumers (Madugu *et al.*, 2005).

Marketing margins, defined as the difference between the prices paid to the first seller and that paid by the final buyer. Market margins were calculated on the basis of data obtained on prices at between at different stages of the supply chain.

$$\text{Market Margin} = \text{PS}/\text{SP} * 100$$

PS= Price Spread (Paid price-sale price)

SP =sale price

Marketing information system is an essential condition to expand the agriculture and food production in a country. Unfortunately, many developing countries do not have such information systems (HARTI,2015).

The total marketing margins constitute price diffusion. The marketing margin includes the marketing costs plus the profits. Usually, when prices are high, marketing margins are low and vice versa. The high percentage of margin to producer-consumer price difference is indicative of large inefficiencies and relatively poor marketing efficiency (HARTI,2015).

The prices of dried fish increased greatly. Various factors and middlemen in the supply chain have caused soaring prices. It is in favor of the vendors if the price increases but due to the middlemen in the supply the complete profit is not reaching to the dried fish producers, there is also a decrease in the demand for dried fish due to the increasing prices into the market, this increase in price make the fish eaters look for alternate eating options like fresh fish, chicken or mutton (Wavare and Jale,2014).

Major beneficiaries of the study of Market margin as follows,

Producers, consumers and traders are concerned about the size of the marketing margins, changes in marketing margins and the incidence of changes in margins

- For Producers

They want the best possible price for their surplus produce.

- Consumers

They need sufficient quantity and of good quality at the lowest possible price.

- Middlemen

Market middlemen are interested in a marketing system which provides them with a steady and increasing income from the purchase.

- Government

It tries to provide the maximum share of the consumer's rupee to the producer; food of the required quality and lowest possible price to the consumers (HARTI,2015).

CHAPTER 3

METHODOLOGY

3.1 Area selection

Selection of the study location is one of the important factors to conduct a research. Ministry of Fisheries in Sri Lanka has demarcated 15 marine fishery districts in the country for administrative purposes. Among that districts, the study was carried out in Matara district. Because it produced 35190Mt of marine fish in 2015. The total fish production of the country was 520, 190 Mt in 2015(NARA, 2015). Kudawalle & Nilwalle villages have been identified as the most important sources for studying the dried fish industry which enriched by full time and part time dry fish processors in Matara district.

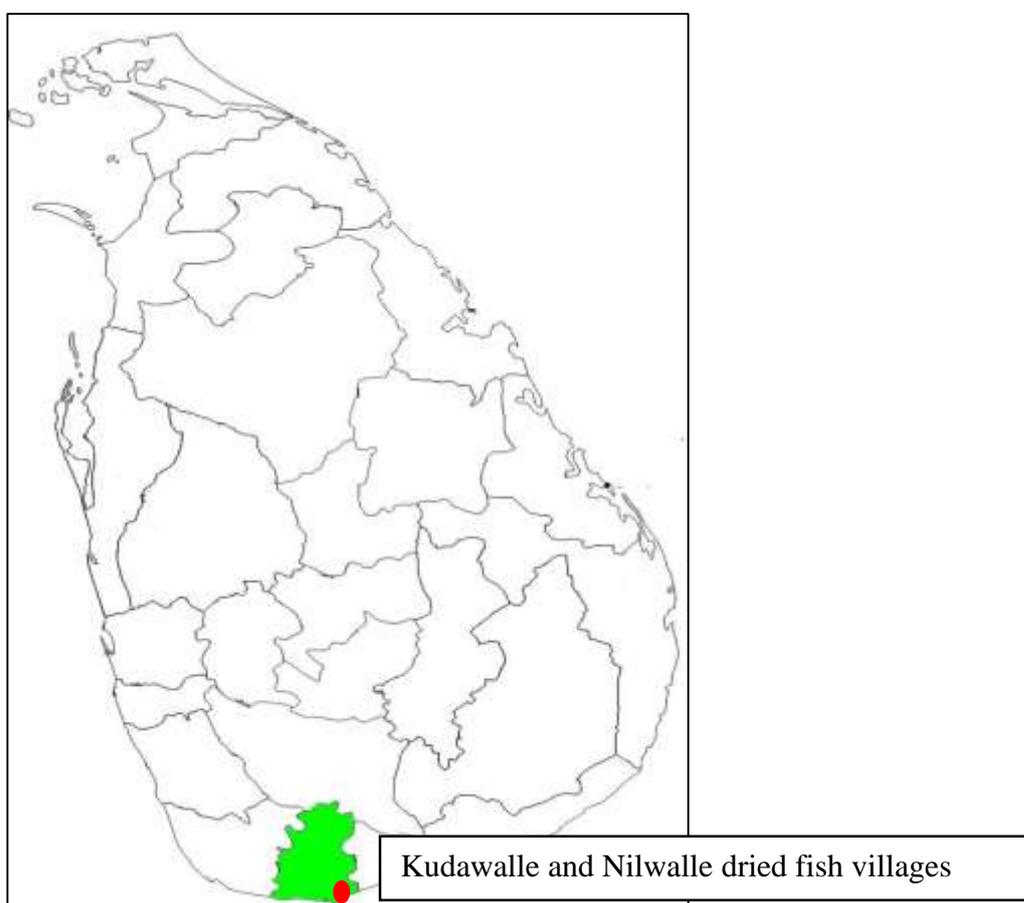


Figure 3.1 Study location in Matara district

Source: Googlemap.com (Edited by author)

3.2 Sources of information

In order to achieve the objectives of the study, the relevant data and information were collected from primary and secondary data sources.

3.2.1 Secondary data collection

Using secondary sources of information, a literature survey was carried out. In order to acquire a higher level of conceptual clarity, the adequate amount of previous publications were referred. Certain secondary data and information were obtained from readily available sources as Annual Reports of Central Bank of Sri Lanka, Journals, Newspapers, Books and Websites etc. Also, secondary data were obtained from publications of related organizations such as the Department of Census and Statistics, Ministry of Fisheries and Aquatic Resources Development (MFARD), National Aquatic Resources Research and Development Agency (NARA) etc. Most of secondary were collected from government institutions and ministries.

3.2.2 Primary data collection

Pre-tested Questionnaire, In-depth interviews and key informant discussions were used to collect data from dried fish processors and dried fish vendors. Questionnaire Survey was directed to supply chain approach starting from production, processing and distribution to marketing within the Matara district.

3.3 Sample selection

The Snowball sampling technique was applied to select the sample because of no any data list for the selection of the sample. The total sample size of the study was 100 comprising of 50 dried fish processors & 50 dried fish vendors including 20 wholesalers, 20 retailers and 10 marketing agents in Matara district.

3.4 Data collection

The survey was conducted for a period of one month from October to November 2017. Two different structured questionnaires were used, one for producers who participate in the production process of the dried fish while other one used for vendors who engaged with the marketing of dried fish. Interviews were conducted in a systematic manner with selected processors and vendors. The dried marine fish producers were interviewed at their plants. The traders were interviewed at the market during market time. Special attention was paid to identify the product, trade channels, price levels and production characteristics in these areas.

3.5 Variables and measurements

Following variables and measurements were designed to reach the objectives of this research.

Table 3.1 Variables and Measurement of the study

Objective	Variables	Measurements
1.To identify the major dried fish supply chain/s in Matara district	Processor, Vendor, Marketing agent	Qualitative
2.To analyze market margin at different nodes in major dried fish supply chains	Buying price, Selling price	Rs, Kg
3. To suggest pragmatic solutions for the major problems in each node of supply chains	Financial, input, storage & other	Qualitative

3.6 Data analysis

In data analysis procedure, the data were manipulated and arranged in a way that it's easy to use them to analysis to achieve the intended objectives of the research. At first, data was filtered from different data sources. After that data was tabulated in Excel sheet of MS Excel-2007 and prepared the tables separately. Those tables were used to illustrate the results by using Descriptive analysis like bar charts, line charts, pie charts, tables etc.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter deals with all results, obtained from analyzing the collected data for each considered objective. The first section shows the socio-economic factors related to the nodes of the supply chain. The second section shows major dried fish supply chains in Matara district. The third section shows the market margin calculations for major dried fish supply chain and forth one consists which problems associated with the dried fish marketing system.

4.1 Socio-economic characteristics related to the nodes of supply chain

Results of the research were based on the information obtained from the field survey. Gender distribution, job involvement, experience in the sector, income distribution are the socio-economic characteristics.

4.1.1 Gender involvement

4.1.1.1 Gender involvement in dried fish production

Figure 4.1 shows the gender distribution of dried fish producers. According to the results, out of all respondents there is a high amount of females engaged with dried fish production process and it was 82 percent. 18 percent was represented by male producers.

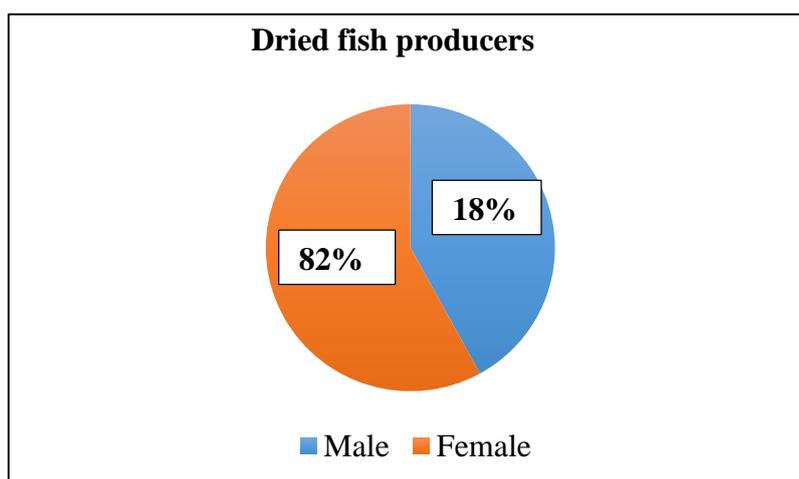


Figure 4.1 Gender distribution of dried fish producers

4.1.1.2 Gender involvement in dried fish selling

Out of all respondents of dried fish vendors, the figure 4.2 shows the Gender involvement in dried fish selling. The high amount of males were engaged in dried fish marketing process. It was 73 percent. 27 percent was represented by females.

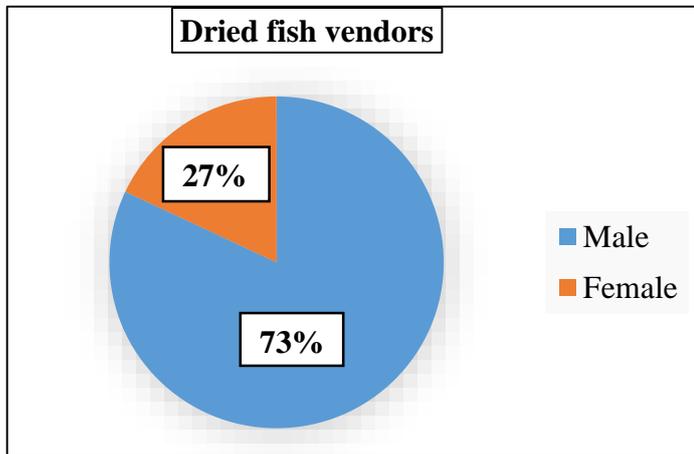


Figure 4.2 Gender distribution of dried fish vendors

4.1.2 Experience in the sector

4.1.2.1 Producers' experience in the sector

Figure 4.3 represents the respondents' processing experience they were categorized into the four groups as <10 years processing experience, 11-20 years processing experience, 21-30 years processing experience and >30 years processing experience. In sample <10 years processing experienced producers were relatively higher than others.

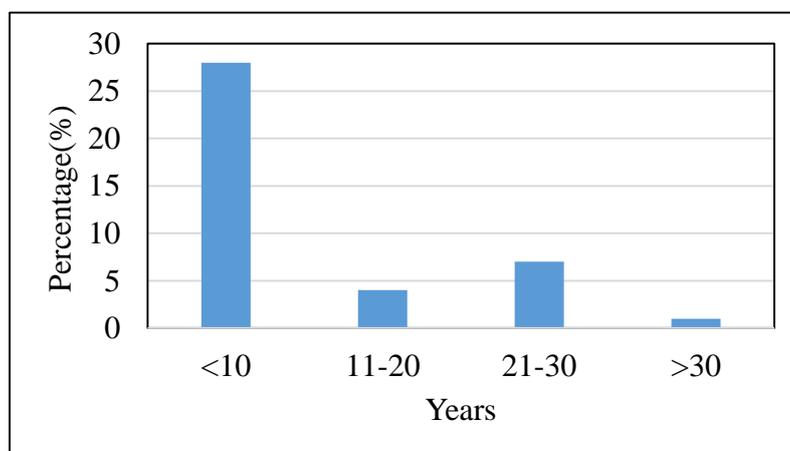


Figure 4.3 Processing experience of producers

4.1.2.2 Vendors' experience in the sector

Figure 4.4 represents the respondents' selling experience they were categorized into the four groups as <10 years selling experience, 11-20 years selling experience, 21-30 years selling experience and >30 years selling experience. In sample <10 years selling experienced wholesalers were relatively higher than others.

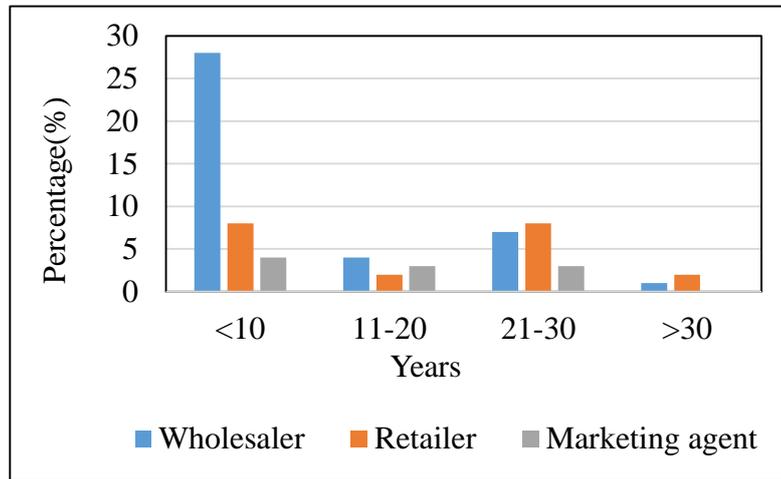


Figure 4.4 Marketing experience of vendors

4.1.3 Income distribution

4.1.3.1 Income distribution of the producers

In Kudawalle and Nilwalle villages predominantly have fishery economy. They were engaged in fishing practices as their major income source. Majority of people engaged in dried fish production as an additional income source. According to the figure 4.5, there were 20 of dried fish producers earn less than Rs. 25000.00 for a month.

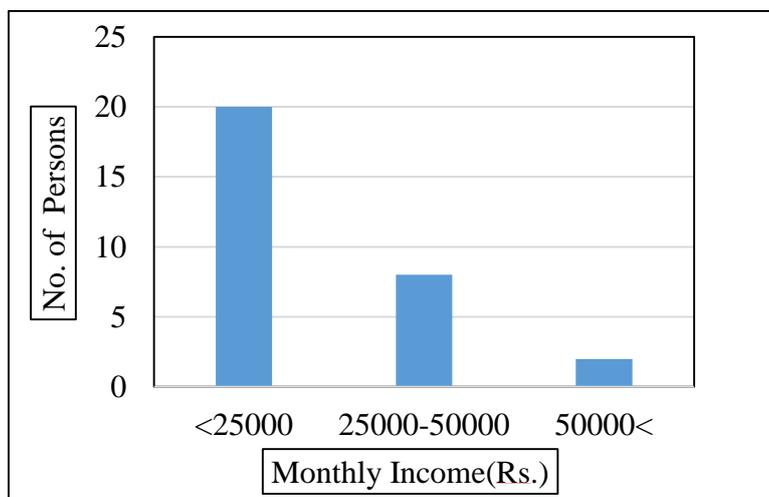


Figure 4.5 Dried fish producer's income distribution

4.1.3.2 Income distribution of vendors

According to the figure 4.6, there were 20 respondents of retailers earned Rs. <25000.00 income per month while 10 wholesalers earned Rs.>50000.00 per month.

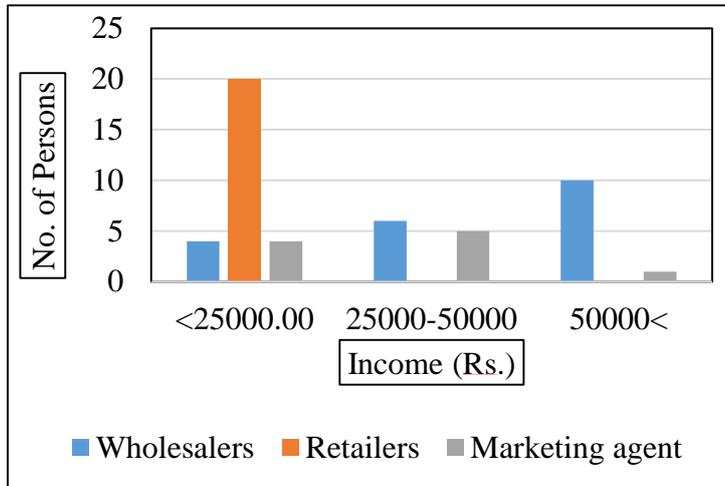


Figure 4.6 Dried fish vendor's income distribution

4.1.4 Job involvement

4.1.4.1 Job involvement of producers

According to figure 4.7, 59 percent of part time involvement was represented by dried fish producers. 37 percent of producers were engaged in full-time occupation while 4 percent of respondents were not engaged regularly.

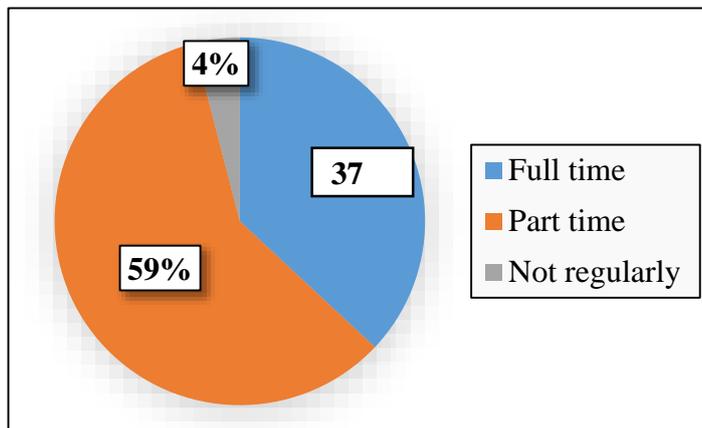


Figure 4.7 Job involvement of dried fish producer

4.1.4.2 Job involvement of vendors

The figure 4.8 shows 75 percent of dried fish vendors' major occupation was dried fish marketing while 23 percent of vendors engaged in a part-time job.

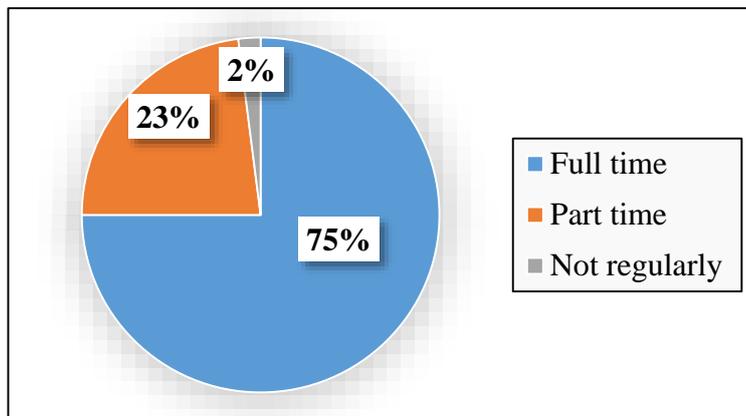


Figure 4.8 Job involvement of dried fish vendors

4.2 The major dried fish supply chain/s in Matara district

Sri Lanka is well-off in many marine fish varieties. The fishing effort in Matara consists of two major sectors. The off-shore fishery is carried out by multi-day boats that remain in the sea for 28-36 days per one fishing trip. They may travel around the island.

In coastal fishery, the boats which do not spend more than 24 hours in sea per fishing trip are engaged in coastal fishery activities. Mainly gill nets beach seine nets are used in this category of the fishery. Off-shore, fishery contributes to about 80 percent of the marine catch in Sri Lanka.

The beach seine netting is an important supply point in the production of dried fish. This is due to the fact that a larger part of the fish caught in the seine nets are damaged and are not transported to the Colombo as fresh fish. They are sold locally for the production of dried fish.

According to the results of the survey could have been able to identify the major seven dryable fish species in Kudawalla & Nilwalle which is recorded below.

Table 4.1 Common species that utilized by study area

Sinhala Name	Scientific Name
Thora	<i>Cybium spp.</i>
Balaya	<i>Katsuwonus pelamis</i>
Paraw	<i>Caranx spp.</i>
Mora	<i>Caracharhinus spp.</i>
Kelawalla	<i>Thurnnus spp.</i>
Pothubari	
Lenaparaw	

The species abundance in the marine harvest of the Matara district comprises large pelagic fish In Sri Lanka mainly two seasons in fishing called “varakan” and “Haraya”. According to the field survey and by referring secondary data sources seasonality of fish have been identified. For Matara district in the Southern province, it has shown as follows.

Varakan → July to October

Haraya → January to April, May

Dried fish marketing practices in Matara district is the combination of series of functions or services that are performed by several market participants like marketing agents, wholesalers, retailers etc. Supply chains were identified using the participants and the route through which processed fish was transferred from producers to consumers and a distribution channel was drawn.

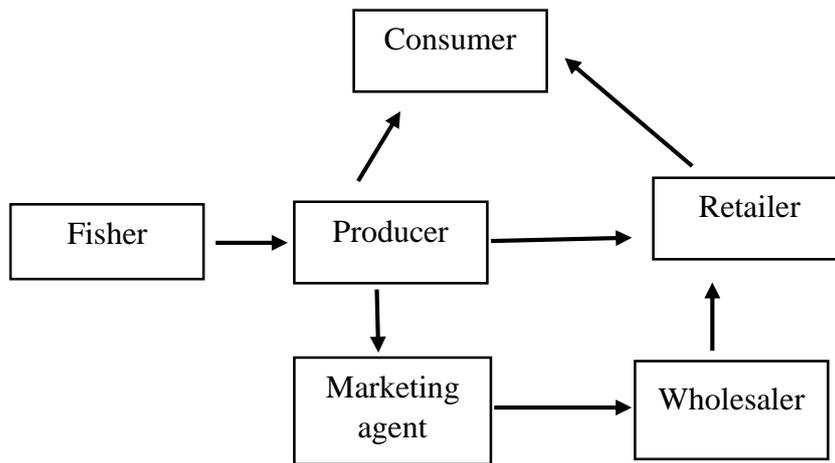


Figure 4.9 Dried fish distribution channels in Matara district
Source:- By author

Figure 4.9 shows that consumers, marketing agents and also retailers buy directly from the producer/processors (that is, fishermen processors, female/male processors). This chain reveals that the distribution channel in the area is decentralized. As an example, both consumers and agents (middlemen) buy directly from the producers. Supply chains are the alternative routes of product flows from producers to consumers. Major supply chains of dried fish in the study areas are as follows. There were major three dried fish supply chains in Matara district.

In domestic market

1. Dried fish → Processor → Marketing agent → Wholesaler → Retailer → Consumer
2. Dried fish processor → Wholesaler → Retailer → Consumer
3. Dried fish processor → Retailer → Consumer

Mainly four intermediaries were found to be involved in the marketing of dried fish in the study area. They were producers, wholesalers, marketing agents and retailers.

Dried fish producers:-

In the study area, the dried fish producers buy fresh fish directly from harbor production of their products. According to their own assets, they buy fresh fish as raw materials. The dried fish production process is normally time consuming activity. Normally they produce dried fish by using their own effort. According to them, chemicals were not used. The traders of dried fish also handle fresh fish in these areas because of most of the males are fishermen they were tried on fishing. In study areas, females are very much concern about the additional income of her family and to avoid wastage of fish. This is common in all fishing villages and this is developed up to commercial aims. The role of women in fisheries varies with ethnicity and religion. In the predominantly Buddhist Southern coastal fishing communities, the presence of women in the beach is not socially accepted and they are hardly get involved directly in fisheries activities. Involvement of women in fisheries activities like dried fish processing which helped them to secure their family living standards, ensure food security while gaining supplementary income to their family.

The processing cost amount differs according to the fish variety. The supply chain analysis indicate producers sold 70 percent of their dried fish to wholesalers and retailers at their own place. Because world famous Hummanaya Blowhole is located in the study area. So there are so many visitors and they act as customers. Therefore producers can sell their products to them by comparing the retail prices at current market. As an example, they buy kelawalla at Rs.200/kg. The processing cost amount to Rs.120/kg including the cost of the drying rack, labor and preservation materials like salt. They sell kelawalla at 550/kg. Other portion of the dried fish carried to markets by their own vehicles and remaining part sell to the consumers directly. Some producers buy “Bottu karawala” from boat owners. Multi-day boats make dried fish on the deck from their early catch and damaged fish and sell them to the traders. If they are not properly dried they are given to dried fish producers for further drying. Price of that types normally higher. As an example they buy kelawalla (Bottu karawala) at Rs.

500.00/kg and sell to the market at Rs.550.00-600.00/kg. This is common to all varieties. They normally get Rs.50.00-100.00 profit by selling 1 kg of Bottu kalawala. According to the dried fish processors' perspective, the production of own dried fish products by using fresh fish and marketing is cheaper than the marketing of Bottu karawala species.

Wholesalers:-

In the study area wholesalers purchased dried fish from processors and commission agents. Sometimes wholesalers act as retailers also. They had some part- time or full- time salaried persons for performing various functions such as loading, unloading, weighing, grading like that. By the wholesalers, dried fishes are supplied to the other districts of the country.

Marketing agents:-

Marketing agents are the major profit making actors in the dried fish supply chain. They directly affected the price of the products.

Retailers:-

Retailers are the end link in the channel of dried marine fish marketing. They purchased dried fish from wholesalers and producers. Then sold it to the consumers at their marketing places.

There is no actual pricing system in dried fish markets. Although the government provides support in the form of roads and infrastructures, does not play an active role in properly regulating market behavior and market performance regarding the dried fish sector. Physically visiting the markets and use of telephone/mobile phone was the common sources of collecting market information for all supply chain actors.

The price of dried marine fish depends on species, size of the species, market and season. The price of dried marine fish was maximum in April, June and July months. Price during harvesting season came down to the minimum and maximum in the offseason. The variation

of prices might be varied due to seasonal variation and availability of fish. The higher price was observed in the urban areas than those of the rural markets.

If the product is of good quality it is not difficult to sell, there were more market opportunities. The quality of the dried product can improve through making awareness among the fishermen to use high-quality water and salt. The introduction of simple dried fish equipment like- solar or artificial drier for process Processors.

According to the all the nodes of dried fish supply chains, the characteristics identified as factors contributing to the quality of the product are low humidity, no signs of salt crystallization on the fish flesh, absence of a red/pink color, absence of sand, less un-edible parts in a piece, flesh sturdy to the touch, absence of putrefying smell, absence of dried fish dust or small broken pieces when in pack, when soaked in water, the flesh should look and feel as close as possible to the original condition of the fresh flesh.

4.3 The market margin at different nodes in major dried fish supply chains

4.3.1 Pricing for dried fish

In the study areas, all intermediaries who were involved in the buying and selling of dried fish followed the open bargaining method for fixing the price of their products. The dried fish producers enjoyed low bargaining power because of many factors such as perishes ability of product due to climate changes, an absence of storage facilities and immediate need for cash. The number of buyers attending the market and the volume of product offered for sale mainly determined the price at market level. In the wholesale market, price varied with the variation of quality of and size of dried fish.

Table 4.2 Average producer prices of selected dried fish types

Dried fish type	Average wholesale price(Rs./Kg)	Average retail price(Rs./Kg)
Balaya	420.00	450.00
Linna	300.00	425.00
Kelawalla	500.00	650.00
Wanna	550.00	600.00
Pothubari	350.00	475.00
Lenaparaw	350.00	400.00
Mora	650.00	750.00

The average prices of marketing agents, wholesalers and retailers for dried fish in the study area have been presented in Table 4.3 as below.

Table 4.3 Average dried fish prices of vendors

Dried fish type	Average marketing agent price(Rs.per Kg)	Average wholesale price(Rs. Per Kg)	Average retail price(Rs. Per Kg)
Balaya	435.00	440.00	450.00
Linna	340.00	380.00	425.00
Kelawalla	520.00	600.00	650.00
Wanna	560.00	585.00	630.00
Pothubari	360.00	400.00	475.00
Lenaparaw	360.00	375.00	400.00
Mora	680.00	700.00	750.00

4.3.2 Market margin

The marketing margins of all intermediaries for dried fish in the study area were presented as below.

Table 4.5 Market margins analysis for most common dried fish supply chain

Dried fish type	Dried fish producer	Marketing agent	MM%	Wholesaler	MM%	retailer	MM%	Total MM%	Producer receiving (%)
Balaya	420.00	435.00	3.33	440.00	1.11	450.00	2.22	6.66	100-6.66=93.34
Kelawalla	500.00	520.00	3.07	600.00	12.30	650.00	7.69	23.06	100-23.06=76.94
Linna	300.00	340.00	9.41	380.00	9.41	425.00	10.58	29.4	100-29.4=70.6
Wanna	550.00	560.00	1.66	585.00	3.96	630.00	7.14	12.76	100-12.76=87.24
Mora	650.00	680.00	4	700.00	2.66	750.00	6.66	13.32	100-13.32=86.68
Pothubari	350.00	360.00	2.10	400.00	8.42	475.00	15.78	26.3	100-26.3=73.7
Lena paraw	350.00	360.00	2.5	375.00	3.75	400.00	6.25	12.5	100-12.5=87.5

Profit of intermediaries varies due to variation in their costs, purchase price and sales price. Amongst all intermediaries, market margin of retailers is the highest, thus it can be concluded that retailers in the study area are making the profit by the marketing of dried fish to the consumers.

4.4 Identify the major problems in each node of supply chain

Dried marine fish processors and traders faced various problems in the study area. According to the dried fish producers perspective there are major six problems were identified at fresh fish buying stage.

- Dried fish producers' perspective

According to the figure 4.10, it has shown the 75 percent of producers in Kudawella and Nilwalle areas were bought fish from shore (harbor) for the dried fish process.

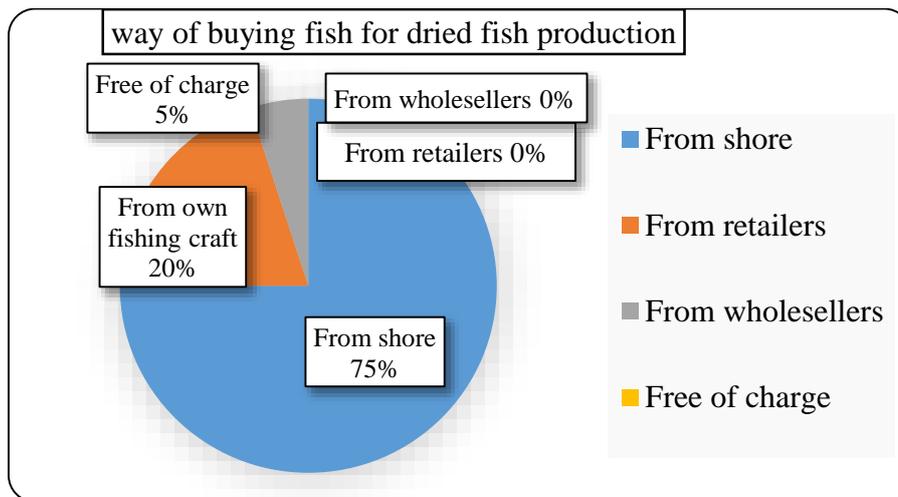


Figure 4.10 Way of buying fish for dried fish production

Problems of producers at raw fish buying stage

- Higher transport cost
- Seasonality of fish availability
- Higher labor cost
- On the spot transactions
- Low quality raw materials
- Higher Price of fresh fish

Among those problems, the data illustrated that majority of dried fish processors was suffered from higher prices of fresh fish. It was about 83 percent of total respondents.

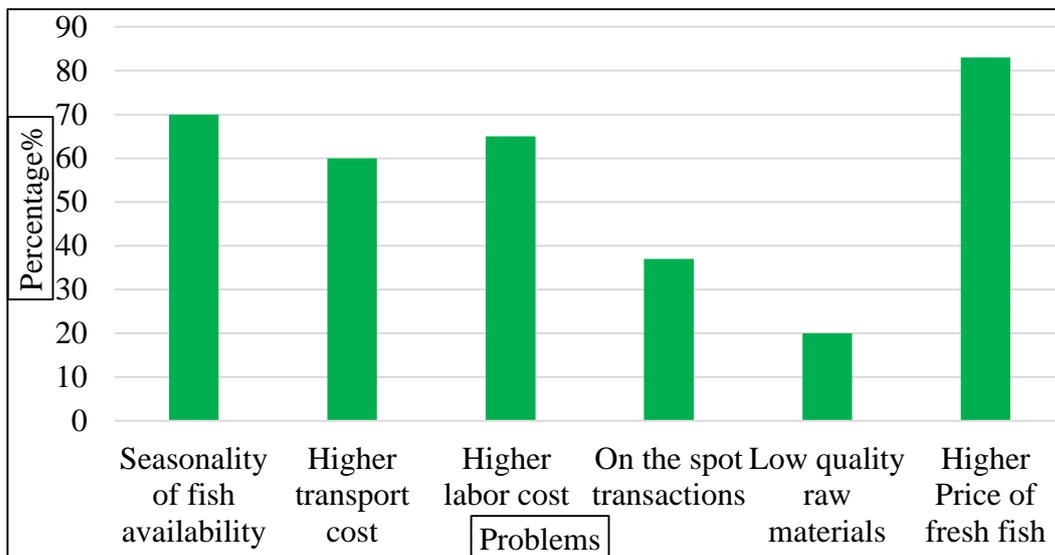


Figure 4.11 Problems of producers at raw fish buying stage

Problems of producers at dried fish processing stage

At dried fish processing stage there were major five problems were identified. They are high labor cost, uncertainty of climate, time-consuming process and lack of raw materials, equipment and storage facilities and the higher price of additional raw materials. Among them, the uncertainty of climate was the severe problem.

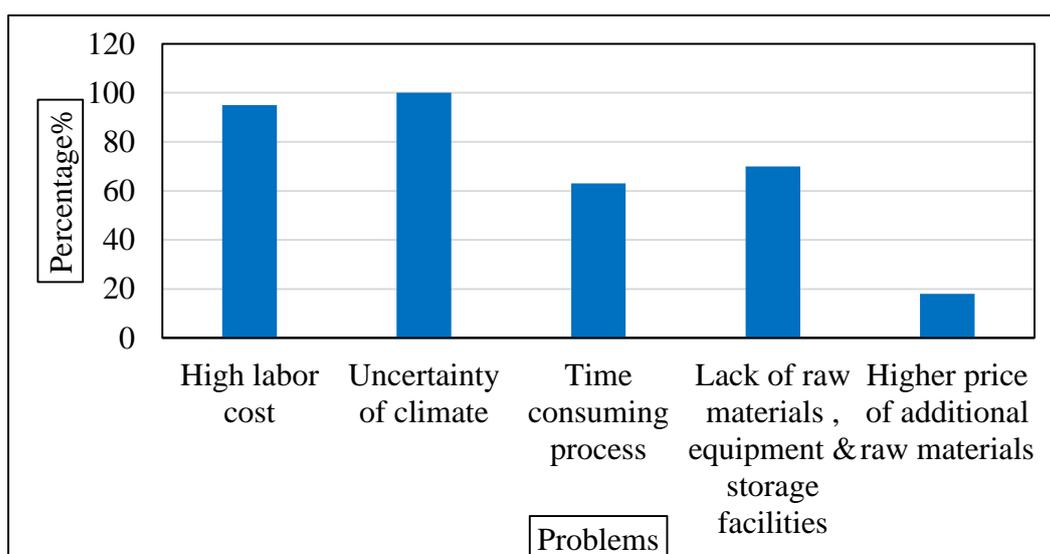


Figure 4.12 Problems of producers at dried fish processing stage

At dried fish marketing stage

Lack of stable market facilities, lack of market information, government tax system were identified as problems of dried fish producers at dried fish marketing stage.

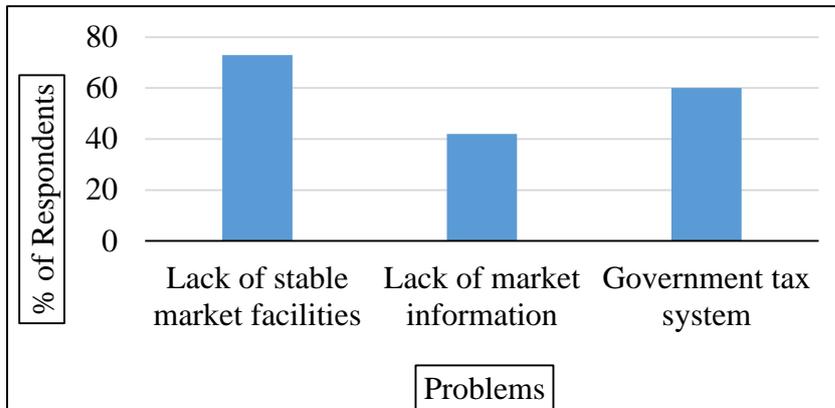


Figure 4.13 Problems of producers at dried fish marketing stage

- Dried fish vendors' perspective

At dried fish marketing stage

lack of stable market facilities, effect of government tax for the prices, lack of market information, effect of unfavorable climate conditions and also higher transport and labor cost were major problems that faced by the dried fish vendors at dried fish marketing stage. Among them an effect of unfavorable climate conditions and also higher transport and labor cost were major problems were identified as major problems.

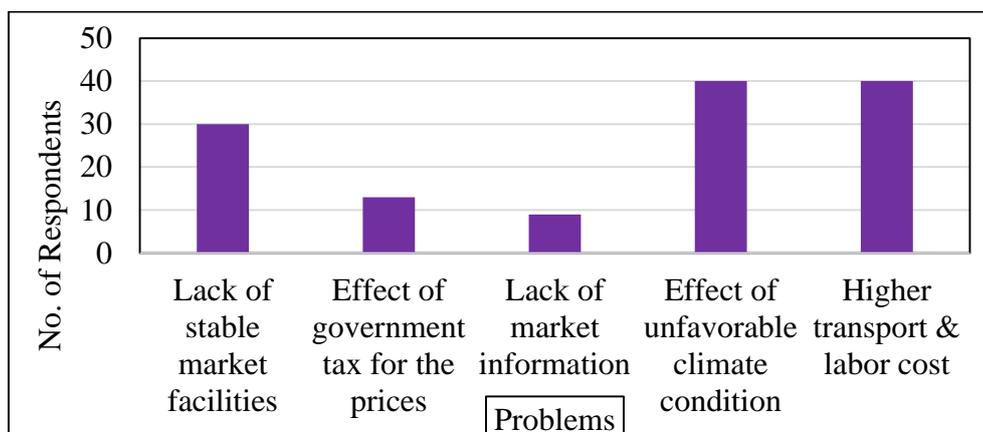


Figure 4.14 Problems of vendors at dried fish marketing stage

CHAPTER 5

Conclusions and Recommendations

5.1 Conclusions

The study was undertaken to analyze the supply chain of selected dried fish varieties within the Matara district in Sri Lanka. Dried fish production was important economic activity in Kudawalle and Nilwalle villages in Matara district. Dried fish production was the full-time occupation for 59 percent of dried fish producers, part-time occupation for 37 percent producers and 4 percent of producers were not engaged regularly. As well as 75 percent of dried fish vendors engaged in this sector as full-time occupation and 23 percent of vendors involved as the part-time job while 2 percent were not regularly. 82 percent of the dried fish producers were females, while 73 percent among the vendors of dried fish marketing process were males. Production of dried fish was profitable only in on the season of fish to the dried fish producers. Major seven types of dried fish varieties were (Balaya, Linna, Kelawalla, Wanna, Pothubari, Lenaparaw, Mora) produced in Matara district. Producers, marketing agent, wholesalers, retailers and consumers were main actors that engaged in dried fish supply chain in Matara district. Three major supply chains can be identified in Matara district regarding dried fish marketing. When dried fish moves through value chains, every intermediary adds some extra costs with the purchase price as part of their involvement or profit. The total market margin for Balaya, Linna, Kelawalla, Wanna, Pothubari, Mora, Lenaparaw was 6.66, 23.06, 29.4, 12.76, 13.32, 26.3, 12.5 percent respectively. The less involvement of middlemen and commission agents in marketing was increased benefit to the dried fish producers. According to the dried fish producers' perspective, the higher price of fresh fish was identified as a major constraint by the 82 percent of respondents at fresh fish buying stage, whereas all the respondents were highlighted the uncertainty of climate is the major problem at the dried fish processing stage. As well as 73 percent of respondents were emphasized the lack of stable market facilities is the major problem at the dried fish

marketing stage. Forty percentage of respondents were notified effect of unfavorable climate conditions and higher transport and labor cost were major constraints in the local dried fish market. Although dried fish producers and vendors were faced many problems, the engagement with this sector is beneficial. Dried fish producers were received a relatively higher share of the retail value for all the dried fish types in Matara district.

5.2 Recommendations

Special attention was focused on idea and comments were used to decide the recommendations to uplift the dried fish production and marketing in Matara district.

To fishers

- Concern of quality production of dried fish products should start from fish catching and land to minimize the unnecessary bruises of fish.

To dried fish vendors

- Poor infrastructure facilities in fish drying areas should be provided with scientific and modern equipment. Can use a solar dryer and hygienic method for improving the quality of dried fish products to obtain a high price for the producers by selling their products.
- The financing function is the advancing of money by someone to carry on the business. For effective operation, financing is of crucial importance in the whole marketing system of dried fish. Therefore, local dried fish marketers should be organized into cooperatives. This could help to improve their business through assistance such as loans and other benefits from the cooperative society (Alam *et al*, 2012).
- Improve the quality of dried fish handling done by marketers, by training them on efficient fish transportation & storage techniques. Attainment of such knowledge could help to reduce the level of losses and improve profit. The storage facilities help

buyers and sellers to reduce the wide fluctuation of prices between peak and lean seasons. The storage function is primarily concerned with making goods available at the desired time and enables traders to receive better prices for their products. Transportation is a basic function of making goods available at proper place and it creates place utility (Alam *et al*, 2012).

- Direct selling to consumer gain higher profits and avoid severe exploitation by mediators.
- By value adding of products like better packaging, brand and certification can get high profit in the market. Packaging is the process of designing and producing the container or wrapper for a product. Packaging is essential for proper transportation of fish. Currently in Bangladesh, plastic crate, steel and wooden boxes are commonly used by all types of intermediaries (Hasan,2016).

To policy makers

- Have to create the stable policy on imports and exports of dried fish products, the tariff on imports on fishery products and minimize the imports to encourage the local production.

There are no focused policies for the dried fish producers and sellers. There needs to be provision for policy to get assured price to the producers of dried fish. (Alam *et al*, 2012).

- By establishing proper fish marketing system can purchase fresh fish from regions with the surplus to ensure year around dried fish production.

Fish markets are mainly used for selling fresh fish and are mostly equipped with some necessary arrangements. But lack of appropriate facilities during the dried fish sale is an important issue faced by the dried fish vendors. The daily fish catch decides the amount of dry fish production (Wavare and Jale,2014).

- Government should introduce the transference price mechanism system and effective and efficient policy framework for the dried fish market system.

The government provides support in the form of roads and infrastructures but does not play an active role in properly regulating market behavior and market performance. Price is determined by direct bargaining between the sellers and buyers. Normally prices of dried fish increase before monsoon as many people prefer to buy and store dry fish with them for the rainy season. Looking at an increasing demand the vendors increase prices during this period. Prices of dried fish are often depended on the prices and sale of fresh fish. Dried fish producers need to be assured minimum per Kg price for the production (Wavare and Jale,2014).

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Annexure

Annexure 01: Questionnaire for dried fish producers

Price analysis of selected dried fish varieties within the value chain of Matara district

Questionnaire for dry fish producers

General information

1. Date of interview:
2. Location(area):
3. Name of the interviewer:
4. Gender:
 - a. Male
 - b. Female
5. Age(Years):
 - a. 26-30
 - b. 31-35
 - c. 36-40
 - d.41-45
 - e.46-50
 - f.50<
6. Marital status:
 - a. Married
 - b. Unmarried
 - c. Widow
7. Education level(Grade):
 - a. 1-5
 - b.6-10
 - c.11-13
 - d. Other
8. Household number(person);
 - a.2
 - b.3
 - c.4
 - d.5
 - e.5<
9. Monthly income(Rs./month):
 - a. <20000
 - b.20000-50000
 - c.50000<
10. Dried fish processing experiences(years):
 - a. <5
 - b.6-10
 - c.10<
11. How do you engage in dry fish processing?
 - a. Full time dry fish processing
 - b. Dried fish processing as a part time job
 - c. no regularly

12. Boat ownership and processing

12.1 Do you own your boat?

a. Yes b.no

12.2 How many Kilograms do you process?

a. <50kg b.50-100kg c.100kg<

13. Do you have any problems related to?

	Problems	Used solutions
Fish buying stage		
Raw material and equipment supplement stage		
Fish processing stage		
Dry fish marketing stage		

14. Which variety do you process?

Name/ Type	Wholesale selling price(Rs./kg)	Retail selling price(Rs.kg)

15. Cost for processing

Activity	Cost(Rs./200kg)
Buying of fish	
Transport	
Labor	
Salt	
Electricity	
Water	
Packaging materials	

16. Did you get advice or training on the processing of dry fish?

a. Yes b. No

16.1 If yes, where?

a. From government extension officers b. From family c. From neighbor

17. Dry fish selling

To whom	Where	How often	Price (Rs/Kg)

18. Do you mainly sell to the same buyer?

- a. Yes
- b. No

18.1 If yes, why?

- a. Relation
- b. Best price offered

18.2 If no, why?

- a. Wait for better price
- b. Other

19. Who set the selling price for you?

- a. My self
- b. Buyer
- c. Other

20. How did you get market information?

- a. Buyer
- b. broadcasting
- c. Cell phone
- d. Other

21. Do you get your expected outcomes by engaging dried fish processing?

- a. Yes
- b. No

22. Do you plan to engage in dried fish processing in future as well?

- a. Yes
- b. No

23. Do you have any barriers to enter in dried fish processing?

Legal	Financial	Social	Cultural	Technical

24. What are the problems in regard to selling your products?

- a. Price fluctuations
- b. Import volume
- c. Insufficient buyers

Thank you,
Department of Agric.Economics and Extension,
University of Ruhuna,
Faculty of Agriculture
2017

Annexure 02: Questionnaire for dried fish vendors

Price analysis of selected dried fish varieties within the value chain of Matara district

Questionnaire for dried fish vendors

General information

1. Date of the interview:
2. Location:
3. Name of the person:
4. Type of the business:
 - a. Wholesaler
 - b. Retailer
 - c. Middlemen trader
 - d. Producer
5. Gender:
 - a. Male
 - b. Female
6. Age
 - a. 26-30
 - b.31-35
 - c.36-40
 - d. 41-45
 - e.46<
7. Educational level
 - a. 1-5
 - b.6-10
 - c.11-13
8. How are you involved in the dry fish trade?
 - a. Own processing
 - b. Buy from producers and sell
 - c. Buy from wholesalers and sell
 - d. Buy from producers and transport and sell to the retailers
 - e. Other
9. Do you buy from?
 - a. Producers
 - b. Wholesale market
 - c. Both
 - d. Other

10. Do you mainly buy from same person?

- a. Yes b.No

11.1. If yes, why?

- a. Relation
b. Best price offered
c. Good quality
d. Lack of better seller
e. Other

11.2 If no, why?

- a. Wait for better price
b. Other

11. List the variety that you trade with reasons

Variety	Reason

12. To whom do you sell?

- a. Wholesalers b. Retailers c. Consumers

13. Who set this price?

- a. My self b. bargaining process c. Other

14. After how long do you pay producers?

- a. Spot cash b. After one week c. Immediately after selling
d. Give them cash advance

15. How do you pay?

- a. Cash b. Bank c. Other

16. How much do you pay?

Variety	When buying(Rs./kg)	When selling(Rs/kg)

17. Which circumstance do constrain your selling/trading business of dry fish?
- a. Access to credit
 - b. Lack of storage possibility
 - c. Lack of market space
 - d. No labor available
 - e. Other
18. Do you transport dry fish?
- a. Yes b. No
- 18.1 If yes, where do you find your means of transport?
- a. Own vehicle b. Hire c. Other
- 18.2 How much you pay for hire?
19. What are the main problems when it comes to the buying and selling of dry fish?
20. What are weaknesses you see in your process?
21. What are the opportunities in your service?
22. What are the threats in your job?

23. What are the solution you suggested?

problems	Solutions

Thank you,

Department of Agric.Economics and Extension,

University of Ruhuna,

Faculty of Agriculture

2017

Annexure 03 : Supply of Dried Fish (Mt) in Sri Lanka

	Local Production	Imported			Total Dried Fish
		Sprats	Other	Total	
1999	18,450	15,132	30,180	45,312	63,762
2000	24,360	19,133	31,417	50,550	74,910
2001	17,640	19,237	26,043	45,280	62,920
2002	24,690	17,627	26,861	44,488	69,178
2003	21,480	20,896	24,615	45,511	66,991
2004	25,390	17,643	20,199	37,842	63,232
2005	7,560	21,516	23,092	44,607	52,167
2006	33,400	23,222	21,528	44,750	78,150
2007	36,200	25,390	22,702	48,092	84,292
2008	42,320	22,085	22,778	44,863	87,183
2009	43,790	20,244	25,361	45,605	89,395
2010	46,570	27,304	18,477	45,781	92,351
2011	52,230	27,593	19,589	47,182	99,412
2012	61,320	25,181	14,251	39,433	100,753
2013	68,200	23,471	14,138	37,609	105,809
2014	71,810	24,874	10,406	35,280	107,090
2015	57,450	24,608	8,445	33,053	90,503

Source: Statistics Unit, Ministry of Fisheries and Aquatic Resources Development

Annexure 04: Marine fish production by fisheries Districts (Mt)

Fisheries District	2011	2012	2013	2014	2015
Negombo	35530	35990	41080	38030	36260
Colombo	3370	2970	4780	7110	6770
Kalutara	51870	52610	48170	40180	32350
Galle	25330	27410	49230	51550	55240
Matara	46580	48380	48850	42370	35190
Thangalle	26830	27320	42540	58870	66100
Kalmunai	20120	23410	23070	21660	8240
Batticaloa	34290	35690	37130	31720	27790
Trincomalee	33910	36410	24370	22340	24770
Mullaitivu	2580	6790	8480	8930	10080
Kilinochchi	5260	6700	14670	15780	13800
Jaffna	25670	32400	21380	25890	29290
Mannar	12860	13450	11110	22130	19390
Puttalam	31120	31540	34530	38280	43790
Chilaw	29950	36150	36540	34460	33830

Annexure 04: Major marine dried fish species/groups of Sri Lanka

Commercial group	Sinhala name	Scientific name
Seer	Athin Thora	<i>Scomberomorus commerson</i>
	Thal Thora	<i>Cybium spp.</i>
	Angila	<i>Cybium spp.</i>
Paraw	Vattiya	<i>Carangoides gymnostethus</i>
	Thumba paraw	<i>Carangoides fulvoguttatus</i>
	Atanagul paraw	<i>Caranx ignobilis</i>
	Guru paraw	<i>Caranx heberi</i>
Balaya	Balaya	<i>Katsuwonus pelamis</i>
Kelawalla	Balaya	<i>Katsuwonus pelamis</i>
Sharks	Mee Mora	<i>Isurus spp.</i>
	Kasa Mora	<i>Alopias spp.</i>
	Bala Mora	<i>Carcharhinus falciformis</i>
	Polkola Mora	<i>Carcharhinus longimanus</i>