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Sudan University of Science and Technology

College of Graduate Studies

Problems and Constraints of Fish Production and Marketing

Case Study Sawakin area Red Sea State

مشاكل ومعوقات انتاج وتسويق

الاسماك في منطقة سواكن ولاية البحر الاحمر

A Thesis Submitted for Partial Fulfillment of Requirement for Degree of Master in Fish Science and Technology

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Dedication

I dedicate this work to.

- ***My father who encourage me to study.***
- ***My mother who support me to study.***
- ***For my sister who prepare the place to study.***
- ***Administration of Fisheries in PortSudan and Department Sawakin.***
- ***For every one who contributed to accomplish this work.***

Acknowledgement

Foremost my thanks are almighty to Allah, for giving me the health and strength to accomplish this work.

I wish to express my deep appreciation to my supervisor Dr: Umsalama Yousif Hamid Yousif for keen guidance, advice and encouragement; appreciation is also extended I'm particularly thankful to the staff of Administration of Fisheries in Portsudan and Department Sawakin for providing facilities and help.

At last, I'm indebted to my family and all my friends for their encouragement and support.

Abstract

This study was concerned in Sawakin area – Red Sea State – Sudan at (May, 2017). The study problem represents to recognize the problems and constraints of fish production and marketing in study area. The study area located in West Red Sea Costal in Sudan. It contributes about 40% of fish capture in the Sudanese Red Sea coast. The study was aimed to identify the problems of fish production and marketing in study area, the secondary objectives from this study to identify production problems, to identify marketing problems, to determine marketing channels, to study relationship between marketing service and cost and their affect on quantity consumed from fishermen and intermediary and to suggest recommendation to solve these problems. The most important hypotheses for this study were finance, fishing tools (boats and nets) and operation factors(labors, maintenance and cost of fuel) affect fish production , grading , preservation and transport affect fish marketing and length of marketing channel affect fish marketing. Data collected through questionnaire distributed random for 10 intermediary, 50 fishermen and 50 consumers from research population in addition to the interviews, also secondary data collected through from the References, Scientific papers, Web site, Reports from difference sources with related to study. Approach is the analytical descriptive approach and case study methodology. Collected data analyzed by using SPSS application including descriptive analysis and simple linear correlation. The study showed that the fish production and marketing in the study area were traditional in terms of fishing tools, storage, transportation which leads to increasing the losses and costs of production and marketing. Most of fishermen in study area sell their products in PortSudan, because PortSudan is a central market which represents the largest market in the

Red Sea State, and some of fishermen are financed through intermediates in PortSudan. The problems of production which found in study area are problems of financial fishing tools, and operation problems. While the main problems and constraints of marketing are lack of marketing services. The study showed that there was medium positive relationship between services and their costs (correlation coefficient 0.575), that means the increase of services leads to the increase of the services cost. The study also found the marketing channels represent on - channel from fishermen directly to consumer, channel from fishermen to intermediary (wholesaler and retailer) to consumer and channel from fishermen - intermediary - agent - consumer.

The study recommend that: - engaging the private sector to provide fishing tools with appropriate costs and finance with low benefit, activation of fishermen organization to facilitate finance process and providing fishing tools.

المستخلص

أجريت الدراسه بمنطقه سواكن - ولايه البحر الاحمر - السودان فى شهر مارس 2017. تمثلت مشكله الدراسه في التعرف على مشاكل ومعوقات إنتاج وتسويق الاسماك في منطقة الدراسه، والتي تساهم بحوالي 40% من الإنتاج الكلي لساحل البحر الاحمر السوداني. هدفت الدراسه للتعرف علي مشاكل ومعوقات انتاج وتسويق الاسماك بالمنطقة، الاهداف الثانوية لهذه الدراسه معرفة المشاكل الإنتاجيه، معرفة المشاكل التسويقيه، تحديد القنوات التسويقيه، دراسه العلاقه بين الخدمات التسويقيه وتكاليفها وأثرها علي الكميه المستهلكه من الصياد والوسيط وطرح التوصيات لحل هذه المشاكل. وكانت اهم الفروض هي ان التمويل، معدات الصيد (المراكب والشباك) والعوامل التشغيليه(العماله، الصيانه وتكاليف الوقود) تؤثر علي الأنتاج. النقل والحفظ والتدريج يؤثر علي التسويق. طول القناة التسويقييه يؤثر علي تسويق الاسماك. تم جمع البيانات الاوليه عبر إستبيان وزع عشوائيا علي عدد 10وسيط، 50 صياد و50 مستهلك من مجتمع البحث بالاضافه الي المقابلات. كما تم جمع البيانات الثانويه من خلال المراجع، الاوراق العلميه، المواقع الالكترونيه، تقارير ومن ادارة المصايد ببورتسودان وفرعها بسواكن. المنهج المتبع هو المنهج الوصفي التحليلي ومنهج دراسة الحالة. حيث تم تحليل البيانات عن طريق التحليل الوصفي والإرتباط الخطي البسيط باستخدام تطبيق الحزم الاحصائيه للعلوم الاجتماعيه. أظهرت الدراسة ان إنتاج وتسويق الاسماك بمنطقه الدراسه تقليدي من حيث معدات الصيد والنقل والتخزين مما يؤدي الي زيادة الفاقد وبالتالي زيادة تكاليف الإنتاج والتسويق. معظم الصيادين يتم بيع إنتاجهم من الاسماك بمدينه بورتسودان لان بها سوق مركزي وهو يمثل أكبر سوق للاسماك بولاية البحر الاحمر. بعض الصيادين يتم تمويلهم عبر الوسطاء الموجودين ببورتسودان. مشاكل الإنتاج التي وجدت في منطقة الدراسه تمثلت في مشاكل معدات الصيد، التمويل و

العوامل التشغيليه، في حين ان مشاكل ومعوقات التسويق الاساسية تمثلت في الخدمات التسويقيه. وأوضحت الدراسه ان هنالك علاقة موجبه متوسطه بين الخدمات التسويقيه وتكاليفها بمعامل إرتباط (575.) وهذا يعني ان زيادة الخدمات التسويقيه تؤدي الي زيادة التكاليف. توصلت الدراسه الي ان القنوات التسويقيه تمثلت في: قناة من الصياد مباشرة للمستهلك، قناة من الصياد الي الوسيط (تاجر جملة وتجزئة) ومن ثم الي المستهلك، ومن الصياد – الوسيط – وكيل – المستهلك.

أوصت الدراسه بالاتي: - إشرك القطاع الخاص لتوفير معدات الصيد بتكاليف مناسبهو التمويل بفوائد اقل، تنشيط الجمعيات التعاونيه للصيادين لتسهيل عمليه التمويل وتوفير معدات الصيد

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Operational Definitions

Problem: question raised for inquiry consideration or solution.

Constraints: the threat or used force to prevent, restrict or dictate the action or thought of others or limitation and restriction.

Fishermen: a person who catches fish for a living or sport or someone whose occupation is catching fish.

Intermediaries: a person who acts as link between people in order to try brings bout agreement or reconciliation a mediator.

Marketing intermediate: help firm or producers to promote sale and make good and service available.

Consumers: a purchaser of a good or service in retail or a person who purchases good or service for personal use.

Fishing tools: is the equipment used by fishermen when fishing.

Fishing gear: net or gear used to catch fish.

Nets or gears: these are instruments used for catching fish.
Craft and boats: it provides platform for fishing operation.

Skipper: leader.

Indolent: (lazy).

Chapter One

Introduction

1.1Background

Fish is an important food; it contributed about 100 sea food types derived from wild fish. As well as farmed has always been an important source of protein in the human diet. On global scale fish and fish products are the most important Source of protein and it is estimated more than 30% of human consumption comes from aquaculture (Omer, 2011). Sudan's huge fishing potentialities and fish resources are represented by the 800 kilometers coastline on the Red Sea and about 42 billion square meters of fresh water stretched from lakes and rivers, the most important of which are the river Nile and its tributaries. That collectively harbors an estimated fish potential of 23700 tons annually and product about 17000 tons annually. The fish inventory reservoirs at Sennar, Roseiris, and Jebel Awlia Dam in addition to the Nubian lake at Wadi Halfa, account for hundreds of thousand tons of fish in fresh and marine waters (Somia, 2009). The Red Sea in Sudanese coast divided in three zones included: Central zone, Northern zone and Southern zone according to division of Administration of Fisheries. The most important zone is Southern zone which include Sawakin, it contributed about 40% total capture, while Northern zone contributed about 25% and Central zone contributed about 35% from total capture (Report of Administration of Fisheries, 2017).

The table (1-1) Shows Fish Production in Red Sea for Different Years

Years	Amount of fish (ton)
2011	1156
2012	479
2013	883
2014	1156
2015	1302
2016	1183,057

Source: Report of Administration of fisheries source-PortSudan, 2017

1.1.1 Fish production

Oceans, Marines, Rivers and others water bodies contain huge amount of natural resources. These resources are used it in different purposes by human. They are considered as depots of nutrient from fish and most of minerals and others things. The oceans covered about 70% of Earth this equates about 144million mile squared, the internal marines covered about 12.5 million mile squared and coast marines covered about 4 million mile squared .Production from fish in 2000 -2001 about 105 million tons included aquaculture 70% for human consumption and 30 % for industry (Ibrahim, 2003).The contribution of fish production about increase 100 million tons, the percent of marine fisheries about 85 % and inland fisheries about 13.5% tons (Ibrahim, 2003). Aquaculture is an important economic activity worldwide and is one of the fastest growing areas of food production in the USA. In China aquaculture harvest grow at an annual rate of 16.7 % in 2005 accounting for 70.0 % of the world fish production (Ibrahim, 2014). Sudan capture fisheries production was estimated to be about 34.000 tons in 2012, 29.000 tons from inland fisheries and 5000 from marine fisheries .the aquaculture sector is still incipient and the annual production was estimated at 2000 tons in 2012 (FAO, 2014).

1.1.2 Constraints of Fish production

There are different problems and constraints facing fish production which can be summered in many points. There is no accurate and total survey to determine fishing regions, lack in labor, unavailable of modern cooling facility in boat to save fish well, the information about fish stock unavailable, the research about fish production cannot take attention, fishing in breeding season (Mona.2015). Fish prices are influenced by demand and supply factors, including

the costs of Production and transportation, but also of alternative commodities (FAO, 2014).

1.1.3 Fish Marketing

Fish marketing is an important agricultural domain. Seafood is one of the most extensively traded commodities in the world and export of fish produce from developing countries, comprises 20% of agriculture and food processing exports and is likely to increase as demand for fish produce continues to increase. In 2004, the fishery sub-sector contributed to the food and nutritional security of 200 million Africans and provided for 10 million engaged in fish production, processing and trade (Ismail, 2014). Marine fish marketing starts at the point where fish is landed, although this process is dependent on the prior activity of fishing itself to which degree is financed by owners of fishing vessels (Wiomsa, 2009). It is argued that 95% of the fishing boats and gears are mostly owned by boat owners, after fish is landed under this arrangement, the proceeds are shared. The boat owner may give in advance small amounts of the payment to the fishermen but the rest of the payment will be paid later (Andrew, 2009). Boat owners may sell fish at or away from the landing site (markets). The fish commodity may be selling directly to fish dealers or retailers or industrial fishing companies (Andrew, 2009).

1.1.4 Constraints of Fish Marketing

Marketing involves a lot of problems which sometimes prevent the producers to achieve their objectives to satisfy consumer wants and to ensure suitable profit for them (Nwabunike, 2015). Marketing problems are related to infrastructural facilities , high Perishability of the commodity, lack of storage facility, lack of processing unit, and high bargaining power of the consumers, huge competition, high price fluctuation, inconstant supply of fish and lack of government support (Rahaman and Bara, 2013). Also pre -harvesting methods of

fishery products, unavailability of adequate transportation (roads, vehicles, and rails), ineffective of distribution system to transport goods from one point to another are considered as constraints of fish marketing (Nwabunike, 2015). Price is main constraint of fish marketing in the low income sector of the population. Lack of capital also constitutes a problem in the marketing process. The ineffective of distribution system of fish increases the marketing margins as transporters and wholesalers recover the high cost of vehicle maintenance from consumer price (Nwabunike, 2015).

1 .2 Statements and Justification of Study

The Red Sea State is the only state in Sudan bordering the sea with a coastline of 750 km and an Exclusive Economic Zone of 91,600 km^2. The most important zone in Red Sea is Southern zone which include Sawakin, it contributes about 40% of the total capture. The fish producers and market intermediaries are facing multidimensional problems ranging from production problems represented in financing, fishing tools (boats and nets), operation problems (labors ,maintenance and cost of fuel) , marketing problems (marketing services as financing, transportation, preservation, and grading) and environmental problems (seasonality of fishing and pollution). The problems that are facing consumers are represent in high of fish, the quick spoilage of product due to in availability of good preservation method and in abundance of fish due to fishermen sell majority of fish in PortSudan.

1.3 Objectives of study

This study is mainly conducted to identify the production and marketing constraints in the Red Sea State (Sawakin area).

The specific objectives of the study to:

1. To identify the production problems in the study area.

2. To identify marketing problems in the study area.

3. To identify marketing channels.

4. To study the relationship between marketing services and cost and their effect on quantity consumed from fishermen and intermediary.

5. To study the relationship between age and experience in fishing.

6. To suggest means and measures for improving the production and marketing for sustainable use.

1.4 Hypotheses of study

The hypotheses are based on the objectives of the study. The following hypothesis will be tested.

1. Finance, fishing tools, operation factors affect fish production.

2. Finance, transportation, preservation and grading affect fish marketing.

3. The length of marketing channel affects fish marketing.

4. Marketing services and cost effect on quantity consumed from fishermen and intermediary.

5. Age effect on experience in fishing

1.5 Organization of study

The research will be presented in six chapters Chapter one is an introductory. It includes background about the subject, the study

problem, justifications of the study, objectives of study, hypotheses to be tested and organization of study.

Chapter two is a literature review related to the subject.

Chapter three describes the methodology and the methods used for data collection and data analysis.

Chapter four presents the descriptive statistics of fishermen, intermediates and consumers it also presents the analytical part of the results.

Chapter five discusses the results.

Chapter six contains summary, conclusions and suggested recommendations

Chapter Two

Literature review

This chapter displays the literature about fish production, marketing and the problems and constraints which are facing them.

2.1 Fish

Fish are the most numerous of vertebrate, with least 20,000 know species, and more than 58% found in environment marine (Omer, 2011).

Fish defined as cold-blooded, aquatic vertebrate animal, which breathe oxygen in simple solution in water by means of gills, and has fin for movement. Some fish have scales and others have not. Fish flesh is composed of an average of about 75% to 80% of water, which is strongly bound to proteins in structure. This protein makes up from 15% to 28% of fish muscles and consists of essential amino acids (Somia, 2009). The animal production has large important in agriculture economic activities, it percent the important part national findings the major products utilized for human nurture whereby consider main source of animal protein It has nurture value it percent about 80% from life weight in the fish whereas in the pottery about 65% and about 54% in the livestock (Yahuh,2014). Fish is one of most important animal source of food for a healthy diet. It is rich in amino acids, unsaturated fatty acids, vitamins, and trace metals. Furthermore, it is easy to digest due to lack of connective tissue. Several researchers have investigated the nutritional value of fish and its importance in human diet from various perspectives. Some studies revealed that fish consumption helps preventing cardiovascular diseases, high blood pressure, cholesterol, Alzheimer's disease, and various types of cancer (Mehmet and etal, 2015). Fish is an important source of animal protein in the especial cases of African countries, where the combine forces of high cost, disease, low genetic potentials of indigenous species among other factors have raised the cost of livestock almost beyond the reach of the low income groups (Addis and etal, 2015). Fish is an important and highly desirable food for people suffering from protein, energy and malnutrition which is a leading cause of infant mortality

in the developing world. It could be good source against endemic goiter caused by lack of dietary iron and iodine. Each 100 grams of lean or white fish contains less than1% of fat, about 18% of protein and an energy value range of 50-80 k.cal. Oily fish contains 8-15% of fat and so has a higher energy value (80-160kal/100g) (Somia, 2009).

2.2 Fish production

2.2.1 Production

Production is a process of workers combining various material inputs and immaterial inputs in order to make something for consumption. It is the act of creating output, a good or service which has value and contributes to the utility of individuals. The action of making or manufacturing from components or raw materials, or the process of being so manufactured. The process of or financial and administrative management involved in making a movie, play, or record (Wikipedia.htm, 2017).

2.2.1.1 Product

Product can be defined in many different ways. In marketing, product means the physical products and service offered, and the ideological actions of the company. Often product is defined as the benefitting factors that a customer gets when purchasing the product (Gronholm and etal, 2012).

2.2.1.2 Fishing:

Fishing is defined as the operation through which the natural production of fish could be harvested from the open water for human benefit (Somia, 2009).

2.2.1.3 Fishing effort

Fishing effort is the number of fishermen and gears (Somia, 2009). The craft and gears using in fishing technology play very important role and help enhancing the production. The success of fishing depends upon to who and which type of net

are used to capture the fish. They are two main types of fishing devices used both in marine and inland fisheries (Santosh and Manju, 2010).

2.2.1.4 Tools of Fish Production

2.2.1.4.1 Fishing Gear and craft

Nets or gears: Define fishing gear, as any net, trap, sieve, line, spear or other implement or tool used for fishing, these are instruments used for catching fish.

Craft and boats: It provides platform for fishing operation, carrying the crew and fishing gears. Various types of craft and gears used in different parts according to the nature of water bodies, the age of fish and their species some nets use without craft and other used with craft (Santosh and Manju,2010).

2.2.2 Fish production in world

The Oceans, Marines, Rivers and others water bodies contain huge amount of natural resource, human used it in different purposes. It considers as depots of nutrient from fish and most of Minerals and others things. The oceans covered about 70% of Earth this equates about 144million mile squared, the internal marines covered about 12.5 million mile squared and coast marines covered about 4 million mile squared. The contribution of fish production about increase 100 million tons, the percent of marine fisheries about 85 % and inland fisheries about 13.5% tons (Ibrahim, 2003). Global fishery production in marine waters was 82.6 million tons in 2011 and 79.7 million tons in 2012Global inland waters capture production reached 11.6 million tons in 2012, but it's Share in total global capture production still does not exceed 13 percent. Global aquaculture production attained another all-time high of 90.4 million tons (FAO, 2014). In recent years capture fishery production has been flat, at around 90 million tons per year, while aquaculture has continued to show sustained growth currently around 6.5 percent a year faster than all other food sectors. It is a well-known fact that the production of fish and fisheries worldwide is approximately154 million tons per year and their

consumption is 18.5 per capita per year (Mehmet and etal, 2015). Aquaculture is an important economic activity worldwide and is one of the fastest growing areas of food production in the USA (Ibrahim, 2014). China has been responsible for most of the growth in fish availability, owing to the Dramatic expansion in its fish production, particularly from aquaculture (FAO, 2014). In China aquaculture harvest grow at an annual rate of16.7 % in 2005. Accounting for 70.0 % of the world fish production. Production from fish in 2000 -2001 about 105 million tons included aquaculture70% for human consumption and 30 % for industry (Ibrahim, 2003).

2.2.3 Fish production in Sudan

Sudan capture fisheries production was estimated to be about 34.000 tons in 2012, 29.000 tons from inland fisheries and 5000 from marine fisheries .The aquaculture sector is still incipient and the annual production was estimated at 2000 tons in 2012 (FAO, 2014). Sudan has two sources of fish production; it is presented in inland fisheries and marine fisheries. The inland fisheries are mainly on the River Nile and its tributaries, contributing over 90% of the estimated production potential of the country. And Red Sea in Sudanese costal. (Somia, 2009).

The estimation of sustainable yield in Sudanese Red Sea Costal about 9000 tons per year, it divided to three fisheries

1 – Surface fisheries 4000 tons in year

2 – Bottom fisheries 3000 tons in year

3 – Coral fisheries 2000 tons in year

(Report of statistical office, 2014)

Table (2-1) Fishing landing in main fishing area in Sudan:

Location	Surface area (km)	Fish potential (ton per years)	Fish landing (ton per years)	Percentage %
Sudd Region adjacent area	16500	75000	30000	40
Gebel Awlia Reservoir	1500	15000	13000	86.7
Rosairs Reservoir	290	1700	1500	88.2
Sennar Reservoir	160	1100	1000	91
Khashm Elgirba Reservoir	125	800	500	62.5
Lake Nubia	1144	5100	1000	19.5
Red Sea	91600	10000	5000	500

Source: Somia, 2009

2.2.4 Marine environment and fisheries in Sudan

The marine environment and fisheries have been observed to be apparently subject to various hazards and risks that demand high priority attention. Some of these negative impacts are overfishing and stress on some component of fisheries resources as a consequence of improvement of fishing gears and techniques .Illegal fishing performed by unlicensed foreign vessel and smuggling of catch. By-catch and discards of untargeted fish which is thrown back to the water particularly by shrimp trawlers have negative economic and environmental impacts. Use of illegal fishing methods (dynamite) by foreign fishermen or fishing during the breeding season. The process of construction of new ports (Bashayr Petroleum Port, rehabilitation of Sawakin Port and Ooseif Port). Deterioration of Coastal environment through cutting of Mangroves and blocking of natural water courses from reaching the sea by the fast pace of industrial and economic development oil

pollution (Osman, 2004). The marine fisheries sector is still under developed. Most fishing activities are carried out by the artisanal sector using traditional gear, craft, and fishing techniques and are confined to the near shore area, targeting finfish, shrimp, mollusks and sea cucumbers. Fishing activity takes place off shore in the Coastal area and in the lagoon bay. There are approximately1, 900 to 2,500 registered fishermen (UNIDO, 2014).

2.2.5 Nature of fishing in Sudan

Fishermen are considered in most of the developing countries as one of the most neglected and poorest groups within society, having traditionally inherited fishing methods those are not adapted to modern fishing ones, gears, handling and preservation. Actually, the same conditions are prevailing (dominant) in Sudan there is a huge gap between the world modern fisheries and the traditional fisheries in the country. Fishing boats in Sudan are mostly wooden canoes (boats) with few steel and fiberglass boats. Generally, there is low motorization level and most engines are in fact used by fish collection boats and seldom engaged in fishing operations (Somia, 2009).

2.2.6 Relationships between owner's boats and fishermen

The relationship between owners' boats and fishermen is often unequal and many fishermen complain that they are being exploited because they do not have the fishing rights, but are subcontracted by the ownership. The deal between owner and fishermen is that the owner pays for the maintenance of the boat, for fuel and for bait, while the fishermen bring their own gear, hand lines, and other tools. A fixed rate of 50% of the catch goes to the boat owner to cover those costs and the remainder is split between the crew if no fish is caught, then no money changes hands, and the boat owner gives the fishermen an advance on credit will be deducted from future catches. These results in indebtedness and, once fishermen

have built up a debt they cannot repay, they often move to another vessel to earn a daily rate. (Moenieba, 2013). It can be argued that 95% of the fishing boats and gears are mostly owned by boat owners. Boat owners finance fishing by providing fishing boats and sometimes fishing gear to fishers. After fish is landed under this arrangement, the proceeds are shared in order of agreed sharing methods. The boat owner may advance small amounts of the payment to the fishermen with the balance being paid later (Andrew, 2009). Catches of fish fluctuate widely between years and localities, and the seasonal movements can be highly variable fishermen have only 10 to 15 optimal Fishing days per month, which are entirely dependent on weather patterns and sea conditions. Sea temperature changes impact availability and catches; if the sea gets warmer, the fish move offshore. Climate change, with estimated sea surface temperature rising, is likely to exacerbate this variability. Many respondents stated that fish has become scarcer, and fishermen think this is due to climate change and impacts on the fishing activity are the increasing number of fishermen (Moenieba, 2013).

2.2.7 Fish consumption

Fish consumption, frequency, and preferences are affected by consumers' geographic, social, and cultural characteristics. It is known that foods preferences are also affected by a number of sensory (taste, smell and texture) and non-sensors' factors (behavior, beliefs, personal characteristics, risk perception (Mehmet and etal, 2015). People in the developing countries are generally much more dependent on fish as a part of their daily diets than people living in the developed world. It may be used fresh, frozen, canned, cured salted, dried or smoked. Fish meal and fish flour are two products of the fishing industry used for the dairy and poultry feeds and so add to the world's supply of protein rich food (Somia, 2009). Global fish production has grown steadily in the last five decades with food fish supply increasing. World per capita apparent fish consumption

increased from an average of 9.9 kg in the 1960s to 19.2 kg in 2012(preliminary estimate) this impressive development has been driven by a combination of population growth, rising incomes and urbanization, and facilitated by the strong expansion of fish production and more efficient distribution channels (FAO, 2014).

2.2.8 Fish consumption in Sudan

"The per capita consumption of fish in Sudan is about 1.3 kg/year and it is considered very low when compared to the international level, which is about 13 kg/year according to FAO statistics. In Sudan as a national average was close to 1 kg/year. In urban areas consumption was estimated to be as > 2 kg/year; while for rural areas, it was < 0.5 kg/year". Fisheries resources in Sudan, are not fully exploited therefore there are considerable resources which could contribute significantly to rectifying the low per capita consumption (Somia, 2009).

2.2.9 Constraints of fish production

The factors that affect fish production are capital the capital is important part in any process if production or marketing process, there is no accurate and total survey to determine fishing regions, lack in labor and training in this scope, lack in infrastructure as (transport, storage and cooling), unavailable of modern cooling facility in boat to save fish well, the information about fish stock unavailable, the research about fish production cannot take attention, dispose of industrial wastewater in water bodies, overfishing and fishing in breeding season (Mona, 2015). Fish prices are influenced by demand and supply factors, including the costs of Production and transportation, but also of alternative commodities (FAO, 2014).

2.3 Fish marketing

2.3.1 Marketing concepts

A market is a group of potential buyers with needs and wants and the purchasing power to satisfy them. (John, 2008). The marketing concept is a philosophy which states that the key to achieving goals is to determine the needs of

the target customers and to satisfy those needs more efficiently and effectively than competitors. The marketing concept does not target to maximize profitable sales volumes but to generate profits through customer satisfaction. Therefore, the emphasis is not solely on selling products but on selling satisfaction (Gronholm and others, 2012). Marketing concepts are built and developed to satisfy the needs and wants of customers. In the competitive fashion industry, companies are forced to put more effort and thought into their marketing plans and means of attracting the customers in the first place. Marketing is simply the performance of business activities that direct the flow of goods and services from the producer to the consumer (Ehinimore, 2007). The different stages promised by fish marketing system to deliveries products to consumers. The marketing activity included formatting between different marketing activities such as develop product, determine appropriate price and forecast for selling size ……ect (Ibrahim, 2003). Fish marketing enterprise is an important agricultural domain. Declared that seafood is one of the most extensively traded commodities in the world and export of fish produce from developing countries, comprises 20% of agriculture and food processing exports and is likely to increase as demand for fish produce continues to increase (Ismail, 2014). Marine fish marketing starts at the point where fish is landed, although this process is dependent on the prior activity of fishing itself which to a degree is financed by owners of fishing vessels (Wiomisa, 2009). Fish sale by the boat owner may be at or away from the landing site. The latter may be direct sale to a fish dealer or sale to retailers at the dealers shop located in the main consumer markets. Part of the catch is however sold directly from Fishermen or in some places from industrial fishing companies in the form of by-catch (Andrew, 2009).

2.3.2 Market place

A market place is a common place for seller; buyer and dealers, this common place shopping center, a block, a portion of a block, and even the site of a single retail store (John, 2008).

2.3.3 Fish marketing practices

To make fish available to consumers at right time and in right place requires an effective marketing system. Fishermen who catch fish overnight do not usually sell fish in retail market. At the break of day, they take their catches to place where retail meet them and bargain by the lot at the land the numbers of Intermediaries are low. Enter into the market is difficult for fisherman for many reason, mainly because of strong non –cooperation and resistance from retails. Thus it is obvious why fishing commodities' remain poor or are getting poor over the years, although they trade an important, necessary and every-day commodity (Dominic, 2010).

2.3.4 Factors affecting fish marketing

There are several factors which have various impacts on fish marketing these factors include: Economic factors: This is a situation where by majority of the population cannot meet up with their needs in terms of money resulting from falling incomes per head of household and unemployment hence many people have less money to buy fish. Political factor this has to do with people in power, if majority of people who are in control can circulate money, there will be enough money to buy fish, but if money is not circulated it will be difficult to buy fish.

Demographic factor this factor deals with the population of a given place, the increase in number of people in a place increases the demand for fish, while decrease in population decreases the demand for fish in a given place (Adegeye, 1985).

2.3.5 Marketing services (functions)

Proper and quick handling is needed for fresh fish as it is a very perishable community especially under Sudan hot climatic conditions, but the existing fish marketing is practiced in traditional ways.

Most importance marketing services which done by fishermen.

2.3.5.1 Financing

Most of the fish farmers, fishermen, retailer, packers and are self-financed. Other sources of finance for the farmers are banks, friends and relatives (FAO report 2012). Finance is an important facilitating function, most of fishermen or Retailers do not want to be financed from commercial banks as they do not want to have the risk of being unable to repay due to the market fluctuation and their limited business. While the fish mongers (transporters) mentioned they are willing to be financed for fish transportation (Somia, 2009).

2.3.5.2 Grading

Grading is an important activity in fish marketing as different sizes of fish fetch different prices. Grading facilitates buying and selling of fish. Most fish are graded on the basis of size and weight. However fish are graded into three categories small, medium and large depending on (weight). However, weights across species vary depending on species graded (FAO report 2012).

2.3.5.3 Storage

The storage function is primarily concerned with making goods available at the desired time. It enables traders to obtain better prices for their communities. Because it is highly perishable commodity, fish requires extremely specialized storage facilities matching the seasonal demand. Other intermediaries use only ice to transport fishes from one place to another (FAO report 2012). Storage of fish is

a marketing function which can be performed by fish monger, and retailer. The retailer usually has ice boxes in which ice and sawdust are kept for fish preservation. Fish transporters practice storage by keeping the fish inside the vehicle till the whole quantity is sold (Somia, 2009).

2.3.5.4Transporting

Fish farmers and intermediaries use various modes of transportation such as van, rickshaw, truck, passenger bus, and pickup, to transfer products from the producing areas to the consumption centers. Ice is used while transporting the fish as most carriers are non-refrigerated (FAO report 2012). Transportation is a physical function to transport fish from the fishing boat the fishermen have no good preservation means for fish till it is handled to the Consumers or fish mongers use water weeds to cover their catch. The nonexistent of transportation method may cause great losses in weight especially during the summer season (Somia, 2009).

2.3.6 Marketing costs

Marketing costs can be differentiated into three distinct types of costs direct costs that involve direct marketing functions and services. Transportation and assembly costs. Handling costs (loading, unloading, repackaging,), processing and storage costs as well as other costs as taxes, levies, customs and duties. The operating costs, which include the opportunity cost of the tied-up capital usually taken as percent of annual profits as determined by the Central Bank and physical losses arising from transportation, storage loss or processing in value terms as a percentage of the initial market crop value (SIFSIA- 2011). In Sudan the marketing services are traditional and inefficient Resulting in the waste of a large portion of the total production in Addition to the use of non-insulated trucks for fish transportation and the unavailability of other preservation facilities (Somia 2009).

2.3.7 Marketing channels

Can be defined as an array of exchange relationships that create customer value in the acquisition, consumption, and disposition of commodity and services. Marketing channels always emerge out of a demand that marketplace needs be better served. However markets and their needs never stop changing; therefore marketing channels operate in a state of continuous change and must constantly adapt to confront those changes. From its inception to its contemporary standing, the evolution of marketing channels (David and James, 2014). Marketing channel is simply the path of a commodity from its raw form to the finished product or the path of a product as it moves from the producers to the final consumers. In other word, it is the sequence of intermediaries or middle, and the marketers through which goods passes from producers to consumers. Marketing channels are important in evaluating marketing system because they indicate how the various market participants are organized to accomplish the movement of a commodity from the producer to the final consumers (David and James, 2014). Marketing and distribution channels are important characteristics in the process of getting produce from source to consumers. However, marketing channels are identifiable pathway through which goods and services flow before reaching the final consumer (Pauly, 2002). Marketing channels have traditionally been viewed as a bridge between producers and users. However, this perspective fails to capture the complex network of relationships that facilitate marketing flows, the movement of goods, service, and information (David and James, 2014). The are many factors affect fish marketing channels such as ownership of fish storage as cooling facility, quantity of fish sold, Profit margins, transport time to selling point and quantity of fuel wood used for fish and Processing per day (David and James, 2014) .

2.3.8 Intermediaries

Intermediaries are individuals or organizations who mediate exchange utility in relationships involving two or more partners. Intermediaries generate form, place, time, and/or ownership values by bringing together buyers and sellers. While the names of the players have changed, the functions performed by channel intermediaries remain essentially the same. Intermediaries have always helped channels to create utility by contributing to contractual efficiency, facilitating Reutilization, simplifying Assortment, and Minimizing uncertainty within marketing channels (David and James, 2014). Intermediaries contributed substantially to the movement of goods and people from rural area to new industrialized urban centers. Intermediaries surfaced in the marketplace. Large retailers expanded further, while smaller retailers generally settled into unnerved or underserved market niches. (David and James, 2014).

2.3.8.1 Characteristics of Intermediaries

Fish farmers and fishermen are the first link in the fish marketing channels. They are the supplier of fish to the market. An Intermediary who does not have the ownership of the commodity but establishes a bridge between buyers and sellers and receive commission from farmer. Another type of intermediary is found in marketing system who purchases a small quantity of fish form fishermen far away from the market and carry it to the terminal point and sell it to retailer Piker handles large volume of fish. They purchase fish from fish farmers at farm or through retailer in the local market and sell those to the retailers through commission agent in market. Piker (licensed trader/exporter) purchase fish from fishermen through retailer and sell (export) their entire product to overseas market. A retailer negotiates sales of fish on behalf of the producers, seller. A retailer

arranges selling of fish through an auctioning system and receive a commission. A retailer often acts as a supplier of fish (FAO report 2012).

2.3.9 Problems and constraints of fish marketing

There are many types of constraints

1-Policy constraints 2 - resource constraints 3- marketing constraints 4- dummy spurious constraints.

A marketing constraint defined as situation in which the production /operations resource capacity exceeds market demand and lack of profitable orders prevents the system from achieving higher value to its shareholders (Kudi and others, 2008). Marketing involves a lot of problems which often times prevent the objectives of the producer which is to satisfy consumer wants and to ensure the profitability of them (Nwabunike, 2015). Profitable marketing of fish is a constant challenge to the industry observed that the problems of agricultural products are not the instability of the Marketable overflow which is affected by loss in the distributive system. (Nwabunike, 2015). Market problems related to infrastructural facilities High Perishability of the commodity, Lack of storage facility, lack of processing unit, and high bargaining power of the Consumers, huge competition, high price fluctuation, Inconsistent supply of fish, and lack of government support (Rahaman and other, 2013).Also Pre -harvesting methods of fishery products, unavailability of adequate transportation (roads, vehicles, and rails) also prevents effective distribution of goods from one point to another, Price is main constraint of fish marketing in the low income sector of the Population. Lack of capital also constitutes a problem in the marketing process. The limit distribution of fresh increase in the marketing margins as transporters/ wholesalers recover the high cost of vehicle maintenance from consumers (Nwabunike, 2015). Quantity of fish sold, Ownership of fish storage facility, Number of household members,

Education, Selling price of fish, Sex and Transport time to selling point. (Andrew, 2009). The major problems faced in marketing of fish are documented as low production and high demand to identified high Perishability coupled with absence of storage facilities, quality deterioration result lower income of intermediaries are also major problems faced by market intermediaries necessitates efficient marketing system to benefit all stakeholders including fishermen, consumers and market intermediaries. According to the observation of market intermediaries. High perish ability associated with cut throat competition is the most damaging aspects of fish (Rahaman and Bera, 2013). Market force losses are due to inadequacy between demand and supply leading to changes in price of fish. If the price of fish falls because of oversupply, the seller may incur a market force loss. Market force loss is difficult to measure accurately, because it usually sets the ground for quality and physical losses (Andrew, 2009).

Chapter Three

Research methodology

This chapter aims to explain the research methods of the study. To achieve this objective primary and secondary data were collected .while descriptive statistics and correlation coefficient were applied in the analysis of data

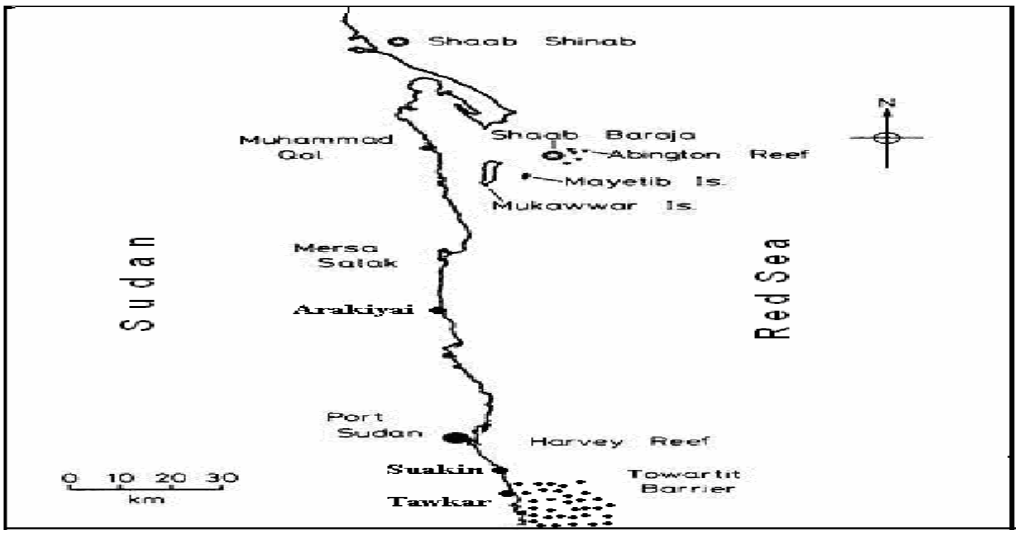
3.1 Study Area

3.1.1 Red sea

The Red Sea is the only state in Sudan bordering the sea with a Coastline of 750 km and an Exclusive Economic Zone of 91,600 km2, including a shelf area of 22,300 km2. Weak currents characterize Sudan's. It territorial waters, as well as a lack of upwelling phenomena, weak tides, high water temperatures, high salinity and lack of permanent rivers and fresh water inflows. Runoff water, except for seasonal khors during the rainy season, has no negative impact on the productivity and organic production of the fisheries sector in the study area. Activities are largely traditional and just for subsistence (UNIDO, 2014).

Red Sea State is divided into eight localities (Mahallies): Port Sudan, Sawakin, Gunub/Aulib, Snikat, Hayya, Halaib and Tokar/Agig.

The capital of the State is Port Sudan which was founded in 1905 to replace the old port of Sawakin (UNIDO 2014).



www.worldattas,aatlas,info page ، Map (3-1) Map of Red Sea Coastal

3.1.2 Sawakin

Sawakin located at West Sudanese Costal, it located at latitude 19, n), longitude at (37'E) and altitude 66m. The distance between Sawakin and Khartoum 642km. Sawakin was originally built on a flat oval-shaped island, about 750 m. long and less than 500 m. wide, located inside a narrow inlet to the Red Sea, and connected to the main land by a causeway. For much of the second millennium Sawakin was one of the most important port cities in the upper Red Sea region. Effectively abandoned in the late 1920s, the historic core of the urban centre has deteriorated to such an extent that it now consists of little more than a pile of rubble. (Sawakin Dilemma, 2016). Sawakin was found at the north-eastern tip of the Arabian-African Coastal Region, bordered by Saudi Arabia to the north across the Red Sea and Sudan coastal to the north and west across an oval-shaped island. The Coral Buildings of Sawakin developed a distinctive art and Architectural style, which was applied throughout the Coastal, it shares specific culture and social values which are embedded in their everyday system of social organization, also had its influence on their Architecture as well (Olakanbi and osama , 2016).

Map (3-1) Map of Sawakin

3.1.3 Fishing Regions

There are several fishing regions in Sawakin enumerate them according to department of fisheries in sawakin:

Antalbub, Mogadm land, Agag, Aggtuau, Agrbab, Khor torat and Khalphuh.

3.2 Samples design

The samples have been obtained by using simple random sampling due to homogeneity of population in the study area.

3.2.1 Sample size

There were three types of respondents for this study from whom primary data was collected from fishermen, consumers and intermediates. Due to homogeneity of population 50 individuals from fishermen the total number of them about 211 individuals and 50 individuals from consumers were interviewed. Since the population of intermediates is limited, thus the whole population was studied (10 individuals from intermediates were interviewed).

3.2.2 Data Collection

Data was collected from two sources

3.2.2.1 Primary data

Three surveys were conducted during the period (May, 2017). The first survey was for fishermen, the second was for consumers and the third for intermediates. Interview questionnaires were used to interview the respondents. The questionnaires used were used designed in such way to give abroad set of data (Appendix 1,2and 3). It is composed of close-ended and open-ended questions. The questionnaires were prepared in Arabic and the personal interview method was used with respondents. Also managers and some fishery employees of the Administration were interviewed. Besides that direct observations in the study area were used.

3.2.2.2 Secondary data

Besides the primary data secondary data was collected from relevant sources including reports and studies relevant to the field of the study; from various Ministries, research centers, references (books) and related sources on internet (website).

3.3 Data analysis

In order to achieve the objectives of the study, the data collected were subjected to descriptive analysis procedures; also the correlation coefficient was used to show the relationship between some variables. The data analysis has done be using SPSS application.

3.3.1 Descriptive statistics (frequency distribution)

It is an important field of mathematics used to analyze, interpret, and predict outcomes of data. The frequency tables were used to summarize the data to examine the characteristics of the respondents on percentages.

3.3.2 Correlation coefficient:

It is used to measure the relationship between two variables .the relationship can expressed in a graphical form .The correlation coefficient ranges from +1 to-1 when the correlation coefficient ranges from 0.7- 0.9 irrespective of signal positive or negative, the relationship between dependent and independent variables is strong .If correlation coefficient ranges between 0.4 - 0.6 regardless of signal, there is a medium relationship between dependent and independent variables . If correlation coefficient ranges between 0.1 - 0.3 irrespective of signal that mean weak the relationship between dependent and independent variables is weak and if correlation coefficient equals zero, there is no relationship between dependent and independent variables.

Chapter Four

Results

This chapter displays the results of data analysis, it consists of two parts.

4.1 Descriptive statistics (frequency distributions)

This part deals with descriptive statistics of the respondents.

4.1.1 Descriptive statistics of fishermen

4.1.1.1 Position

Table (4 - 1) shows that all the respondents are from Sawakin.

Table (4 - 1): Position of fishing

Position	Frequency	Percentage %
Sawakin	50	100.0%

Source: survey data, 2017

4.1.1.2 Sex

From table (4-2) it is clear that 100% of the respondents are male which indicates that female has no direct contribution in fishing because customs and norms prevent women to practice fishing directly in the study area .

Table (4 - 2): Sex of fishermen

Sex	Frequency	Percentage %
Male	50	100 %
Female	0	0.0%

Source: survey data, 2017

4.1.1.3 Age per years

Age has an important effect on productivity and output of an individual, either on mental or manual; also it may reflect experience. The age structure may indicate

that the fishing process is not easy and needs strength and experience. Thus table (4 - 3) shows that the age of fishermen in the study area. from the table it is clear 52% of fishermen their ages range between 31 – 45 years, 20% of fishermen their ages range between 46 -60 years , 18% of them their ages range between 16 -30 years,8.0% of respondents their age is above 60 years while 2.0% of them their ages less than 15 years.

Table (4 - 3): Age per years

Age per years	Frequency	Percentage %
Less15	1	2.0 %
15 -30	9	18.0 %
30-45	26	52.0 %
45 – 60	10	20.0 %
60 more	4	8.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.4 Educational level

Educational level is positively associated with efficiency increase so that table (4-5) shows educational level in the study area. From the table it is clear that the rate of illiteracy among the fishermen is about 36%, the rate of those who have informal education at Khalwa is 8.0%, about 26% of the fishermen have primary or basic education. The rest of them have received either secondary or higher education.

Table (4- 4): Education level

Education level	Frequency	Percentage %
Illiterate	18	36.0 %
Khalwa	4	8.0 %
Primary	9	18.0 %
Basic	4	8.0%
Secondary	11	22.0 %
University	3	6.0 %
Above university	1	2.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.5 Marital status

It is an important economic feature, since it indicates whether this occupation generates enough income to support family or not. Therefore the table (4 - 5) shows that 82.0% of the fishermen are married and18.0% of them are not married (single).

Table (4 - 5): Marital stage

marital status	Frequency	Percentage %
Married	41	82.0 %
Unmarried(single)	9	18.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.6 Family size

The number of family members has a great importance from economic point of view since it indicates if income from this occupation supports big or small family. Therefore the table (4 - 6) shows that most of the fishermen in the study area have family of small size (about 56.0%) ,those who have family size in the range of 6-

10 members is 34.0% , 6.0% of fishermen have family size in the range of 11-15 members , while 4.0% 0f fishermen have family size more than 16 individuals.

Table (4 - 6): Family size

Family size	Frequency	Percentage%
Less than 5	28	56.0 %
6- 10	17	34.0 %
11- -15	3	6.0 %
More than 16	2	4.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.7 Main occupation

The main occupation indicates whether the fishing activity is main source of income for fishermen or this activity does not generate enough income and so fishermen do other jobs to increase their income to meet their needs. Table (4 - 7) shows that fishing activity is the main source of income for 78.0% of fishermen while 22.0% of fishermen practice it as secondary occupation.

Table (4 - 7): Main occupation

Main occupation	Frequency	Percentage %
Fishing activity	39	78.0 %
Other activities	11	22.0 %
Total	50	100.0 %

Source: survey data, 2017

There are many reasons lead fishermen to choose fishing as main occupation, such as heredity, inexpensive activity and easy to carry, thus table (4 - 8) shows the reasons behind choosing fishing as main occupation, from the table it is clear that most of respondents herded this occupation from their parents (58%) of them,

12.0% of fishermen choosing it because it is inexpensive activity, while 8.0% choosing it because it is easy occupation, and22 % of fishermen practice fishing as a hobby.

Table (4 - 8): Reasons for choosing fishing as main occupation

Reasons	Frequency	Percentage %
Heredity	29	58.0 %
Inexpensive activity	6	12.0 %
Easy to carry	4	8.0 %
Hobby	11	22.0 %
Total	50	100.0 %

Source: survey data, 2017

While fishermen practice fishing as a secondary occupation either it is a hobby 4.0% or practice it to increase their income 18% and the rest have no clear reason for practicing fishing 78.0% as in table **(**4 - 9).

Tab (4 - 9) Reasons for choosing fishing as a secondary occupation

Reasons	Frequency	Percentage %
Hobby	2	4.0 %
Increase income	9	18.0 %
No thing	39	78.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.8 Experience per years

Experience plays great role in the distribution of fishermen in the area. Table (4 - 10) shows that the rate of experienced fishermen is high, about 70% of fishermen have experience more than 10 years , while the rest of them have experience less than 10 years.

Table (4 - 10): Experience per years

Experience per year	Frequency	Percentage %
Less than 5	9	18.0 %
6 – 10	6	12.0 %
11 – 15	12	24.0 %
16 – 20	6	12.0 %
More than 20	17	34.0 %
Total	50	100.0

Source: survey data, 2017

4.1.1.9 Financial sources

There are many sources of finance available for fishermen such as self financial, bank loan, and other sources .Table (4 - 11) shows the sources of finance for fishermen .From this table it is clear that most of fishermen depended mainly on either self financial or individual fund (44% and 46% of respondents respectively) to finance their fishing activity ,the bank loan comprised only 4.0% and this due to fright of inability to repay the installments , due to fishing fluctuation in production, while the zakat as a source of fund represented only 6.0% .

Table (4 - 11): Financial sources

Financial resources	Frequency	Percentage %
Self financial	22	44.0 %
Bank loan	2	4.0 %
Individual fund	23	46.0 %
Zakat	3	6.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1. 1.10 Type of nets (gears)

The type of net has great importance in determining the type of fish which fishermen can fish. Table (4 - 12) shows that 12%of respondents use gill net, 10% of fishermen use trap, 28% of fishermen use hock because it doesn't need effort, while 18% of them use both gill net and hock, 20% of respondents use both hock and shuha, 2.0% of them use both trap and hock and those who use all type of nets are 10%.

Table (4 - 12): Type of nets (gears)

Type of nets (gears)	Frequency	Percentage %
Gill net	6	12.0 %
Trap	5	10.0 %
Hock	14	28.0 %
Gill net and hock	9	18.0 %
Hock and shuha	10	20.0 %
Trap and hock	1	2.0 %
All type of nets	5	10.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.11 Cost of nets (gears) in lbs per trip

The fishermen use different types of net and these nets have different cost, thus table (4 - 13) shows that most of fishermen (58% of them) use low cost nets in fishing (350- 1350 Ibs per trip, while those who use high cost nets are only 2.0% (cost is in the range of 5350- 6350 Ibs), the rest of fishermen (40%) use net that cost about 1350 -5350 Ibs. The cost use as indicator of quality of products.

Table (4 - 13): Average cost of nets (gears) in lbs per trip

Average cost of nets (gears) / lbs per trip	Frequency	Percentage %
350 – 1350	29	58.0%
1350 – 2350	6	12.0%
2350 – 3350	9	18.0%
3350 – 4350	1	2.0%
4350 – 5350	4	8.0%
5350 - 6350	1	2.0%
Total	50	100.0%

Source: survey data, 2017

4.1.1.12 Age of nets (gears) /month

Table (4 - 14) shows that 90% of the respondents mentioned that their nets stay for less than 10 months since most of fishermen depend on low cost nets of low quality , while for the rest of fishermen it stays for more than 10 months.

Table (4 - 14): Age of nets (gears) /month

Age of nets (gears)/ month	Frequency	Percentage %
Less than 10	45	90,0%
11 – 20	3	6.0%
More than 20	2	4.0%
Total	50	100.0%

Source: survey data, 2017

4.1.1.13 Type of fishing crafts

It indicates if this activity generates enough income so as to obtain a fixed high cost capital or not. Table (4 - 15) shows type of fishing crafts. From the table we found that 10.0% of fishermen use launches, 76% of fishermen use hori with

machine, while 8.0% of them use hori without machine, and 6.0% of respondents use shatuh.

Table (4 -15): Type of fishing crafts

Type of fishing crafts	Frequency	Percentage %
Launch	5	10.0 %
Hori with machine	38	76.0 %
Hori without machine	4	8.0 %
Shatuh	3	6.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.14 Type of ownership crafts

There are many types of ownership in the study area range from individual ownership, participation, rent from others, assembly or provided by some organizations. Table (4 -16) shows that 52.0%, of fishermen individually own crafts, 22% of fishermen share with others the ownership,18% of them rent the crafts, 6% of respondents are work in assembly and only 2.0% of respondents get access to crafts via some organization.

Table (4 -16): Type of ownership crafts

Type of ownership of crafts	Frequency	Percentage %
Individual ownership	26	52.0 %
Participate(shareholding)	11	22.0 %
Rent	9	18.0 %
Assembly	3	6.0 %
Organizations	1	2.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.15 Cost of ownership in Ibs per month

Table (4 - 17) shows the cost of ownership different, from the table it is clear that 16.0% of fishermen said that average cost of craft ownership per month in the range of 300 – 1330 lbs per month , 56.0% of them said that the cost of ownership of craft in the range of 1300 – 2300 lbs per month, while 28.0% of fishermen said that the cost of ownership of craft in the range of 2300 – 3300 lbs per month, and 2.0% of fishermen said that the average cost of ownership per month is in the range of 3300 - 4300 lbs per month, also 2.0% of fishermen said that the average cost of craft is in the range of 4300 – 5300 lbs per month, and 4.0% of fishermen said that the average cost of ownership per month is more than 5300 lbs per month .

Table (4 - 17): Cost of craft ownership in Ibs per month

Cost of craft ownership in Ibs per month	Frequency	Percentage %
300 – 1330	8	16.0%
1300 – 2300	28	56.0%
2300 – 3300	14	28.0%
3300 – 4300	1	2.0%
4300 – 5300	1	2.0%
More than 5300	2	4.0%
Total	50	100.0%

Source: survey data, 2017

4.1 1.16 Number of fishing trips per month

The number of fishing trips indicate the availability of fish in the fishing area that if trip takes long time that means in availability of fish in fishing area. Table

(4 -18) shows that 10 % of fishermen said that the number of fishing trip is once per mouth ,while 72 % of them said that number trips of fishing are two time per month , and those who practice fishing three times per month are 18.0%.

Table (4 -18); Number of fishing trips per month

Number of fishing trips per month	Frequency	Percentage %
One trip	5	10.0 %
Two trips	36	72.0 %
Three trips	9	18.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.17 Number of fishing trips per year

Table (4 - 19) clears that 4.0% of respondents used to go in fishing trips 10^{th} times or between 10-15 trips per year that means they do not practice fishing as main occupation, while most of respondents (82%) used to fish in the range of 15 -20 trips per year and 10% of the respondents used to go in more than 20 trips in the year.

Table (4 -19): Number of trips per year

Number of fishing trips per year	Frequency	Percentage %
10 trips	2	4.0 %
10 – 15 trips	2	4.0 %
15 -20 trips	41	82.0 %
More than 20 trips	5	10.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.18 Problems of fishing crafts

Fishing crafts have important role in fishing process, the fishermen suffer from

many problems related to fishing crafts. Thus table (4 - 20) shows that 48.0% of fishermen are suffering from unavailability of fishing crafts and 52.0%of them are suffering from high price of crafts.

Table (4 - 20): Problems of fishing crafts

Problems of fishing crafts	Frequency	Percentage %
Unabandance	24	48.0 %
High price	26	52.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.19 Operation problems

The table (4-21) shows that fishermen are facing different types of operation problems 38 % of them said that the problem which is facing them is high cost of fuel, 32% of them mentioned that high cost of maintenance is the main problem facing them, 6 % of respondents said high cost of workers is a problem face them and 14% of fishermen said they are suffering from all problems mentioned a above while 10 % of respondents said there is no problem face them.

Table (4 - 21): Operation problems

Operation problems	Frequency	Percentage %
High cost of fuel	19	38.0 %
High cost of maintenance	16	32.0 %
High cost of workers	3	6.0 %
High cost fuel , maintenance and workers (all problems)	7	14.0 %
No problem	5	10.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.20 Problems of fishing gears

Table(4 - 22) shows that 56 % of fishermen are suffering from the high price of Fishing gears , 18% of fishermen said that the problem face them is unavailability of fishing gears ,while 10% of fishermen said they are suffering from problem of nets repair ,8.0 % of fishermen are suffering from both high price and unavailability of fishing gears 8.0% of fishermen have no problems .

Table (4 - 22): Problems of fishing gears

Problems of fishing gears	Frequency	Percentage %
High price	28	56.0 %
Unavailable	9	18.0 %
Problem of repair of nets	5	10.0 %
High price and unavailable	4	8.0 %
No problem	4	8.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.21 Financial problems

Table (4 - 23) shows that financial problems which face fishermen. From the table it is clears that 44% of them suffer from deficiency in financial sources, 20% of fishermen suffer from high benefit of loan, 8.0% of fishermen suffer from the short allowance period of loan, and also 8.0% of fishermen suffer from both financial problems and allowance period of lean is short while 20% of fishermen indicate there is no problem facing them.

Table (4 - 23): Financial problems

Financial problems	Frequency	Percentage %
Deficiency in financial sources	22	44.0 %
high benefit of loan	10	20.0 %
Allowance period of loan is short	4	8.0 %
Finance and allowance period of loan short	4	8.0 %
No problem	10	20.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.22 Environmental problems

The environment is an important factor effects fishing process, if the environment is suitable, the fishing process will bring a suitable yield. Fishermen are facing with different environment problems as shown in table (4 - 24), from the table it is clear that 76% of fishermen are suffering from seasonality of fishing, 8.0% of fishermen are suffering from problem of water pollution, while 6.0% of them said that they are suffering from wind, and 10 % of fishermen said there is no problem facing them.

Table (4 - 24): Environmental problems

Environmental problems	Frequency	Percentage %
Seasonality of fishing	38	76.0 %
Water pollution	4	8.0 %
Wind	3	6.0 %
No problem	5	10.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.23 To whom the product sell

Fishermen sell fish to various categories of buyers (traders, consumers, agents, and retailers) as shown in table (4 - 25), from the table it is clear that most of fish production is distributed through traders 80%of fishermen, only 12% of fishermen sell fish directly to consumers, and 4.0% of fishermen sell fish either to agents or retailers.

Table (4 - 25): To whom the product sells

To whom the product sell	Frequency	Percentage %
Traders	40	80.0 %
Consumers	6	12.0 %
Agents	2	4.0 %
Retailers	2	4.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.24 Average price of fish in lbs per kg

Table (4 -26) shows that 58.0% of fishermen mentioned that the selling price is in the range of 20 - 49 lbs per kg, 20%of fishermen mentioned that the selling price is in the range of 50 - 79 lbs per kg, and 10%of fishermen mentioned that the selling price is in the range of 110 - 139 lbs per kg, while 10%of fishermen sell their fish with price in the range of 110 -139 lbs per kg, and only 2.0% of fishermen mentioned that the selling price is in the range of 140 - 169 lbs per kg .

Table (4 - 26): Average price of fish in Ibs per (kg)

Average price of fish in Ibs per (kg)	Frequency	Percentage %
20 – 49	29	58.0%
50 – 79	10	20.0%
80 – 109	5	10.0%
110 – 139	5	10.0%
140 – 169	1	2.0%
Total	50	100.0%

Source: survey data, 2017

4.1.1.25 Methods of payment

There are many methods of payment between fishermen and buyers (intermediaries and consumers) according to the agreement between them. Table (4 - 27) clears that 44% of fishermen deal with cash, 32%of fishermen deal with forepart, while 14% of them deal with delayed, 8.0% of fishermen use both forepart and delayed deal for payment and 2.0% of respondents deal with both cash and forepart as m.

Table (4 - 27): Methods of payment

Method of payment	Frequency	Percentage %
Cash	22	44.0 %
Forepart	16	32.0 %
Delayed	7	14.0 %
Forepart and delayed	4	8.0 %
Cash and forepart	1	2.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.26 Position of sale

Table (4 - 28) shows that fishermen sell their production in different positions. From the table we found that 86.0% fishermen sell their fish at market, 10.0% of fishermen sell their fish at landing position and 4.0% of fishermen sell production at home (market penetration).

Table (4 - 28): Position of sale

Position of sale	Frequency	Percentage%
Market	43	86.0
Landing position	5	10.0
At home (Market penetration)	2	4.0
Total	50	100.0

Source: survey data, 2017

4.1.1.27 Tools of fish transportation

The transport tools play a significant role to make commodities a available for consumers thus table (4 - 29) shows that most of the respondents **(**78.0% of the respondents) use cars to transport their fish, 4.0% of fishermen use lorry as a mean of transportation, while bikes (motors) is used by 12.0% of fishermen, 2.0% of respondents use racsha and 4.0% of fishermen use bicycle.

Table (4 - 29): Tools of transportation fish

Tools of transportation fish	Frequency	Percentage %
Cars	39	78.0%
Lorry	2	4.0%
Bikes (motors)	6	12.0%
Racsha	1	2.% 0
Bicycle	2	4.0%
Total	50	100.0%

Source: survey data, 2017

4.1.1.28 Average cost of transportation in Ibs per month

There are different tools to transport fish from prom production place to consumption place , the price of transportation varies according to the tools of transport which used, thus table (4 - 30) shows that 42% respondents said that the average cost of transport per month in the range of 100 - 399 lbs / month , 56.0% of fishermen mentioned that the cost of transport their fish is in the range of 400 - 699 lbs / month , and 2.0% of respondents found that the cost of transporting fish is more than1000 lbs / month.

Table (4 - 30): Average cost of transportation in Ibs per month

Average cost of transportation in Ibs / month	Frequency	Percentage %
100 – 399	21	42.0%
400 – 699	28	56.0%
700 – 999	0	0.0%
1000and more	1	2.0%
Total	50	100.0%

Source: survey data, 2017

4.1.1.29 Methods of screener and graduation fish

The grading is important marketing function through it fishermen can determine price of fish. Table(4- 31) shows that 66.0% of fishermen screened and graded fish before sell via type of fish, 16.0% of fishermen use weigh , whilst 6.0% of fishermen said that they sell their fish without screener or graduation and 12.0% of fishermen said that they use both Screener and Graduation .

Table (4 - 31): Methods of screener and graduation fish

Methods of screener and graduation fish	Frequency	Percentage %
Type(species)	33	66.0 %
Weigh	8	16.0 %
Nothing	3	6.0 %
type and weight	6	12.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.30 Methods of fish preservation

To make fish available the fishermen preserve it by using different methods .Ice is good method of preservation, it doesn't need effort to preserve fish. Table (4 -32) shows that most of fishermen use ice to preserve 96.0% fish, 2.0% of fishermen use sackcloth for preservation ,while 2.0% of them use sawdust to preserve fish.

Table (4 - 32): Methods of fish preservation

Methods of fish preservation	Frequency	Percentage %
Ice	48	96.0 %
Sackcloth	1	2.0 %
Sawdust	1	2.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.31 Cost of preservation in lbs per ton

From table (4 - 33) we found that the cost of preservation was different according to amount of fish 50% of respondents said that the cost of preservation per ton is in the range of 100 - 299lbs, 48.0 % of fishermen said that the cost of services is between 300 - 499lbs, and 2.0% of them said that the cost of services is between 700 - 899lbs.

Table (4 - 33) Cost of preservation in lbs per ton

Cost of preservation in lbs per ton	Frequency	Percentage %
100 – 299	25	50.0%
300 – 499	24	48.0%
500 – 699	0	0.0%
700 – 899	1	2.0%
Total	50	100.0%

Source: survey data, 2017

4.1.1.32 Methods of supply

The table (4 -34) shows that 28%of fishermen use Goffa to supply fish,10.0% of fishermen use safeguarding to supply their fish ,while 48.0% use refrigerator to supply their commodities, all tools of supply used by 16.0% of fishermen.

Table (4 - 34): Methods of supply

Methods of supply	Frequency	Percentage %
Goffa	14	28.0 %
Safeguarding	5	10.0 %
Refrigerator	23	46.0 %
All tool	8	16.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.33 Problems of fish preservation

Table (4 -35) we shows 90.0% of fishermen suffer from unavailabity of ice and high price and cost in summer while 4.0% of them said price not fixed and 6.0% of fishermen said no problem facing them .

Table (4 -35): Problems of fish preservation

Problems of fish preservation	Frequency	Percentage %
Unabandance of ice, high price and Cost in summer	45	90.0 %
Price not fixed	2	4.0 %
no problem	3	6.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.1.34 Problems of Transportation

Table (4 -36) shows that 20% of fishermen are suffering of transportation problem they said that cooling transport unabandance, 38% of them are suffering from far of production position from position of consumption and high price ,while 36% are suffering from high price of transport costs and no problem answer by 6.0% of fishermen.

Table (4 -36): Problems of transportation

Problems of transportation	Frequency	Percentage %
Cool transport un abundance	10	20.0%
Position of production far from Position of consumption and high price	19	38.0%
High price of transport costs	18	36.0%
No problem	3	6.0%
Total	50	100.0%

Source: survey data, 2017

4.1.1. 35 Other problems face fishermen

Table (4 -37) clears that many problems face fishermen without problems which found in questionnaire 4.0% said that they suffer from insect when they go in fishing trip, 12% of them are suffering from high price of spares and disallows to

buy adequate fuel, while 4.0% of them said that some time no sell and low price of fish and 84% said that no problems.

Table (4 -37): Other problems facing fishermen

Other problems face fishermen	Frequency	Percentage %
Insect	2	4.0%
Lack of fish in winter season	3	6.0%
High price of spares of fishing tools and disallows to buy adequate fuel	6	12.0%
Sometimes no sale and low price of fish	2	4.0%
No problem	37	84.0%
Total	50	100.0%

Source: survey data, 2017

4.1.2 Descriptive statistics of intermediaries

4 .1.2.1 Positions

Table (4-38) shows that 30.0 %, of the intermediaries from Sawakin area, While the rest of them 70.0 % are found in Portsudan because Port Sudan is considered as a central market.

Table (4 -38): Position

Position	Frequency	Percentage %
Sawakin	3	30.0 %
Portsudan	7	70.0 %

Source: survey data, 2017

4.1.2.2 Sex

Table (4 - 39) shows that 100.0% of respondents are male that means female has no direct contribution in fish marketing because costumes.

Table (4 - 39): Sex

Sex	Frequency	Percentage %
Male	10	100.0 %
Female	0	0 %

Source: survey data, 2017

4.1.2.3 Age per years

Table (4 -40) shows that 10% of respondents age in the range of 15 - 30 years while 40.0% of them their ages between 31 - 45 years, 40.0% of intermediates age between 46 -60 year and the rest of them 10.0% are above 60 years.

Table (4 - 40): Age per years

Age per years	Frequency	Percentage%
15 – 30	1	10.0%
31 – 45	4	40.0%
46 – 60	4	40.0%
more than 61	1	10.0%
Total	10	100.0%

Source: survey data, 2017

4.1.2 .4 Marital statuses

Table (4 - 41) shows that 90.0% of the intermediaries are married and10.0% of them are not married.

Table (4 - 41): Marital status

Marital status	Frequency	Percentage %
Married	9	90.0%
Unmarried(single)	1	10.0%
Total	10	100% .0

Source: survey data, 2017

4.1.2.5 Educational level

Table (4 - 42) shows that 20.0 % of the intermediaries are illiterate, 20.0% attended (Khalwa), 20.0% primary , while 10.0% of them attended basic school (2) represent 2.0% attended secondary schools, and10.0% above university.

Table (4 - 42): Educational level

Education level	Frequency	Percentage %
Illiterate	2	20.0%
Khalwa	2	20.0%
Primary	2	20.0%
Basic school	1	10.0%
Secondary	2	20.0%
University	0	0.0%
Above university	1	10.0%
Total	10	100.0%

Source: survey data, 2017

4.1.2 .6 Main occupation

Table (4 - 43) shows that all respondents work in scope of fish market as main occupation are 100. 0% that mean fish market is main occupation.

Table (4 -43): Main occupation

Main occupation	Frequency	Percentage %
Employees	0	0.0%
Traders	10	100.0%
Farmer	0	0.0%
Herder	0	0.0%
Total	10	100%

Source: survey data, 2017

4.1.2 .7 Experience per years

Table (4 -44) shows that 50.0% of the respondents have experience of (more than20 years) which indicates the long experience in fish market, and their knowledge about market of fish, while percent of less than 5 is 10.0 % and (6 – 10) experience of work in fish scope represent 10.0% in range (11 – 15) represent10. 0 % and 20. 0 % for (16 – 20).

Table (4 - 44): Experience per years

Experience per years	Frequency	Percentage %
Less than 5	1	10.0%
6 - 10	1	10.0%
10 – 15	1	10.0%
11 – 20	2	20.0%
More than 20	5	50.0%
Total	10	100.0%

Source: survey data, 2017

4.1.2 .8 Fish distribution

Table (4 - 45) clears that 40.0% of intermediaries distributed their fish as wholesale, 40.0% distributed their fish as retailing and 20.0% of intermediaries distributed fish in both way of distributed.

Table (4 - 45): Fish distribution

Fish distribution	Frequency	Percentage %
Wholesale	4	40.0 %
Retailing	4	40.0 %
Wholesale and retailing	2	20.0 %
Total	10	100.0%

Source: survey data, 2017

4.1.2 .9 Marketing services

Proper and quick handling is needed for fresh fish as it is a very perishable community especially under Sudan hot climatic conditions .The table (4 -46) shows that 20.0 % of intermediaries the services which present for commodities are cooling,10.0% of them services which present are collect /cooling /transportation and distribution to the fish they, while 10.0% of the intermediaries collect , cooling and distributed fish,10.0% of intermediaries collect, transport ,storage and distributed, cleaning and transport fish through10.0% of intermediaries, whilst cleaning and frying via ,10.0% and all service except cleaning present by10.0% , all services done by 20.0%.

Table (4 - 46): Marketing services

Marketing service	Frequency	Percentage %
Cooling	2	20.0%
Collect / cooling /transport and /distribution	1	10.0%
Collect / cooling and distribution	1	10.0%
Collect/ transport/ / storage and distribution	1	10.0%
Cleaning/ transport	1	10.0%
Cleaning frying pan	1	10.0%
All except cleaning	1	10.0%
All services	2	20.0%
Total	10	100.0%

Source: survey data, 2017

4.1.2.10 Cost of marketing services in lbs per ton

Table (4 - 47) clears that the costs of services were different from one to another according to number of services which present for commodities.

Table (4 - 47): Cost of marketing services in lbs per ton

Cost of marketing services in lbs per ton	Frequency	Percentage %
180 - 400	2	20.0%
400 - 620	2	20.0%
620 - 840	4	40.0%
840 - 1060	0	0.0%
1060 – 1280	1	10.0%
Total	9	90

Source: survey data, 2017

4.1.2.11 From where you obtain fish

Table (4 - 48) shows that 10.0% of intermediaries are obtaining fish from market, 20. % of them are obtaining fish from land position ,while majority of intermediaries 60.0% are obtaining fish direct from Selling center and 10.0% of intermediaries obtain fish from marker and land position equates.

Table (4- 48): From where you obtain fish

From where you obtain fish	Frequency	Percentage %
Market	1	10.0 %
Land position	2	20.0 %
Selling center	6	60.0 %
Market and land position	1	10.0 %
Total	10	100.0 %

Source: survey data, 2017

4.1.2.12 Season achieves profit

Table (4 -49) shows that 70.0% of intermediaries said that the best season to achieve high profit is winter whilst 30.0% of them said summer best season to achieve profit**.**

Table (4 - 49): Season achieves profit

Season achieves profit	Frequency	Percentage %
Summer	3	30.0 %
Winter	7	70.0 %
Total	10	100.0 %

Source: survey data, 2017

4.1.2.13 Reason of achieves profit

Table (4 - 50) clears that 10.0% respondents said that the reason to achieve profit is abundance of fish, 60.0% of intermediaries believe that the high price is reason to achieve profit, while 30.0% said that the increase demand of fish is reason.

Table (4 - 50): Reason of achieve profit

Reason of achieve profit	Frequency	Percentage %
Abundance of fish in big amount	1	10.0 %
High price	6	60.0 %
Increase demand of fish	3	30.0 %
Total	10	100.0 %

Source: survey data, 2017

4.1.2.14 Methods of preservation

The respondents used different methods to persevere their products. Table (4 - 51) clears that 90.0% of intermediaries used cool as method of fish preservation while 10.0%use cool and freezing as method of preservation fish.

Table (4 - 51) Methods of preservation

Methods of preservation	Frequency	Percentage %
Cool	9	90.0 %
Cool and freezing	1	10.0 %
Total	10	100.0 %

Source: survey data, 2017

4.1.2.15 Reason to choose cooling method

Ice is efficiency way to preserved fish respondents selected it for different reasons. Table (4 - 52) shows that the reason of choose method of preservation 30.0%, of respondents said the reason is low cost of this method, 40.0% said the reason of choose method is not need effort they represent, 20.0% of intermediaries said the reason is high efficiency and10.0% believe that the reason is low cost and high efficiency.

Table (4 - 52): Reason to choose cooling method

Reason to choose method	Frequency	Percentage %
Low cost	3	30.0 %
Not need effort	4	40.0 %
High efficiency	2	20.0 %
Low cost and high efficiency	1	10.0 %
Total	10	100.0 %

Source: survey data, 2017

4.1.2.16 Problems face marketing demand and supply of fish

Table (4 - 53) clears that the problems which facing marketing demand and supply of fish 40.0% of intermediaries said the problem is increase of demand with decrease supply, while 40.0% of respondents said the problem is increase of supply

with decrease demand they represent 40.0% and 2.0% of them said no problems facing them.

Table (4 53): Problems face marketing demand and supply of fish

Problems face marketing demand and supply of fish	Frequency	Percentage %
Increase of demand with decrease supply	4	40.0%
Increase of supply with decrease demand	4	40.0%
No problem	2	20.0%
Total	10	100.0%

Source: survey data, 2017

4.1.2.17 Problems of Price

All intermediaries said the problem of price is changefulness price they represent of them 100.0% shows that in table (4 -54).

Table (4 - 54): Problems of Price

Problems of price	Frequency	Percentage %
Changefulness price	10	100.0 %

Source: survey data, 2017

4.2.18 Problems of transportation tools

Transportation is an important marketing service to make commodities available in right place and time for consumers. Intermediates face many problems which related to this service. Table (4 - 55)shows that 40.0% of intermediaries believe that the problems of transportation tools are un abundance and position of production far from consumer position , 20.0% of them said the transport tool unsafe ,while 30.0% said that its high cost and traditional 10.0% no problem.

Table (4 -55): Problems of transportation tools

Problem transportation tools	Frequency	Percentage %
Un abundance position of production far from consumer position	4	40.0%
Unsafe	2	10.0 %
High cost and traditional	3	30.0 %
No problem	1	10.0 %
Total	10	100.0 %

Source: survey data, 2017

4.1.2.19 Problems of fish preservation tools

The table (4 - 56) shows that 50.0% of intermediaries are suffering from problems of fish preservation tool they said that high price and unabandance of ice special in summer, 20.0% of them said preservation tool is traditional, while 30.0% said high price and traditional of preservation tools

Table (4 - 56): Problems of fish preservation methods

Problem of preservation methods	Frequency	Percentage %
High price and un abundance of ice special in summer	5	50.0%
Traditional	2	20.0 %
High price and traditional	3	30.0 %
Total	10	100.0 %

Source: survey data, 2017

4.1.2 .20 Other problems facing intermediaries

Table (4 -57) shows that many problems face intermediaries without problems which found in questionnaire 10.0% said no contact between fishermen and trader

incase emergency equates, 10.0% said high price of production ,while 20.0% of intermediaries said high cost of spares and unavailability in lock market.

Table (4 - 57): Other problems face intermediaries

Other problem face intermediaries	Frequency	Percentage %
No contact between fisherman and trader incase emergency	1	10.0
Nigh price of production input	1	10.0%
High cost of spares and unavailability in local market	2	20.0%
Total	4	4.0%

Source: survey data, 2017

4.1.3 Descriptive statistic of consumers

4.1.3.1 Positions

Table (4 - 58): shows that consumers positions are Sawakin (100 %).

Table (4 - 58) Position

Position	Frequency	Percentage %
Sawakin	50	100.0 %

Source: Sampling survey in 2017

4.1.3.2 Sex

The sex of respondents in study area shown in table (4 -59). 54 % of respondents are male while 46 % of them are female.

Table (4 - 59): Sex

Sex	Frequency	Percentage %
Male	27	54.0 %
Female	23	46.0 %
Total	50 %	100 %

Source: survey data, 2017

4.1.3.3 Marital status

Table (4 - 60) shows that 78.0% of the consumers are married and 22.0% which interviewed said that they are not married.

Table (4 - 60): Marital status

Marital status	Frequency	Percentage %
Married	39	78.0 %
Unmarried (single)	11	22.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.3.4 Age per years

Table(4 - 61) shows that 40% people age ranging 16-30year, 16 % present age category 31-45 years whereas age category46-60 years is 26 % and age category 60 years and more is 2 %.

Table (4 - 61): Age per years

Age per years	Frequency	Percentage %
16-30	20	40.0 %
31-45	16	32.0 %
46-60	13	26.0 %
60 and more	1	2.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.3.5 Educational level

Table (4 - 62) shows that 14.0 % of the consumers are illiterate, no one of them intended Khalwa, 20.0% of them intended primary school, while basic school

intended 12.0%, 34.0% of consumers intended secondary school, and 20.0% said intended university represent, while no personal intended above university.

Table (4 - 62): Educational level

Educational level	Frequency	Percentage %
Illiterate	7	14.0 %
Khalwa	0	0.0%
Primary	10	20.0 %
Basic school	6	12.0%
Secondary	17	34.0 %
University	10	20.0 %
Above university	0	0.0%
Total	50	100.0 %

Source: survey data, 2017

4. 1.3 .6 Family size

Table (4 - 63) shows that 66.0% of consumers said the family size 5 and less individual, 32.0% of consumers said the number of individual family are 6 -10 ,while11- 15 individual represent 2.0% .and no one said their family 15 and more individual.

Table (4 - 63): Family size

Family size	Frequency	Percentage %
5and less	33	66.0 %
6 - 10	16	32.0 %
11 -15	1	2.0 %
15 and more	0	0.0%
Total	50	100.0 %

Source: survey data, 2017

4.1.3.7 Main occupation

The respondents in the study area practice various occupations as show as table (4 64). 22.0% of respondents are employees, who practices traders 6.0%, 2.0% of them are grazer, while36.0% of consumer are worker and 34.% of them stay at home present in house life.

Table (4 - 64): Main occupation

Main occupation	Frequency	Percentage %
Employees	11	22.0 %
Trader	3	6.0 %
Grazer	1	2.0 %
Worker	18	36.0 %
Housewife	17	34.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.3.8 Rate of income / Ibs

The rate of income indicate to economic status of respondents .The table (4 - 65) shows that 50.0% of consumers rate of their income 1000 and less Ibs that means half consumers are poor , 32.0% of them their rate income 1000 - 2000 Ibs ,while 12.0% of consumers rate income 2000 - 3000Ibs and 6.0 % of consumer rate of their income 3000 and more Ibs.

Table (4 - 65): Rate of income/ Ibs

Rate income/ Ibs	Frequency	Percentage %
1000 and less	25	50.0 %
1000 - 2000	16	32.0 %
2000 - 3000	6	12.0 %
3000 and more	3	6.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.3.9 Type of favorite's fish

Table (4 - 66) shows that some people prefer special type of fish 10.0% of consumers prefer Najil 10.0%, prefer Bohar equates, 16.0% prefer Shooer, while 6.0% of them prefer Silemani and Goshar prefer via 10.0% , majority of consumers did not know type of fish which consumption 48.0% **.**

Table (4 - 66): Type of favorite's fish

Type of favorite's fish	Frequency	Percentage %
Najil	5	10.0 %
Bohar	5	10.0 %
Shooer	8	16.0 %
Silemani	3	6.0 %
Goshar	5	10.0 %
Unknown	24	48.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.3.10 Number of fish meals in month

Fish play a vital role in feeding in world population. Recent global statistics reveal wide variation in fish consumption, but people in the developing countries are generally much more depend on fish as part of their daily diets than people living in developed countries. In the table (4- 67) shows that 24% of consumers take 1-3 meal in the month, 44% of them take 3 - 5 meal in the month and 32% take 5 and more meal in the month.

Table (4 - 67): Number of fish meals in month

Number of fish meals in month	Frequency	Percentage %
1 - 3	12	24.0 %
3 – 5	22	44.0 %
5 and more	16	32.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.3.11 Amount of fish consumed in kg/ month

Table (4 -68) shows that the amount of fish consumed in month less than 3kg consumed by 22.0% of respondents, while most of consumers consumed 3 - 5 kg present 68.0% and 10.0% of consumers consumed 5 and more kg /month.

Table (4 -68): Amount of fish consumed in kg/ month

Amount of fish consumed in kg/ month	Frequency	Percentage %
Less than 3	11	22.0 %
3- 5	34	68.0 %
5 and more	5	10.0%
Total	50	100.0 %

Source: survey data, 2017

4.1.3.12 From where consumer buys fish

Table (4 - 69) shows that 26.0% of consumers buy fish from fishermen, 50.0%, of them buy fish from market, and 24.0% of consumers buy from distribution center.

Table (4 - 69): From where buys fish

From where buys fish	Frequency	Percentage %
Fishermen(land position)(sea side)	13	26.0 %
Market	25	50.0 %
Distribution center	12	24.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.3 .13 Price of fish from fishermen at (land position) /Ibs (kg)

The table (4 - 70) clears that 22.0% of consumer buy fish direct from fishermen by price 20 – 40 Ibs, and price 40 – 60 Ibs via 8.0% of consumers ,whilst 4.0% buy in price 60 – 80 Ibs their and 6.0% of consumers buy fish from fishermen in price 80 – 100 Ibs**.**

Table (4 - 70): Price of fish from fishermen at (land position) /Ibs (kg)

Price of fish from fishermen at (land position) /Ibs (kg)	Frequency	Percentage %
20 –40	11	22.0%
40 – 60	4	8.0%
60 – 80	2	4.0%
80 – 100	3	6.0%
Total	20	40.0%

Source: survey data, 2017

4.1.3.14 Price of fish from intermediary / Ibs (kg)

Table (4 - 71)shows that 62.0% of consumers buy fish from intermediary in price 30 – 60 Ibs , no one buy in price60 – 90 Ibs, while 4.0% buy fish in price 90 – 120 Ibs and 2.0% of consumers buy in price 120 Ibs and more.

Table (4 - 71): Price of fish from intermediary / Ibs (kg)

Price of fish from intermediary / Ibs (kg)	Frequency	Percentage %
30 – 60	31	62.0%
60 – 90	0	0.0%
90 – 120	2	4.0%
120 and more	1	2.0%
Total	34	68.0%

Source: survey data, 2017

4.1.3.15 Effect of price decrease of fish on quantity demanded

From table (4 -72) it is clears that 94.0% of respondents said that the decrease in price of fish leads to increase the quantity demanded, while 6.0% of them said there is no effect on the quantity demanded .

Table (4 -72) Effect of price decrease of fish on quantity demanded

Effect of price decrease of fish on quantity demanded	Frequency	Percentage %
Increase	47	94.0 %
Decrease	0	0 %
No change	3	6%
Total	50	100.0 %

Source: survey data, 2017

4.1.3.16 Effect of price increase of fish on quantity demanded

Table (4 -73) shows that 70.0% **o**f consumers said amount of fish they buy effected by change in price and 30.0% of consumers said the change in price did not effected amount of fish buy.

Table (4 -73): Effect of price increase of fish on quantity demanded

Effect of price increase of fish on quantity demanded	Frequency	Percentage %
Increase	15	30.0 %
Decrease	35	70.0 %
No change	0	0%
Total	50	100.0 %

Source: survey data, 2017

4.1.3.17 Effect of income increase on quantity demanded

Table (4 - 74) clears that most of consumer's consumption fish effect by increase of income present 88.0% that means increases in income assumingly increase consumption amount of fish whilst 12.0% said no effect. Shows

Table (4 -74) Effect of income increase on quantity demanded

Effect of income increase on quantity demanded	Frequency	Percentage %
Increase	44	88.0 %
Decrease	6	12.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.3.18 Number of Family Individual who eats Fish

The table (4 - 75) shows that 86.0% of consumers said all family individual take fish while 14.0% said not all family take fish.

Table (4 - 75): Number of family individuals who eat Fish

Number of family individual who eat fish	Frequency	Percentage %
All	43	86.0 %
Not all	7	14.0 %
Total	50	100.0 %

Source: survey data, 2017

4.1.3.19 Problems of obtain fish

Table (4 - 76) shows that 34.0% of consumers said the problem which face them to obtain fish is unabandance of fish they, while majority of them said the high price of fish their percent 52.0 % and minority of them 4.0% said fish high perishables and10.0% said there is no problems are facing them.

Table (4 - 76): Problems of obtain fish

Problems of obtain fish	Frequency	Percentage %
Un abundance	17	34.0 %
High price	26	52.0 %
High perishables	2	4.0 %
No problems	5	10.0 %
Total	50	100.0 %

Source: survey data, 2017

4.2 Analytical part

Correlation coefficient is used to know the relationship between some variables.

4.2.1 Relationship between services and Costs of services

The study revealed that there is a medium positive relationship between services and their costs (coefficient of correlation is 0.575) that means the increase of services lead to the increase of costs.

Table (4 - 77) Relationship between services and costs of services

Correlations

			service	cost
Kendall's tau_b	service	Correlation Coefficient	1.000	.575*
		Sig. (2-tailed)	.	.024
		N	10	10
	cost	Correlation Coefficient	.575*	1.000
		Sig. (2-tailed)	.024	.
		N	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

4.2.2 Relationship between rate income and amount of fish consumed per month

The analysis of data indicates there is a relationship between rate income and amount of fish consumed per month. The relationship between these two variables was found to be medium relationship (correlation coefficient0.417) that means the rate income effect on amount of fish consumed per month.

Correlations

		rate income	amount of fish consumed per month
rate income	Pearson Correlation	1	.417**
	Sig. (2-tailed)		.003
	N	50	50
amount of fish consumed per month	Pearson Correlation	.417**	1
	Sig. (2-tailed)	.003	
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

4.2.3 Relationship between amount of fish consumed / month and price from fisherman

There is a medium positive relationship between a mount of fish consumed per month and the price from fishermen (correlation coefficient is 0.346) that means the amount of fish consumed increase when they buy from fishermen since the marketing services are low and consequently the price becomes low and acceptable for consumers .

Table (4 -79) Relationship between amount of fish consumed per month and price from fisherman

Correlations

		amount of fish consumed per month	price from fisherman
amount of fish consumed per month	Pearson Correlation	1	.346*
	Sig. (2-tailed)		.014
	N	50	50
price from fisherman	Pearson Correlation	.346*	1
	Sig. (2-tailed)	.014	
	N	50	50

*. Correlation is significant at the 0.05 level (2-tailed).

4.2.4 Relationship between amount of fish consumed/ month and price from intermediary

There is a weak negative relationship between amount of fish consumed per month and price from intermediaries (correlation coefficient -0.265) that means inverse- relationship between amount of fish consumed per month and price from intermediaries . this is because the increase of services lead to increase of cost and consequently leads to decrease amount of fish consumed per month from

Table (4 - 80) Relationship between amount of fish consumed per month and price from intermediary

Correlations

		Amount t of fish consumed per month	price from intermediary
Amount t of fish consumed per month	Pearson Correlation	1	-.265
	Sig. (2-tailed)		.063
	N	50	50
price from intermediary	Pearson Correlation	-.265	1
	Sig. (2-tailed)	.063	
	N	50	50

Chapter Five

Discussion

This chapter discusses the results of research analysis of collected data of the study.

5.1 Production problems and constraints

5.1.1 Finance

Finance has a great role in the production and marketing processes. Most of fishermen depend mainly on carry personal and individual loans to conduct production and marketing activities. They avoid to take fund from bank due to high interest rate and risk of un ability to repay the fund, while zakat as a source of finance is not access to all fishermen because it is amid to a certain fishermen and procedures of it is complicated and it take long time, thus fishermen avoid it. As in table (4 - 11). This approves utterance of (Somia in 2009). Majority of the fishermen have not taken any loan or credit because they afraid of not being able to repay the installments, due to fishing fluctuation in production.

5.1.2 Fishing tool

Fishing tools have importance role in fishing process, they include boats, fishing gears .Fishermen in sawakin are using different types of fishing tools as shown in table (4 -12). They facing many problems, one of these problems is the unabandance of fishing tools, which lead to increase their prices which used to manufacture boats and gears this is the major problems. Another problem is the unabandance of fishing gears also high price and problem of repair nets as found in table (4 -15).

5.1.3 Operation factors

There are many operation problems, these problems include in availability of adequate fuel amount because rules and legislations in the area do not allow to buy

adequate fuel due to security situation. The scarcity of fuel leads to the increase price of it and consequently reflected in the price of fish product. Also the in availability of spare parts leads to increase their price and consequently the cost of maintenance will increase which restrict the production process. The in availability of labors in quantity and quality has direct effect on production. There is a problem of lack of qualified fishing labors due to their indolence (laziness), since they have money they stay at home until finishes their money. This is founding is confirmed by (Mona in 2015). Lack in labor and training in this scope is a production problem.

5.1.4 Ownership of fishing tools

The relationship between fishermen and ownership of boat is different in the Red Sea area, some of them deal with shareholding that mean give any one participated in fishing share .In shareholding the division of product or the income is unequal that indicates the relationship between ownership and fishermen is unequal this is founding agreed with (Moenieba in 2013). The relationship between boat owner and fishermen is often unequal and many fishers complain that they are being exploited because they do not have the Fishing rights, but are subcontracted by the ownership. Therefore, this unequal relationship between fishers and the boat owner has an adverse effect on fishing activities.

5.1.5 Communication problems

Communication is an important tool helps to contact people with other. Fishermen in study area suffer from lack of communication facilities. There is no contact between fisherman and traders especially in case of emergency because of lack of communication facility that refer to communities of fishermen traditional and not developed this agree with (Somia in 2009).Fishermen are considered in

most of the developing countries as one of the most neglected and poorest groups within society, having traditionally inherited fishing methods those are not adapted to modern fishing ones, gears, handling and preservation. Actually, High price of production input and high cost of spares this refers to unavailability in local market.

5.1.6 Instability of prices

Change in amount of fish catches per journey due to change in weather patterns , sea conditions and temperature resulted in problem of price instability, also when there is no fish sale or the fish sale is low the fish price decline and change from time to time. As (Moenieba in 2013) said that catches of fish fluctuate widely between years and locations, and the seasonal .Movements of fish can be highly variable dependent on weather patterns and sea conditions. Sea temperature changes impact availability and catches that is if the sea gets warmer, the fish move offshore; Climate change, with estimated sea surface temperature fishermen think fish will be the scarcer due to climate change and also (Misganaw and etal, 2015) found that market force losses are due to inadequacy between demand and supply leading to changes in price of fish. If the price of fish falls because of oversupply, the seller may incur a market force loss. Market force loss is difficult to measure accurately, because it usually sets the ground for quality and physical losses. This approves utterance of Fish prices are influenced by demand and supply factors, including the costs of production and transportation, (FAO in 2014).

The results showed the best season to achieve high amount of income is winter due to high price and increase demand of fish (decrease of supply because most of fishermen do not practice fishing because changefulness of weather .as (Somia

in200)9 mentioned the lowest prices are received in summer due to peak supply at that season while the highest prices are received in winter and autumn.

5.2 Marketing problems and constraints

There were many problems and constraints face fish marketing in the Red Sea area the most importance ones are:

5.2.1 Grading

Grading is an important activity in fish marketing as different sizes of fish fetch different prices. Most fish are graded on the basis of size, weight. However, Fish are graded as namely and also divided in to three categories, small, medium and large depending on size (FAO report 2012). Fishermen in Sawakin used to screen and grade fish before sale, this marketing service is an important activity used to determine fish price. So the fishermen grade fish according to size and species.

5.2.2 Storage

Storage is an important function for fishermen, intermediaries and consumers because fish is very perishable commodity need adequate storage. The fish preservation problems due to fluctuation of ice price and the in availability of it especially in summer season, beside that the tools which used to carry fish on is traditional .Since the fishing trip takes many days in sea ranging from 7 -15 days thus the fishermen need a large amount of ice to save the fish from spoilage when marketed at Sawakin or Portsudan market, this agree with Ferdous and others in 2012 said that the storage function is primarily concerned with making goods available at the desired time. It enables traders to obtain better prices for their products. Being a highly perishable commodity, fish requires extremely specialized storage facilities matching the seasonal demand. And agree with (Somia in 2009)

who said that storage of fish is a marketing function which can be performed by fishermen, fish monger and retailer.

5.2.3 Problem of transport

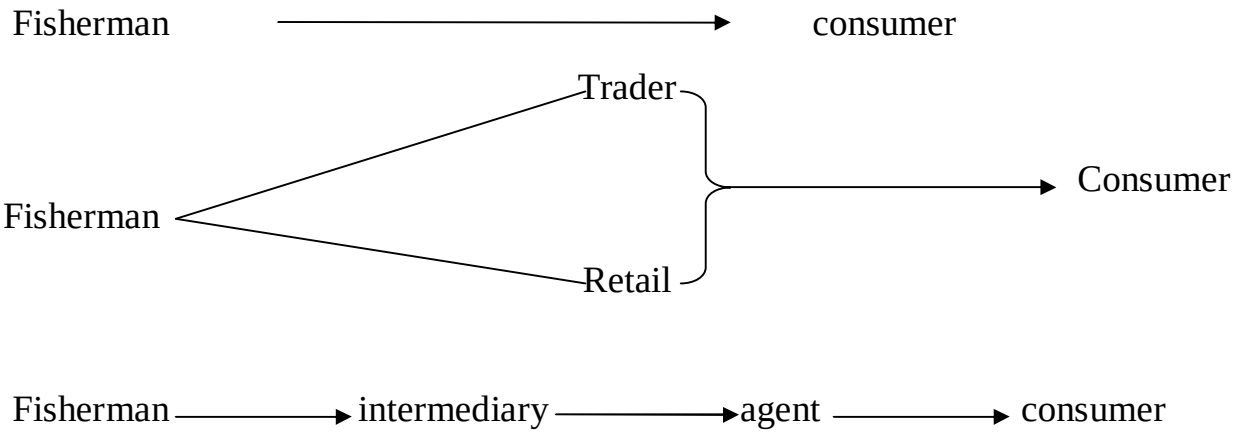
Transport is an important function to transfer commodities from place of production to place of consumption. The fishermen and intermediates using different types of transport such as cars, lorries, bikes (motor), racsha and bicycles as in table(4 -21) there are many problems facing them during transfer of product which was very perishable commodity. These problems are position of production far from position of consumption that leads to increase cost of transport, cool transport is in available which result in spoilage of the product also these tools are so traditional and unsafe all these constraints lead to increase the cost of transport and consequently result in increase of fish price which negatively affect the demand. (FAO report 2012)**,** said that fish farmers and intermediaries use various modes of transportation such as van, ricksha, trucks, passenger bus, and pickup, to transfer products from the production areas to the consumption centers. Ice is used during transporting fish since many carriers are non-refrigerated. Also fishermen used to sell the product in Portsudan because it is considered as a central market and most of intermediaries who finance fishermen found there. therefore transport cost will be high which affect demand negatively through increasing price as shown in table (4 - 38) this coincides with utterance of Wamukota in 2009 that marine fish marketing starts at the point where fish is landed, although this process is dependent on the prior activity of fishing itself which to a degree is financed by owners of fishing vessels.

5.3 Marketing channels

Marketing channel is a path or a way through which product moves from the producer to the final consumer. The study revealed that fishermen used to

transfer the product through different channels. As in table (4 -25) most fishermen sell their products for traders because they afraid from spoilage of products due to its high Perishability and they don't possess tools of preservation. The channels found in the study area are either fish product sells directly from fisherman to ultimate consumer; this is considered the shortest channel. Another way or channel is through intermediaries (traders or retailers) to reach the final consumers. And also through fishermen to intermediary to agents and finally to consumers .The different marketing channels found in the study are illustrated in diagrams below.

Diagram of the marketing channels of fish commodity



Chapter Six

Summary, Conclusion and Recommendations of study

6.1 Summary

This research about problems and constraints of fish production and marketing in Sawakin area. The study depended mainly on primary data .The primary data surveys were conducted during the period March 2017. The respondents were interviewed directly through simple random sampling using Interview questionnaires. The sample size selected was 50 Fishermen and 10 Intermediates and 50 Consumers. Fishermen, Intermediaries and consumers face multidimensional problems ranging from production problems represented in (financing, fishing tools, operation problems), marketing problems (marketing services as transport, preservation) and environmental problems (seasonality of fishing and water pollution). This study was intended to identify the production and marketing constrains in the red sea area (Sawakin).

Descriptive statistics (frequencies and percentages) and linear correlation were used to analyze the collected data.

The present study revealed that production problems and constraints in availability of fishing tools and in availability of fishing gears that lead to increase their prices and the high cost of repair and maintenance. Also finance and operation problems are considered main problems face the production in the study area. While the marketing problems and constraints are mainly problems of marketing services (transport, preservation and grading).

Also the study showed that there is a medium positive relationship between services and their cost (correlation coefficient0.575) that mean increase of services lead to increase costs , also there is a positive relationship between rate income and amount of fish consumed per month (correlation coefficient+0.417) that mean rate income has effect in amount of fish consumed per month, relationship

between amount of fish consumed per month and price from Fishermen is positive (correlation coefficient+ 0.346) that mean the amount of fish which consumed by consumers increase when they buy from Fishermen because the marketing services offered by fishermen are low so this the price become acceptable for consumers, while the relationship between amount of fish consumed per month and the price from intermediaries is negative weak relationship, (correlation coefficient - 0.265) that mean inverse-relationship between amount of fish consumed per month and price from intermediatries. because increase of services lead to increase of costs and this lead to increase the price that lead to deline amount of fish which consumed per month from Intermediates. The study also found the marketing channels represent on - channel from fishermen directly to consumer, channel from fishermen to intermediary (wholesaler and retailer) to consumer and channel from fishermen - intermediary - agent - consumer.

Based on the results and discussin some recommendations are suggested such as engaging the private sector to provide fishing tools with appropriate costs and finance with low benefit, activation of fishermen organization to facilitate finance process and providing fishing tools.

6.2 Conclusion

The main problems and constraints facing fish production and marketing in Sawakin area are:-

1 - The high costs of fishing tools.

2 - Fishermen suffer from limitation of financial ability that prevents them from improving their occupation.

3 - High cost of transportation because the means of transport used are traditional and unsafe.

4 - Preservation problems especially in summer due to in availability of preservation means and their cost become high.

5 - High cost of maintenances.

6.3 Recommendations

The study recommended that:-

1- engaging the private sector to provide fishing tools with appropriate costs and finance with low benefit
2- collaborate with researches in the fish sector to find solution for problems and constraints of fish production and marketing
3- Administration of fisheries must give awareness for fishermen, development of infrastructures, activation of fishermen organization to facilitate finance process and providing fishing tools
4- In addition to engage extension agriculture to educate fishermen and contribute and participate of scientific research in preparation of refrigeration and manufacturing units.
5- Activate the fish production and marketing in costal sea via make infrastructure facilities. These may lead to constant of production of fish products and increase income of fishermen
6- Development and improvement of fishermen organizations, to enable them to access finance and marketing facilities especially with regard to transportation and storage and to have more bargaining power and incur less marketing cost.

7- To develop the fish sector must develop and modernize the preservation and transportation to encouraging investment

. 8- Government should make spares available in local market to decrease cost of maintenance.

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بسم الله الرحمن الرحيم

Appendix (1)

جامعة السودان للعلوم و التكنولوجيا

كليةالدر اسات العليا

دراسة مشاكل ومعوقات إنتاج وتسويق الأسماك

منطقة سواكن – ولاية البحر الاحمر

إستبيان الصيادين

بيانات عامة:

1/ الموقع.....

2/ النوع

1/ ذكر ( ) 2/ أنثي ( )

3/ العمر (سنة)

1/ 15و أقل ( ) 2/ 16 - 30 ( ) 3/ 31 - 45 ( )

4/ 46 - 60 ( ) 5/ أكثر من 61 ( )

4/ المستوى التعليمى

1/أمي ( ) 2 / إبتدائي ( ) / أساس ( ) 3/ ثانوي ( )

4/جامعي ( ) 5/ فوق الجامعي( )

5/ الحالة الإجتماعية

1/ متزوج ( ) 2/ غير منزوج ( )

6 / عدد أفراد الاسرة :

5/1و أقل ( ) 2/ 6 - 10 ( ) 11/3- 15 ( ) 4/ أكثر من 15 ( )

7/ هل مهنة الصيد مهنتك الأساسيه ؟.

1 / نعم ( ) 2 / لا ( )

8 / إذا كانت الإجابة بنعم لماذا؟.

1 / مهنة متوارثه ( ) 2 / غير مكلفه ( ) 3 / سهلة ( ) 5/ أخرى (حدد)

9 / إذا كانت الإجابة بلا لماذا؟.

1 / هوايه ( ) 2 / زيادة دخل ( ) 3 / أخرى (حدد)

10/ متي مارست الصيد (سنة)

1/ 5 و أقل ( ) 2 / 6 - 10 ( ) 3/ 11 - 15 ( )

4/ 16 - 20 ( ) 5/ أكثر من 20 ( )

بيانات عن الإنتاج

مصادر التمويل :

1/ ذاتي ( ) 2 / قرض بنكي ( ) 3/ قرض من الأفراد ( ) 4 / أخرى (حدد)

11/ نوع ادوات الصيد المستخدمه

1/ شباك خيشوميه 1 / سطحيه ( ) 2/ قاعيه ( )

2 / طراحه ( ) 3 / الشراك ( ) 4 /سناره ( ) 5 / أخرى (حدد)

12 / تكلفة الشباك ( )

13 / عمرها الافتراضى ( )

14 /نوع ملكية وسيلة الصيد وتكلفتها

نوع وسيلة الصيد	نوع الملكية						متوسط التكلفة الشهرية
	ملك	مشاركة	إيجار	جمعيات	منظمات	أخرى	
لنشات ( )							
هورى بمكنة ( )							
هورى عادي ( )							
أخرى (حدد)							

15/ عدد مرات الصيد في الشهر

1/ مره ( ) 2/ مرتين ( ) 3/ ثلاثة مرات ( )

16 / عدد الرحلات الصيد في السنه

1/ 10مرات و أقل ( ) 2 / 10 - 15 ( ) 3 / 15 - 20 ( ) 4 / 20 - و أكثر ( )

17/ المشاكل الإنتاجية

أ/ معدات الصيد

1/ غير متوفرة ( ) 2/ أسعارها مرتفعة ( ) 3/ أخرى (حدد)

ب /مشاكل تشغيليه

1/ تكاليف الوقود ( ) 2 / تكاليف الصيانة ( ) 3 / تكاليف العماله ( ) 4 / أخرى (حدد)

ج / وسيلة الصيد

1 / إرتفاع الأسعار معدات الصيد ( ) 2/ غير متوفرة معدات الصيد ( )

2 / مشاكل في إعادة ترميم الشباك ( ) 4 / أخرى (حدد)

د / مشاكل مالية

1 /تمويل ( ) 2 / فوائد القروض مرتفعه ( ) 3 / فترة السماحة لسداد القرض قصيرة ( )

4 / جبايات ( ) 5 / أخرى (حدد)

و/ مشاكل بيئيه

1/ تلوث المياه ( ) 2 / موسمية الصيد ( ) 3 / أخري (حدد)

18 / بيانات التسويق

أ / لمن تبيع

لمن تبيع	متوسط سعر الوحدة	طريقة الدفع او التحصيل		
وكلاء ( )		مقدم	فوري	آجل
تجار الجملة ( )				
تاجر تجزئة ( )				
مستهلكون ( )				
تصنيع ( )				
مصدرين ( )				
أخرى (حدد)				

ب / مكان البيع

1/ مكان الإنزال ( ) 2/ السوق ( ) 3/ أخرى (حدد)

ج/ وسيله النقل المستخدمه لنقل الاسماك

الوسيلة	متوسط التكلفة
لوري ( )	
دفار ( )	
بوكس ( )	

موتر ( )	
أخرى (حدد)	

19 / معاملات قبل التسويق

كيف يتم فرز الأسماك قبل بيعها

1 / حسب النوع ( ) 2/ حسب الحجم ( ) 3 / لايتم فرزها ( ) 4 / أخرى (حدد)

20 / وسيلة حفظ الأسماك من لحظة الصيد إلي أن يتم بيعها.

الوسيلة	متوسط التكلفة
ثلج ( )	
خيش ( )	
نشارة ( )	
أخرى (حدد)	

21/ الأدوات التى يتم عبرها بيع الأسماك

1 / قفف ( ) 2 / حافظات ( ) 3 /ثلاجات ( ) 4 / أخرى (حدد)

22/ المشاكل التسويقيه التي تواجهك كمنتج

أ / مشاكل حفظ الأسماك

1 / إرتفاع الأسعار ( ) 2 / عدم توفرها 3 / أخرى (حدد)

ب / مشاكل الترحيل

1/ بعد أماكن الإنتاج عن أماكن الإستهلاك ( ) 2 / إرتفارع أسعارها ( )

3 / عدم توفر وسائل ترحيل مبردة ( ) 4 / أخرى (حدد)

23 / هل توجد مشاكل اخرى تواجهك اذكرها؟

بسم الله الرحمن الرحيم

Appendix (2)

جامعة السودان للعلوم والتكنولوجيا

كلية الدراسات العليا

برنامج ماجستير علوم وتكنولوجيا الأسماك

دراسة مشاكل ومعوقات إنتاج وتسويق الأسماك

منطقة سواكن - ولاية البحر الأحمر

إستبيان الوسطاء

بيانات عامة

1 / الموقع.....

2 / النوع

1 / ذكر ( ) 2/ أنثي ( )

3 / العمر

1/ 15 وأقل ( ) 2/ 16 - 30 ( ) 3/ 31 - 45 ( )

4/ 46 - 60( ) 5/ أكثر من 61 ( )

4/ الحالة الإجتماعيه

1/ متزوج ( ) 2/ غير متزوج ( )

5/ المستوى التعليمى

1/أمي ( ) 2/ إبتدائي/ أساس ( ) 3/ ثانوي ( ) 4/ جامعي ( ) 5/ فوق الجامعي ( )

6/ المهنة الأساسية

1/ / موظف ( ) 2 / تاجر ( ) 3 / مزارع ( ) 4 / راعى ( ) 5 / اخرى (حدد)

7/ الخبرة في مجال العمل بالأسماك

1/ 5 وأقل ( ) 2/ 6 - 10 ( ) 3/ 11- 15 ( ) 4/ 16- 20 ( ) 5/ أكثر من 20 ( )

8/ كيف تقوم بتوزيع الأسماك:

1/ جملة ( ) 2 / تجزئة ( ) 3/ أخري (حدد)

9/ الخدمات التي تؤديها في الأسماك قبل بيعها:

نوع الخدمة	تجميع ( )	تبريد( )	تخزين( )	نقل( )	توزيع ( )	نظافه ( )	تحمير( )	أخرى (حدد)
التكلفة								

10/ من أين تتحصل علي الأسماك:

1 / السوق ( ) 2 / أماكن الانزال ( ) 3 / موزعين 4 / أخرى (حدد)

11/ لمن تبيع

1 / مستهلك ( ) 2/ تاجر ( ) 3/أخرى (حدد)

12 /في أي موسم يتحقق أقصي ربح:

1 / الصيف ( ) 2/ الشتاء ( )

13 / أسباب تحقيق أقصى ربح في هذا الموسم

1 / توفر الأسماك بكميات كبيرة ( ) 2 / إرتفاع الأسعار ( )

3 / زيادة الطلب ( ) 4 /أخرى (حدد)

14/ ماهي الطريقه التي تحفظ بها الأسماك:

1 / تبريد ( ) 2 / تجميد ( ) 3 / تلميح ( ) 4 / تجفيف ( ) 5/ تخمير ( ) 6 / أخرى (حدد)

15/ سبب إختيار هذه الطريقة

1 / قليلة التكلفه ( ) 2 / لاتحتاج للمجهود ( ) 3 / ذات كفاء عالية ( ) 4 / أخرى (حدد)

16/ ماهي المشاكل التي تواجهك في مهنه التسويق:

أ / الطلب

1 /زيادة الطلب في مو اسم معينه ( ) 2 / قلة الطلب في مواسم معينه ( ) 3 / أخري (حدد)

ب / العرض

1 / زيادة الطلب مع قلة العرض ( ) 2 / زيادة العرض مع قلة الطلب ( ) 3 / أخرى (حدد)

ج / مشاكل تتعلق بأسعار الأسماك

1 / عدم ثبات الأسعار ( ) 2 / أخرى (حدد)

د / وسيلة النقل

1 / عدم توفر وسائل ( ) 2 / إرتفاع التكلفة ( ) 3 /بعد أماكن الإنتاج من أماكن الإستهلاك ( )

4 / تقليدية ( ) 5 / غير آمنة ( ) 6 / أخرى (حدد)

و / مشاكل تتعلق بوسائل الحفظ

1 / إرتفاع الاسعار ( ) 2 / عدم توفرها ( ) 3 / تقليدية ( ) 4 / غير جيدة ( )

هـ / هل توجد مشاكل أخرى تواجهك أذكرها

بسم الله الرحمن الرحيم

Appendices (4)

جامعة السودان للعلوم والتكنولوجيا

كلية الدراسه العليا

برنامج ماجستير علوم وتكنولوجيا الأسماك

دراسة مشاكل ومعوقات إنتاج وتسويق الأسماك

منطقة سواكن – ولاية البحر الاحمر

إستبيان المستهلكين

بيانات عامة

1 / الموقع.....

2 / النوع :

1 / ذكر ( ) 2/ أنثي ( )

3 / الحالة الإجتماعية :

1/ متزوج ( ) 2/ غير متزوج ( )

4 / العمر (سنه) :

1/ 15 أقل ( ) 2/ 16 - 30 ( ) 3/ 31 - 45 ( )

4/ 46 - 60 ( ) 5/ أكثر من 61 ( )

5 / عدد أفراد الأسرة :

5/1 اقل ( ) 2/ 6 - 10 ( ) 3/11- 15 ( ) 4/ أكثر من 15 ( )

6 / المستوى التعليمى :

1/أمي ( ) 2/ إبتدائي / أساس ( ) 3/ ثانوي ( ) 4/جامعي ( ) 5/ فوق الجامعي ( )

7 / المهنة :

1 / موظف ( ) 2 / تاجر ( ) 3 / مزارع ( ) 4 / راعى ( ) 5 / أخرى ( )

8 / معدل الدخل في الشهر (جنيه):

1/ أقل من 1000 ( ) 2 / 1000-2000 ( )

3/2000-3000 ( ) 4/ أكثر من 3000 ( )

9 / أنواع الأسماك الأكثر تفضيلاً :

لا أعرف	ناجل	بهار	شعور	سلماني	قشر	فارسي	هريد	سافن	أخرى
( )	( )	( )	( )	( )	( )	( )	( )	( )	(حدد)

10 / كم مرة تتناول فيها الأسماك خلال الشهر:

1 / أقل من 2 مرة ( ) 2 / 2 - 3 مرة ( ) 3 / أكثر من 3 مرات ( )

11 /ماهي الكميه المشتراه في كل مرة ؟ ( )

12 / من من تشترى الاسماك:

1 / مباشرة من الصياد ( ) 2 / السوق ( ) 3/ باب المنزل ( ) 4 / مراكز البيع ( ) 5 /أخرى ( )

13/ إذا كنت تشتري من الصياد بكم تشترى سعر الكيلو ( )

14/ إذا كنت تشتري من وسيط بكم تشترى سعر الكيلو ( )

15/ أثر زيادة السعر فى الكمية المطلوبة من الأسماك:

1 / يؤثر ( ) 2 / لا يؤثر ( ) 3/ لا يوجد تغيير ( )

16/ أثر نقصان السعر فى الكمية المطلوبة من الأسماك:

1 / يؤثر ( ) 2 / لا يؤثر ( ) 3/ لا يوجد تغيير ( )

17/ أثر الدخل علي الكمية المطلوبة من الأسماك

1 / يؤثر ( ) 2 / لا يؤثر ( ) 3/ لا يوجد تغيير ( )

18 /عدد افراد الأسره الذين يتناولوا الأسماك:

1 / كل ( ) 2 / جزء ( )

19/ ماهي المشاكل التي تواجهك في الحصول علي الأسماك

1/ غيرمتوفره ( ) 2/أسعارها مرتفعة ( )

3/ سريعة التلف ( ) 4/ بعد أماكن الحصول عليها ( )

5 / أخرى (حدد)

ملحوظة: هذة الإستمارة تستخدم لأغراض البحث العلمي فقط.

Appendix (4)

Local, common and Latin name of some marine fish

Local name	**Common name**	**Latin name**
Najil	coral trout	Plectropomus Leopardus
Shouar	red mouthed bream	Lethrinus nebulosus
Bohar	Snapper	Lutjanus bohar
Goshar	Epaulet grouper	Epinephelus stoliczkae
Silemani	Squaretail coralgrouper	Plectropomus areolatus
Rishal	Yellow-edged lyretail	Variola louti
Hareed	Bicolor parrotfish	Cetoscarus bicolor

Farsi	Farsi abusinena	Aphareus furca
Derak	Derak abukhatain	Grammatorycnus bilineatus
Sardine	White sardinella/ Sardine abyad	Sardinella albella
Arabi	Fringelip mullet	Crenimugil crenilabis
Kas	Silver biddy	Gerres oyena