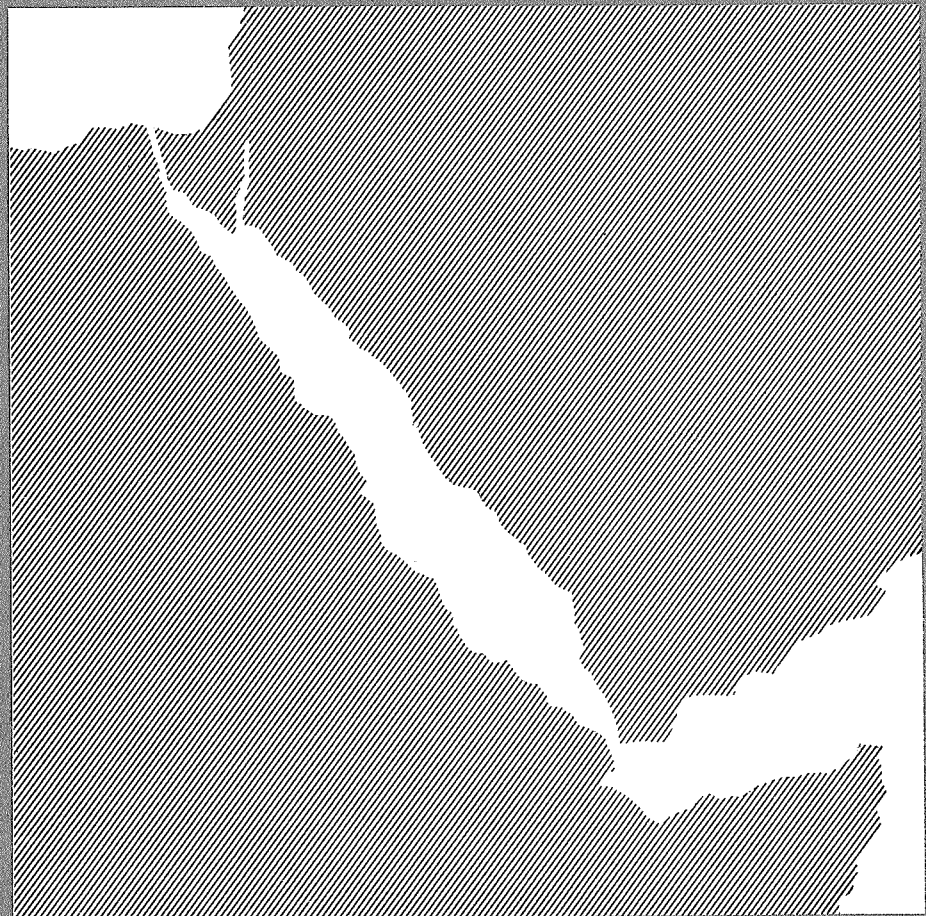


DEVELOPMENT OF FISHERIES IN AREAS
OF THE RED SEA AND GULF OF ADEN

R E P O R T
on the SOCIOECONOMIC SURVEY
of the GULF OF AQABA,
The Hashemite Kingdom of Jordan



UNITED NATIONS DEVELOPMENT PROGRAMME
FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

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By

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Some Merchants	
Some Fishermen	

Abbreviations Used Above:

M.A. Ministry of Agriculture. C.O. Cooperative Organization

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1. INTRODUCTION

According to the Project Document of the Project for Development of Fisheries in Areas of the Red Sea and Gulf of Aden, the immediate objectives of the project are to aim at improving fishery production in the participating countries to benefit small-scale fisheries, and at developing the industrial potential; to prepare the ground, identify the means and initiate the reactivation and expansion of the existing marine fisheries and thereby to preserve the fishing communities; and to plan and, where appropriate, design and initiate investment-oriented development schemes.

To carry out the socio-economic aspects of the above aims, the work plan was to:

- a. undertake socio-economic studies to define the most suitable approaches to fisheries development in consultation with members of the fishing communities and with due regard to available resources;
- b. carry out investigations in collaboration with national staff in order to determine the reasons for the decrease in the number of fishermen, to encourage recruitment of young people into the fishery industry and to propose solutions to problems identified;
- c. collaboration with the investment analyst in preparing integrated plans for immediate investment and also for longer term fisheries development;
- d. assist in identifying sites and areas for the establishment of fishing community centres based on socio-economic conditions and fishery resources; and
- e. explore ways and means of attracting the necessary government and/or international donor's financial support for the establishment of the community centres.

To survey the socio-economic aspects of the Red Sea fishing communities in Jordan, a visit was arranged to these communities along the coast.

In accordance with the terms of reference, the main tasks of the survey were as follows:

- a. establish contact with the fisheries authorities;
- b. assess the size and scope of the relevant fisheries authorities;
- c. gather information and collect data on all facilities available in the country which are related to fisheries;

- d. obtain historical data on any past activities and assess their impact on the fisheries in general;
- e. assess fishermen's organizations or groupings;
- f. make field trips to fish landing places; such visits should include main landing sites and various other fishing villages along the coast;
- g. carry out various discussions with fishermen or their representatives in order to understand their problems and their needs in an effort to arrive at acceptable solutions to improve the well-being of the small-scale fishermen;
- h. survey market sites with data collected on wholesale and retail fish prices of fish species;
- i. assess any available infrastructural facilities, i.e. harbour sites, landing beaches, boat-building facilities, ice plants, cold stores, boat repair workshops and service activities, etc;
- j. ascertain number of fishermen and number and types of boats;
- k. assess any processing activities concerning fish drying, salting, smoking or canning;
- l. introduce for discussion the concept of setting up fishing community centres; and
- m. study any other related subject during the visit.

From the above terms of reference, the expert was entrusted with many responsibilities covering a wide area. It is, therefore, important to mention that the report does not go deeply into all items and problems.

2. BACKGROUND INFORMATION

The Hashemite Kingdom of Jordan covers an area of 97,000 km², with Syria bordering it from the North, Iraq from the East, the Kingdom of Saudi Arabia from the South and the Armistice line from the West.

Its only outlet to the sea is the Gulf of Aqaba in the South, which is connected to the Red Sea, and on which the port of Aqaba is located.

According to the population estimates for 1977, the population of the East Bank of the Jordan River is about 2 million inhabitants. 40 percent of the labour force is engaged in agriculture in an area representing only 4.3 percent of the total area.

Agriculture is considered the most important of all the natural resources next to phosphate production. Tourism is also considered one of the most important economic activities, considering that the Gulf of Aqaba Coast is among the winter touristic centres.

Administratively, the East Bank is divided into five governorates, namely: Amman, Belqa, Irbid, Karak, and Ma'an. Each governorate includes a number of provinces. The Jordanian coast is located on the Gulf of Aqaba within the boundaries of Aqaba province which lies within Ma'an governorate.

Amman governorate is considered the largest population centre since it has more than 50 percent of the population. On the other hand, Ma'an governorate is considered the smallest population centre, only 3 percent of the total population.

The Jordanian economic system depends mainly on private enterprises supported by the government through providing infrastructural facilities and auxiliary services. The government has set up a number of projects, some of which were established in conjunction with private capital. However, its direct participation in the economic activity outside the scope of infrastructural projects and auxiliary services remains limited. Traditionally the economic role of the government is restricted to the preservation of internal security, building and maintenance of roads, or organizing private economic activity by promulgating laws and preventing the abuse of rights.

Fish production is very low and does not exceed 100 tons annually from all resources which include the Jordan and Yarmouk Rivers and the fish farms; therefore, the need for fish has been increasingly met through imports. The amount of imported fish rose from 1450 tons in 1970 to about 4600 tons in 1978. The annual per capita consumption of fish is estimated at 2 Kgs.

3. AGENCIES CONNECTED WITH GULF OF AQABA FISHERIES

There are several authorities responsible for the organization and administration of the Gulf of Aqaba fisheries, each has a different set of tasks and responsibilities. See Annex (1). Figure (2).

Ministry of Agriculture

This Ministry is responsible for the fish production sector from the organizational point of view, being one of the branches of animal production. It is responsible for providing infrastructural facilities and auxiliary services for fish production projects; within the framework of the States economic system, through the Fish Production Division of the Animal Health and Production Directorate to which the Fish Inspection in Aqaba is subordinated which, in turn, is under the administrative supervision of the Agriculture Department of Aqaba Province.

Until the present time, the role of the Ministry of Agriculture is restricted to taking part in issuing fishery permits for fishermen, inspecting the quality of fish, making sure it is edible, collecting marketing duties*, and preparing some statistical data on fish production. These duties are performed by the Fish Inspector in Aqaba and Head of the Fish Production Division Section in the Animal Production and Health Directorate in Amman.

Actually, the role of the Ministry of Agriculture should not be restricted to the afore-mentioned activities. Its activities should be directed to providing infrastructural facilities and auxiliary services which will be mentioned later on.

Ministry of Defence

The coast guard force work under the supervision of the Ministry of Defence. It carries out instructions regarding the coming and going of fishing boats in the landing sites through a control unit in the same site. It prevents fishing boats from entering or leaving the landing site after sunset. It prevents boats from going within 5 kilometres of the coast at night. This causes a number of problems to the fishermen, such as running the risk of exposing their fish to decay or exposing the fishing boats to danger in case of unfavorable weather conditions.

The coast guard station checks fishing permits for fishermen and fishing boats. It does not allow unloading of fishing boats except in the presence of the Fish Inspector who supervises the unloading operations with the objective of preventing people from evading sales duties which are collected by the Ministry of Agriculture. The Ministry of Defence takes part through its different organs, in issuing fishing permits to fishermen.

Port Authority

This authority registers all data related to fishing boats and issues permits for them.

The Cooperative Organization

This is an independant civil institution which supervises the founding and registering of cooperative societies of various kinds. It is the official authority which speaks on behalf of the cooperative movement in Jordan, organizes its administrative and financial affairs through its board of directors, and represents it when dealing with other bodies. The Organization provides guidance and technical services to the cooperative societies and their members. It audits cooperative society accounts, and is in charge of the management of the cooperative bank that issues loans for cooperative societies and their members and provides them with banking services at an interest rate that changes according to the purpose of the loan, in the following manner:

* See Section on Fish Handling and Marketing

- 5 percent interest rate for medium-term loans given to cooperative societies for collective purposes like building constructions and stores, buying equipment and giving loans.
- 5.5 percent interest rate for medium-term loans given to cooperative societies which are to be repaid as loans to members of these societies.
- 6 percent interest on seasonal loans (short-term) given to cooperative societies. On repayment of loans on time or beforehand, 1 percent is returned to the cooperative societies.

The Organization established the fishermen's cooperative society in Aqaba in 1975.

Faculty of Science, University of Jordan

The Marine Research Station, which is currently under construction, is officiated to the Faculty of Science. However, it has its temporary seat at the present time where some foreign researches are carrying on some studies on the Gulf of Aqaba. On the whole, studies on fish are still limited.

4. THE GULF OF AQABA FISHERIES

4.1 Introduction

The Gulf of Aqaba extends for 125 kms as an extension to the Red Sea. The Jordanian coast is about 29 kms. long, and an average of 16 kms. wide.

The Jordanian coast extends along the Gulf of Aqaba till the Saudi Arabian borders at Durra area. The coastal strip is mostly rocky or pebbly. Coral reefs are prevalent in some sectors. Deep waters are very close to the shore, while the shallow belt is narrow and in some places is only 10 meters wide. Following this strip there is profound depth.

The depth of the Jordanian side of the Gulf of about 1800 meters, and sometimes reaches a maximum of 1829 meters.

4.2 Landings

There are no comprehensive statistics for the total fish catch that is unloaded at Aqaba landing site, since the only source of statistics is the production lists prepared by the fish inspector for collecting duties from fish mongers. These lists indicate the quantities delivered to the mongers and are used as bases for calculation as well as quantities of decayed fish. However, the fish that is not delivered to mongers is mostly from small boats, and is directly sold by fishermen to the consumers and are not recorded on these lists. Besides, there is no accurate specific listing of fish. Quantities of different kinds are listed according to the personal assessment of the fish inspector.

It is noteworthy to mention that the published official statistics include only the quantities for which taxes have been paid and exclude the decayed quantities. Hence, they do not represent the actual production. It was possible to obtain the monthly production, from these lists during the period 1972-1978 for which complete data were collected, see Annex (2), table (1). 1/

These quantities represent the yield of an area that extend up to 300 kms. south. It is noticed that production decreased from 180 tons in 1965 to about 143 tons in 1972 2/. It reached its minimum of about 31 tons in 1978. This is due to many factors such as the use of harmful fishing methods (dynamite) in past years prior to its prohibition; pollution caused by the increased traffic of trading ships at the Port of Aqaba, prohibiting fishing in many areas in the gulf which have been reserved for touristic purposes; and the decrease in the number of fishermen for a variety of reasons which will be mentioned later on. These elements have resulted in a drop in production by 78 percent during the past seven years.

4.3 Seasonal Variations and Catch Composition

By measuring the acuteness of seasonal variations of catch by using the seasonal coefficient 3/, we find that the catch is characterized by relatively high seasonal variation as the seasonal coefficient during 1972 - 1978 ranges between 1.3 - 4.3 at an average of 1.6, except during 1977 where the seasonal coefficient reached ∞ .

From Annex (2) Table (2) it is evident that the largest catch occurs during the second quarter of the year (April, May, June) when an average of about 31 percent of the annual catch is made. This is followed by the first quarter (January, February, March), where the catch of these months represent an average of about 27 percent of the overall production during the period covering 1972 - 1978.

1/ Including spoilt or decayed production.

2/ FAO Mediterranean Development Project- Jordan Country Report, Rome, 1967, P. 72

3/ Seasonal coefficient = highest catch percentage in a given time period (one or three months) during a year, over lowest percentage in an equivalent time period in same year, when the catch is equal over the various periods of the year, the seasonal coefficient = 1.

There is a variety of fish species in the Gulf of Aqaba. According to the information obtained from the Biology Department, Faculty of Science University of Jordan, about 100 species have been recorded, of these only 20 species are of commercial importance.

There is the problem of the inability to determine the Latin and English names of the species. Besides, these names did not appear in the references and reports that we were able to obtain. There were no sufficient nor precise data in this regard in the section of Biological Science, Faculty of Science; therefore, we are going to use the local names only, until the Latin and English names are determined by the biological experts of the project.

Due to the unavailability of statistics on the composition of catch, we depend in our analysis on available data for the month of Dec. 1978, and the months of Feb. till August 1979. These data were registered by the Fish Inspector in Aqaba. In an attempt to give a general picture of the catch composition obtained from the Gulf of Aqaba, Annex (2), Table (3), we find that Al Sho'or fish alone represents more than half the catch for this period, i.e. about 57 percent of the total period, followed by Fares about 18.5 percent, Segan and Reem about 3 percent for each, Freeden and greebden, about 4.5 percent, and other fish, about 14 percent*.

5. FISHING BOATS AND GEAR

The number of fishing boats registered in the Port Authority is estimated at about 62 fishing boats of different sizes. Their lengths range from 3.5 to 11 meters and all are equipped with motors ranging from 2 to 72 horsepower. About 30 boats of different sizes are in actual operation. According to fishermen and fisheries authorities this is due to the high cost of operation for most of the boats because they used petrol, the price of which has increased. The boats that use petrol and are engaged in fishing operations at the presnet time are restricted in movement in order to reduce operating costs. This, in turn, reduces productivity. All boats are made of wood and built in Aqaba, except two which have been built in Syria.

Fishing boats engaged in fishing operations at present may be divided into two groups:

Large Fishing Boats

Their average length is estimated at about 9 meters with a beam of 2.75 meters and a height of 1.20 meters. They are equipped with diesel engines ranging from 25 to 45 horsepower. These boats have an insulated box (ice box) to preserve fish and bait. One third of the box is used to preserve bait and the rest to preserve fish.

* Other fish include : Boher, Dagham, Shran, Boas, Hereed, Qamar, Reshan, Aisoun, Track, and Tween.

There is one boat which is equipped with a mechanical refrigerator which freezes the fish to temperatures reaching -25°C . This refrigerator is not fixed to the boat. It is lifted up and lowered down by a crane operated by the boat engine. At present time a five horsepower motor is being installed especially to operate the refrigerator when the boat's motor is not working. The refrigerator has a capacity for 2 tons of fish. It is 2.35 meters long x 1.75 meters wide x 1.5 meters high. Its cost is estimated at about Jordanian Dinars 2000. It has been locally manufactured in Amman. The boat and motor cost about JD 4000, that is, the total cost of the boat is JD 6000. The make of the boat motor is Japanese 'YANMAR' and works with diesel oil.

Fishermen who were interviewed said that this boat is more efficient than other boats that use ice to preserve fish both in terms of the length of the fishing trip and the cost of production, especially after the increase in the price of ice. The price of a block of ice weighing 25 kgs ranges between JD .70 - 1.00.

Most of these boats operate in Saudi Arabian waters up to a distance of 300 miles south of Aqaba according to the agreement concluded between the Hashemite Kingdom of Jordan and the Kingdom of Saudi Arabia. The fishing trip lasts 12 to 16 days of which 8 - 10 days are spent in the fishing ground and 4 - 6 days are spent in travelling to and from their bases. The average catch of one trip ranges from .8 to 1.5 tons. The number of fishing trips per year ranges from 8 to 10. Thus, the average boat catch per annum is about 10 tons.

All these boats use hand lines. They use a line with 2 or 3 hooks for depths less than 100 meters. For more depth a line with 10 - 12 hooks is used.

Three to four fishermen and sometimes more depending on the availability of fishermen, work on these boats. Every fisherman brings his line. As to the tramail nets which are used for fishing Bagha and Sardines for bait, they are provided by the boat owner himself.

There are about 18 boats of this size engaged in fishing.

Small Fishing Boats

These boats have an average length of 3.5 meters, with a beam of 1.5 meters and a height of one meter. They are equipped with 'JOHNSON' and 'YANMAR' outboard engines ranging from 5 to 22 horsepower. These boats are also equipped with sails.

These boats are in action in Jordanian waters in the ship lane inside the Gulf of Aqaba. However, some of these boats operate in the neighbouring Saudi waters where they spend two days in travelling to and from their bases and five days in the fishing ground.

The boats that operate in the Jordanian waters start the fishing journey at 6.00 am till before sunset, according to the military instructions which prevent fishing boats from coming close to the coast after sunset.

These boats use hand line. The daily average catch of a trip is 6 - 10 kgs. Not all these boats use ice. In case they fish in Saudi waters they carry an insulated box with a capacity of 200 - 250 kgs. to preserve fish by using ice.

An average of one or two fishermen work on each boat. The cost of one boat is estimated at JD 400, the motor at JD 108, and the fishing gear at JD 100.

The number of small fishing boats that operate at present is about 12 boats.

6. THE FISHERMEN

The number of fishermen fluctuates from one year to the next depending on the number of permits issued to them. According to 1979 data the number of licensed fishermen is estimated at 114. However, during the past 7 years 1972-1978, the average number of licensed fishermen is estimated at 90, see Annex (2), Table (4) where the number of fishermen who own fishing boats ranges from 25 to 30. The majority own one boat. Some share one boat. There are two fishermen who own two boats each. Issuing fishing permits is one of the problems that fishermen suffer from, due to the lengthy procedure and the number of authorities responsible for issuing them. Besides, fishermen should follow up this procedure themselves.

It is estimated that about 70 percent of the fishermen are below age 35. The percentage of fishermen who are illiterate is estimated at 40, the majority of whom are aged.

The average number of family members is about six persons. According to the numbers of fishermen in 1979, the number of fishermen population is about 684 persons.

Most of the fishermen live in the old quarter of Aqaba city. However, these quarters are being demolished and new modern houses are being built for fishermen. Payment will be in installments after compensating them for their old houses; some fishermen have received these houses which have running water and electricity.

Fishermen do not have any kind of social insurance against disability, old age or illness. This is due to the absence of any real organization to group the fishermen and represent them when dealing with responsible authorities and defend their rights. The organization existing at present in form only, is the Fishermen's Cooperative Society at Aqaba, which was founded by the Cooperative Organization in 1975. It has 26 members only.

This is due to the lack of awareness on part of the fishermen regarding the objections and importance of the cooperative organization, especially if we know that Aqaba fishermen do not have a leadership that represents them and solves problems which might take place among them, and affect them. This situation resulted in lack of confidence regarding one another.

The chairman, secretary and treasurer of the society were elected. The Cooperative Organization gave the society a JD 20,000 loan. The society bought land to build its seat, an ice plant, cold storage rooms and shops. However, everything stopped at this point due to the insufficiency of the remaining funds to build these establishments, and to the refusal of the Cooperative Organization to finance the project, since as planned it would cost JD 150,000. In addition to other procedural reasons. The fact that the project stopped shook the fishermen's confidence in the society. They questioned its utility and alienated themselves gradually from it.

This ambitious start for a beginning society, undoubtedly, emphasizes the necessity of providing administrative and technical supervision and guidance for the responsible authorities of such organization.

Regarding production relations among fishermen, production revenue is distributed between the owner of the boat and the fishermen who are chosen to be of compatible traits and friendly relations, in the following manner:

- 10 percent of the total revenue is allocated to the motor.
- Food and fuel costs and other fishing trip expenditures are deducted from the remaining amount.
- $1/5$ of the remainder is allocated to the boat.
- The remainder is distributed equally among the fishermen and owner of the boat.

Some boat owners said that distribution takes place in the following way:

- 30 percent of the revenue is allocated to the boat and motor
- Food cost and other fishing trip expenditures are deducted.
- The remainder is distributed equally among fishermen including the owner of the boat.

Small Boats

- Food and fuel costs are deducted.
- The remainder is distributed equally among fishermen, including the owner of the boat.

Some fishermen said that sometimes the revenue is distributed in the same way as with large boats. Average monthly income for a worker fisherman (who does not own a boat) is about JD 100.

There has been a decline in the number of fishermen for the following reasons:

1. A decrease in the fishermen's income as a result of an increase in the cost of production. This is due to the increase in the price of petrol and ice which forces them to look for other jobs with better income as in the field of construction where the average monthly salary ranges from JD 150 - 160.
2. As a result of the increased cost of production, fishermen ask for high prices to cover their expenditures and get an income commensurate with the effort they exert and the risks they are exposed to. This, in turn, decreases the demand for fresh fish specially if substitutes are available like imported fish and poultry for much cheaper prices. This creates marketing difficulties as we will see later.
3. Restrictions imposed on fishing operations whether regarding fishing areas or fishing time ; as well as the lengthy procedures for issuing permits for every fishing trip even for small boats.
4. Non-availability of maintenance facilities for boats and motors
5. The drop in the fishermen's income has led to a similar drop in his saving capacity. Hence, he became dependent on the mercy of merchants in order to be able to meet his family's needs as well as his own as he has nowhere else to go.

It was noticed that most of the fishermen who gave up fishing as a profession do not own boats. This is due to the limited saving capacity of boat-owners who cannot give loans to the fishermen workers to meet their needs and those of their families during the inactive periods between fishing trips , This forces the fishermen to look for other jobs. This, in turn, leads to an insufficient labour force for fishing boats.

7. FISH HANDLING AND MARKETING

Fish handling and marketing proceed through the following phases:

- Fish is washed by sea water, dried by a sponge, and put aboard the boat until an appropriate quantity is accumulated to be put in the ice box of the boat, in order not to open the ice box often.

- During the fishing trip the fish is stirred in the ice-box in order to get the fish at the bottom on the top and vice-versa. This is done for better distribution of the cooling system.
- After the arrival of the boat at the landing site at Aqaba, the fisherman who owns the boat visits the fish mongers in the city, who are only seven. Their shops are equipped with electric freezers. The total storing capacity for all mongers is estimated at 24 tons. The fisherman visits the mongers in order to know the offers they make to buy his fish. The fisherman determines its composition, different species and quantities. Upon agreement with a specific monger, who is the one who offers the highest price, he prepares a mini-truck to transport the fish from the landing site. This takes place when the fisherman (boat-owner) is not indebted to a specific monger. Otherwise he would be committed to deliver his fish to him.
- The fish is unloaded from the boat to the vehicle in the presence of the fish inspector. It is put in the truck of the vehicle without cover. Sometimes it is covered prior to transporting it to the fish monger's shop.
- Decayed fish and fish not proper for human consumption are put away by the fish inspector. The fish is then weighed (different species are weighed together). Every 15 kgs. are weighed together.
- Accounts are made with the fisherman on the basis of the quantities weighed, with one price for all species.
- The merchant sorts the various species, washes them and arranges them in separate piles beside each other in the freezer.
- The fish inspector registers the quantities which have been sold to the merchant as well as the discarded quantities in special lists. These lists are the only statistical source for the fish landings. This is done with the purpose of collecting sales duties from the merchant at the rate of 5 Jor. Fils for every three kilograms (one pound).
- Fishermen who work on small boats sell their catch directly to consumers. This is done often without securing a permit from the fish inspector. Consequently, these quantities are not included in the registered production estimates.

The percentage of decayed fish from total production during the period covering 1972 - 1978 was as follows:

<u>Year</u>	<u>%</u>
1972	54.1
1973	1.7
1974	10.8
1975	27.9
1976	1.1
1977	no data available
1978	-.4

The high percentage of decayed fish in some years which reached more than 50 percent of the production in 1972, about $\frac{1}{3}$ of the production in 1975, is an indication of the lowered standard of fish handling operations.

Marketing problems are considered one of the main obstacles to the development of fish production in the Gulf of Aqaba. This is due to the limitation of the local market regarding fresh fish in Aqaba city, where the average daily consumption of fresh fish is about one ton, according to the estimates of fishmongers, in addition to the fact that most Jordanians are not consumers of fish, with the exception of immigrants from coastal areas. The limitation of the local market is due to the following:

1. The high prices of fresh fish (gulf fish) compared with the prices of imported frozen fish and poultry, Annex (2), Table (5) whose prices are less than half the prices of fresh fish. Average retail price of one kilogram of fresh fish is estimated at one Jordanian Dinar. This is due to the high cost of production as a result of the increased cost of fuel and ice.
2. A small group of merchants control the fish trade, which makes them in a powerful position to impose prices. Besides, the fact that they control fish-storing operations puts the fishermen in no position to choose. They either have to accept the prices offered or run the risk of exposing their product to decay, especially in the high production season.
3. The demand on fish increases during the winter season, which is the touristic season in the area, while the high production season (50 percent of the production) is during the second and third quarters of the year (see Annex (2), table (2)). Those are the months during which the demand for fish decreases as a result of the hot weather. This increases production and marketing problems.

8. COASTAL FACILITIES AND INFRASTRUCTURE

There are no piers for boat landing, nor is there a sheltered area for their protection. This, in turn, exposes them to danger during unfavorable weather conditions where a definite point is specified near the coast guards station to watch outgoing and incoming of boats. The absence of such facilities causes many obstacles and difficulties in supplying and unloading of boats, as well as inspection by coast guards during the high tide. It also causes difficulties for outgoing boats during the low tide.

Similarly there is no covered place to protect the fish from the sun after unloading the boat and prior to their transport to the market.

There are no fresh water supplies in spite of the existence of pipeline at the unloading site. There are no fuel supplies as well. It is transported in tins by cars in exactly the same way as water is transported from within the city of Aqaba.

There are two boat-building yards near the unloading site. There is a carpenter in each yard who is sometimes assisted by one or more workers. Fishermen complain of the shortage of carpenters, which delays boat repair for long periods which can last for months. The process of building a new boat can last for a year. This is one of the reasons that some boats discontinued fishing activities.

As for the maintenance and repair of boat engines, there is one mechanic in Aqaba city who undertakes these repairs whenever possible. In the case of major repair, the damaged part is taken to the workshops in Amman, about 300 kms away.

There are two ice plants in Aqaba city which are privately owned. The first has a daily production capacity of 140 blocks, each block weighing 25 kgs. with a storage room for 1500 blocks. The second plant has a daily production capacity of 70 blocks, each block weighing 25 kgs, and a refrigerator for storing fish with a capacity of 30 tons. The ice plant owner is a fish monger as well. The selling price of an ice block (25 kgs) for fishermen is 70 J.P. in each factory.

According to the estimates of plant owners, the average requirements of ice for fishermen is about 1400 blocks monthly (35 tons). The production of the two plants in the present circumstances is sufficient even when the demand on ice increases during the months of June, July and August. However, the problem raised by the fishermen was the increase in the prices of ice which increases the cost of production.

At Aqaba city there is a refrigerator, with a capacity of 1500 tons, that belongs to the Ministry of Supply and that is designated for storing imported frozen meat, poultry and fish. At present some empty spaces in this refrigerator are rented to individuals at J.D. .175 per cu.mt. for two weeks. However, according to the Ministry of Supply's plan for expanding the importation of frozen meat all available storing space will be allocated for storing imported meat only, (according to the Head of the Supply Bureau in Aqaba). Accordingly it will not be possible to depend on this refrigeration to preserve locally produced fish if we want to improve fish handling and marketing..

A 6000 ton refrigerator is currently under construction in al Aqaba free zone. It has not yet been decided to what degree it will be used for preserving locally-produced fish if the need arises in the future.

9. RECOMMENDATIONS

The implementation of any proposals and recommendations with the objective of developing fish production in Aqaba Gulf, and improving the fishermen's conditions and limiting the abandonment of the fishing profession cannot be achieved without close cooperation between the Jordanian Ministry of Agriculture, the Cooperative Society for Fishing in Aqaba and the Cooperative Organization.

The Development of Fisheries in the Red Sea and Gulf of Aden Project could participate in achieving this purpose by making proposals for a pattern of cooperation as follows:

1. Solving the problems of the Cooperative Society with the Cooperative Organization and other official authorities so that the Society starts its activities with a programme commensurate with its potentialities. It should start by building its Headquarters, a fuel tank and a sunshade at the unloading site in order to weigh the fish for precise checking of the landings as well as offering some short-term loans for financing fishing trips.
2. The society should be the only authority with whom fishermen deal regarding the issuing of fishing permits. The society will make contacts and coordination with other authorities concerned in order to save time and effort for fishermen in following up on the issuance of such permits.
3. There is a necessity for a more precise arrangement of statistics so that they include all fish landings of different species. This could be done by checking landings directly at the unloading site.

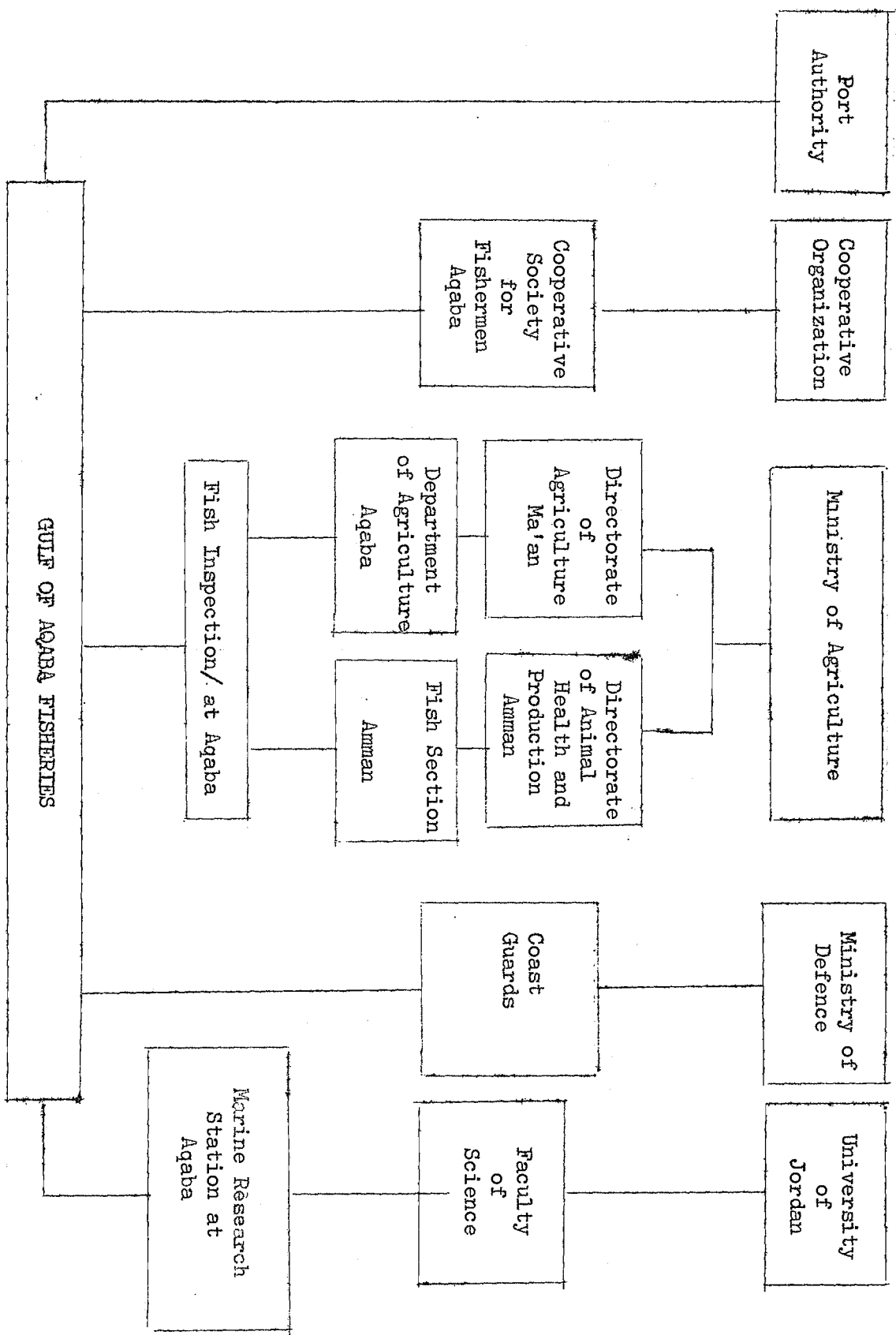
4. Studying the possibility of experts working in the Project for Development of Fisheries in the Red Sea and Gulf of Aden to train sons of the fishermen's sons in motor repair and boat-building prior to building special workshops to be managed by the Cooperative Society in order to overcome the shortage in this area.
5. Studying the possibility of the project providing some equipment and apparatuses needed for the Marine Research Station in Aqaba, and the participation of the project's experts in planning for research programmes which serve the development of fisheries in the gulf of Aqaba.
6. As most of the fishermen who left the fishing profession were non-owners it is possible to deal with this problem by studying the possibility of cooperation between the Red Sea and Gulf of Aden Project, the Cooperative Society and the Cooperative Organization in distributing fishing boats to these fishermen, by rental sale and studying the possibility of more than one fisherman sharing the ownership of a large boat equipped with an electric refrigerator like the ones used at present and introducing suitable modifications if the need calls for them to raise the efficiency of the boat.
7. Regarding the Project for Development of the Fisheries in the Red Sea and Gulf of Aden, it could take part in reducing the cost of production and solve marketing problems through the following:
 - Substituting motors that operate with petrol for motors that operate with diesel oil in order to reduce fuel cost whenever possible. This would be achieved by providing such motors and distributing them among fishermen by rental sale and using funds accumulated from sales for buying motors to be distributed among another group and so on. This would be done through the cooperative society and its fishermen members with the objective of deepening the idea of cooperation among fishermen and strengthening it.
 - Providing an ice-making machine with a capacity of two tons per day, as well as small freezers to preserve fish with the objective of reducing ice cost and breaking the merchants' monopoly of the market and their control over the fishermen, provided that the Cooperative Society would manage and operate these units for reasonable prices which would cover maintenance, renewal and substitution costs.
 - Reducing the cost of production and providing storage capacity would undoubtedly reduce the price of fish and consequently increase the demand for it, facilitate its marketing and decrease the severe fluctuations of prices as a result of increasing and decreasing of production.

8. Improve the fish handling process through the project's fish handling expert with the objective of reducing the quantities of fish wasted.
9. Since the role of the Ministry of Agriculture is to provide infrastructural facilities to its different sectors, according to the Jordanian economic system, this calls the Ministry to provide the following facilities:
 - Building a pier to facilitate unloading and supply operations of fishing boats.
 - Resumption of water supply to the unloading site.

Annex (1) :

MAP OF THE HASHEMITE KINGDOM OF JORDAN





Agencies Connected With Gulf of Aqaba Fisheries

Table (1)

Annex (3)

DEVELOPMENT OF FISH LANDINGS

AT AQABA

1972 - 1978
(in tons)

Year Month	1972	1973	1974	1975	1976	1977	1978
JANUARY	13,566	2,930	2,326	20,643	5,250	3,150	- *
FEBRUARY	26,816	5,580	3,876	11,030	4,050	4,500	2,138
MARCH	17,079	3,569	6,585	5,210	4,538	3,486	3,255
APRIL	14,299	7,098	10,018	7,099	3,626	2,850	5,632
MAY	17,160	13,454	9,271	12,438	5,854	6,600	3,970
JUNE	14,721	9,195	13,784	4,361	4,000	3,270	- ,910
JULY	5,535	13,905	9,584	6,159	3,000	1,500	3,450
AUGUST	6,240	6,900	6,345	5,486	3,500	3,000	2,220
SEPTEMBER	1,620	8,269	6,720	3,830	3,946	2,400	1,150
OCTOBER	5,952	9,892	12,845	3,675	4,946	-	3,720
NOVEMBER	9,345	4,766	10,777	7,299	5,850	-	1,180
DECEMBER	10,368	7,364	10,518	3,057	- ,600	-	3,325
TOTAL	142,701	92,922	102,649	90,287	49,160	30,756	30,950

* No fish available.

Fig. (1) : Development of Fish landings at Aqaba during
1972 - 1978

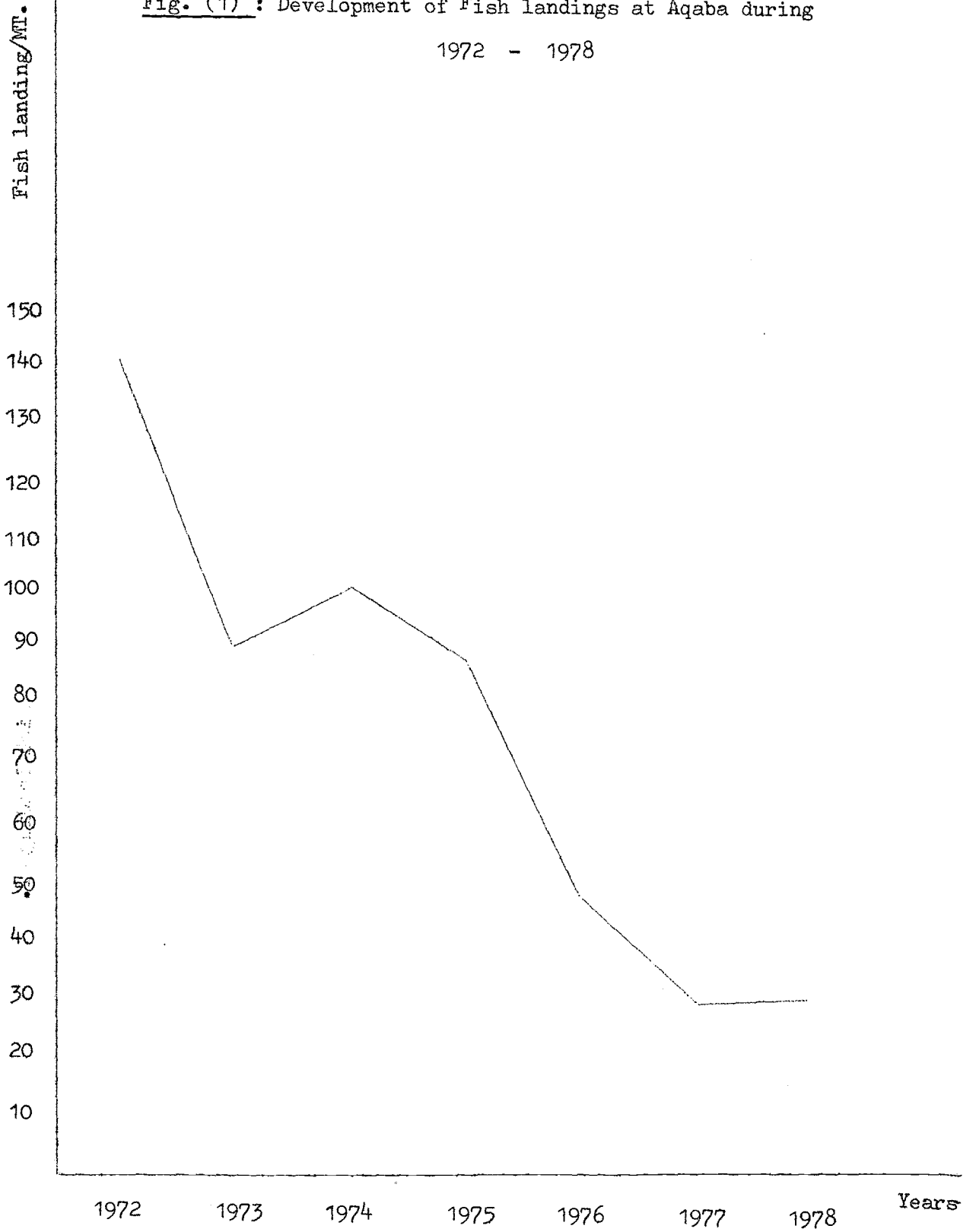


Table (2) :

Seasonal Variations of Registered Fish Landings at Aqaba
1972 - 1978

YEAR	TOTAL CATCH		FIRST QUARTER Jan. Feb. March		SECOND QUARTER Apr. May. June		THIRD QUARTER July. Aug. Sept.		FOURTH QUARTER Oct. Nov. Dec.		Seasonal Coefficient
	tons	%	tons	%	tons	%	tons	%	tons	%	
1972	142,701	100	57,461	40,3	46,180	32,4	13,395	9,4	25,665	18,0	4,3
1973	92,922	100	12,079	13,0	29,747	32,0	29,074	31,3	22,022	23,7	2,5
1974	102,649	100	12,787	12,5	33,073	32,2	22,649	22,1	34,140	32,3	2,6
1975	90,287	100	36,883	40,9	23,898	26,5	15,475	17,1	14,031	15,5	2,6
1976	49,160	100	13,838	28,1	13,480	27,4	10,446	21,3	11,396	23,2	1,3
1977	30,756	100	11,136	36,2	12,720	41,4	6,900	22,4	-	-	-
1978	30,950	100	5,393	17,4	10,512	34,0	6,820	22,0	8,225	26,6	1,9
Average	77	100	21	27,3	24	31,2	15	19,5	17	22,0	1,6

Fig. (2) : Seasonal variations of registered fish landings at Aqaba during 1972 - 1978.

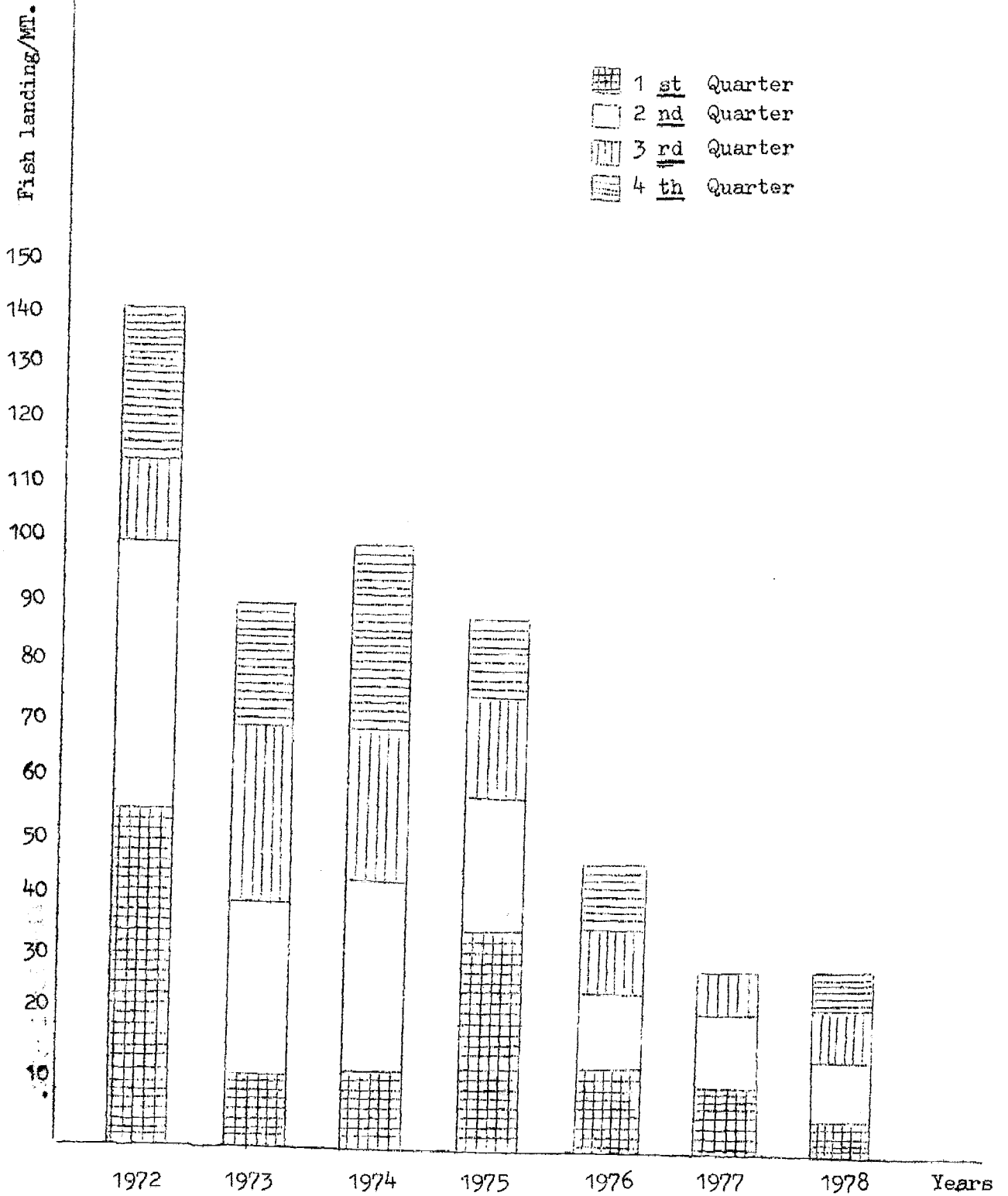


Table (3) :

Catch Composition During Dec. 1978 and February through August 1979
(Kilograms)

Species Months	ShoRor	Fares	Segan	Reem	Freeden	Gerbeden	Bohar	Sultan Ibrahim	Others	Total
	Dec. 1978	1500	795		105					
Feb. 1979	2400	1950		-				150	150	4650
March	7500	390		450					600	8940
April	1200	1500		450	300				510	3960
May	4800								480	5280
June	900		1050						600	2550
July	900	900				600			1200	3600
August	750	900			600		600		675	3525
TOTAL	Kg. 19950	6435	1050	1005	900	600	600	150	4215	34905
%	57.2	18.4	3	2.9	2.6	1.7	1.7	0.4	12.1	

Table (4)

Number of Licensed Fishermen
from 1972 to 1979

Y E A R	NO. OF FISHERMEN
1 9 7 2	76
1 9 7 3	96
1 9 7 4	93
1 9 7 5	95
1 9 7 6	75
1 9 7 7	91
1 9 7 8	101
1 9 7 9	114

Table (5)

STATEMENT OF THE PRICES
Of Local & Imported Fish In Aqaba City
for the month of August
1979

Prices of Local Fish		Prices of Imported Fish	
S P E C I E S	PRICE J.D.	S P E C I E S	PRICE J.D.
FARES	1.5	SELF	.40
KADA - SHO'OR	1.25	MALITA	.40
SEGAN	1.30	HEADLESS FISH	.45
BOHAR	1.20	HALB	.70
AL AMD	1.25	FREEDEN	.65
QASHOOR	1.20	MESHT	.60
BAWASI	1.30	GERBEDEN	.70
BONQOS	1.30	SULTAN	.65
FARES ASWAD	1.40	ARABI	.65
GHOM (RED FISH)	1.20	ARBAN (REEM)	.80
LOBSTER	3.50		