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**PROJECT PROPOSAL FOR THE  
REHABILITATION OF THE FISHERY SECTOR  
IN THE GAZA STRIP**

94-0377

## Preface

The rehabilitation of the agricultural sector in the occupied Palestinian territories was recognized as a priority area in the rehabilitation of the Palestinian economy. Following consultations with the concerned parties, a joint ESCWA/FAO (Food and Agriculture Organization of the United Nations) mission visited the occupied territories during the period 10 February-2 March 1993 with the objective of undertaking a critical review of the agriculture sector in the territories and proposing a plan of action for the rehabilitation of this sector, including the identification of priority programmes and projects.

During the mission, extensive consultations were held with a number of institutions and individuals in the occupied territories, including informal meetings with senior Palestinian staff members of the departments of agriculture in the West Bank and the Gaza Strip.

The rehabilitation of the fishery sector in the Gaza Strip was identified as a priority project. A joint ESCWA, FAO/RNEA (FAO Regional Office for the Near East) and the Arab Organization for Agricultural Development mission visited the occupied Palestinian territories during the period 30 March-14 April 1994 to prepare a project proposal for the rehabilitation of the fishery sector in the Gaza strip. The present report is based on the findings of the mission.

The fisheries rehabilitation mission to the Gaza Strip wishes to express its deep thanks and gratitude to all those who assisted the mission during the duration of its assignment, in particular the Directors and staff of the Fisheries Section of the Department of Agriculture, El-Tawfiq Cooperative Society and the UNDP Office in Jerusalem.

UNDP  
FISHERIES SECTION

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## *Introduction*

The joint ESCWA/FAO Agricultural Division conducted in mid 1993 a study on the rehabilitation of the agricultural sector in the occupied Palestinian territories. The study reviewed the main issues and constraints in the agricultural sector in the territories, and identified programmes and projects in priority areas for implementation. The outstanding constraints facing the agricultural sector including fisheries were grouped under the following six headings:<sup>1</sup>

1. Land confiscation and restrictions

These include a vast array of military orders which have resulted, *inter alia*, in the loss of land, curfews, restrictions on water use, and even sea water for fishing, restriction on land use for grazing and afforestation, uprooting of trees, controls on the movement of people and goods, border restrictions and difficulties in obtaining permits and licences.

2. Insufficient agricultural supporting facilities

Palestinian farmers as well as fishermen are deprived of the benefits of such services as applied research, effective extension services, market information, institutionalized credits, support prices and incentives.

3. Lack of infrastructure

The physical infrastructure in the occupied Palestinian territories is planned primarily to accommodate the needs and security of the Israeli settlers and the military. The construction of rural roads is neglected and little is done to promote private investment in storage and processing facilities.

4. Market constraints

Marketing difficulties are overwhelming, particularly with respect to the export market. Palestinian farmers and fishermen have no open access to the Israeli market, while the occupied Palestinian territories have become an unrestricted market for Israeli goods. Obstacles such as permit fees, border fees, taxes, and high transport costs have eroded the competitive edge of the territories in the export market. Consequently surpluses have been accumulated which cannot be sold, particularly of vegetables, citrus crops, olive oil, poultry products and sardines.

5. Weak agricultural institutions

The Agricultural Departments in the occupied Palestinian territories are paralysed by reductions in staffing, lack of funds and the elimination of the development budgets. Their role, if they have one, is now passive. The emergence of the non-governmental institutions is intended, in principle, to rectify the situation. However, these newly created institutions are plagued by a shortage of experienced personnel and by a lack of financing. In fact, one of the major problems facing any donor agency is the identification of the right non-governmental organization (NGO) with a proven capacity for planning and implementation.

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<sup>1</sup> ESCWA, Rehabilitation of the Agricultural Sector in the Occupied Palestinian Territories (E/ESCWA/AGR/1993/9).

6. Absence of planning and coordination

No effort has been made by the official agricultural departments or the NGOs to analyse outstanding problems critically, establish priorities or adapt a sound and feasible course of action with its complementary rules and procedures. All this leads to uncertainty and confusion and deprives the agricultural sector of fisheries as well as a sense of direction.

The above-mentioned study further identified the fact that basic action-oriented studies are needed in the areas of water resource development, land reclamation, livestock development and the development of fisheries in the Gaza Strip. In close cooperation with FAO/RNEA and the Arab Organization for Agricultural Development (AOAD) a joint ESCWA/FAO/AOAD mission visited the occupied Palestinian territories during the period 30 March-14 April 1994.

The objectives of the mission were to undertake a critical assessment of the existing situation of the fishery sector in the Gaza Strip and to propose a brief plan of action for the rehabilitation of the sector, including needs assessment and preparation of project proposals in priority areas for possible funding by donors interested in providing assistance to the territories.

The mission was composed of the First Economic Affairs Officer in the Joint ESCWA/FAO Agriculture Division who acted as Mission Coordinator, and Mr. Andrew Keleshis (Fishing Gear Technologist and Consultant to AOAD). Mr. Issat Feidi, Regional Fisheries Officer, FAO/RNEA, could not join the mission owing to a delay in the issuance of his visa. However, he reviewed and contributed to the present report. The mission visited the Gaza Strip and made a one-day visit to the fishing port in Acre. The mission had extensive consultations with the Department of Agriculture, the El-Tawfiq Cooperative Society of fishermen of the Gaza Strip (El-Tawfiq Cooperative), with NGOs and individuals in the occupied Palestinian territories concerned with the fishery sector.

The mission received the full support of the Department of Agriculture including the Fishery Section, the El-Tawfiq Cooperative and the UNDP Office in Jerusalem without which the mission could not have completed its assignment.

This report consists of four chapters:

- Chapter I. Assessment of the existing situation of the fishery sector in the Gaza Strip;
- Chapter II. Status of the institutional structure of the fishery sector;
- Chapter III. Proposed programme of action for rehabilitation of the fishery sector in the Gaza Strip;
- Chapter IV. Proposed project activities.

Chapter III, which could be considered the most important part of the report, includes the major findings of the previous two chapters, the immediate and longer-term objectives. Project activities identified for the rehabilitation of the fishery sector in the Gaza Strip are presented in chapter IV.

## I. ASSESSMENT OF THE EXISTING SITUATION OF THE FISHERY SECTOR IN THE GAZA STRIP

### A. BACKGROUND INFORMATION

Fishing is a profession with a long-standing tradition in the Gaza Strip, since the Palestinians have always lived in close proximity to the Mediterranean Sea. However, after the Palestinian tragedy in 1948, many groups of fishermen from Jaffa, Hamameh, Jura and Majdal were forced to flee and settle in the Gaza Strip, where many of them continued to fish. The number of fishermen in the Gaza Strip consequently tripled as did the number of boats.<sup>2</sup> But the fishery industry, since 1967, was severely constricted by Israeli military control over the area in which Palestinian boats were allowed to operate.

The Gaza Strip is a densely populated semi-arid area of 360 square kilometres (km<sup>2</sup>) with a population of 850,000 people of which about 250,000 inhabitants live in the town of Gaza alone.

The coastline of the Gaza Strip is 45 km long, a straight and sandy coast without any protected bays. The continental shelf is wide and the 200-metre isobath is situated at a distance of 33 km off Rafah in the south, narrowing to 25 km off Gaza town.

Bottom grounds are mostly smooth or sandy and muddy and suitable for trawling and purse seining up to 45 metres depth. From there down to depths of 120 metres the sea bed is irregular with rocky grounds and patches suitable for stationary nets and bottom long-lines. Further seaward, the bottom becomes regular and smooth or soft mud, again suitable for trawling.

The fisheries of Gaza are classified as artisanal and traditional, mainly based on bottom stationary nets, purse seining, trawling and long-lines. Fishing operations with the exception of bottom long-lines, are carried out at depths of up to 50 metres.

No precise knowledge of the fishery resources of the area is available. However, it should be pointed out that the continental shelf is wide and rich in both pelagic and demersal fish, if compared with other parts of the Eastern Mediterranean. Owing to this and by comparison with neighbouring countries, where more accurate information is available, it can be extrapolated that fishing efforts could eventually be increased by 50 per cent to produce even more than the 5,000 tons of fish landed in 1976/1977, especially if this effort is also extended into deeper waters. It should be pointed out that vessels from Israel and other areas are operating in the area.

### B. MANAGEMENT/FISHING REGULATIONS

Fisheries are the responsibility of the Fisheries Section of the Department of Agriculture in Gaza. It could be stated that the fisheries institutional organization is weak and its technical capacity is non-existent. Little thought was given to the need for the management of the sector.

Fisheries regulations are outdated or not applied. Minimum mesh size regulations exist only for the sardines fishery. Mesh size smaller than 20 millimetres (mm) is not allowed. In addition, the authorities decided to limit the number of skiffs (*hasaka*) to 481, and their outboard engines to 20 horsepower (hp).

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<sup>2</sup> Khalid Fayad, "Overview of fish production in the Gaza Strip", *Shu'un Tanmawiyyeh*, (in Arabic) vol. 3, Nos. 1 and 2, Jerusalem, April 1993.



### C. FISH PRODUCTION

Fish production in the Gaza Strip during the period 1967-1992 fluctuated from one year to another, as shown in table 1. During the period 1967/1968 - 1978/1979, fish production reached its maximum of 5,100 tons in 1976/1977 and its minimum of 3,200 tons in 1970/1971. In the second period 1979/1980 - 1983/1984, fish production fell sharply to 1,000 tons in 1982/1983 and in 1983/1984. Later it reached its minimum of 300 tons during 1985-1991 and increased to 1,800 tons in 1990/1991 and decreased again to 1,000 tons in 1991/1992. Table 2 compares in values the contribution of the fisheries sector with the values of livestock products and of the total agricultural output in the Gaza Strip; it is easy to note that this contribution differs from one year to the next according to the fluctuations in the fish landings as presented in table 1. The following factors contributed to the fall in fish production in the Gaza Strip.<sup>3</sup>

**Table 1. Fish production in the Gaza Strip  
1967/1968 - 1991/1992**

Year	Fish (1,000 tons)	Year	Fish (1,000 tons)
1967/1968	3.70	1980/1981	1.40
1968/1969	3.80	1981/1982	1.30
1969/1970	3.40	1982/1983	1.00
1970/1971	3.20	1983/1984	1.00
1971/1972	4.20	1984/1985	0.60
1972/1973	4.60	1985/1986	0.30
1973/1974	3.50	1986/1987	0.30
1974/1975	4.80	1987/1988	0.30
1975/1976	4.70	1988/1989	0.30
1976/1977	5.10	1989/1990	0.40
1977/1978	4.50	1990/1991	1.80
1978/1979	4.00	1991/1992	1.00
1979/1980	1.20		

Source: Society for Austro-Arab Relations, Development Perspectives for Agriculture in the occupied Palestinian territories, Jerusalem/Vienna, 1992.

<sup>3</sup> Ibid., pp. 27 and 28.

**Table 2. The contribution of the fishery sector to the value of the agricultural output in the Gaza Strip**

Year	Quantity landed (tons)	Value (1,000 NIS*)	% of the value of livestock	% of the agricultural output
1989/1990	400	1,947	2.1	0.7
1990/1991	180	7,008	5.8	2.2
1991/1992	100	4,685	3.4	1.2

Source: Central Bureau of Statistics, Statistical Abstract of Israel, No. 44, 1993, 789.

\* 1 US\$ = 2.98 new shekels (NIS) as of 30 March 1994.

Before the construction of the High Dam in southern Egypt in 1964, the Nile River carried fertile soil to the Mediterranean Sea, from where the current took it to the Gaza coast. This created a rich marine environment where fish could grow and reproduce. After the construction of the High Dam, that marine environment along the Gaza coast was weakened owing to the loss of nutrients and destruction of the spawning grounds; the reproduction of the fish population was therefore badly affected. This was confirmed by the fishermen interviewed in Gaza and Acre.

Prior to 1979, the Gaza fishermen were also allowed to fish along the Sinai coastline. After 1979 and as a result of the Camp David peace agreement between Egypt and Israel, the fishing zone of the Gaza fishermen was restricted to the Gaza Coast.

The Israeli Administration in the Gaza Strip, which is under the direct supervision of the Israeli Defence Ministry, restricted the fishing operations along the Gaza coast. The fishermen are not allowed to fish near the Egyptian nor the Israeli borders. They must remain at a distance of 5 km from either border. Moreover, they are not allowed to fish opposite the Israeli settlements established in the Gaza Strip during the Israeli occupation.

The imposition of heavy taxes, fines and licence fees on the fishermen and the boats by the Israeli Administration made the life of the Palestinian fishermen intolerable, and forced some of them to drift away from fisheries and to look for another profession.

Military orders, curfews, group punishment and house arrest are some of the practices imposed by the Israeli occupation authorities which adversely affected economic life, including the fishing activities of the people living in the occupied Palestinian territories.<sup>4</sup>

The Israeli Administration paid scant attention to developing and maintaining the infrastructure and supporting services. For instance, untreated sewage water in some parts of Gaza was left to pour into the sea, polluting the waters, devastating the fish stocks and the seaweeds to the detriment of the whole marine environment, as well as the fish spawning grounds. As a consequence, the catch rates of fishermen have substantially dropped. In addition, it must be emphasized that owing to the lack

<sup>4</sup> ESCWA, "The economic and social consequences of the establishment of settlements by Israel in the Palestinian territory, including Jerusalem, occupied since 1967, and the Syrian Golan: report of the Secretary-General", Amman, 1994.

of fishing ports or any other adequate facility in the area, the Gaza fishermen operate from open beaches. The 16-m purse seiners and trawlers have to be launched and beached up to 30 times a year, under the most trying conditions, a practice badly affecting the lifespan of the crafts.

#### **D. FISHING CENTRES**

Along the 45-km coastline, there are four fishing centres, as indicated in table 3, where fishermen operate from open beaches. Entrance to these centres is strictly controlled by the Israeli army. At all centres, apart from small stores built by the municipalities and rented to fishermen, no other facilities exist. Small winches, tractors and bulldozers are used for launching and pooling vessels and boats. At Gaza town, two old jetties exist, but are not used by any type of craft.

The total number of boats and fishermen per year and per area is given in table 3, based on a survey carried out by the mission. Gaza is the largest of the four fishing centres in both the number of boats and the number of fishermen.

#### **E. MARKETING OF FISH**

Fish is sold to fish dealers by auction at the fish market. There are 10 licensed dealers purchasing the bottom (demersal) good quality fish sold in Israel, where demand for such fish is high. As a consequence, the retail price of good quality fish became too expensive for the local population.

In addition, there are a number of dealers (about 200) selling sardines, covering the whole area. The sardines fishery is the most important, not only in terms of production, but also because of the fact that it constitutes the most important animal protein dish for the people of Gaza. Prices depend always on quantity landed, but are considered comparatively low. It must be mentioned that large amounts of good quality sardines are sold to Israeli canning factories: low quality sardines landed in Israel are sold in the local markets of the Gaza Strip. In case of overproduction, or restrictions imposed by Israel, large amounts of sardines are thrown back into the sea. This practice increases the problems of pollution.

Wholesale prices for good quality bottom fish, such as red mullets, groupers and breams, vary from US\$ 10 - 25 per kilogramme (kg), while the price of shrimps is US\$ 25 - 30 per kg. For sardines the wholesale prices vary from US\$ 0.5 - 2.50 per kg.

The auctioneers receive 5 per cent from the fishermen, while the buyer pays in addition 3 per cent municipality fees and 17 per cent for value added tax (VAT). Common commercial species of fish available in the waters of the Gaza Strip are listed below.

#### **F. PROVISION OF FISHING EQUIPMENT**

Apart from the El-Tawfiq Cooperative in the Gaza Strip, about 10 dealers in the area provide fishing equipment for fishermen. Suitable material is expensive and in short supply in the area and mostly depends on Israeli supplies.

Table 3. Distribution of boats and fishermen within the fishing centres

	Gaza Town		Der El-Balah		Khan Younis		Rafah		Total	
	Boat	Fishermen	Boats	Fishermen	Boats	Fishermen	Boats	Fishermen	Boats	Fishermen
Trawler (Lunch Jar)	12	144	1	12	--	--	--	--	13	156
Purse seiner (Chinchola)	37	518	2	28	8	112	8	112	55	770
Long-liners (Lunch Sonar)	10	40	--	--	--	--	--	--	10	40
Skiff ( <i>hasaka</i> )	269	807	66	198	48	144	67	201	450	1 350
Light boats (Fluka Lux)	148	148	8	8	32	32	32	32	220	220
Totals	476	1 657	77	246	88	288	107	345	748	2 536

Source: Compiled by the ESCWA/FAO mission to the occupied Palestinian territories, 1994.

Chart 1. List of common commercial fish species

Latin Name	Local Arabic Name	Common English Name
Mugil sp.	Bouri	Grey Mullet
Upeneus moluscencis	Sultan Ibrahim	Red Mullet
Mulus surmuletus	Sultan Ibrahim	Red Mullet
Mulus barbatus	Barbounni	Striped Mullet
Seriola dumerili	Hammouri	Amberjack
Trachurus sp.	Trachon	Horse Mackerel
Auxis thazard	Polamida	Frigat Mackerel
Euthinus alliteratus	Polamida	Little Thunny
Sardinella aurita	Sardin	Sardine
Spicara sp.	Lubus	Picarel
Merluccius merluccius		Hake
Scopaena sp.	Akra	Scorpion Fish
Serranus cabrilla		Sea Bass
Epimephelus sp.	Lucus	Grouper
Siganus rivulatus	Garras	Spine foot
Boops boops	Goubous	Bongue
Boops salpa	Salpeia	Salema
Diplodus sarcus	Sarrui	White Seabream
Oblada melanura		Saddle Bream
Pagellus erythrinus	Giarbiti	Pandora
Pagrus pagrus	Farrida	Common Seabream
Sauri sp.	Seusi	Lizard fish
Solea solea	Sola	Sole Fish
Lithognathus mormyrus	Marmir	
	Hout	Sharks
	Bursht	Rays
Aenaeus japonicus	Jamberi	Shrimps
	Kalmari	Cuttle Fish

## G. BOAT BUILDING

Boat building is quite advanced and based on a long tradition, as in other parts of the Eastern Mediterranean. All boats are of local construction. A full-displacement typical wooden vessel was developed in the area with shallow draught (maximum for a trawler 1.20 m), an essential element for operations from open sandy beaches. There is a transom stern, fully decked with or without a wheelhouse, its length varying from 8-17 m.

For frames, locally available Eucalyptus timber is used, while planks are made from imported white timber. The cost of a 16-m overall length craft is presently US\$ 37,000. The small glass reinforced plastic (GRP) skiff 6-m long, with raised bow to suit operations from beaches is also built locally. There are four building sites. The skiff costs US\$ 1,800.

## H. BOAT OWNERSHIP

Co-ownership by working fishermen, mostly members of the same family, is very common for larger vessels, such as purse seiners and trawlers. Only small craft like skiffs (*hasaka*) are owned by just one person. After deducting operational expenses, 50 per cent of the daily income or catch is set aside for the boat owners, the rest being shared by the crew. As an additional incentive, trawler owners advance the crew a small part of their share.

## I. ISRAELI MILITARY ORDERS AFFECTING FISHERIES

Departure and landing of any fishing boat is allowed only during daylight from four points along the coast controlled by the Israeli army, i.e. Gaza town, Deir El-Balah, Khan Younis and Rafah. Boats at sea during the night must stay 800 metres off the coast. In addition, fishing boats must stay 5 km away from Egyptian borders and 1 km from Israeli borders, a factor limiting the coastline to 39 km. Moreover, fishing is forbidden in the areas opposite the Israeli settlements. Table 4 presents the fishing workdays in relation to the Israeli restrictions on fishing and on daily life and in relation to the absence of fishing infrastructure. The figures mentioned in table 4 are based mainly on discussions with the fishermen and the authorities.

## J. BOATS AND EQUIPMENT

### 1. Trawler (Lunch Jar)

The typical trawler has a length of 15-17 m in overall length and is propelled by 300-400 hp engines, taken from trucks and adapted locally with 3:1 reduction gear.

Wheelhouse and crew accommodations are in the fore of the vessel, the gear being hauled over a stern roller. A two-drum and two-gypsyhead hydraulic trawl winch of five-ton capacity is situated at the wheelhouse. Few vessels are equipped with echo-sounders. An insulated fish hold (ice) is available on few vessels. A crew of 12 is employed, but the vessel operates with 6. The crew changes after each 24-hour trip.

Table 4. Workdays/fishing method, 1993

Fishing gear	Actual days worked	Days lost owing to Israeli restrictions	Days lost owing to launching problems	Notes
Trawler	84	41	175	65 days owing to bad weather/maintenance
Purse seining with lights	62	22	36	Seasonal fishery actual days per year 120
Purse seining without lights	22	19	79	Actual workdays per year 120
Skiffs ( <i>hasaka</i> )	139	38	153	35 days lost owing to bad weather

Note: Based on discussions with local fishermen and authorities.

2. Purse seiner (Chincola Lunch)

The craft is very similar in design to the trawler, but smaller, 11-14 m in overall length without wheelhouse, and propelled by 85-100 hp engines. All boats are equipped with hydraulic pursing winch and power block. Few are also equipped with echo-sounders. Each vessel operates with four to five lightboats, 5 m long and fitted with 4 x 2,000 candle gas surface lights. The unit operates with a crew of 12-16 persons.

3. Long-lines (Lunch Sonar)

This is an even smaller version of trawler, 8-11 m in overall length, fully decked without wheelhouse and propelled with inboard diesel engines of 50-90 hp. It occasionally operates with gill nets and in a few cases is equipped with a pursing winch for purse seiner operations. This was the most common craft (a sort of multipurpose vessel) in the past; it has now been largely replaced by the skiffs.

4. Skiffs (*hasaka*)

This fully decked transom stern craft of 6 m overall length made of GRP, was introduced after 1985. The bow is raised to suit the daily operation and launching from open beaches. The craft is propelled by outboard engines of 12-20 hp with a crew of two to four persons.

#### K. FISHING GEAR

1. Trawl net (Ghazal Jar)

The trawl net used in the area is equally effective for catching both demersal fish as well as shrimps. It is made of polymer-based filament (PBS) material with a minimum mesh size of 40 mm at the cod end. Its length is 33 m while the length of the fishing line is 26.1 m. Oval steel otter boards are used with 150 m long combination ropes. Fishing operations are carried out at depths ranging from 15-50 m. The main catch consists of mulus sp., cod, breams, pagellus sp., sole, shrimps, squid and cuttlefish.

2. Purse seine net (Ghazal Chinchola)

The old lampara net that existed in the area was replaced by the modern Israeli purse seine net. The net is of light construction PBS material 210/3 and 20 mm stretched mesh, with the bunt on one upper end, and a hanging length of 300 m. Each vessel is equipped with two nets, one 45 m and the other 75 m hanging depth. To fish by night, four to five boats are used, each with 4 x 2,000 candles surface gas light to attract fish. Two fishing seasons are observed: 15 April to 15 June, and 15 September to 15 November. The same net is used for December-April without lights and the fish are located by sight. The depth of operations varies from 30-50 m. A smaller net 200 m long and 25 m deep is used by the skiffs (*hasaka*). The main catch is sardines, Boops, *Trachurus* sp. and *Auxis Thazard*.

3. Surface gill net (Maltash)

Three such nets are in use. They have the same monofilament construction No. 20, a hanging length of 50 m and a hanging depth of 9-12 m, with different mesh size, i.e. 32, 38 and 50 mm stretched. The gear is mostly used by the skiffs, each using about five units, i.e. 250 m length. The net is set in the afternoon at depths of up to 20 m and pulled back in the morning. The same gear is



extensively used for surrounding sardines and grey mullets located by sight. The fish are pushed into the net. The main catch consists of sardines, grey mullets and Boops.

4. Bottom gill net (Zeida)

Two types are used, made of mono Nos. 45 and 70, with a stretched mesh size of 80 mm and 140 mm. Hanging length is 50 m (E=.50) while hanging depth is 12 m. Each boat operates with four to six units. Fishing is carried out at depths of up to 30 m, the catch being different species of Sparidae, Serranidae and little thunny.

5. PBS trammels (Mbattan silk)

This is made of fine multifilament PBS twine, the lint being 210/2 mesh size 44 mm stretched and 100 meshes deep, while respective figures for armouring (outer walls) are 210/6, 240 mm and 10 meshes deep. The net is extensively used by the skiffs, each employing five to six units, set at depths at up to 40 m, the catch being different species of Mulus sp., Sparidae sp., Pagellus sp., Sauri Sp., Siganus sp. and shrimps.

6. Monofilament trammels (Mbattan Mono)

They are used to a lesser extent. The lint is mono No. 45, with 80 mm mesh, the outer walls made of mono No. 90. Hanging depth of the net is 3 m and its length is 50 m. Boats employ two to three units at depths of up to 50 m. The main catch is Salpa sp., Pagrus sp., Siganus sp. and Epinephelus sp.

7. Bottom long-line (Sherak)

This is an important piece of gear for the area owing to extensive rough grounds. Monofilament No. 90-120 is used for main line to which branch lines No. 60-90, about 1 m long, are tied at intervals of 3-6 m. Mustard Round Bent hooks are used, varying in size from No. 6 to No. 10. A unit consists of 800 hooks, the boat employing two to four units at depths of up to 150 m. Sardines are used as bait. The main catch consists of Epinephelus sp., Pagrus sp., sharks and rays.

8. Minor fishing methods

Cast nets, hand lines and beach-seines are also used. The latter, though a very important and productive piece of gear in the past, almost disappeared owing to the fact that the Israeli military authorities allow fishing operations from only four points along the coast. The net is made of PBS 210/9 with 20 mm mesh size, a length of 200 m and a working depth of 6 m. It is operated with sweep lines of up to 300 m by 10-12 persons.

## **II. STATUS OF THE INSTITUTIONAL STRUCTURE OF THE FISHERY SECTOR**

The above-mentioned ESCWA study,<sup>5</sup> concluded that one of the major dilemmas in the occupied Palestinian territories is the weakness of its indigenous institutions to analyse critically the principal issues of sustainable development and to formulate a coherent planning framework for the optimal use of the natural and human resources available in the occupied Palestinian territories. The gap is visible in all sectors of the economy including the fishery sector in the Gaza Strip.

At present, there are two kinds of institutions in the Gaza Strip involved in the fishery sector. These are:

### **A. THE FISHERY SECTION IN THE DEPARTMENT OF AGRICULTURE**

This is the official department that deals with all aspects of fisheries in the Gaza Strip. The fishery sector has only one fishery officer, who is the head of the section and deals with the issues of the fishery.

The Department of Agriculture itself is lacking in staff and financial resources; its functions, at least in the last 10 years, were limited to rendering agricultural extension services. This Department as well as the Fishery Section became instruments for the implementation of Israeli military orders which, as mentioned above, impose restrictions on the economic life in the occupied Palestinian territories. Under the present conditions, it is obvious to conclude that the Fishery Section lacks technical staff for providing extension services to the fishermen and for managing the fishery resources in the waters off the Gaza Strip.

### **B. EL-TAWFIQ COOPERATIVE SOCIETY OF FISHERMEN IN THE GAZA STRIP**

The El-Tawfiq Cooperative in the Gaza Strip was established in 1973. At present it has 366 members, of whom 230 are from Gaza, 17 from Deir El-Balah, 51 from Khan Younis and 68 from Rafah. However, the total number of fishermen in the Gaza Strip is 2,536 (see table No. 3).

Since the El-Tawfiq Cooperative provides its services to all fishermen, the number of its members did not increase in the last few years. For this reason, a fisherman who is not a member of the Cooperative is not encouraged to apply for membership. At present, the Cooperative is considering limiting its services to members only, so as to induce other fishermen to apply for membership.

The financial sources of the Cooperative are:

(a) Membership shares and dues paid by the members. This is paid once. Each member should buy at least one share of NIS 100 and pay NIS 500 as dues.

(b) Income generated from the sale of fishing nets and equipment to the fishermen. The Cooperative yields 5 per cent of the nets' sales, which amounts to about US\$ 10,000 a year.

(c) Profits from the petrol station owned by the Cooperative. This station earns an income of about US\$ 20,000 a year for the Cooperative.

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<sup>5</sup> See note 1.

The United Nations Development Programme (UNDP) and Japanese assistance provided the Cooperative with the following:

Block ice factory: 5 tons/day/shift.

1 cold store for ice: 20-ton capacity.

1 cold store for fish: 20-ton capacity.

2 stores: 20-ton capacity each.

Offices for the headquarters of the Cooperative.

Central fish market.

US\$ 170,000 in kind to be paid back after the materials are sold (nets and equipment) to the fishermen.

The Cooperative staff consists of the following:

General manager.

One accountant.

One assistant engineer to operate the block ice factory.

One worker for the stores.

One worker for the petrol station.

One guard.

The staff of the Cooperative do not include any fishery technical officers. The Cooperative and the Fishery Section of the Agriculture Department could not provide technical services, extension or training, since, as indicated above, neither institution has technical officers who could provide such services.

### **III. PROPOSED PROGRAMME OF ACTION FOR REHABILITATION OF THE FISHERY SECTOR IN THE GAZA STRIP**

#### **A. FINDINGS**

Based on the above, the following findings are set forth:

1. Fisheries, in general, have been neglected by the authorities. Institutional organization of fisheries services are very weak while technical capacity and supervision is non-existent.
2. Currently, the fisheries in the Gaza Strip are artisanal and traditional, mainly based on demersal stationary nets and long-lines, purse seining and trawling adjusted to operations from open beaches.
3. Owing to the complete lack of fishing ports or protected bays, fishing operations are carried out from open beaches, with the vessels launched daily under difficult conditions.
4. Although there has not been a stock assessment survey carried out recently, it is known that, compared with other parts of the Eastern Mediterranean, the fishing stock is wide in variety and rich in both pelagic and demersal fish species.
5. Annual numbers of workdays/boats are very low owing to lack of ports, and to Israeli military restrictions.
6. The fish marketing and distribution system needs to be upgraded and developed.
7. Fishing gear is set in shallow waters.
8. Professional staff and ample manpower are available. Fishermen are always ready to accept the introduction of more advanced and productive methods, an essential factor for development.
9. Boat-building capacity is satisfactorily adjusted to build and maintain crafts with shallow draught for operations from open beaches. There is a lack of modern machinery.
10. The El-Tawfiq Cooperative in the Gaza Strip is established and functioning well under the circumstances. Upgrading is, however, essential.
11. Fishing gear is expensive and unavailable in the area. Purchases have to be made from Israel.
12. Modernization of existing fishing methods, as well as introduction of new gear, is needed to increase the efficiency of fishermen and fish production.
13. Strong technical assistance, together with expatriates to provide on-the-job training, is necessary to implement a rehabilitation project as well as to identify future needs.
14. The lack of credit facilities is a crucial problem and compounded by the rising rates of inflation.

## B. OBJECTIVES OF THE REHABILITATION PROJECT

### 1. The immediate objectives

The immediate objectives are:

- (a) To improve management of fisheries by establishing a Fishery Technology and Extension Unit in the Fisheries Section;
- (b) To construct fishing shelters at four locations along the Gaza Strip;
- (c) To establish ways and means to enforce fisheries regulations;
- (d) To provide technical and institutional support to artisanal fishermen;
- (e) To establish a revolving fund to strengthen services rendered by the Cooperative;
- (f) To investigate possibilities for exporting high value fish species;
- (g) To bring the level of the fish catch to the 5,000 tons landed in 1976.

### 2. The longer-term objectives

The longer-term objectives are:

- (a) To increase marine fish production to about 7,500 tons by increasing the number of fishing days at sea for existing craft, through the introduction of modern craft and gear as well as by extending fishing operations to deeper fishing grounds;
- (b) To improve the efficiency of the fleet by upgrading the existing craft and introducing modern craft and gear;
- (c) To enable fishermen to have equitable and permanent access to credit;
- (d) To improve the income and standard of living conditions of fishermen;
- (e) To improve availability of fish for the population;
- (f) To promote exports and reduce imports;
- (g) To develop fish-processing facilities and installations.

## C. PLAN OF ACTION

The main purpose of the Plan of Action is to rehabilitate the fisheries sector of the Gaza Strip which has suffered from the occupation and hostilities during the past 27 years. The major and immediate inputs needed by this integrated project are in the fields of institutional structure, training, fishing, technology, and the provision of modern equipment to be supplied through the existing fishing cooperative. Assistance is required to secure the establishment of a revolving fund as well as the construction of the essential fishing shelters needed to protect the fishing fleet, to increase the number of fishing days per vessel and subsequently to increase the fish catch.

The integrated development needed will be backed by the proposed Fisheries Technology and Extension Unit (FTEU) to be established within the Department of Fisheries. The concept emphasizes improvement of the well-being of the fishing community as well as increased fish production. The Cooperative will be supported by FTEU, which will ensure that sustained transfer of technology through training at the lowest cost takes place efficiently. Another urgent step is the enforcement of updated fisheries regulations by providing a patrol boat and two vehicles and adequate staffing.

FTEU will engage in experimental and exploratory fishing. This Unit will introduce to fishermen, through extension activities and on-the-job training, improved fishing methods and equipment. Emphasis will be put on extending the fishing operations into deeper and more distant grounds, so that fish stocks presently unexploited by Gaza fishermen may be exploited to contribute to an increase in total fish production.

In order to upgrade boat-building, the project will assist the Cooperative in establishing a modern workshop. The proposed project staff, through surveys and consultants, will make recommendations for follow-up activities and projects in such fields as mariculture, a sardine canning factory, and a fish meal factory, and will handle environmental and pollution problems.

For the rehabilitation of the fisheries sector, the Plan of Action should follow the sequence listed below:

1. Establishment of institutional structure capable of implementing the project efficiently, which should be regarded as the most essential factor for any development in this field;
2. Construction of fishing shelters and infrastructure facilities;
3. Establishment of a revolving fund and provision of inputs to fishermen;
4. Developing of local skills and capabilities through training, both practical and theoretical;
5. Follow-up activities to identify areas in which additional assistance is needed.

The following timetable is proposed based on the above-mentioned sequence.



#### IV. PROPOSED PROJECT ACTIVITIES

A. Institution-building of the governmental fishing services	Exp. US\$
1. <u>Establishment of government fisheries service</u>	
<p>Owing to complete lack of government services, this is an essential factor for the implementation of the project. Presently the Director of Fisheries is the only man dealing with this field. Appointment of local staff is considered essential. It is also considered necessary to provide running expenses for the operation of the project during the first two years.</p>	
<u>Personnel required</u>	
(a) One Assistant to the Director;	
(b) Four (4) technical staff to establish the FTEU;	
(c) Four (4) Fishery Inspectors, one for each fishing centre (Gaza, Deir El-Balah, Khan Younis and Rafah);	
(d) Other administrative support personnel.	
Total expenditure	300,000.00
2. <u>Fishing technology and related activities</u>	80,000.00
Recruitment of a qualified Fishing Gear Technologist with experience in Mediterranean fishing conditions and methods for a period of one year to assist in the project:	380,000.00
(a) To prepare, organize and carry out the training course for FTEU and other staff;	
(b) To assist in ordering the following departmental and other equipment necessary for operation of project and for training purposes:	
Twine/netting material	3,000.00
Echo sounder (2)	3,000.00
Net-line haulers (2)	7,000.00
Radio telephones (VHF) (6)	5,000.00
Equipment for experimental fishing	10,000.00
Two vehicles for enforcement of fishery regulations	40,000.00
Miscellaneous	<u>10,000.00</u>
Subtotal	78,000.00
(c) For the expert together with the FTEU staff to carry out experimental and exploratory fishing with gear and methods not known in the area in order to introduce new, more efficient fishing methods such as:	6,000.00



Floating long-lines for sword fish (xiphios gladius) period Jun-Oct.  
Promote the participation of the Gaza fishermen in this well-established fishery in the Eastern Mediterranean, conducted by the other countries of the region in international waters, including on-the-job training and provision of technical assistance (in gear) and advice to equip up to 10 vessels.

Local deep-water long lines. Carry out experimental fishing off the coast at depths varying between 150-300 metres for high-quality fish. On-the-job training of fishermen. Again the expert together with the FTEU will be involved.

(d) To introduce improvements in layout and construction of skiffs (*hasaka*) in order to upgrade this very important small-scale fishery of the area. Experimental fishing and demonstrations are necessary to prove efficiency. 150,000.00

(e) To prepare tenders for the purchase of construction and equipping of a multipurpose vessel of about 12 m overall length to be used both for experimental fishing and fishery patrol purposes. 150,000.00

(f) To assist the Cooperative in ordering suitable equipment and gear needed.

### 3. Training

Training of counterparts and other local personnel including those in cooperatives, will be covered by the following:

(a) Two-month course to be organized and conducted by the Fishing Gear Technologist for the training of FTEU and other personnel. This intensive course will be carried out at Gaza. Trainees will receive both theoretical and practical applications on:

- Fishing terminology-materials
- Design-construction of fishing gear
- Operation of fishing gear
- Deck machinery
- Propulsion-marine engine
- Boat-building
- Marine electronic equipment

As a continuation of this training course the trainees will give courses to fishermen on specialized matters such as echo-sounding radio telephones.

(b) On-the-job training throughout the project.

(c) Provision of four (4) study tours to counterparts in countries where advance technologies exist such as Italy, the United Kingdom, Spain and Tunisia. 16,000.00

Total study tour: 12 months

(d) Provision of one overseas fellowship for 18 months on fisheries management. 30,000.00

4. Follow-up activities 40,000.00

The project staff through six months of consultant services will make recommendations for follow-up activities and will identify areas in fisheries requiring additional assistance.

It is recommended that top priority should be given to a sardine canning factory as is the wish of Gaza fishermen. Otherwise priorities should be as follows:

- Feasibility study for a sardine canning factory
- Cage or land mariculture
- Management
- Further improvement of fishing shelters
- Fish meal factory
- Environment

Total operational activities 780,000.00

**B. UPGRADING OF FISHING COOPERATIVE/ESTABLISHMENT  
OF REVOLVING FUND** 40,000.00

The El-Tawfiq Fishing Cooperative in the Gaza Strip should be upgraded and reorganized establishing offices at Deir El-Balah, Khan Younis and Rafah. For this, the appointment of personnel is necessary. The project will provide the funds to cover such expenditure for the first two years.

Cooperative personnel will be also trained by the project.

The equipment and materials as well as the cash to be supplied by the project to the El-Tawfiq Fishing Cooperative will be for the establishment of the revolving fund system. The equipment and materials as well as loans (for building of boats or purchase of engines or winches should be issued to member fishermen. A 10 per cent profit should be allowed for the Cooperative to cover expenses and rising inflation. Fishermen will reimburse their cooperative in instalments in either cash or kind (catch), thus providing the Cooperative with the necessary funds for further supply of equipment and materials.

The revolving fund will be planned and established with the full cooperation and participation of the fishermen involved as well as other interested institutions.

The project will also provide assistance to the Cooperative to establish a fully equipped workshop with wood electric machinery for repair of vessels and boat-building. 20,000.00

The project will provide the Cooperative with a small lorry equipped with an insulated chamber for the transfer of ice, fish and even fishing equipment. The detailed list of equipment and materials to be ordered by the project for the Cooperative will be prepared in consultation with the expert. 35,000.00

Inputs will be:

Fishing equipment for trawlers	100,000.00
Fishing equipment for purse seiners	100,000.00
Fishing equipment for small crafts	100,000.00
Fishing equipment for the new fishing methods to equip 10 boats	40,000.00
Radio telephones (30 pieces)	18,000.00
Radars (5)	35,000.00
Echo-sounders for deep waters (20 pieces)	30,000.00
Net/line launchers (6)	20,000.00
Miscellaneous	18,000.00

Funds for the issue of loans for construction of vessels, purchase of engines and winches.	1,000,000.00
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It is pointed out that the Revolving Fund can also be operated or even established through an authorized bank or institution.

<b>Total Cooperative/Revolving Fund</b>	<b>1,556,000.00</b>
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### C. CONSTRUCTION OF FISHING SHELTERS

The main setback and constraint preventing development of the fisheries in the Gaza Strip is the lack of ports or protected bays. Although it is well established that the fishery sector is of primary importance and that it should have rich and extensive fishing grounds as well as good and ample manpower, the sector has been completely neglected.

It should be pointed out that the fishermen are operating from open, unprotected sandy beaches under the most trying conditions, employing daily bulldozers and tractors for launching and beaching of even large craft (trawlers and purse seiners) and facing dangers every day, a factor much affecting the life-span of craft and limiting also the number of working days.

The construction of fishing shelters at landing points will allow the introduction of larger and modern craft, expansion of operations to deeper waters, will offer security to the craft of the area, and will increase the number of workdays per boat per year with a consequent increase in fish production. Simple shore installations and facilities, and workshops and stores are also essential.

At Gaza town where the larger number of small craft is concentrated as well as almost all larger vessels (trawlers and purse seiners), a rather larger shelter, i.e. a fishing port, is needed, while smaller fishing shelters at Deir El-Balah, Khan Younis and Rafah will solve the problem.

The prevailing sea currents are causing coastal erosion. The construction of an "Island Fishing Shelter" connected to the land with a stationary jetty built on pillars should be considered in order to prevent problems of beach erosion.

However, it must be pointed out that the needs for a commercial port and a fishing harbour should be separated.

### 1. Gaza town fishing shelter

Construction of a fishing shelter (small fishing port) for berthing about 80 vessels (trawlers and purse seiners) of 15-20 m overall length and about 350 smaller boats of 6-10 m overall length. The minimum depth of water required is 3 m.

#### Main facilities required

Berthing quays  
 Unloading - service quays  
 Auction hall  
 Slipway, 20- m ton capacity  
 Boat yard/workshop  
 250 small stores for fishermen  
 Cold stores 2 x 20-ton capacity

Estimated cost 5,000,000.00

It must be pointed out that facilities such as the slipway and boat yard will be used for maintenance and repair of all large vessels of the area.

### 2. Fishing shelters

Deir El-Balah	1,000,000.00
Khan Younis	1,000,000.00
Rafah	<u>1,000,000.00</u>
	3,000,000.00

Three fishing shelters smaller in size and identical, to be constructed to each above centre, each sheltering about 15 purse seiners of about 13 m overall length and about 100 boats of 6 m overall length. Minimum depth of water requirement is 2 m.

#### Main facilities required

Berthing quays  
 Unloading - service quays  
 Slipway, 4-ton capacity  
 Workshop  
 50 small stores for fishermen  
 Cold stores 5-ton capacity

Total cooperative fishing shelters 8,000,000.00

**D. TOTAL PROJECT EXPENDITURES**

Total expenditure is as follows:

Establishment of government fisheries service	300,000.00
Fishing technology and related activities	394,000.00
Training	46,000.00
Follow-up activities	40,000.00
<b>Total component</b>	<b>780,000.00</b>
Upgrading fishing cooperative and establishment of revolving fund	
<b>Total component</b>	<b>1,556,000.00</b>
Construction of Gaza fishing shelter	5,000,000.00
Construction of fishing shelter at:	
Deir El-Balah	1,000,000.00
Khan Younis	1,000,000.00
Rafah	1,000,000.00
<b>Total component</b>	<b>8,000,000.00</b>
<b>GRAND TOTAL US dollars</b>	<b>10,336,000.00</b>