

General Description of Marine
Small-Scale Fisheries

BANGLADESH

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and

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CONTENTS

	<u>Page No.</u>
1. Country Data	1
2. Introduction	3
3. Brief History	3
4. Fisheries Administration	4
5. Specialized Institutions	5
6. Corporations	7
7. Cooperatives	8
8. Fishery Resources	9
9. Production	10
10. Craft and Gear	10
11. Landing Centres	11
12. Handling and Processing	12
13. Marketing and Distribution	13
14. Export and Import	14
15. Ancillary Industries	15
16. Socio-Economics	15
17. Government Policy	16
18. Development Plans	16
19. Bibliography	18

Appendices

1.1 Map of Bangladesh	19
4.1 Fisheries in the Government Administration	20
8.1 Trawl Catch-Distribution of Fish off the Coast of Bangladesh.	21
9.1 Important commercial marine fish and shrimp species	22
10.1 Fishing craft and gear used in estuarine and coastal fishing	23
12.1 Existing and planned ice making and cold storage facilities in the coastal districts	24
12.2 Fish Processing Facilities	25
16.1 Fishermen and fishing households in the coastal districts (1967/68)	26
18.1 Fisheries Projects in Bangladesh receiving external support	27

Currency

Tk. 1 = \$.065

US\$ 1 = Tk 15.4

1 COUNTRY DATA

1.1	<u>Location</u>	At the northern end of the Bay of Bengal with coastal borders with India in the west and Burma in the south east. Latitudes 20°30' N - 26°45' N Longitudes 88°0' E - 92°56' E (Map in Appendix 1.1)
1.2	<u>Size</u>	Area (km ²): 141,131 Coastline (km): 480 Continental shelf to 200 m (km ²): 60,000
1.3	<u>Population</u> (1974)	Total (million): 76 Density (nos/km ²): 540 Birth rate (%): 4.6 Death rate (%): 1.7 Growth rate (%): 2.9
1.4	<u>Education</u> (1973)	Adult literacy rate (%): 23 Primary school enrolment (%): 56
1.5	<u>Health</u> (1973)	Population per physician 10,000 Population per hospital bed 7,000
1.6	<u>Nutrition</u> (1973)	Calorie intake in % of requirement 54 Per capita-protein intake (gr/day): 40 Per capita animal protein intake (gr/day): 7.5 % of animal protein intake consisting of fish: 87
1.7	<u>Employment</u> (1973)	Labour force (millions): 26 Agriculture (%): 78 Industries + Services (%): 22
1.8	<u>Gross National Product</u> (1972/73 constant prices at factor costs)	Total (million Tk) 55648 Per capita (Tk) Annual rate (1965 - 1973) of growth (real) of GNP per capita 1.6
1.9	<u>Trade</u> (1975/76)	
	Exports (%)	Jute 31 Jute goods 50 Leather 8 Tea 5 Shrimp) Fish and) 3 Froglegs) Others 3
	Imports (%)	Food 31 Investment goods 19 Petroleum 11 Fertilizer 5 Cotton, Cotton textiles etc. 7 Others 27
	Trade Balance (million Tk)	Export (fob) 5540 Import (cif) 18200 Trade balance -12660

1.10 Prices (1975/76) General price index (1969/70 = 100) 380.2

1.11 Administration

Bangladesh is divided into 19 civil Districts, grouped into 4 administrative divisions as follows :-

<u>Divisions</u>	<u>Districts</u>
Rajshahi (north-west)	Dinajpur, Rangpur, Bogra, Rajshahi and Pabna.
Dacca (centre)	Mymensingh, Tangail, Dacca and Faridpur.
Khulna (south-west)	Kushtia, Jessore, <u>Khulna</u> , <u>Barisal</u> and <u>Patuakhali</u> .
Chittagong (east)	Sylhet, Comilla, <u>Noakhali</u> , <u>Chittagong</u> and Chittagong Hill Tracts.

(Coastal districts are underlined).

The districts are divided into Sub-Divisions which are divided into Thanas (Police Stations): each thana consists of Unions which are the smallest administrative units. There are 62 Sub-Divisions in the country, about 450 Thanas, about 4,500 Unions and about 65,000 villages.

2 INTRODUCTION

Nearly all fishing in Bangladesh consists of small-scale fishery activities.

The fisheries sector (inland and marine) contributes about 5% to the national economy. The inland sector is the most important one but marine fisheries are increasing and has a good potential for further expansion.

This paper deals primarily with the small-scale fisheries of the five coastal districts viz: Chittagong, Noakhali, Barisal, Patuakhali and Khulna, including the estuarine fisheries of these districts and of the contiguous sea.

The fisheries of these waters play an important role in providing animal protein. About 95% of the estimated total marine landings of 100,000 tonne of fish per year refers to the efforts of small-scale fishermen. In addition, the rich estuarine fisheries resources are harvested by this category of fishermen. The delta region is regarded as the most fertile fishing ground in the open inland waters of the country but the actual magnitude of the estuarine catch is not known.

The small-scale fishery is an important source of employment. A survey undertaken in 1974/75 identified 149,000 fishing families in which there were 156,000 persons engaged in wholetime fishing and a further 92,000 persons engaged in part-time fishing and ancillary activities.

High value fishery products such as prawns are being exported and yielded about US \$ 10 million in 1976/77.

There are good prospects for an expanded marine small-scale fishing industry and, given additional state support, the coastal fishermen can play a more important role than hitherto in harvesting the untapped marine fisheries resources.

3 BRIEF HISTORY

The history of the fisheries of Bangladesh is not well documented because of the scarcity of statistics and other quantitative information.

Until early mid-sixties, very little effort was made to upgrade the traditional fisheries and to develop the industry.

At that time, the nylon nets were introduced and the motorization of indigenous craft was started, which boosted the marine production. It is estimated that it has doubled since 1962 from about 50,000 tonne to the present 100,000 tonne. Since 1965/66, about 1,200 units of traditional craft have been motorized.

After the creation of Bangladesh (1971) the introduction of new, locally built, coastal fishing boats and of imported larger trawlers has been accelerated.

The export of fishery products was in the mid-sixties an important trade and was the biggest foreign exchange earner after jute. The fish export declined during the subsequent political conflicts and is now negligible. However, the export of frozen prawns (and froglegs) has recently shown a sharp increase.

The development of the Bangladesh fisheries is hampered by unfortunate climatic and topographic conditions. The history is full of small and large tragedies caused by cyclones and floods. In the 1970 disaster, thousands of fishermen were drowned and thousands of boats with equipment were lost and houses and other facilities were damaged or washed away.

4 FISHERIES ADMINISTRATION

Fisheries administration and management in Bangladesh is characterized by multiple control (ref. Appendix 4.1), though the main responsibility rests with the Ministry of Fisheries and Livestock, headed by a Presidential Adviser (comparable to Minister*).

The chief public sector agencies involved in the implementation of fisheries development activities are the Fisheries Department and the Bangladesh Fisheries Development Corporation (BFDC) both of which are under the direct control of the Ministry of Fisheries and Livestock.

Other Government and cooperative agencies directly connected with fisheries development are: (i) the Cooperative Department, (ii) the Integrated Rural Development Programme (IRDP), and (iii) the Revenue Department, all of which form part of Divisions of the Ministry of Local Government, Rural Development, Cooperatives, Land Administration and Land Reform, (iv) Bangladesh Sugar and Food Industries Corporation (BSFIC) of the Ministry of Industries and (v) Bangladesh Jatiya Matshyajibi Samabaya Samity Ltd., (BJMSS), a cooperative organization working under the direct supervision of the Cooperative Department.

For overall planning there is a Fisheries Section in the Planning Commission.

The Fisheries Department was established in 1943. The main functions of the Department are research, extension, training, administration, fishermen's welfare, promotion of fisheries development, legislation, licensing and certification. The major tasks presently executed by the Department relate to inventories of inland fisheries resources, production oriented research and to reclamation of Government derelict ponds and other enclosed water bodies for fish culture. Other important activities are extension work and training of inland fisheries personnel. The Department has a marine fisheries department based in Chittagong.

Taka 212.95 million, with a foreign exchange component of Taka 48.6 million, has been tentatively earmarked for development projects of the Fisheries Department for the period 1972/73 to 1977/78. The annual development programme for 1976/77 provides Taka 68.5 million, of which about 50% will be invested for collecting essential basic information regarding resources and for production oriented research. About 40% of the programme allocation will be invested for reclamation and development of derelict waters for fish production. Out of the total programme provision for 1976/77, Tk.42.32 million will be used for capital expenditure and Tk.26.25 million for revenue expenditure. A separate non-development budget amounts to Tk 12 million.

The department employs 208 officers and 1,224 other staff.

The Bangladesh Fisheries Development Corporation (BFDC) (see chapter 6).

The Cooperative Department is responsible for organizing fishermen into cooperatives and for registration of Cooperative Societies. The apex Cooperative Society (BJMSS) works under the direct supervision of the Cooperative Department and will be dealt with in Chapter 7. The Cooperative Department is also responsible for organizing and registering all other cooperatives, including agriculture cooperatives and weavers' cooperatives. The Local Government, Rural Development and Cooperative Division itself has launched a fish culture scheme in the rural areas through a "Works Programme".

The Revenue Department controls all waters not privately owned and leases, generally on a short term basis, exclusive exploitation rights of unit areas by auction. In recent times, this Department has also been involved in fish culture in Government owned ponds in technical and organizational cooperation with the Fisheries Department, and the Local Government, Rural Development and Cooperative Division.

The Bangladesh Sugar and Food Industries Corporation (BSFIC) owns and operates fish processing plants and exports fish, shrimps and froglegs.

* Fisheries and Livestock was until late 1977 a Division of the Ministry of Agriculture.

5 SPECIALIZED INSTITUTIONS

5.1 Research and Development Institutes.

5.1.1 Marine Biological Laboratory

The establishment of a Marine Biological Laboratory of the Fisheries Department was started in 1968, but not yet completed; it is located at Cox's Bazaar. At present (1977) there is only one biologist posted at the laboratory. The laboratory has a 22 m research vessel, currently under repair of damages incurred during the war of liberation (1971).

5.1.2 Fisheries Technological Research Station (FTRS).

Established in 1947, and originally located at Comilla, the FTRS of the Fisheries Department was shifted to its present position at Chandpur as part of the Fisheries Campus in the years 1960 to 1965. Since its inception, improvement of facilities and strengthening of manpower have been approved by the Government on several occasions. The expenditure of the research station is met from the non-development budget of the Department.

Initially, the station engaged itself in devising processes for refinement of shark liver oil for medicinal use, manufacture of fishmeal for poultry feed, use of fish manures for soil fertilization, preparation of adhesive gum from fish scales and manufacture of printers' ink from fish oil on a semi-commercial basis. Subsequently, with the establishment of BFDC in 1965, the responsibility for production of processed fish and fish products was taken up by the corporation leaving FTRS with research functions only.

FTRS has a cadre of 16 professional officers and other supporting staff; 6 posts are vacant (1977).

It has five Divisions, viz: (i) Fish handling, Processing and Bacteriology, (ii) Oil, (iii) Biochemics and Nutrition, (iv) Fish by-products and (v) Gear and Craft. Current activities relate to preservation of Hilsa by means of ice, improvement of sun-drying methods by salting, study of the seasonal variation of Hilsa in respect of fat, protein, ash and moisture content and studies of shark-liver oil emulsion.

The performance of the station is not entirely satisfactory. The Government is making efforts to improve the activities of FTRS by appointing more qualified and experienced personnel creating better job opportunities and making available necessary equipment and expertise. UNDP has indicated an offer of technical assistance to the Research Station.

5.1.3 Fresh Water Fisheries Research Station (FFRS).

A scheme for establishment of FTRS at Chandpur was approved by the Government in 1961/62, with the objective to study various aspects of fish farming. The scheme was revised one year later to include an investigation of the biology of Hilsa.

This was in operation for five years and in 1966/67 a scheme for expansion of FFRS, at an estimated cost of Tk. 2.96 million, was sanctioned by the Government with the following objectives :-

- (a) Hydrographic mapping of open waters, (b) Mapping of fishing grounds and banks for commercially important fish species,
- (c) Estimation of size and composition of available stocks of different species, (d) Study of the dynamics of the fish populations, (e) Study of the behaviour, movement, migration, etc., of the population, (f) Estimation of rates of recruitment, mortality etc., and other population characteristics with a view to achieve maximum equilibrium yield from the fisheries of the country.

The station has 37 experimental ponds covering a total area of 10.5 ha and 35 cisterns. The ponds depend solely on rain for water supply. A 21 m steel-hulled research vessel donated by DANIDA has been available since 1975 for conducting riverine research but has not been used as yet.

The staff of FFRS consists of 29 professionals and 150 supporting staff.

The expenditure of FFRS is met from the non-development budget of the Fisheries Department.

5.2 Training Institutes.

5.2.1 Marine Fisheries Training Centre (MFTC).

With a view to create a cadre of qualified skippers, marine engineers and other crew for operation of existing and planned trawlers for exploitation of the marine fisheries resources, the BFDC established a training centre at Chittagong Fish Harbour with USSR assistance in 1973/74, at a cost of Tk. 13.81 million with a foreign exchange component of Tk. 4.9 million.

The objectives of the Centre are to impart training in the following fields:

(a) Navigation, (b) Marine Engineering, (c) Electrical Engineering, (d) Refrigeration Engineering, (e) Radio Engineering and Operation, (f) Trawl Operation and Care, (g) Fish Processing and, (h) Boatswain Duties.

In 1973/74, short courses of one year or less were conducted for pre-qualified in-service personnel and 11 navigators, 13 marine engineers, 6 radio specialists, 6 fish processing technicians, 3 trawl operators, 8 refrigeration technicians and 4 boatswains were trained; they are now working on board trawlers. During the period 1974/75 to 1975/76, 37 cadets for training in navigation, 43 in marine engineering, 11 in refrigeration engineering, 11 in electrical engineering, 19 in fish processing and 15 in trawl operation were recruited. 27 cadets have been trained in the USSR.

The duration of the course for navigation and marine engineering is 2½ years, while that of other disciplines is 1 year.

Eight instructors and eight interpreters from the USSR worked in the Fisheries Training Centre from 1973 to 1976. Since no local counterparts could be trained in the required fields, the repatriation of these instructors has created a vacuum in the training programme. Attempts are being made to recruit instructors within the country.

5.2.2 Vocational Training Centres (VTC).

Four vocational training centres were established in 1961/62 by the Fisheries Department at Sirajganj (Pubna) Kuliarchar (Mymensingh), Chandpur (Comilla) and Kashipur (Barisal). Their purpose was to provide selected fishermen with on-the-job training in operation and maintenance of mechanized craft, use of modern fishing gear, use of sonic devices for fish detection and location, fish behaviour, modern methods of handling and preservation of fish, etc. It was expected that BFDC, BJMSS and private fishing enterprises would employ the trained personnel. To date, about 800 persons have been trained.

The recurrent expenditure for these centres is Tk. 60,000 which is met from the regular budget of the Department. Present staff consists of 4 professional officers and 15 supporting staff.

5.2.3 Inland Fisheries Training Centre (IFTC).

The IFTC was established in 1960/61 and was originally located in Dacca but later shifted to the Chandpur Fishery Campus. It was established with the objective of imparting pre-service training to under-graduate and graduate students with a view to appoint them to suitable posts in the Fisheries Department. With the establishment of a Fisheries Faculty at the Bangladesh Agricultural University, Mymensingh, the graduate training programme was discontinued in 1967. IFTC now conducts an in-service training programme which provides refresher courses to officers of the Fisheries Department to enable them to extend fish culture techniques and to follow the development of fisheries management and administration.

IFTC has 10 professional posts (5 vacant) and 25 supporting staff.

The scheme is being revised to make the training more practically oriented and to suit the present and future needs of the country. FAO/NORAD has provided technical assistance in support of the centre. Since August 1976, a programme to expand the training of extension workers in the fields of fresh water fisheries and marine fisheries has been formulated.

5.3 Educational Institutions.

Three Universities cater for fisheries education at degree level. These are: University of Dacca, University of Chittagong and the Bangladesh Agricultural University, Mymensingh.

The Department of Zoology, Dacca University, offers a Master's Degree in Zoology with specialization in several subjects, one of which is fisheries.

The Department of Marine Biology, University of Chittagong has been recently instituted and is providing graduate level education and training in various aspects of marine fisheries, such as shrimp biology and culture, fish taxonomy and marine ecology.

The Bangladesh Agricultural University, Mymensingh, has a full-fledged Faculty of Fisheries which was instituted in 1967/68. The faculty has three Departments: (a) Fisheries Biology and Limnology, (b) Aquaculture and Management and (c) Fisheries Technology and offers B.Sc. (Hons) and M.Sc. Degrees in fisheries. It has currently an enrolment of about 300 students. To date (1976) 40 students have been graduated. The faculty does not have sufficient accommodation for class room and laboratory use but a new faculty building is under construction. Several ponds of various shapes and sizes are at the disposal of the faculty and an elaborate experimental pond complex is planned within the university campus under a project of the Fisheries Department. (Assistance may be available from DANIDA and UNDP for implementation of the project).

6 CORPORATIONS

The Bangladesh Fisheries Development Corporation (BFDC) was established in June 1964. In terms of the most recent Act (1973), the functions of the Corporation are: (a) To take measures for the development of fisheries and the fishing industry; (b) To establish units for capture of fish and promote a better organization for exploitation of fish wealth; (c) To establish fishing industries; (d) To acquire, hold or dispose of fishing boats, fish carriers, road river transports and all equipment and accessories necessary in connection with development of the fishing industry; (e) To establish units for preservation, processing, distribution and marketing of fish and fish-products; (f) To advance loans to fishing industries and to fishermen's cooperative societies; (g) To encourage establishment of fishermen's cooperative societies; (h) To undertake survey and investigation of fish resources; (i) To establish institutes or make arrangements for training and research in the methods of catching, processing, transport, preservation and marketing of fish; (j) To set up organization for export of fish and fish-products.

BFDC operates a fishery harbour at Chittagong constructed by assistance from Japan, at a total cost of about Tk. 48 million; the construction was completed in 1971. The harbour has a basin area of 2.5 ha, a wharf of 65 m, a slipway for 33m (250 tonne) vessels, auction hall, workshop, ice plant, cold storage and processing facilities. The harbour campus also accommodates training facilities (MFTC) and a boat building yard. Heavy siltation of the harbour basin and its mouth are causing serious and continuous problems.

BFDC has a fleet of 14 large trawlers which landed merely about 1,000 tonnes in 1975/76.

BFDC has distributed 225 outboard engines and 33 inboard engines to small-scale fishermen to encourage mechanization of country fishing craft. The Corporation intends to procure and distribute about 500 mechanized boats with inboard engines (14.5 hp) to small-scale fishermen on hire purchase or cash payment basis (DANIDA scheme) by 1977/78.

BFDC has established 3 wholesale fish markets - one at Cox's Bazaar, one at Khulna and one at Dacca. Fish is also marketed wholesale at Chittagong Fish Harbour. Nine temporary retail shops, 7 at Chittagong and 2 at Khulna, are in operation on a trial basis, for sale of frozen marine fish. Under an on-going marketing and distribution scheme the Corporation intends to establish landing facilities, ice plants and cold storages in Galachipa (Patuakhali) and Hatiya (Chittagong). In order to provide marketing facilities for the Sunderban estuarine area a refrigeration complex is under construction at Mongla.

BFDC has at present 4 insulated trucks and 1 refrigerated van for transport of marine fish landed at Chittagong and Khulna. These vehicles are also used for carrying freshwater fish landed elsewhere.

BFDC sometimes uses its trawlers for carrying fish to Dacca. The corporation plans to import 2 carrier vessels and 4 vans through an Asian Development Bank Loan.

A small fish processing complex with facilities for manufacturing of fishmeal, extraction of shark liver oil and fish drying has been in operation at Cox's Bazaar since 1966/67.

There is a workshop for servicing and repairing outboard engines at Cox's Bazaar.

BFDC has a net factory at Comilla.

The annual development budget for BFDC (1976/77) is Tk. 91.42 million with a foreign exchange component of Tk. 31.5 million. Of this amount, Tk. 73.27 million has been earmarked for capital expenditure and the balance for revenue expenditure. The Corporation has a non-development budget of Tk. 13.32 million.

The Government has recently formed a Committee to look into the operations of the Corporation to suggest ways and means to improve its efficiency.

7 COOPERATIVES

Records show that there were about 120 fishermen's cooperatives in Bangladesh at the partition in 1947. Cooperative societies remained largely neglected and uncared for until 1960. In that year an effort was made to organize them into meaningful and functional cooperatives by the establishment of an apex Cooperative organization - the Provincial Fishermen's Cooperative Society, now known as Bangladesh Jatiya Matshyajibi Samabaya Samity (BJMSS).

The objectives of BJMSS are (i) to improve socio-economic conditions of fishermen and encourage thrift, self-help and mutual cooperation; (ii) to procure and supply fishing inputs to the fishermen at reasonable prices; (iii) to issue loans to the affiliated societies for financing their members; (iv) to introduce innovations and mechanized techniques in fishing; (v) to set-up ice plants, cold storages, workshops, net making machines; (vi) to arrange marketing of fish and set up fish processing units for exporting fish and fish products.

The cooperatives are organized in terms of the traditional three tier pyramidal structure - primary, central and apex. There is one national society (apex), 80 central societies and 3885 primary societies. The total individual membership of the primary societies stands at 376,879.

BJMSS employs a staff of 200 persons at a monthly cost of Tk. 90,000 on salaries, excluding provident fund and other facilities. The staff consists of executive and administrative officers, accountants, supervisors, engineers, mechanics and supporting staff.

The supply and service programme forms the major function of the apex society. BJMSS imports fishing materials for their members, exempt from all taxes and duties. It has imported nylon rope, marine diesel engines, floats, etc., worth Tk. 50 million since 1972.

BJMSS has imported 1604 marine engines for motorization of boats and has installed several ice plants freezing plants and cold storages at landing centres in the coastal area. It has also established workshop facilities, a net making factory, a ferro-cement boatyard and wholesale marketing facilities in the coastal districts.

Other activities besides fishing are processing at one centre (Chittagong) and export of frozen fish, shrimp and froglegs. Exports of shrimps by the National Society were worth Tk. 12.5 million in 1976/77.

The regular source of finance for BJMSS consists of share capital and savings. The share capital and savings contributed from 1960/61 to 1970/71 by the various tiers is as follows :-

Table 7.1 Share Capital and Savings of BJMSS.

<u>Societies</u>	<u>Share capital</u> (Million Tk.)	<u>Savings</u> (Million Tk.)
A. Primary	2.92	1.86
B. Central	0.36	0.15
C. Apex	0.47	1.73

BJMSS obtains loans from the Government and from the Bangladesh Bank on 100% Guarantee by the Government. A total amount of Tk. 31.41 million was received to cover losses in the period 1961/62 to 1975/76.

A "Depth Scheme for Development of Fishermen Cooperatives" has been sanctioned recently. The total cost is estimated at Tk.90 million. The scheme envisages the establishment of 9 ice plants, one freezing plant, the issue of 425 mechanized boats, 750 country boats and 30 carriers. Furthermore, a net making factory, a workshop and training and transport facilities will be included in the scheme.

8 FISHERY RESOURCES

The total area of the inland and estuarine waters of Bangladesh is about 60,000 km², of which about 43,000 km² have potential for fish production.

The Continental shelf area is about 60,000 km² of which 37,000 km² is no deeper than 50 m.

The estuaries as well as the continental shelf area are rich in fish, shell-fish and other aquatic organisms. Several surveys have been conducted to estimate the resource potential of the Bay of Bengal. The most comprehensive of these was the UNSF/PAK - 22 Project conducted by Bangladesh Fisheries Development Corporation in collaboration with FAO. The survey covered about 26,000 km², mostly north of latitude 20° 40'N.

As a result of this survey three major fishing grounds, "South Patches" 6,200 km², "Middle Ground" 4,600 km² and "Swath of No Ground" 3,800 km² were charted (Appendix 8.1). According to this survey, a minimum sustainable yield of 57,000 tonne of fish per year is available for exploitation. This would be in addition to the present landings of marine fish of about 100,000 tonne per annum. The estimate has been made without taking into consideration potential catch of shrimps and pelagic fish.

From results of various surveys it has been estimated that the standing stock of shrimps is about 9,000 tonne.

There is a largely untapped resource of pelagic fish in the Bay of Bengal. Some estimates indicate a potential of the order of 200,000 tonne but no proper assessments have been made.

Seasonal, climatic and oceanographic variations are determined by the monsoon periods which largely influence the present fisheries. The peak season is during the fair weather period i.e. from November to March. During the rest of the year, there is practically no fishing activity in the open sea and the availability of fish is largely unknown.