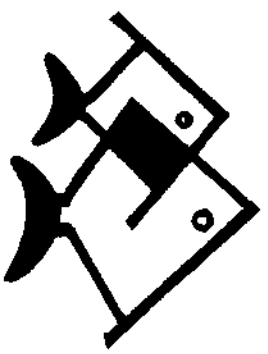
INDIAN FISHERIES

1947 – 1977



ISSUED ON THE OCCASION OF THE FIFTH SESSION OF
THE INDIAN OCEAN FISHERY COMMISSION HELD AT COCHIN FROM
19TH TO 26TH OCTOBER, 1977

12

thirty years of progress and a challenging future

In the preceding pages an attempt is made to trace the progress, and to summarise and assess the present knowledge of the fish and fisheries of India, and the status of its industry by assembling the various components into a more unified whole. In the light of this background information, it is apparent that the Indian fisheries during the last three decades has registered an inpressive progress, though it cannot be over-emphasised. Beginning with the establishment of specialised fisheries research and other institutes, and the implementation of the development programmes formulated particularly under the National Plans, it progressed through the discovery of the commercial fishing grounds in the inshore waters, modernisation of fishing crafts and gears, improvement of fishing and processing techniques, better transportation and marketing systems. The period also witnessed the birth and growth of a modern fishing industry in the country. Above all these, it has been made possible to create a consciousness across the country, about the potentials of the fisheries, its significant role to supplementing the food requirements of the growing population and its vast scope for future development.

The overall policy of the fisheries development of the country is one of promoting growth with stability. The formulation of policies and priorities is closely related to the broad objectives of the country's development programmes. The main objectives of fisheries research and development are to collect all information relating to fishery resources and factors influencing their fluctuations in abundance and sustainability, to step up the production to maximum possible extent through capture and culture means; to monitor and recommend measures for rational exploitation of the various resources; to improve the socio-economic conditions of fishermen and to tap on an increasing scale the vast potential for foreign exchange earnings

through export of selected varieties. While formulating the programmes the main thrust is given for rural development.

Through the marine fisheries research programmes, valuable data on the fishery resources, their characteristic and dynamics as well as their environment in the inshore waters have been gathered. Intensive researches are being under taken to assess the resources in the contiguous offshore/deep-sea regions covering the extended fisheries jurisdiction of 200 miles economic zone and for their rational exploitation and conservation. The strategy of the development of marine fisheries sector is on the improvement of traditional, coastal mechanised and deep-sea fisheries. The development of traditional fishery is envisaged through improvement of designs, material and operational aspect of fishing units, fish handling, distribution and marketing and economic betterment of the fishermen community. The coastal mechanised fishery is to be further developed by introducing additional mechanised boats, by increasing their operational efficiency and reducing the operational costs, and diversification of fishing. Greater emphasis in the marine fisheries sector of the country in recent years is towards integrated development of deep-sea fishery involving fishing, processing, and marketing as well as establishment of infrastructural facilities. While there is little doubt regarding the existence or availability of resources in the seas around India and the adjacent Indian Ocean, the progress of this sector has been slow due to the limited data on economic viability of the enterprise on commercial proposition, inadequate larger fishing vessels and equipments, and expertise. However, the vessel acquisition programmes through import and indigenous construction, encouragement for joint collaboration with suitable agencies having resource and expertise, and greater awareness for the development of the sector will help to accelerate the progress of deep-sea fisheries of the country in the coming years. Besides, India with its advantageous geographical position in the Indian Ocean has bright prospects for the development of the oceanic and distant water fisheries. These opportunities together with the declaration of an exclusive economic zone of 200 miles, to explore, exploit, manage and conserve the living resources of our seas, offer a challenging future to the coastal rural population, scientists, planners, administrators and industrialists engaged in the promotion of the marine fisheries of the country.

In addition to the conventional fishery resources available for exploitation in the shelf waters,there are several non-conventional pelagic and demersal fishery resources. Important resources among them are the cuttlefishes and squids, myctophids, crabs, deepsea gastropods and echinoids and several other deepsea fishes and crustaceans. In the oceanic waters outside the continental shelf, exploitable fishery resources comprise of tunas and related species, bill fishes, pelagic sharks, oceanic squids, marine turtles and whales. These resources are at present not exploited by our country. An overall programme at the exploitation and utilisation of such resources should considerably help in the diversification of fishing and a more balanced development of the fishing industry.

Oceanic research has at present diversified into several fields and spectacular advances have been made in the field of oceanography, marine electronics, instrumentation, system designs, ships and structures, marine transportation, ocean engineering, and ocean mining. Ocean resources development programmes are becoming more significant in the national programmes of many of the affluent countries. However, in view of the huge investment required for the implementation of these programmes many of the developing countries may find it difficult to participate in these programmes on their own. Nevertheless, international co-operation and joint collaboration in the field of mutual interest would greatly benefit the participating countries.

We are developing a technology of large scale culture of selected commercial species such as marine prawns, fishes, mussels, oysters and seaweeds, and production of cultured pearls. Increased attention now given to coastal aquaculture (mariculture and brackish water fish culture) both in research and pilot projects would pave the way for an organised industry for culture fisheries of the cultiviable organisms,utilising the suitable coastal waters. Endeavours to tie up these programmes with the normal activities of the small fishermen (the concept of blending sea-brackishwater farming with the traditional capture fisheries) will have a major impact in rural development and economy.

The inland fisheries research programmes particularly relating to culture of freshwater fishes and composite fish culture have made considerable advancement and have laid the foundation for the establishment

of an extensive and intensive culture fisheries in the vast inland water ecosystems. In this context, self-sufficiency in fish seed has assumed urgency and region-wise massive efforts will have to be put in. Researches and developmental programmes towards wide application of induced breeding techniques, establishment of modern hatcheries and seed banks, increased production of fish from reservoirs and lakes, conversion of small farms into viable larger units, intensive cultivation employing composite fish culture techniques and successful implementation of Fish Farmers Development Agencies will not only enhance inland fish production but also provide gainful employment to large number of fisherman and fish farmers.

Increased exploitation and utilisation of the marine as well as inland fisheries of the country largely depend on the progress of fisheries technology evolving improved and new methods of capture, preservation and marketing. Continued efforts are being made to developing efficient fishing crafts and gears, catching and processing techniques, developing new products and to promoting profitable marketing. Similarly, a considerable amount of industrial wastes resulting from the processing of prawns and other organisms available now could be processed further for the production of useful bye-products.

There are several species of marine animals and plants which have pharmaceutical use. These are not commercially exploited at present. As the demand for these are likely to grow in the future, it is necessary to initiate researches on these organisms and develop suitable technology for their utilisation.

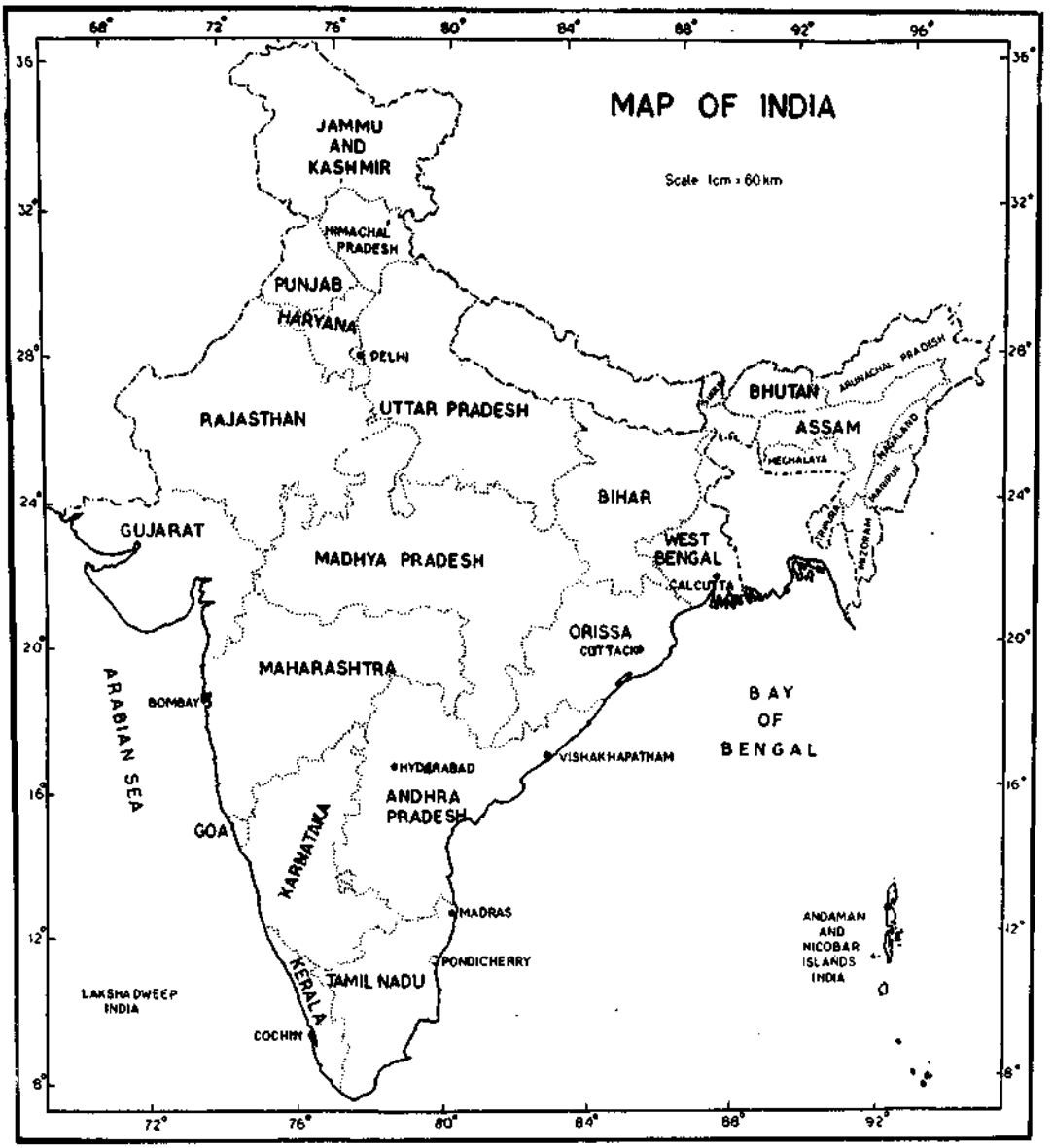
Availability of trained manpower forms an essential prerequisite for an organised development of any sector. In fisheries, necessary infrastructural facilities for education and training of various categories of essential and industry-specific personal have been established. Future planning should take into account training in management techniques at various levels, which is wanting in the present system. Increased involvement and interest of the Governments and ICAR in recent years on fisheries education and training would further strengthen the base and promote its expansion to meet the requirements of trained manpower. Simultaneously efforts are being made to transfer the technology developed in the laboratories to the field through intensive training of the actual and prospective fishermen/fish farmers and extensive extension service.

With the increasing pace of urbanisation and industrialisation of the country, pollution of the sea, and inland waters by industrial and other wastes has a hazard to local fisheries in many areas. The Central Government has passed a Water Pollution Bill in 1974 and most of the States are also having statutory regulations including Pollution Control Boards to enforce the law. However, our responsibility towards prevention of pollution and protection of our resources has considerably increased. In this context, active research on pollution problems and continuous monitoring have become imperative.

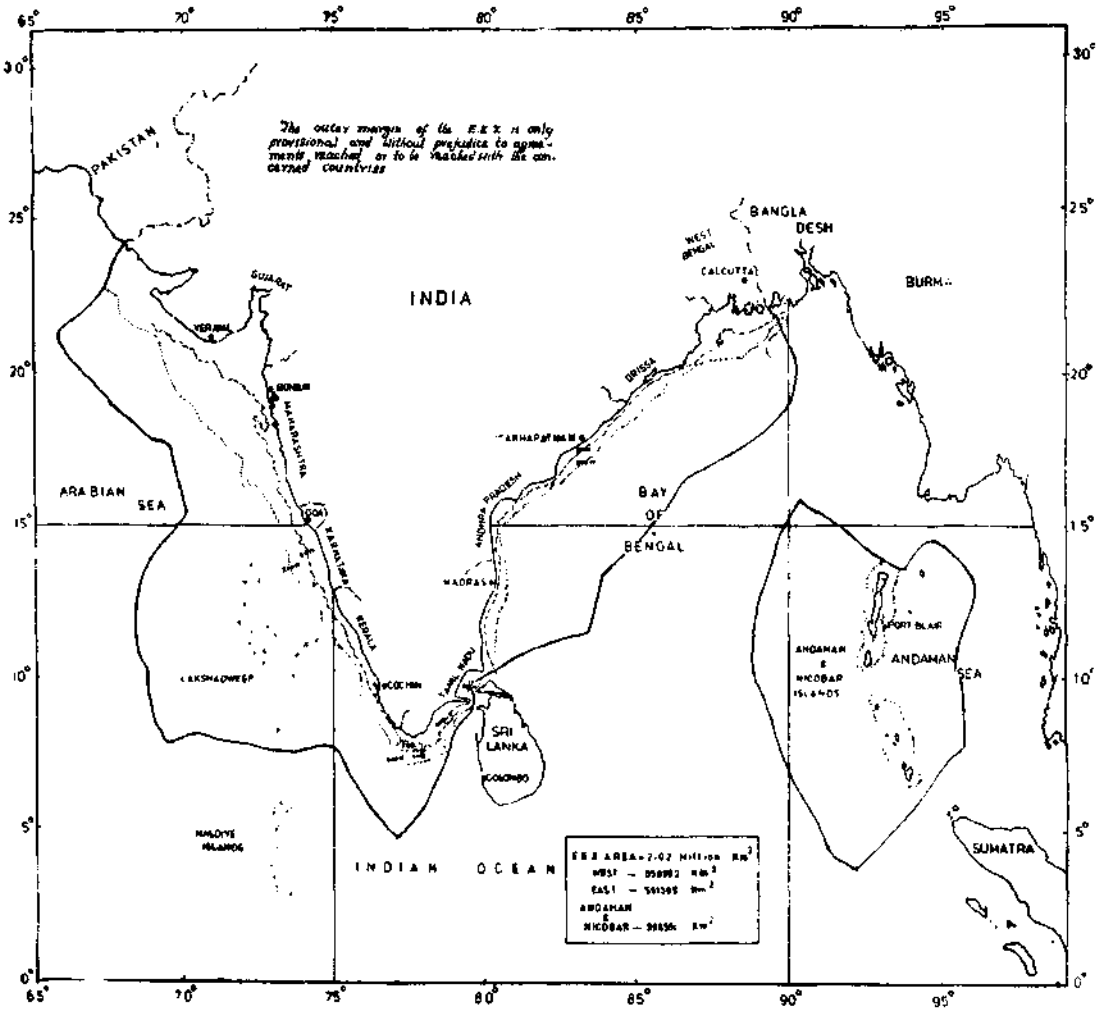
It is well known that the fishing industry of India since its inception in the early post-war period, has registered a phenomenal growth through the years. However, this pace of growth has been partial. Although the efforts and contributions of the industry towards the development and progress of the fisheries of the country are quite appreciable, its heavy dependence on the export trade has camouflaged the coherent growth of the various other sectors, particularly the domestic front. While the export sector should continue to receive due promotion and many of its problems require immediate attention, it is essential that concerted efforts are made to develop an equally strong domestic base so as to ensure an allround sustained growth of the industry.

Management and conservation of the fishery resources of the country is at present based and guided by the Indian Fisheries Act which was enacted as early as 1897, and the subsequent rules and regulations framed by the various State Governments under this Act. However, the development that have taken place in the fisheries since that time and the importance it has assumed in the national economy make it imperative to bring the various sectors of fisheries under a comprehensive Act which provides the necessary guidelines for the exploitation, mangement, conservation and optimum utilisation of not only the fishery resources, but all the living aquatic resource.

APPENDIX 1


MAP OF INDIA
Scale 1cm = 60 km
JAMMU AND KASHMIR
HIMACHAL PRADESH
PUNJAB
HARYANA
DELHI
RAJASTHAN
UTTAR PRADESH
BHUTAN
ARUNACHAL PRADESH
ASSAM
NAGALAND
MEGHALAYA
MANIPUR
TRIPURA
MIZORAM
BIHAR
GUJARAT
MADHYA PRADESH
WEST BENGAL
CALCUTTA
ORISSA
CUTTACK
MAHARASHTRA
BOMBAY
ARABIAN SEA
BAY OF BENGAL
HYDERABAD
VISHAKHAPATNAM
ANDHRA PRADESH
GOA
KARNATAKA
MADRAS
PONDICHERRY
TAMIL NADU
KERALA
COCHIN
LAKSHADWEEP INDIA
ANDAMAN AND NICOBAR ISLANDS INDIA
36°
32°
28°
24°
20°
16°
12°
8°
68°
72°
76°
80°
84°
88°
92°
96°

APPENDIX 2



Map of India showing the economic zone

APPENDIX 3

INDIA : COUNTRY DATA

1. Location

India extends between Latitudes 8°4′ and 37°6′ north and longitudes 68°7′ and 97°25′ east; adjoined in the north by China, Nepal and Bhutan; in the east by Burma and Bangladesh; in the north-west, Afghanisthan and Pakistan border on India. South of the Tropic of Cancer, the country tapers off into the Indian Ocean between the Arabian Sea on the west, and Bay of Bengal on the east. The Gulf of Mannar and the Palk Strait separate India from Sri Lanka. The Andaman and Nicobar Islands in the Bay of Bengal and Lakshadweep in the Arabian Sea are parts of the territory of India (Map in Appendix 1).

2. Area

Area:	32,87,782 km² (Provisional as on 1st July, 1971).
Coastline:	6,100 km
Continental shelf area (200m):	4,14,868 km²

3. Population

1971 (census)		
Total:		548 million
Urban:		20%
Rural:		80%
1975 (Estimated)		
Population:		597 million
Birth rate (1961–70):		41.1 per thousand
Death rate (1961–70):		18.9 per thousand
Growth rate (Decennial 1961–71):		24.80%
Density of population:		177 per km² (worked after excluding figures of Jammu & Kashmir)
Life expectancy (1961–70):	Males	47.1 years
	Females	45.6 years

4. Education

Literacy rate:	Total	29.45%
	Males	39.45%
	Females	18.69%

4.1 Enrolment at different levels of education (1973-74)

Level	Age group	Percentage of enrolment of the total population in the age group
Primary school (Classes I -V)	6-11	83.5
Middle School (Classes VI-VII)	11-14	35.6
Secondary School (Classes VIII and above)	14-17	21.2
Universities and Colleges	17-23	5.0

5. Health (1973-74)

Population per hospital bed:	2,000
Population per doctor:	4,200

6. Nutrition (1970-71)

Calorie intake in % of requirement: 77.8
Per Capita protein intake: 40-52 gm/day

7. Employement by different categories (1971)

Category	Total (in million)	Percentage of total workrers
(i) Cultivators	78.1	43.3
(ii) Agriculture labourers	47.5	26.3
(iii) Live stock, forestry, fishing, etc.	4.4	2.4
(iv) Mining, Manufacturing and Construction	20.2	11.2
(v) Trade, Commerce, Transport and Communication	14.4	8.0
(vi) Other services	15.8	8.8
Total workers	180.4	100

8. Gross and Net National Product at factor cost

(1973-74 estimates)

Total GNP (Rs. in million)	521,930
Index number of GNP with 1960–61 as base (Rs.)	372.7
Net National Product (Rs. in million)	492,900
Per capita NNP(Rs.)	849.8
Index number of NNP with 1960 as base (Rs.)	371.5
Index number of per capita NNP with 1960–61 as base (Rs.)	278.0

9. Trade

9.1 Exports of Principal commodities (1973-74)

Commodity	Percentage in total export
Cotton manufactures	9.5
Jute manufactures	9.1
Leather	6.7
Tea	5.8
Iron ore and concentration	5.3
Marine Products	4.6
Fresh fruits and meats	3.2
Tobacco unmanufactured	2.7
Iron & Steel	2.3
Crude vegetable material	2.3
Other commodities	49.5

9.2 Imports of principal commodities (1973-74)

Commodity	Percentage in total imports
Petroleum, crude & partly refined	14.8
Machinery other than electric	14.2
Wheat unmilled	11.8
Iron & Steel	9.2
Petroleum products	4.9
Electric machinery and appliances	4.2
Chemicals	3.6
Transport equipment	3.0
Raw cotton	1.7
Vegetable oils	1.9
Other commodities	30.7

9.3 Balance of Trade 1973 - 1976

in million Rs.

	1972–73	1973–74	1974–75
Imports (cif)	18,674	29,252	43,486
Exports (fob)	19,708	25,234	32,530
Balance	–1,034	–4,018	–10,956

10. Prices

10.1 Consumer price index numbers of food items* for agricultural labourers (Base 1960-61=100)

	1971–72	1972–73	1973–74	1974–75	1976 Sept.
Index	215	246	313	413	316
Annual change%	14	27	32	–23	

10.2 Annual average indices of wholesale prices of fish, food articles and all commodities(Base 1960-61=100)

Year	Fish	Food articles	All commodities
1971	343.4	207.0	186.1
1972	454.5	230.6	200.7
1973	654.0	278.9	239.3
1974	999.8	351.8	304.6
1975	1176.1	360.8	309.2

Source: Economic Adviser, Ministry of Industrial Development.

11. Union and the States

India, an Union of States, is a Sovereign Socialist Secular Democratic Republic with a parliamentary system. It is administratively divided into 22 States and 9 Union Territories as follows:

Maritime States

West coast	East coast
Gujarat	West Bengal
Maharashtra	Orissa
Karnataka	Andhra Pradesh
Kerala	Tamil Nadu

Maritime Union Territories

Goa, Daman, Diu	Andaman and Nicobar
Lakshadweep	Pondicherry

*Expenditure of rural population exists for about 80% on food items.

Inland States

Assam
Bihar
Haryana
Himachal Pradesh
Jammu and Kashmir
Madhya Pradesh
Manipur
Meghalaya
Nagaland
Punjab
Rajasthan
Sikkim
Tripura
Uttar Pradesh

Inland Union Territories

Arunachal Pradesh
Chandigargh
Dadra and Nagar Haveli
Delhi
Mizoram

APPENDIX 4

PRESENTATION OF THE FISHERIES IN DIFFERENT STATES OF INDIA

Certain basic information on fisheries of each of the States of India is given below. The information is not exhaustive. The data are collected from the information available at C.M.F.R.I., State Reports, and Statistical supplement issued during the 10th meeting of the Central Board of Fisheries, 22-23 March 1976 held at New Delhi, by the Department of Agriculture, Ministry of Agriculture and Irrigation. The data may show variation due to continuous development taking place in different sectors of fisheries.

Abbreviations used:

- Cl – Coastline in kilometers.
- Csa – Continental shelf area in sq. kilometres.
- Flc – Fish landing centres in number.
- Fv – Fishing villages in number
- Fp – Fishermen population in numbers (Active fishermen in numbers).
- Fcs – Fishermen Co-operative Societies in numbers
- Ifc – Indigenous fishing carfts in numbers.
- Mb – Mechanised boats in numbers.
- Mfp – Marine Fish production in tonnes.
- Fw – Fresh water area in million hactares.
- Ba – Brackish water area in million hactares.
- Sp – Spawn production numbers in Million.
- Ffp – Fry and fingerlings production numbers in million.
- Ifp – Inland fish production in tonnes.
- Fpo – Fifth Plan outlay in million Rupees.
- Frp – Freezing plant in numbers (capacity).
- Cp – Canning plant in numbers (capacity).
- Icp – Ice making plant in numbers (capacity).
- Cs – Cold storage in numbers (capacity).

ANDHRA PRADESH

Cl-982; Csa-39,109; Flc-229; Fv-419; Fp-136,893 (47,700); Fcs - 662; Ifc - 19,772; Mb - 586; Mfp-1,31,035; Fw - 0.3772; Ba - 0.5665; Sp - 47.00 Ffp - 46.00 Ifp - 1,00,000; Fpo - 39.50; Frp - 9 (33.00); Cp - 1 (0.25); Icp-12 (92.75); Cs - 11 (731.00).

ASSAM

Fcs - 375 ; Fw - 19.07; Sp - 185.00; Ffp - 47.00; Ifp - 42,000; Fpo - 20.00.

BIHAR

Fcs - 258; Fw - 0.4855; Sp - 280.800; Ffp - 57.50; Ifp - 68,000; Fpo - 25.00.

GUJARAT

Cl - 1663; Csa - 1,20,000; Flc - 139; Fv - 133; Fp - 82,242 (11,732); Fcs - 57; Ifc - 3,179; Mb - 3,364; Mfp-1,71,294; Fw - 0.3310; Ba 0.4189; Sp - 154.00; Ffp - 41.00; Ifp - 10,000; Fpo - 70.00; Frp - 3 (23.00); Cs - 11 (1,110).

HARYANA

Fcs - Nil; Fw - 0.3800; Sp - 3.65; Ffp - 0.70; Ifp - 1,250; Fpo - 7.50.

JAMMU & KASHMIR

Fcs - 1; Fw - 0.0894; Ifp - 7,000; Fpo - 4.0.

KERALA

Cl-560; Csa-38,673; Flc-272; Fv-249; Fp-3,33,822 (74,241); Fcs - 1,026; Ifc 20,667; Mb - 2,322; Mfp - 3,31,047; Fw - 0.0948; Ba - 0.3399; Sp - 6.00; Ffp -3.00; Ifp; -24,000; Fpo - 175.90; Frp - 99 (476.73); Cp - 40 (152.72); Icp - 47 (520. 75); Cs - 122 (9,670.00).

MADHYA PRADESH

Fw - 0.5269; Sp - 250.00; Ffp - 40.00; Ifp - 9,500; Fpo - 33.50.

TAMIL NADU

Cl - 1000; Csa - 34,820; Flc - 340; Fv - 349; Fp - 2,14,868 (56,586); Fcs - 450; Ifc - 29,661; Mb - 2,371; Mfp - 2,59,046; Fw - 0.4188; Ba - 0.1457; Ffp - 64.00; Ifp - 1,75,000; Fpo - 188.00 Frp - 40 (138.04); Cp - 3 (4.50); Icp - 30 (278.50); Cs - 56 (3,648.50).

MAHARASHTRA

Cl-720; Csa-89,096; Flc-185; Fv-348; Fp-1,03,535 (20.698); Fcs - 445; Ifc-7,894; Mb-4,718; Mfp-2,23,837; Fw - 0.2634; Ba - 0.1214; Sp - 90.00; Ffp - 65.00; Ifp - 19,300; Fpo - 45.30; Frp - 26 (183.00); Cp - 1 (2.50); Icp - 3 (190.00); Cs - 31 (4430.00).

KARNATAKA

Cl - 30; Csa - 24,999; Flc - 74; Fv - 151; Fp - 51,636 (11,732); Fcs - 129; Ifc-6,357; Mb - 2,127; Mfp -95,283; Fw - 0.7490; Ba - 0.1092; Sp - 80.00 Ffp - 27.00; Ifp - 75,000; Fpo - 55.00; Frp - 29 (116.84); Cp - 9 (38.00); Icp - 8 (115.00); Cs - 29 (2462.00).

NAGALAND

Fcs - 2; Fw - 0.0407; Sp - 0.09; Ffp - 0.85; Ifp - 160; Fpo - 4.00.

ORISSA

Cl-480; Csa-20,160; Flc-41; Fv-156; Fp - 33,630 (8,828); Fcs - 160; Ifc - 2,786; Mb - 117; Mfp - 29,823; Fw - 0.4096; Ba - 0.4128; Sp - 400.00; Ffp - 48.00; Ifp - 25,000; Fpo - 32.50; Frp - 8 (18.50); Cp - 1 (1.00); Icp - 3 (18.00); Cs - 8 (255.00).

PUNJAB

Fcs - 3; Fw - 0.4209; Sp - 6.00; Ffp - 1.20; Ifp - 2,100; Fpo - 6.00.

RAJASTHAN

Fcs - 15; Fw - 0.2023; Sp - 70.00; Ffp - 18.00; Ifp - 9,500; Fpo - 7.50.

UTTAR PRADESH

Fcs - 97; Fw - 0.8498; Sp - 191.00; Ffp - 22.00; Ifp - 26,500; Fpo - 15.0.

WEST BENGAL

Cl - 600; Csa - 17,094; Flc - 46; Fv - 182; Fp-2,311 (606); Fcs-610; Ifc - 108; Mb - 55; Mfp - 25,411; Fw - 0.5665; Ba - 0.8175; Sp - 600.00; Ffp - 120.00; Ifp - 2,60,000; Fpo - 96.50; Frp - 13 (35.00); Icp - 3 (65.00); Cs - 17 (88,600).

MANIPUR

Fcs - 44; Fw - 0.0291; Sp - 8.00; Ffp - 2.00; Ifp - 1,800; Fpo - 10.00.

DELHI

Fcs-34; Fw-0.0053; Ffp-0.61; Ifp-300; Fpo - 1.00.

MEGHALAYA

Fcs - 34; Fw - 0.001; Sp - 0.60; Ffp - 0.36; Ifp - 1,250; Fpo - 4.00.

TRIPURA

Fcs - 12; Fw - 0.0275; Sp - 90.00; Ffp - 15.20; Ifp - 4,440; Fpo - 9.30.

ARUNACHAL PRADESH

Fcs - Nil; Fw - 0.0409; Sp - 0.20; Ffp - 0.10; Ifp - 30; Fpo - 3.50.

GOA

Cl - 153; Csa - 9,809; Flc - 59; Mb - 387; Mfp - 43,155; Ifp - 1,000; Fpo - 17.50 ; Frp - 6 (23.00); Cp - 6 (41.50); Icp - 1 (10.00); Cs - 4 (145.00).

PONDICHERRY

Csa - 2,488; Flc - 40; Fv - 39; Fcs - 38; Mb - 257; Mfp - 10,123; Fw - 0.001; Sp - 0.05; Ffp - 0.40; Ifp - 640; Fpo - 20.00; Cp - 1 (1.50); Cs - 1 (1.50).

ANDAMANS

Cl - 1,500; Csa - 34,965; Flc - 26; Fv - 13; Mfp - 1,334; Fpo - 9.40.

LAKSHADWEEP

Csa - 7,770; Mb - 213; Mfp - 2,931; Fpo - 12.10; Cp - 1(1.50).

APPENDIX 5

FISHERIES ADMINISTRATION AND ORGANISATION SET UP

Administration

Under the Indian Constitution, both the Union Government and States share responsibilities for the development of fisheries. Each of the States is directly responsible for the development of fisheries within the territorial waters of the sea and of the inland waters. The Union Government is responsible for the development of fisheries beyond the territorial waters and for fisheries research although these are shared by the State Governments as well (Chart on page 92).

The Fisheries Wing in the Department of Agriculture under the Ministry of Agriculture and Irrigation, Government of India, is in overall charge of all important matters relating to policy and administration of the fisheries of the country. It is responsible for the formulation of national policies and programmes of fisheries development, fishing harbours, processing and preservation of fish, fisheries education and training, fish trade, etc., so designed as to achieve the optimum development and utilisation on modern lines of the country's fishery resources and to achieve the objective of self-reliance in this field. It is also responsible for taking all necessary steps for making available timely and adequate supply of inputs and services required; for participating in International Organisations and promoting bilateral and multilateral co-operation, collection and maintenance of relevant statistics. It assists State Governments in formulation of policy, plans and projects, setting up of fisheries corporations, and offers technical advice and guidance whenever required.

Apart from the Department of Agriculture, at the level of Union Government, the Ministry of Commerce also looks after certain functions concerning fisheries. These relate to the grant of industrial licence for the establishment of processing plants and export trade promotion.

Fisheries Education and Research are the responsibilities of the Indian Council of Agricultural Research (ICAR) which is a registered Society, and the Department of Agricultural Research and Education (DARE). The DARE is under the Ministry of Agriculture and Irrigation and provides the ICAR with the requisite linkages with Central and State Governments who are the agencies to extend the technology evolved at the Research Institutes to the field.

The fisheries administration in each of the States is carried out generally by the Department of Fisheries, under which functions a Directorate of Fisheries. The State Directorates of Fisheries are responsible for the formulation of plans for the development of fisheries of the concerned State and their implementation.

In the Union Territories, the Directorates of Fisheries administer the fisheries programmes.

ORGANISATION SET UP

Central Government

The Union Minister for Agriculture is in overall charge of fisheries of the country. He is assisted by Minister of State. The Secretary (Agriculture), who is the official head of the Department of Agriculture, assisted by the Additional Secretary (Animal Husbandry and Fisheries) holds charge of fisheries. The Joint Secretary is the head of Fisheries Wing in the Department of Agriculture. On the administrative side he is assited by a Deputy Secretary and an Under Secretary. On the technical side, Joint Commissioner is the principal adviser to the Government on all matters concerned with fisheries development. He is assisted by Deputy Commissioners and Assistant Commissioners.

DARE AND ICAR

The Department of Agricultural Research and Education (DARE), comes under the overall charge of the Union Minister of Agriculture, who is also the President of the Indian Council of Agricultural Research (ICAR). In all matters of policy and administration relating to this Department, he is assisted by a Minister of State. The Director General, ICAR, who is also Secretary to DARE, is the Principal Executive Officer

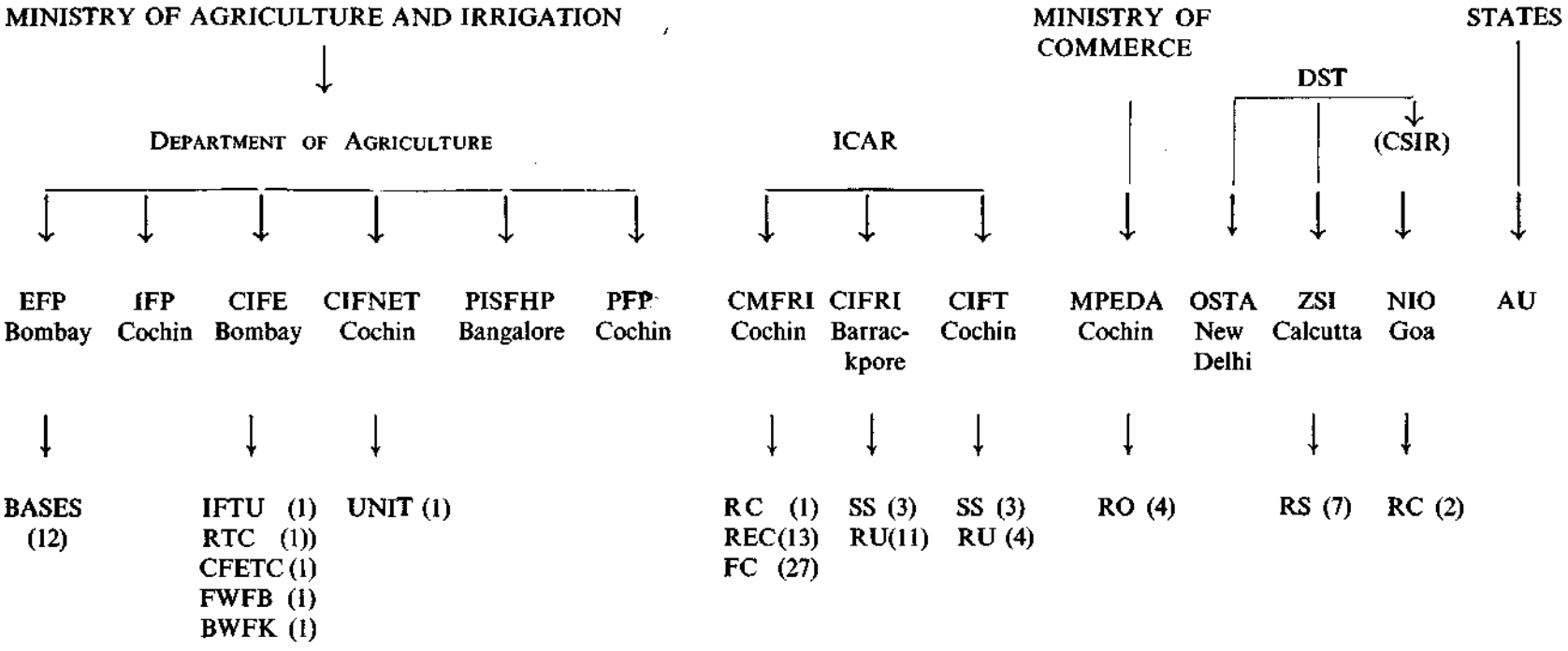
and Vice-President of ICAR. On the administrative side, he is assisted by the Secretary of the Council, who is Joint Secretary to the Government of India, and Additional Secretaries and Under Secretaries. On the technical side for Fisheries, the Director General is assisted by one of the Deputy Director Generals, dealing with Animal Sciences, one Assistant Director General (Fisheries) and one Scientist (Fisheries).

State Governments

There is considerable diversity in the organisation of Fisheries Departments in different States in India. In general, one of the Ministers of State Governments is in overall charge of Fisheries. The Secretary in charge of fisheries is the Principal Executive Officer. In the Directorates of Fisheries, Director of Fisheries is the head and responsible for planning and implementation of fisheries programmes. When the Director of Fisheries is a member of the Indian Administrative Service, he is assisted by a Joint Director on technical matters. Senior Personnel in the Directorate of Fisheries include Deputy Directors who act as zonal or regional officers, Assistant Directors or Superintendents of Fisheries, District Fishery Officers and Wardens who are in charge of each of the Districts or a particular programme. Under these District Officers, Inspectors of Fisheries and other field officers function.

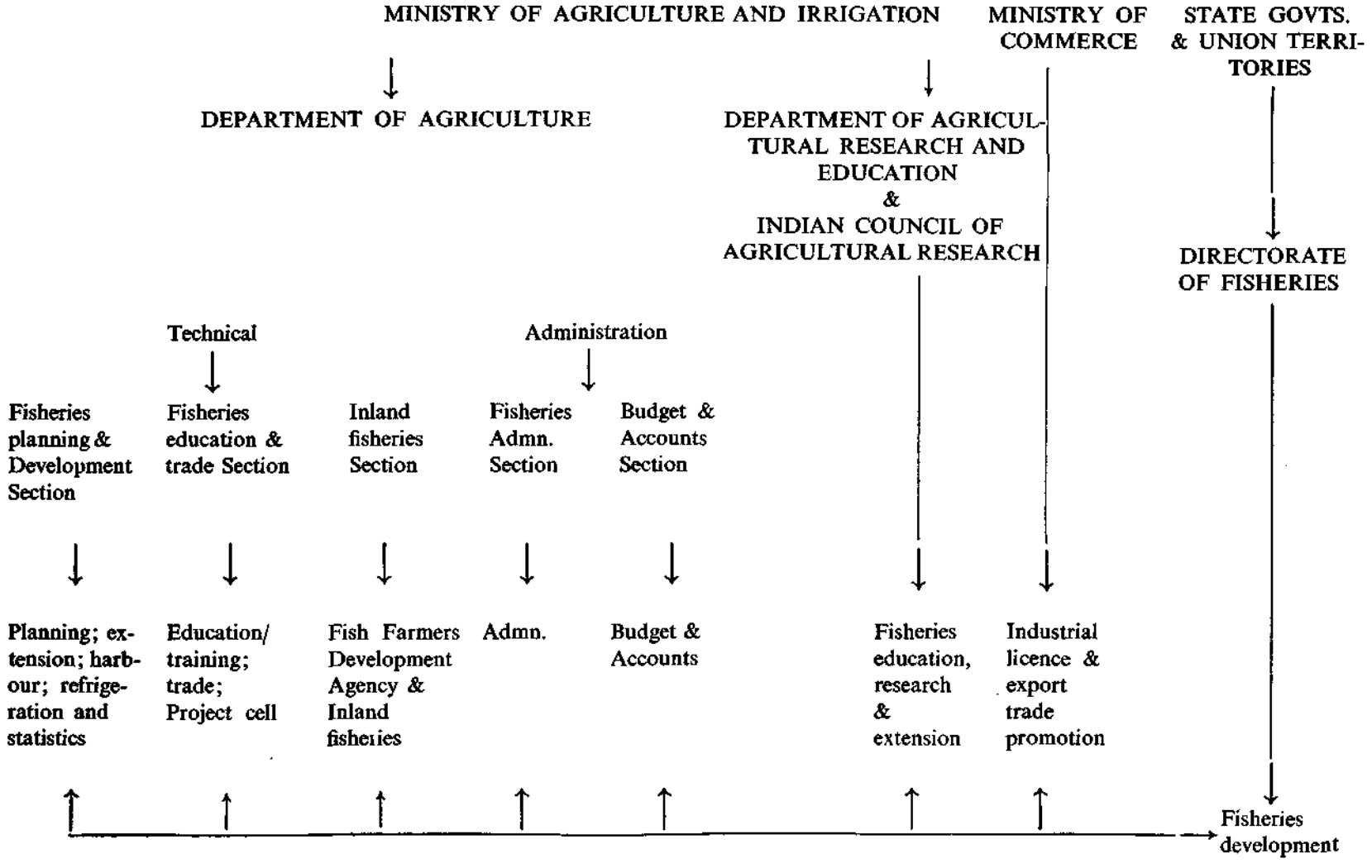
APPENDIX 6

CHART INDICATING THE NODAL ORGANISATIONS AND INSTITUTES



AU	-	Agricultural Universities
BWFK	-	Brackish water fish farm, Kakinada, Andhra Pradesh
CFETC	-	Central Fisheries Extension Training Centre, Hyderabad (Estb. 1973)
CIFE	-	Central Institute of Fisheries Education, Bombay (Estb. 1961)
CIFNET	-	Central Institute of Fisheries Nautical and Engineering Training, Cochin (Estb. 1963)
CIFRI	-	Central Inland Fisheries Research Institute, Barrackpore (Estb. 1947)
CIFT	-	Central Institute of Fisheries Technology, Cochin (Estb. 1957)
CMFRI	-	Central Marine Fisheries Research Institute, Cochin (Estb. 1947)
CSIR	-	Council of Scientific & Industrial Research
DST	-	Department of Science and Technology
EFP	-	Exploratory Fisheries Project, Bombay (Estb. 1947)
FC	-	Field Centre
FWFB	-	Fresh Water fish farm, Balabhadrapuram, Andhra Pradesh
ICAR	-	Indian Council of Agricultural Research
IFP	-	Integrated Fisheries Project, Cochin (Estb. 1952)
IFTU	-	Inland Fisheries Training Unit, Barrackpore (Estb. 1947)
MPEDA	-	Marine Products Export Development Authority, Cochin (Estb. 1972)
NIO	-	National Institute of Oceanography, Panaji, Goa (Estb. 1966)
OSTA	-	Ocean Science and Technology Agency
PFP	-	Pelagic Fishery Project (Estb. 1971)
PISFHP	-	Pre-Investment Survey of Fishing Harbours Project, Bangalore (Estb. 1968)
RC	-	Regional Centre
REC	-	Research Centre
RO	-	Regional Office
RS	-	Regional Station
RTC	-	Regional Training Centre for Inland Fishries Operatives, Agra (Estb. 1967)
RU	-	Research Unit
ZSI	-	Zoological Survey of India, Calcutta (Estb. 1916)

FISHERIES ADMINISTRATION AND ORGANISATIONAL SET UP IN THE CENTRAL AND STATE GOVERNMENTS



APPENDIX 7

IMPORTANT ASSOCIATIONS/SOCIETIES FOSTERING MARINE SCIENCE AND ALLIED SUBJECTS IN INDIA

Asiatic Society
1 Park Street, Calcutta - 700 016.

Bombay Natural History Society
The Honorary Secretary, Bombay Natural History Society, Hornbill House, Shabid Bhagat Singh Road, Bombay - 400 001 (BR).

Indian Fisheries Association
Taraporewala Aquarium, Bombay-400 002.

Inland Fisheries Society of India
c/o Central Inland Fisheries Research Institute, 24 Parganas, Barrackpore, West Bengal.

Indian Society of Ichthyologist
c/o Zoological Survey of India,
69, Santhome High Road, Madras-600 028.

Indian Meteorological Society
c/o The Director General, Indian Meteorological Department, The Observatory, Lodi Road, New Delhi-110 003.

Marine Biological Association of India
P. B. No. 1244, Cochin-682 011.

Phycological Society (India)
Indian Agricultural Research Institute,
Division of Microbiology, New Delhi-110 012.

Sea Food Exporters Association of India
The Secretary, Sea Food exporters Association of India, XII/125 (A), Jew Town Road, Cochin-682 011.

Seaweed Research and Utilisation Association of India
The Secretary, Seaweed Research and Utilisation Association of India, Mandapam Camp, Ramnad District, Tamil Nadu.

Society of Fishery Technologists
c/o Central Institute of Fisheries Technology
Willingdon Island, Matsyapuri P. O., Cochin-682 029.

Society for Clean Environment (Socleen)
Garden Resort, 606, Sion-Trombay Road, Bombay-400 071.

Zoological Society of India
c/o Zoological Survey of India,
34, Chittaranjan Avenue, Calcutta-700 012.

APPENDIX 8

IMPORTANT INDIAN PERIODICALS IN MARINE SCIENCE AND ALLIED SUBJECTS

Administration Report of the Department of Fisheries. All States, India.

Agra University Journal of Research — Science. Agra University, Agra-282 001, Uttar Pradesh.

Annual Report, Central Inland Fisheries Research Institute. Director, Central Inland Fisheries Research Institute, Barrackpore-743 101, West Bengal.

Annual Report, Central Institute of Fisheries Technology. Director, Central Institute of Fisheries Technology, Matsapuri P. O., Cochin-692 029.

Annual Report, Central Marine Fisheries Research Institute. Director, Central Marine Fisheries Research Institute, Ernakulam, Cochin-682 018.

Annual Report, Central Institute of Fisheries Natutical & Engineering Training. Director, Central Institute of Fisheries Nautical & Engineering Training, Cochin-16.

Annual Report, Integrated Fisheries Project. Director, Integrated Fisheries Project, Cochin-682 016.

Bibliography of Indian Fisheries. Director, Central Inland Fisheries Research Institute, Barrackpore-743 101, West Bengal.

Bulletin of the Department of Fisheries, Kerala. Directorate of Fisheries, Trivandrum-695 010, Kerala.

Bulletin of the Department of Marine Science, University of Cochin. The Managing Editor, Bulletin of the Department of Marine Science, Cochin-682 016.

Central Institute of Fisheries Education, News letter. Director, Central Institute of Fisheries Education, Jaipradash Road, Versova, Bombay-400 061.

Central Inland Fisheries Research Institute, News letter. Director, Central Inland Fisheries Research Institute, Barrackpore-743 101.

Central Marine Fisheries Research Institute, News letter. Director, Central Marine Fisheries Research Institute, Cochin-682 018.

Central Marine Fisheries Research Institute, Bulletin. Director, Central Marine Fisheries Research Institute, Cochin-682 018.

Current Science. The Manager, Current Science Association, Bangalore-560 006, Karnataka.

Fishery Technology. The Editor, Fishery Technology, c/o CIFT, Cochin-682 029.

Food farming and Agriculture. The Editor, 105-C, Block F. New Alipore, Calcutta-700 053.

I. C. A. R. Reporter. Under Secretary, Indian Council of Agricultural Research, New Delhi-110 001.

Indian Farming. The Business Manager, Indian Council of Agricultural Research, New Delhi-110 001.

Indian Fisheries Bulletin. Government of India, Ministry of Food & Agriculture, New Delhi.

Indian Journal of Animal Research. Agricultural Research Communication Centre, Sadar, Karnal-132 001 (Haryana).

Indian Journal of Animal Science. The Business Manager, Indian Council of Agricultural Research, New Delhi-1.

Indian Journal of Experimental Biology. C. S. I. R., Publications & Information Directorate, Hillside Road, New Delhi-110 012.

Indian Journal of Fisheries. The Director, Central Marine Fisheries Research Institute, Cochin-682018.

Indian Journal of Marine Science. C. S. I. R., Publications & Information Directorate, Hillaside Road, New Delhi -110012.

Indian Journal of Meteorology, Hydrology and Geophysics. The Editor, I J M H & G. The Observatory, Lodi Road, New Delhi-110 003.

Indian Journal of Zoology. Publication Division, Department of Zoology, Saifia College, Bhopal, M.P.

Indian Seafoods. The Director, Marine Products Export Development Authority, Cochin-682 016.

Journal of Asiatic Society. The Asiatic Society, 1 Park Street, Calcutta-16.

Journal of Bombay Natural History Society. The Honorary Secretary, Bombay Natural History Society, Hornbill House, Shahid Bhagat Singh Road, Bombay-400 001.

Journal of Aquatic Biology and Fisheries. Department of Aquatic Biology and Fisheries, University of Kerala, Sankumugham Beach, Trivandrum-695 007.

Journal of Inland Fisheries Association. Indian Fisheries Association, Taraporewala Aquarium, Bombay-2.

Journal of Inland Fisheries Society of India. Inland Fisheries Society of India, Barrackpore-743 101, West Bengal.

Journal of Madras University. University of Madras, University Centenary Building, Chepauk, Madras-5.

Journal of the Marine Biological Association of India. The Editor, The Marine Biological Association of India, P. B. No. 1244, Cochin-682 011.

Journal of Scientific & Industrial Research. Council of Scientific and Industrial Research, Publications & Information Directorate, Hillside Road, New Delhi-2.

Journal of University of Bombay. University of Bombay.

Journal of Indian Botanical Society. The Business Manager, Indian Botanical Society, School of Studies in Botany, Vikram University, Ujjain, Madhya Pradesh.

Journal of Zoological Society of India. The Zoological Society of India, c/o The Zoological Survey of India, 34 Chittaranjan Avenue, Calcutta-12.

Proceedings of the Indian Academy of Sciences. The Editor, Indian Academy of Science, Hebbal P.O., Bangalore-560 006.

Proceedings of the Indian Science Congress Association. The General Secretary, Indian Science Congress Association, 14, Dr. Biresh Guha Street, Calcutta-17.

Proceedings of the Zoological Society of Bengal. The Zoological Society of Bengal, 35 Ballygunge Circular Road, Calcutta-19.

Proceedings of the Zoological Society of India. The Zoological Society of India, c/o Zoological Survey of India, 34 Cittaranjan Avenue, Calcutta-12.

Phykos. Phycological Society (India), Indian Agricultural Research Institute, Division of Microbiology, New Delhi-110 012.

Mahasagar. National Institute of Oceanography, Dona Paula, Goa.

Matsya. c/o The Zoological Survey of India, 69, Santhome High Road, Madras-28

Madras Journal of Fisheries. Director of Fisheries, Editor, 'Madras Journal of Fisheries', Administrative office Buildings, Madras-6.

Memoirs of the Indian Museum. Zoological Survey of India, 34 C. A., Calcutta-12.

Records of the Indian Museum. Zoological Survey of India, 34 C. A., Calcutta-12.

Research & Industry. Council of Scienific & Industrial Research, Publications & Information Directorate, Hillside Road, New Delhi-110 012.

Salt Research & Industry Journal. Managing Editor, Salt Research & Industry Journal, Central Salt & Marine Chemicals Research Institute, Bhavnagar 364 002, India.

Science & Culture. Indian Science News Association, 92 Acharya Prafulla Chandra Road, Calcutta-9.

Seafood Export Journal. The Secretary, Seafood Exporters Association of India, XII/125 (A), Jew Town Road, Cochin-682 001.

Seafood Newsletter. The Marine Products Export Development Authority, P.B. No. 1708, Cochin-682 016.

Special Publications of CMFRI . The Director, Central Marine Fisheries Research Institute, Cochin-682 018.

Zoological Survey of India, Newsletter. The Zoological Survey of India, 34 Chittaranjan Avenue, Calcutta-12.

Bulletin, Central Inland Fisheries Research Institute. The Director, Central Inland Fisheries Research Institute, Barrackpore 743 101, West Bengal.

National Institute of Oceanography, Annual Report. National Institute of Oceanography, Dona Paula, Goa.

Copies of "Indian Fisheries 1947 - 1977" can be had from

THE MARINE PRODUCTS EXPORT DEVELOPMENT AUTHORITY

P. B. No. 1708, M. G. Road, Cochin-682 016