

FISHERIES DEPARTMENT

(No. 1857-Y2-57.)

MADRAS,
20th November 1957.

From

SRI C. P. KELU ERADY, I.A.S.,

ADDITIONAL DIRECTOR OF INDUSTRIES AND COMMERCE,
Madras,

To

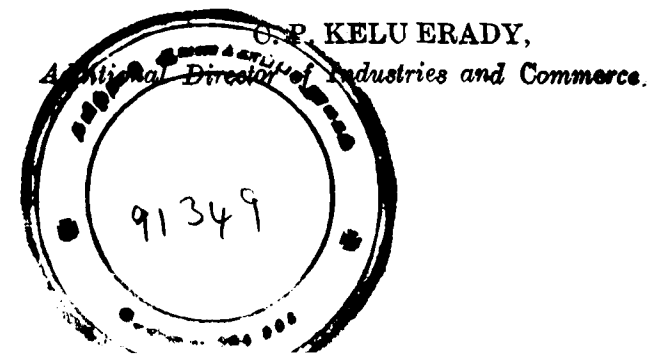
THE SECRETARY TO THE GOVERNMENT OF MADRAS,
FOOD AND AGRICULTURE DEPARTMENT.

[Fisheries of Madras—Administration Report for
the year 1956 57—Submitting]

SIR,

I have the honour to submit the Annual Report on the Fisheries of Madras for the year ended 31st March 1957.

2. The report has been prepared by Dr. P. I. Chacko, Fisheries Marketing and Information Officer. It may kindly be seen that he has taken considerable pain in drafting it and I submit that he deserves credit for it.



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ADMINISTRATION REPORT OF THE
DEPARTMENT OF FISHERIES
MADRAS

FOR THE YEAR
1956-57

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1958

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ADMINISTRATION REPORT OF THE FISHERIES DEPARTMENT FOR THE YEAR 1956-57.

INTRODUCTION.

Sri S. Aruldoss, I.A.S., was in charge of the Fisheries Department throughout the year.

Sri V. John was the Deputy Director of Fisheries (Marine) till 29th October 1956 when he was relieved to join the Department of Fisheries of the Kerala State. Sri D. D. Peter Devadas was Deputy Director of Fisheries (Inland) till 10th November 1956 when he took charge as Deputy Director (Marine) and continued as such till the end of the year. Sri S. Varadarajan was appointed as Deputy Director (Inland) on 11th November 1956 and he continued in that post till the end of the year.

During the year under report the activities of the department were considerably expanded especially through the various schemes of the Second Five-Year Plan though there was some reduction in certain subjects like fish-curing and fisheries education that took place with effect from 1st November 1956 consequent to the reorganization of States. Good progress in all directions was achieved.

Researches on various problems connected with the conservation, development, exploitation and utilization of the marine and inland fisheries resources were continued at the Biological and Technological Research Stations. The Marine Biological Station, West Hill, and the Technological Station, Kozhikode and the posts of Assistant Director of Fisheries (Marine Biology), West Hill and Superintendent of Technological Station, Kozhikode, were transferred to the Kerala State on 1st November 1956. A new technological station was started at Tuticorin in November 1956, with a sub-station at Cape Comorin. The Superintendent of the technological station was also placed in temporary charge of the marine biological stations at Krusadai Island, Tuticorin and Ennore. The Freshwater Biological station at Bhavanisagar continued to be in charge of the Assistant Director of Fisheries (Freshwater Biology). At all these stations valuable data on various aspects of hydrology, planktology, biology of fishes, fluctuations in fisheries, pearl fisheries, chank fisheries, productivity of waters, fish processing, etc., were gathered. Details are given in Part I of this report.

Under the Expanded Technical Assistance Programme of the Food and Agricultural Organization, the Department availed of the services of six experts as detailed in Part II of this report. Mr. Paul Zeiner of Norway and Mr. K. K. Rasmussen of Denmark, Naval Architects, continued to carry out experiments to evolve suitable designs of boats for mechanised fishing. The Pablo boats, designed during the previous years, have now become popular among local fishermen. Attempts were therefore made to modify the design with a view to reduce the cost of a Pablo boat from Rs. 10,000 to Rs. 8,000. The design is expected to be completed in 1957-58.

Mr. G. S. Illugason of Iceland, the Fisheries Engineer, conducted several exploratory fishing surveys with the two Danish boats and two steel dories received from the F.A.O. and also with the T.C.M. vessels, Samudra, Sardinella, Meenakshi, Gudjon, and Dan Boat and located rich fishing grounds for perches, sharks, horse-mackerels, barracudas, leather jackets, ribbon fishes, silver-bellies and shrimps, besides capturing 2,128,813 lb. of fish. These results attracted the attention of the fishermen, who then began to evince interest in mechanised fishing. Mr. Illugason, therefore, trained 85 fishermen belonging to Pulicat, Cuddalore, Pamban, Kilakarai and Tuticorin in handling mechanised boats and the setting of improved types of nylon nets.

The Harbour Specialists, Messrs. C. G. Bjuke and C. R. Bjuke of Sweden, completed their surveys for establishment of fishing harbours at Cuddalore and Nagapattinam and submitted their reports together with preliminary plans and estimates. These are now being considered by Government. In the meantime arrangements for acquisition of sites are being pushed through. Mr. P. A. Lusyne of Belgium, Training Specialist, organized and started the Training Centre at Tuticorin in May 1956 and left India in October 1956 after completing his assignment. At this centre forty fishermen have so far been trained in modern fishing methods. All the fishing vessels, gear and other equipments received under the Indo-United States Technical Assistance Programme, have been put to proper use in the development of the fisheries of this State (vide Part IV of this report for details). Special mention may be made of the vessels, Samudra, Sardinella, Gudjon, and Dan Boat, with which Mr. Illugason located new grounds for perches in waters off Cuddalore, for shrimps off Mangalore, Ennore and Pulicat, for leather jacket, barracuda, ribbon fish and silver-bellies off Pamban, and for sharks, horse-mackerels and barracudas off Pulicat.

Fifteen schemes included in the Second Five-Year Plan, for development of inland, estuarine and sea fisheries with a total outlay of Rs. 84.74 lakhs, were initiated during the year. Though the first year in this Plan period required much spade work and

initial organization, satisfactory progress has been achieved. The details of working of each of the schemes are given in Part IV of this report. 3.45 crores of fish-seed were stocked in the various inland waters against a target of 3 crores. With the working of the Rural Fishery Demonstration Units, there was a general awakening among the public for undertaking fish culture in their own waters. The development of the Bhavanisagar reservoir was intensified by regular stocking and it is expected that a commercial fishery will be formed in this water by the end of the Plan period. The detailed survey of the Adyar estuary and creek was carried out for establishment of a model estuarine farm. Of the 31 Pablo boats constructed during the year 4 were given to Kerala and Mysore States and the remaining 27 distributed to fishermen co-operatives, etc., in this State. With these boats there has been remarkable increase in the average income of the fishermen due to more boats being received from all centres. Sixty-five nylon webbings and 2,525 lb. of Terylene have been distributed to 14 fishermen groups and co-operatives. Under the long-term loan scheme, Rs. 270 lakhs have been given to 832 fishermen belonging to 26 fishermen co-operative societies. A batch of 10 fishermen were trained in modern fishing at the centre in Madras. Nine motor vans were hired to fishermen societies, and these vehicles transported 752 tons of fish. Three vehicles were also given to the Co-operative Federations at Tuticorin and Tanjore and to the society at Porto Novo under the hire-purchase system. Under the salt-subsidy scheme, 25,412.5 tons of cured fish were produced in the departmental curing yards.

A pearl fishery was started on 14th March 1957 and closed on 20th May 1957. A total number of 11,175,214 oysters were fished during this fishery; and a gross revenue of Rs. 1,68,807 was realised.

The chank fishery of the Tirunelveli coast was operated departmentally as usual, and 660,869 full-sized chanks were fished against 554,571 during 1955-56. The Ramanathapuram chank fishery was leased out during the year, and the lessee fished 392,573 full-sized chanks as against 349,609 in 1955-56. The lessee of the Sivaganga chank fishery obtained 124,527 full-sized chanks against 6,544 in 1955-56. The Tanjavor chank fishery was conducted departmentally between Point Calimere and Puthukuda and 31,768 full-sized chanks were fished as against 17,992 in the previous year. Besides, a lease amount of Rs. 15,875 was realised for the remaining portion. The South Arcot and Chingleput chank fisheries were leased out for annual rentals of Rs. 13,406 and Rs. 4,711 respectively.

Sixty-one fish-curing yards on the West Coast were transferred to the Kerala and Mysore States on 1st November 1956. Till this date, 20,315 tons of cured fish were produced in these yards.

To the eleven yards on the East Coast five yards in Kanyakumari district were added to this State from 1st November 1956. In these sixteen yards, 3,062 tons of cured fish were produced. The yard staff continued to be vigilant over the operations of the yards and consequently there was marked improvement in transactions in the yards and the quality of cured-fish was highly satisfactory.

Deep-sea fishing was mainly conducted with the T.C.M. vessels under the guidance of Mr. Illugason and also with few canoes and catamarans; and the total catch of 319,082 pounds of fish was better than in 1955-56 when 265,140 lb. only were obtained.

For the proper conservation of the inland fisheries, the licensing system was successfully continued and extended during the year. The receipts realized by way of licence fees increased to Rs. 42,771 from Rs. 40,378 collected last year. The revenue realized from the provincialised waters was Rs. 1,52,549 as against Rs. 1,71,865 during 1955-56. A total quantity of 30,758 lb. of fish caught from departmental waters were sold for Rs. 8,035. The Rural Fishery Demonstration Units continued to work satisfactorily, and private enterprises in fish-farming have increased appreciably.

The Mettur Reservoir was exploited through licensed fishermen. During the year 227 fishermen took licences at Rs. 72 each. They disposed of their catches to the local merchants. The total landings from the reservoir was estimated to be about 400 tons.

The Gourami popularisation scheme was continued, and efforts were made to maintain a good stock of this valuable exotic fish. A total number of 174,505 fingerlings of murels and etroplus were stocked in 1,571 wells as against 20,354 fingerlings stocked last year. This will give an additional income to the ryots. The exotic Mirror Carp continued to give good results in the upland waters in the Nilgiris; and 63,000 fingerlings of this fish were collected and distributed in the waters in the plains and also supplied to Fisheries Departments in Hyderabad, Mysore, Kashmir and Kerala States and in Nepal. The culture of Tilapia was extended to a large number of waters in Madurai, Tirunelveli and Ramanathapuram districts and this proved a great success. The introduction of Rohu and Mrigal with a view to establish these economical North Indian carps was continued, and a consignment of 40,000 fingerlings was brought from Calcutta during the year. Popularisation of fish cultural procedures in the Community Project and National Extension Service Blocks was also continued during the year.

The Fisheries Marketing and Information Officer appointed at the end of last year gave better attention to the marketing side of the fishing industry. He made an assessment of the present fish production as 60,000 tons of sea-fishes and 38,600 tons of inland fishes, and also made a study of the present pattern of

utilization of the catches for consumption in the fresh and processed condition, for export and for production of manufacture of by-products. The per capital consumption of fish in this State is 10.5 pounds, which is much higher than the All-India average of by-products. The per capita consumption of fish in this State trade of cured and dried fish, fresh fish movements and fish supply to important centres like Madras City, Madurai, Tanjore, Cuddalore, Tiruchirappalli, Tuticorin, Chingleput, Coimbatore and Ootacamund, and on handling, assembling and transport methods have also been undertaken. Special attention was paid to increase the fish supply to Madras City by fixing agencies with the City fish merchants and co-operatives and fish merchants in the districts. A model fish stall was started in the City together with arrangements for house-delivery; and these have become popular with the public. Arrangements for improving fish supply to other towns have also been made through the local fishermen co-operatives, and many of them have been initiated to fish marketing. Popularisation of iced and frozen fish, semi-dried prawns, bonito, fish meal and shell grit was conducted, and about 75 fish trade enquiries were answered.

Fish markets of almost all the important municipalities and panchayats have been surveyed and their existing conditions analysed; and the concerned local bodies were induced to improve their fish markets to satisfy certain minimum standards of structural lay-out and sanitation. The response was satisfactory, and the municipalities of Tuticorin, Madurai, Tanjore and Salem have already effected some improvements. Most of the local bodies expressed financial difficulties for improving their fish markets and wanted financial assistance. The scheme for improving fish markets included in the Second Five-Year Plan, with a provision of Rs. 1.35 lakhs can, therefore, be successfully implemented through the local bodies. The Corporation of Madras, Municipalities of Tuticorin, Madurai and Tanjore and the Mettur Township Committee have already been assisted to prepare necessary plans and estimates to remodel their fish markets. Many other municipalities are also being advised and provided with type designs. Efforts have also been made to induce the owners and contractors of private markets in the City to improve and maintain them; and some of them have started to carry out the suggestions.

Statistical surveys of marine and inland fisheries resources were continued as usual; and a special survey of the newly formed Kanyakumari district was conducted during the year. For a small coastline of 42 miles of this district, the present annual landing is estimated to be about 13,000 tons, which indicates the rich potentialities of this area. With the appointment of a separate Assistant Director for this district, it will be possible to develop the fisheries of this coast.

Dissemination of information pertaining to various aspects of the fishing industry was carried on more vigorously. Meetings of fisherfolks in their hamlets were regularly held and information about the various socio-economic activities of the department and the benefits of the Second Five-Year Plan Schemes were propagated. A beginning with audio-visual methods was made by arranging few film shows. The department participated in 55 exhibitions against 47 in 1955-56. The museum continued to be popular and new exhibits and charts were added to it. The freshwater aquarium in the Marina was also very popular among the public, and 117,332 people visited it and paid Rs. 11,619 as gate fees against 79,456 visitors and Rs. 8,087 as collection in 1955-56. A collection of exotic fishes brought from Singapore was added to the aquarium.

About 116 fishermen co-operative societies were transferred to the Kerala and Mysore States on 1st November 1956, leaving only 143 in the residuary State. But due to good efforts on the part of the co-operative staff more societies were organized. District federations of societies were also formed for Tirunelveli, Ramanathapuram and Tanjavoor districts, in addition to the one already at Madras. A fishermen's co-operative marketing society was also formed at Mettur Dam. The total number of societies and federations at the end of the year is 175 with 17,779 members and Rs. 1,55,269 as paid-up share capital. The fishermen have now realized the advantages of co-operative movements and are now eager to form more societies to take full advantages of the various measures of assistance given by department, especially through the schemes in the Plan. Several of the societies have now commenced to undertake fish marketing for the benefit of its members.

Relief measures to fisherfolk affected by calamities like cyclone, sea-erosion, fire-havoc, accidents in the sea and failure of normal fisheries, etc., were continued to be assisted during the year. Provision of housing schemes and construction of feeder roads to fishing hamlets were also attended during the year. As 64 schools on the West Coast were transferred to Kerala and Mysore States this State had only three fisheries schools with a strength of 279 pupils and six teachers.

The total expenditure and revenue of the department for the year was Rs. 33,34,530-7-2 and Rs. 28,05,963-13-6 respectively against Rs. 25,80,063-3-5 and Rs. 23,23,528-11-8 in 1955-56. The net expenditure of the department was only Rs. 5,28,566-9-8. The charges on account of the supervision, education, welfare, engineering and research schemes came to Rs. 9,39,479-1-9, and considering this and the implementation of the various schemes under the Second Plan, the working of the department from the financial aspect was very satisfactory.

The details of the different activities of the department are given below in nine parts, of which Part IV describes the working of the schemes included in the Plan.

ACTIVITIES OF THE DEPARTMENT.

PART I—FISHERIES RESEARCH.

Researches on the biological, hydrological and technological problems of the fisheries of the State were continued during the year, and valuable information that are essential for the rational exploitation, conservation and management of the resources were gathered. (The programme of work formulated by the Fisheries Research Council at its first meeting held in January 1956 was implemented at the research stations. Consequent to the reorganization of the States, the important marine biological station at West Hill, Malabar Coast, and the Technological Station at Kozhikode were transferred to the Kerala State with effect from 1st November 1956. A new technological station was started at Tuticorin in November 1956, with a sub-station at Cape Comorin.)

A. MARINE FISHERIES RESEARCH.

Sri M. Mukundan Unni was Assistant Director of Fisheries (Marine Biology) from the beginning of the year to 16th July 1956 when he was relieved by Sri P. K. Jacob who continued till the reorganization of the States when the post was transferred to the Kerala State. Since then the Superintendent, Fisheries Technological Station, Tuticorin, was placed in-charge of the Marine Biological Stations as a temporary measure.

(i) Marine Biological Station, West Hill.

1. *Meteorology and hydrography of the Kozhikode coast.*—The monthly averages of the various factors were as in Appendices I and II. The salient features of the seasonal fluctuations were as follows :—

(a) *Atmospheric temperature.*—The maximum of 87°F and the minimum of 68.5°F were recorded during April 1956 and January 1957 respectively. The lowering in temperature conditions in June and July 1956 was due to the stronger winds of south-west monsoon. After June and July the intensity of the wind lowered and consequently the temperature conditions showed a tendency to rise.

(b) *Rainfall.*—The total rainfall at West Hill during the year under consideration was only 296.4 cms. and it was spread over 32 weeks, as against 346.9 cms. recorded during 1955-56. The heaviest rainfall in the year was during the months of May, June and July when 16.15 per cent, 28.39 per cent and 15.73 per cent of total rainfall were recorded. Unlike the previous year, there was no incidence of heavy downpour during September 1956, though a few showers were observed during that month.

(c) *Humidity.*—Humidity of the air was high during June and July when 90.5 per cent and 92.5 per cent were recorded.

This must have been due to the heavy showers observed during these months. Low values as 78.5 per cent and 79.0 per cent were observed during the two dry months of December 1956 and January 1957.

(d) *Current and wind*.—The course of current was north to south during the months of April to August and February and March. The current was south to north from October 1956 to January 1957. The wind was north-west—south-east during April 1956 to November 1956. Afterwards the direction of wind changed to south-east-north-west.

(e) *Surface temperature*.—The maximum of 29.6°C and the minimum of 24.0°C were observed during April and June 1956 respectively. During April and May, the average water temperatures were 29.6°C and 27.45°C respectively. There was a lowering of the temperature after the commencement of monsoon and it continued to be low during July, August and September with an average of 24.68°C. The temperature rose up to 28.5°C in November and there was again a slight fall in December 1956 and January 1957, after which there was an upward trend showing a reading of 20.8°C in February 1957 and 29.°C in March 1957.

(f) *Specific gravity*.—The specific gravity reached the maximum of 1.027 when the temperature reading showed a high value and it reached the minimum of 1.022 when the temperature reached a very low value of 25°C in July 1956. The minimum of 1.022 was also observed in October 1956. This was due to the few good showers experienced in that month.

(g) *pH*.—The maximum and minimum value of 8.6 and 8.05 were observed in January 1957 and August 1956 respectively. During April, May and June the average pH was 8.3. This was followed by low values of 8.25, 8.05 and 8.07 in July, August and September respectively.

(h) *Salinity*.—During the year under review, the range in salinity was from 26.94 per cent to 35.37 per cent. During the summer months of April and May high salinity values of 35.37 per cent and 34.78 per cent were recorded. There was a sharp fall in salinity with the commencement of south-west monsoon in June when the values went down to 28.87 per cent. From July to September 1956 it indicated an upward trend. A few good rains reduced the value to 26.94 per cent during October 1956, after which it was more or less steady till the end of March 1957.

(i) *Alkalinity*.—A low value of 6 mgs./100 c.c. during May 1956 and a high value of 8.08 mgs./100 c.c. during July 1956 were recorded. The values ranged between 7.34 to 7.74 mgs./100 c.c. during the rest of the months without any remarkable change.

(j) *Phosphates*.—The maximum of 96.6 mg/m³ and the minimum of 38.72 mg/m³ were observed during June and December 1956 respectively. During April and May the values recorded were 70 and 87 mg/m³. Soon after the onset of monsoons very high phosphate values as 96.8 mg/m³ were observed during June 1956 and was followed by sharp ups and downs for the rest of the monsoon months, due to intermittent showers. Another peak value of 94.6 mg/m³ was observed during September 1956 when the red-water phenomenon was observed in the sea. The phosphate values were found to be normal for the rest of the months.

(k) *Silicates*.—Varying values of silicates were recorded, the highest values of 235.09 mg/m³ and 243.03 mg/m³ were recorded during September 1956 and February 1957 respectively. Traces of silicates were observed during June and December when 9.3 mg/m³ and 10.27 mg/m³ were recorded. The peak value in September coincided with the red-water phenomenon observed during that month. After attaining a second peak value of 243.03 mg/m³ during February 1957, the value came down to 126.62 during March. The great disturbance in the sea and churning of sea bottom observed during February 1957 might be responsible for the second peak value of silicates during that month.

(l) *Dissolved oxygen*.—Low values of 2.25 c.c./l and 2.014 c.c./l were recorded during September and October 1956 when the red-water phenomenon was observed in the sea opposite to West Hill. The sea was well oxygenated during January, February and March when 3.25 c.c./l, 3.14 c.c./l and 3.67 c.c./l were recorded.

2. *Plankton investigations of the Kozhikode coast*.—Seventy-eight samples of plankton were studied in detail as against 49 hauls in the year 1955-56. The largest densities of plankton were in the months of June and July when the volumes of plankton were 91 c.c. and 100 c.c. respectively per haul. The plankton availability was very low from October to December after which the quantity slightly increased. The year was characterized by the sudden blooms of *Fragillaria* in the months of July and December to February. Consonant with this there was a sudden burst of oil-sardine fishery in the months of December 1956, January and February 1957. Another characteristic was the low occurrence of copepods in the plankton in the months of August, November and December 1956 and January 1957. *Noctiluca* remained close in-shore in heavy concentrations in the months of August to November and prevented the in-shore movements of both mackerel and oil-sardine which limited the availability of both these fishes to very low levels. The year was very much characterized by the heavy mixing up of the cooler bottom waters and the movement of these oceanic waters to close in-shore where soon the salinity and chemical nutrients created oceanic conditions preventing the close in-shore movements of the shoals of mackerel and oil-sardine.

These observations confirmed the observance of 1952-53 when it was projected that a year of low rainfall followed by heavy winds mixed up the less productive bottom waters and later these waters were piled up in the in-shore regions limiting the in-shore movements of oil-sardine and mackerel or in other words, keeping the shoals out of the availability of the local fishing effort. It was postulated then that the 40 fathoms line was the critical line of the availability problem of these two fishes in this coast and that a continuous assessment of the conditions in this line would yield definite indications on the reasons of the wide fluctuations of these two fisheries. The seasonal distribution of the important organisms were as follows :—

(a) *Coscinodiscus*.—This was the most common diatom of the sea. In April, it reached the peak of 16 per cent and dropped to 1 per cent in May and to traces in June. From July onwards this diatom formed 3 to 9 per cent of the total plankton.

(b) *Fragillaria*.—This diatom predominated in the collections made in July 1956 and February 1957 when it contributed to 47 per cent and 54 per cent respectively. When a small start of 11 per cent in April it reached its peak in July and dropped to 30 per cent in August and passing through another peak in February came down to 13 per cent in March. It was noticed in all the months.

(c) *Chatoceras*.—This was responsible for greater density of phytoplankton in June (37 per cent), December (28 per cent) and January (31 per cent). It was rare in September 1956.

(d) *Thalassiothrix*.—This diatom bloomed to 18 per cent in June and 15 per cent in February 1957. For a period of four months from September to December there was no trace of this diatom. In other months it ranged between 6 per cent and 13 per cent.

(e) *Biddulphia*.—It was noticed in traces from June to August and in October and December. It was absent in September. In the other months it contributed to 1 to 3 per cent of the plankton.

(f) *Rhizosolenia*.—It had three peaks, in July and November 1956 and in March 1957. In the other months it fluctuated between traces and 2 per cent except in September and December when it completely disappeared.

(g) *Nitzschia*.—The peak was 18 per cent in December, 10 per cent in November and 4 per cent in July. In June and September it was absent and in the other months it was present in traces to 1 per cent.

(h) *Asterionella*.—This was the largest single organism in May 1956 when it contributed to 65 per cent of the total plankton. It was completely absent in April and from September to November 1956 and in February 1957. It had a peak of 12 per cent in December also. In the other months it was noticed in traces only.

(i) *Ditylimum*.—It was a very sporadic diatom and was noticed mainly in April 1956 and in February 1957. It was not met within the six months from July to December.

(j) *Planktoniella*.—This was another diatom found in traces throughout the year except in October 1956.

(k) *Trichodesmium*.—It appeared in traces in February 1957 and reached the peak of 14 per cent in March 1957 and 5 per cent in April 1956. In the other months it was completely absent in the collection.

(l) *Copepods*.—The greatest single group of zooplankton that dominated the plankton of the year was copepods. The peak was reached in October 1956 and in March 1957. The lean months were August and February. In other months it contributed to only very small percentages of the plankton.

(m) *Noctiluca*.—This dinoflagellate crowded the plankton in August (38 per cent), September (86 per cent), October (53 per cent), and November (28 per cent). During the peak fishery period it lingered in the in-shore region obstructing the in-shore movement of shoals of mackerel and oil sardine.

(n) *Gymnodinium*.—This flagellate reached 13 per cent in November and 25 per cent in December. It was absent in the other months.

(o) *Ceratium*.—This was a common flagellate found throughout the year. It formed 2 per cent in April, 1 per cent in May, 2 per cent in July 1956 and 2 per cent in March 1957.

(p) *Peridinium*.—It formed 1 per cent in June 1956 and in May 1956 and February 1957. It was absent in the other months.

(q) *Dinophysis*.—Frequently this flagellate was noticed in traces in June 1956 and in January 1957.

(r) *Nauplius*.—The peaks were 9 per cent in April 1956 and 4 per cent in January 1957.

(s) *Eradne*.—From June to November this was noticed to form 1 per cent each. In the other months it was almost absent.

(t) *Sagitta*.—Arrow-worms were noticed frequently in small numbers in June, July and September 1956.

(u) *Tintinnus*.—The peak periods were December 1956 (1 per cent), April 1956 (2 per cent), January (3 per cent) and March 1957 (2 per cent).

(v) *Mysis*.—They were noticed in small numbers in November 1956 to March 1957.

(w) *Larval fishes*.—Unlike in the previous year, fish eggs appeared only very seldom in the inshore region of the sea.

3. *Investigation on mackerel fishery*.—The year under report was one of the poorest of mackerel years in recent times. The total landings of mackerel in Malabar were only 39,237,000 kgms. as

against 93,96,988 kgms. in 1955-56. However intensive studies were made on the age composition, food and rate of recruitment and off-take of mackerels. One hundred and ninety-eight samples of 4,419 specimens were examined and the overall percentage age-composition of the total population for the whole year as compared with previous years were noted as follows :—

Years compared.	0	I	II	III	IV
1956-57 ..	0.5	17.6	20.5	48.6	12.8
1955-56 ..	1.4	20.2	30.4	37.5	10.6
1954-55 ..	2.0	33.8	30.0	22.7	11.5
1953-54 ..	1.7	23.8	32.7	38.9	2.9
1952-53 ..	0.1	17.5	17.1	61.8	3.5
1951-52 ..	..	16.1	51.7	41.3	0.9
1950-51 ..	0.2	17.0	30.5	52.3	..

It can be seen that the commercial fishery has depended almost mainly on the 1953-54 brood which contributed to nearly 50 per cent of the total fishery. The 1953-54 groups had already contributed to a major portion of the commercial catches in 1954-55 and 1955-56. Naturally the fishes could not be dependent entirely on a brood that had already contributed to 2 good fisheries in the previous years.

In April, mackerel fishery was comprised of 20 to 25 cm. sizes in which 2-years olds formed the chief commercial catch. Of this about 83 per cent were in fully gravid condition. In May, 22 and 23 cm. contributed to 49 and 39 per cent respectively, in which 3-year olds formed 70 per cent. For the same length, the development of gonad was greater in female than in male. At the commencement of breeding migration, the proportion of males became decidedly greater, viz., 70 per cent of the fish examined were males. Male gonad was found filling the abdominal cavity, but female gonad showed indications of partly spent condition. In June also 70 per cent were 3-year olds. Recruitment of juvenile forms occurred in July. They appeared in 6 fathom line at Pudiappa with *Anchoviella* and *Metapeneus* on 3rd July and shoals were caught on 25th July. As in the previous year, in July several size-groups were noticed from 9 cm. up to 25 c.m., when zero year formed 37 per cent, 1 year 36 per cent, 2 year 22 per cent, 3 year 2 per cent and 4 year 3 per cent. The fishery in August was formed with 1 year chiefly (59.5 per cent) with zero year being 5.5 per cent. In September 1 year and 2 year olds formed 50 per cent and 35 per cent respectively and in October 8 per cent of zero year appeared with 57 per cent 2 years. In November 3 year formed 56 per cent and 4 year 37 per cent, and in December 66 per cent of the commercial catch was of 3 years. In January, February and March 3-year olds contributed to 62 per cent, 85 per cent and 79 per cent respectively of the landings. The details of size frequency during the different months are given in Appendix III.

Detailed computations of the mortality rates, catch-fraction and total population have revealed that only 5 per cent of the total population has been fished in this year. This catch-fraction has been more or less similar to that of 1953-54. The estimation has showed that a major part of the population remained outside the area of operation of the fishermen which has limited the availability to very low limits. The reason for this low availability has been due to inimical hydro-biological conditions preventing the in-shore movements of the shoals. The fair rates of recruitment that took place in 1953-54, 1954-55 and 1955-56 and the existence of a large population of unfished mackerels in the area indicate that on availability being increased to atleast the 1955-56 level, there should be a fishery of a magnitude $2\frac{1}{2}$ times that of this year in the coming season.

The rate of feeding intensity was as high as 2 c.c. in specimens obtained in January 1957. The feeding intensity of juvenile forms obtained in July, August and October varied from 0.2 to 0.7 c.c. The zooplankton formed the chief food of mackerel. *Copepods* contributed to the major food of mackerel. The peak was 60 per cent in December and 50.1 per cent in August. *Larval bivalves* formed 18 per cent in April, 17 per cent in May, 8 per cent in June and 4 per cent in November of the food of Mackerel. It appeared to be another favourite food of this fish. Among flagellates *Peridinium* formed 12.9 per cent in June, 1 per cent in July, 4 per cent in September, 10 per cent in October, 11 per cent in December, 5 per cent in January with a peak of 30 per cent in February 1957 and 25 per cent in March 1957 in the diet of mackerel. *Ceratium* contributed to 5 per cent in July, 8 per cent in August, 12 per cent in September 8 per cent in October, 2 per cent in November and 5 per cent in January 1957. *Dinophysis* contributed to 1 per cent in July, 9 per cent in December reaching a peak of 20 per cent in January and dropping to 12 per cent in February. *Orinotocercus* contributed to 25 per cent in January and 3 per cent in February. This flagellate is frequently noticed in offshore region and its presence indicated shoaling of mackerel in the offshore regions. *Prorocentrum* was chiefly noticed in the diet in July 1956 and November 1956, when it formed 1 per cent and 6 per cent respectively. *Eudae* contributed to 25 per cent in August, 20 per cent in June, 2 per cent in July, 5 per cent in November and 5 per cent in March. It also appeared to be an important food of Mackerel. *Tintinnus* formed 23 per cent of the food in May 1956. In September 4 per cent of the diet was formed with arrow worms (*Sagitta*). Juvenile mackerels examined in July, August and October 1956 had ingested fair quantities of fish scales. Among phytoplankton *Coscinodiscus*, *Fragillaria*, *Thalassiothrix*, *Pleurosigma* and *Trichodesmium* contributed to 7 per cent in April, 8 per cent in May, 5 per cent in July 1956, 12 per cent in October 1956, 10 per cent in February 1957 and 13 per cent in March 1957. *Fragillaria* contributed to 12 per cent in May 1956, 2 per cent in August 1956, 10 per cent in October 1956, 10 per cent in January

1957, 12 per cent in March 1957. *Thalassiothrix* formed 18 per cent of the diet in June 1956. *Pleurosigma* formed 11 per cent of the food in June 1956. *Trichodesmium* was found ingested only in March 1957 (18 per cent) and April 1956 (20 per cent).

4. *Investigation on Oil Sardine fishery.*—Like the mackerel fishery the oil sardine fishery also was of less magnitude than in the previous years. There was a total landing of 12,107,710 kgms. of oil sardines in this year as against 19,106,560 kgms in 1955-56.

Details of the length frequency of the oil sardine population are given in Appendix IV. The age composition as compared to previous years were as follows :—

Years compared.	0	I	II	III	IV
1956-57 ..	7.1	38.7	22.8	31.1	0.3
1955-56 ..	7.4	42.7	35.8	14.0	0.1
1954-55 ..	13.9	45.7	32.1	8.3	..
1953-54 ..	1.4	50.3	16.0	32.3	..
1952-53 ..	24.5	48.6	26.7	0.2	..

The mainstay of the fishery was the 1952-53 brood and the 1954-55 brood. These two had already contributed to very good fisheries in the last year and the 1952-53 brood had contributed to a very major portion of the 1954-55 fishery also. There has been as good a recruitment of the zero groups to this year's fishery as in the last year. Till December 1956, the oil sardine shoals did not move inshore and only in December 1956 with the enrichment of the inshore area with the oceanic phytoplanktonic *Fragillaria* after stabilisation of conditions that the oil sardine shoals moved into the in-shore waters. Till the end of February the oil sardine fishery continued when with the increase of salinity and temperature these shoals moved out. From an examination of the population dynamics it is found that availability level being the same a fishery of the same magnitude is postulated for the next season.

Unlike in 1955-56, there was no landing of sardine in April and May of this year. In June only 20 maunds were landed in Malabar which was formed with 18 and 19 cm. size. They were all fully gravid. In July 13 and 20 cm. size groups were taken of which 18 cm. and 19 cm. formed 44 per cent and 31 per cent respectively. The absolute fecundity of sardine was worked out and found to be 85,500. In August, 16 cm. to 20 cm. sizes were noticed of which the 19 cm. size formed 47 per cent. The ovary was blood shot and loose, while testes were white and flabby. Sardines had commenced spawning in early August. In September the fishery was composed of 15 cm. to 22 cm. of which 42 per cent was formed with 19 cm. size. For the first time in October, 44 per cent of zero year sardines appeared with 18 to 21 cm. size groups. In November 16 to 21 cm. sizes appeared in the catch, of which the 19 cm. formed 42 per cent. In November juvenile forms made their appearance after having moved from northern regions. In January 1957, 11 to 14 cm. were caught of which the 13 cms. formed 66 per cent of the landings. In February 1957 fish of 10 to

20 cm. were landed of which 13 to 14 cm. size groups contributed to 73 per cent.

The feeding intensity reached 1.3 c.c. in September. In the other months the rate varied from 0.4 to 1 c.c. Unlike mackerel the Chief items of food were formed of phytoplankton as detailed below :—

Phytoplankton contributed to 80 per cent of the diet in June, 58 per cent in July, 68 per cent in August, 64 per cent in November and 50 per cent in January 1957. In the other months the major part of the diet contained zooplankton. *Fragillaria* contributed to 25 per cent in June, 35 per cent in July, 45 per cent in August, 28 per cent in November 1956, 30 per cent in January 1957 and 25 per cent in March 1957. *Coscinodiscus* contributed to 12 per cent in June, 5 per cent in July, 15 per cent in August, 20 per cent in September, 10 per cent in November, 20 per cent in January, 20 per cent in February and 18 per cent in March. *Chaetoceras* in June contributed to 20 per cent of its food. *Thalassiothrix* contributed to 15 per cent of the diet in June and 8 per cent in August. *Nitzschia* entered into the diet to the extent of 5 per cent in July and 17 per cent in November. *Biddulphia* formed 9 per cent of the food in November and 12 per cent in February. *Pleurosigma*, *Planktoniella*, *Rhizosolenia* and *Ditylium* were also noticed in a few months.

Of Zooplanktonic organisms, Copepods formed the most important portion of food. It contributed to 15 per cent of the diet in June, 12 per cent in July, 9 per cent in August, 20 per cent in September, 31 per cent in November, 32 per cent in January, 34 per cent in February and 32 per cent in March. *Euphausia* was another important food of sardine and it contributed to 5 per cent of the food in June, 7 per cent in July, 20 per cent in August and 40 per cent in September, *Peridinium* formed 13 per cent of the diet in July, 5 per cent in September, 20 per cent in December, 6 per cent in January and 8 per cent in March.

5. *Investigations on other fishes.*—The following oceanic fishes were examined and studied in detail and valuable data recorded :—

(1) *Elacate nigra*, (2) *Echeneis neucratis*, (3) *Tylosurus strongylurus*, (4) *Trygon sephen*, (5) *Thynnus thunnina*, (6) *Zygana blochi*, (7) *Coryphaenus hippurus*, (8) *Histiophorus brevirostris*, (9) *Shyrcna obtusata* (10) *Caranx crumenophthalmus*.

6. *Museum.*—The following rare specimens were recorded and added to the museum :—

(1) *Holocentrum rubrum*, (2) *Holocanthus xanthurus*, (3) *Apogon aureus*, (4) *PlatyGLOSSUS dussumieri*, (5) *Cæcio xanthonotus* and (6) *Holocanthus annularis*.

7. *Stranding of a whale.*—On 29th September near Kadalundi a live sperm-whale was caught at 6 fathom line by fishermen. It measured 870 cms. in total length. Its liver weighed 61.6 kgms. It was a young female. The blubber was removed and sold, and all the skeleton parts were suitably buried for thorough cleaning.

8. *Trend of fisheries in Malabar.*—The total landings in Malabar in the year was 107,219,077 kgms. valued at Rs. 1,82,70,402 as against 109,653,100 kgms. in 1955-56. The fish landings in general were much less than last year. The major catch was of the Chamban (horse mackerel). Heavy landings of Chamban occurred in September. The oil sardine fishery occupied the second rank. The peak months of the fishery were December, January and February. The third rank of the fishery was occupied by Silver-bellies. The peak period was July to October. Prawn fishery had its highest peak in July. The fishery lasted from July to October. In February also there was some slight recovery of the prawn fishery. The total weight of prawns landed in the year under report was 6,057,265 kgms. The mackerel fishery was comparatively very poor this year. The qualitative and quantitative details are given in Appendix V.

(ii) *Krusadai Biological Station.*

1. *Meteorology and hydrography of Kundugal Channel.*—The highest atmosphere temperature of 91.2°F, was recorded during April and consequently the temperature of the surface sea-water was also (30.29°C) highest during this month. There was a slight fall in the specific gravity of sea water (1.075 — 1.208) during the period, November-January owing to the rain prevalent then. There was not much variation in the hydrogenion concentration in the surface sea water, the range being 8.32 — 8.45. The relative humidity of the atmosphere was high (85 per cent) during November-December. A slight increase in the atmospheric pressure was noticed from October onwards till the end of the season under review (30.029 — 30.145 inches). Maximum rainfall was recorded during November (5,600 c.c.) and the velocity of the wind was highest during December (11.55 miles per hour). The details are shown in Appendix VI.

2. *Plankton studies of Kundugal Channel.*—The volume of plankton was high during the months of May (43.55 c.c.), June (99 c.c.), November (68 c.c.), January (45.5 c.c.) and March (68.5 c.c.). The volume of maximum plankton sedimentation was recorded during the month of June (99 c.c.) and the minimum in February (7.5 c.c.). The volume of plankton was fair on all other months except July (10 c.c.) and December (9 c.c.). During the entire period under review the phytoplankton was found predominating over the zoo-plankton. The zoo-organisms occurred in large numbers during April, May, June, September and November, their total count being 672, 882, 862, 1,374, 671 per litre respectively. The important groups of organisms that contributed greatly to the volume of the plankton were different species of copepods, molluscan post-larvæ and protozoans. Larval and post-larval annelids, also occurred in fair quantities during the various months. The occurrence of nauplii larvæ reached its zenith during the month of September (361 per litre). They occurred in plenty during May (300 per litre). During the other months they

were common in the plankton hauls. The protozoans were found to occur in plenty in April, June and November. Fish eggs and fish larvæ were recorded only rarely. The phytoorganisms occurred in large numbers during April, May, June, August and September, their total counts being 7,020, 10,951, 11,474, 7,274 and 1,251 per litre respectively. Among them the important genera were *Chattaras*, *Fragillaria*, *Rhizosolenia* and *Trichodesmium*. Swarms of the latter were recorded during August.

It was noted that the general trend of occurrence of plankton during the period under review did not correspond much with the preceding year, when the high volume of plankton was recorded during April, August, September, October and November and the maximum and minimum of planktonic volume were noticed during September and July. It was also observed that the effect of the cyclone that occurred by the end of 1955 were only diminishing during 1956.

3. *Studies on fishery of the Rameswaram Island.*—On the Rameswaram Island coast there are six important centres at Rameswaram, Thangachimadam, Kundugal, Kadarsapad, Rameswaram Road, and Dhanushkodi. These centres, except Dhanushkodi, are seasonal in operation. Rameswaram and Thangachimadam, which are on the Palk Bay side, land heavy catches during the south-west monsoon period and Kundugal, Kadarsapad and Rameswaram Road which are on the Gulf of Mannar side land heavy catches during the north-east monsoon period. The Palk Bay during the north-east monsoon and Gulf of Mannar during the south-west monsoon are very rough and fishing operations are suspended at these coasts during these seasons. Because of its unique geographical position, Dhanushkodi lands good catches throughout the year but on the north or south side only during the particular season.

The nets operated at the different fishing centres in Rameswaram Island vary. Parch traps, shore-seine and ola valai are operated off Rameswaram, boat-seine net, Dunlop twine net hooks and lines off Thangachimadam, cast net, Dunlop twine net and hooks and lines off Pamban and Kundugal point, Shore-seine net and ola valai off Kadarsapad, shore net, Dunlop twine net and boat seine nets off Rameswaram Road, and (hooks seines) off Dhanushkodi. Long lines are operated very seldom by a few fishermen of Pamban area very close to the shore in the Kundugal point and Kilakarai channels.

The crafts used in fishing operations at Rameswaram Island can be grouped under three categories, the Tuticorin type boat, the shore-seine donies and the catamarans. The Tuticorin type boats are used for operating the Dunlop twine nets, hooks and lines and shore seining, and the catamarans for the operation of boat-seine net in pairs. The cast net fishermen of Pamban utilize small carvel built canoes or Malabar dug-out canoes.

During the year under review, statistics of fish landings from all the six centres were regularly collected—vide Appendix VII. The total landings were 39,541 maunds. The maximum landings at Dhanushkodi were during April, May and June. Thangachinmadam centre recorded heavy landings during the month of July to September. Among the various fish landing centres in Rameswaram Island, Dhanushkodi centre landed the highest and the Thangachinmadam centre landed the second highest quantity of fish during the period under review. Rameswaram and Rameswaram Road centres landed poor catches during the period under review. Taking into consideration the landing for the entire island it will be noticed that the highest landings were recorded during May when 7,162 maunds were landed and the lowest of 2,073 maunds in September.

A large number of species of fish were found in the catches at the various centres, and the most common among them were *Leiognathus spp.*, *Chirocentrus dorab*, *Cybius spp.*, and *Carcharias spp.* The heaviest landings of *Leiognathus spp.*, were during May, that of *Sardinella spp.* during December and that of *Chirocentrus*, *Cybius spp.* and *Carcharias spp.* during May.

It is of interest to note that the period when there was good fish landings coincided with the period when plankton was high in volume and number.

4. *Departmental deep-sea fishing operations around Rameswaram Island.*—The Departmental Deep Sea Fishing Unit at Pamban, operated around Rameswaram Island, nylon bottom nets and drift nets from motor fishing luggers and Tuticorin-type canoes, both on the Palk Bay and on the Gulf of Mannar side, according to the fishing seasons. The operations were conducted at a distance of 6–10 miles from the shore at depths varying from 6½ fathoms. There were good landings during April, July, August, September 1956 and January 1957, the heaviest catches having been recorded in April 1956. The fishing activities were not steady mostly due to the power boats developing frequent engine troubles.

The most common species found in the catches were *Carcharias spp.*, *Pristis cuspidatus*, *Chorinemus*, *Chirocentrus dorab*, *Cybius spp.*, *Arius spp.*, *Stromateus spp.*, and the Rock perches (*Lethrinus spp.* and *Serranus spp.*). The total quantity of fish caught during the year in the area was 73,115 lb. (Vide Appendix VIII.)

5. *Studies on sea-weeds.*—Systematic studies of the algae occurring around Rameswaram and nearby islands were made by periodical collections and identifications. An experiment on cropping and replenishment of sea weeds of Krusadai was taken up with a view to study the growth rate of the various algae in their natural environments. The area selected was Galaxea reef lagoon. Fortnightly croppings were done and the material obtained was qualitatively and quantitatively analysed. The algal bed of this

particular area contained a total of 33 species of red and brown algae. The rate of algal growth was satisfactory.

6. *Pearl oyster farming.*—The oysters brought from Tuticorin were kept in iron and wooden cages in the pearl oyster park. At regular intervals the cages were taken out and the oysters were cleaned and released in fresh cages. The sedentary fouling organisms found attached to the cages and the oysters were removed and procured for supply to Ennore. An attempt was made during the year to operate the oysters for culture-pearl production without anaesthesia but was not successful as within a short period of one week all the operated oysters died. The farm could not be replenished as a consignment of oysters transported from Tuticorin underwent total mortality during transit.

7. *Marine fish farming.*—The renovation of the chanos farm was in progress during the year under review and it is expected to be completed in 1957–58. However chanos fry were stocked in the pond, and as soon as work on the sluice gates are over additional stocking would be done.

8. *Affording facilities for field studies by visitors.*—Thirty-two parties of teachers and students from colleges throughout India and 12 parties from schools in Ramanathapuram and Madurai districts visited the station on educational tour. All facilities were provided to these parties for the proper conduct of their field work and laboratory studies on the flora and fauna of the area. The acquisition of a motor boat for the station during the year facilitated the transport of the visiting parties.

(iii) Tuticorin Biological Station.

1. *Meteorology and hydrography of Tuticorin sea.*—The atmosphere was generally dry and atmospheric temperature exhibited a double oscillation. High humid conditions above 70 per cent was rare in this region. Conditions of abnormal high temperature of the bottom water and cooler surface water have also been noticed during certain months. Current system in opposite directions were noticed at the surface and the bottom. Sudden rises and falls in the salinity were quite common in these waters. No appreciable variation was observed in the alkalinity. Water was fairly concentrated with oxygen. Silica was fairly high during July to December, and phosphate was generally poor. Concentration of calcium was high. The details of data recorded are shown in Appendices IX, X, XI and XII.

2. *Plankton of Tuticorin sea.*—The average sedimentation was 18 c.c. in April, 11 c.c. in May, 35 c.c. in June, 11 c.c. in July, 18 c.c. in August, 25 c.c. in September, 50 c.c. in October, 30 c.c. in November, 25 c.c. in December, 30 c.c. in January, 68 c.c. in February and 25 c.c. in March. Phytoplankton was dominant in April (60 per cent), October (57 per cent), and November (61 per cent), whereas zooplankton was dominant in January (77 per

cent), May (66 per cent), June (74 per cent) and July (67 per cent). The conditions were almost similar to those of the previous year.

The diatoms were numerically the most important organisms. The blue green alga *Trichodesmium* occurred periodically and its swarming was noticed in the months of April and May. Dinoflagellates were by far less numerous than the diatoms but their monthly variations mostly followed those of diatoms. The distribution of the latter was irregular, a feature being very high productivity in the months of February and September and low production in May. The total zooplankton was found to be rising from February to June. The larvæ of invertebrates occurred throughout the year. Molluscan larvæ were abundant in April. Copepod nauplii showed two maxima the first being in January and the second in June—August. Cirriped and Cyphonautes larvæ appeared irregularly. The copepod abundance was found to be during January—July. Maximal numbers of Chaetognaths were obtained in January with a secondary maximum in July. Fish eggs appeared in good numbers in January-February.

3. *Biology of the Trigger fish—Balists stellaris*.—To ascertain the relationship existing between the oysters and this fish (inhabiting the Pearl Banks) the study of the biology of this fish was undertaken. Many investigators have considered this fish a menace to the settling oyster-spat, and also as an intermediary host for the Tetrarhynchus worm which is said to aid pearl-formation. Length-weight relationship, gonadial stages, stomach contents, etc., were noted and valuable data obtained. During the year the fish did not form any major fishery though the hand line and chank fishermen landed fair quantities of this fish from November to May. The stomach analysis of the fish showed presence of oyster byssus indicating its predatory habit. Broken shells of *Modiola* were found in good numbers thereby indicating that it is a menace to oysters. This investigation will be continued in the coming year also.

4. *Biology of the Tunnies*.—The Tunnies constitute one of the important fishes landed in Tuticorin by trolling line. On an analysis of the landings from 1949 to 1955 it was found that August and September are the best months for the fish when roughly about 100 maunds are landed. There are at least 4 varieties of them locally known as *Ettalai*, *Kilavalai*, *Sourai* and *Elisoorai*. Proper identifications of the species is in progress.

5. *Trend of fisheries of Tuticorin*.—Analysis of landing revealed that sardines, perches and anchovies constituted the bulk of the catches. Seer, Barracuda, sabre fish, sharks, skates and rays also contributed to the landing in fair proportions.

6. *Study of biology of Chanks*.—Nearly 2,000 chanks were measured during the year. It was noticed that there were significant differences in the physical properties of chanks fished from different localities in the Gulf of Mannar and Palk Strait and also

in the chanks fished from the shoreward sides. Samples collected previously from different regions were measured and analysed. The *Tuticorin variety* is elongate and narrow with a well balanced spiral. Its form is elegant and heavy. Its periostracum is thick. The ratio of the axial length to the diameter of the body-whorl averages about 1.71. The *Kilakarai variety* resembles Tuticorin variety closely but for the thick lip of the columellar plicæ. The ratio of the axial length to the diameter of the body whorl is the same as that of Tuticorin type but the protoconch is found broken in all. The *Rameswaram variety* also resembles Tuticorin variety, but are stunted and thick at the diameter of body whorl. The shells are heavy and the columellar plicæ are not well developed. The *Tirupalakudi variety* chanks are stunted with short spire and thick shoulder. The ratio of the axial length to diameter of body whorl is 1.57. The *Pathala chanks* are the shore chanks. The main difference between these and the chanks fished off-shore is that the former is less weightier. Invariably in the interior opercular wall there is an extra oval thickening which is a nodular one and which can be easily felt by applying the fingers inside.

The data collected since 1932 in Chank Marking experiments were analysed and it was clear that chanks do migrate from place to place. Chanks released in one bed were recovered in another bed. The maximum distance covered varied as also the period that elapsed. It was not possible to work out the rate of migration with the existing data. The rate of growth also varied in different beds, due to different reasons. Hence it is proposed to study the ecology of chank beds together with marking experiments in the coming year. Details of number of chanks fished, marked and recovered from 1932 to 1956 are given in Appendix XIII.

7. *Pearl Oyster Biology*.—An inspection of Kudamuthi Par, Rajavukku Chippi Choditha Par, Pudu Par, Nadumalai Par and Karuval Par revealed that a population of 127 lakhs of fishable oysters were present on them. Analysis of a sample of 397 oysters, fished out during the inspection in December-January showed that 79 per cent of the oysters in Kodamuthu Par, 83 per cent in Rajavukku Chippi Choditha Par, and 72 per cent of the oysters in the Karuval Par were 4 years and more in age. In Tholayiram Par alone bigger-sized oysters were taken out and their age was assessed to be over 4 years. Middle and North Tholayiram Par contained immature oysters less than six months of age, their population being in crores.

(iv) Ennore Biological Station.

1. *Meteorology and hydrography of Ennore Estuary*.—During the summer period, April to June, atmospheric temperature was generally high, ranging on the average between 90 and 92° F. Humidity was at its lowest, average ranging from 58 to 74 per cent. There was rain in all the three months, rainfall of 5.6 inches in April being the highest for the year. Wind direction was uniformly north-east in the morning and south-west in the evening

Due to fall in the water level in the backwaters by evaporation, tidal flow gradually weakened at the end of April and by May 25th the flow stopped when bar was also closed. During the pre-monsoon period (July to September) there was a gradual fall in the atmospheric temperature, the average ranging from 83° F to 87° F. There was a gradual rise in humidity, its average ranging from 71 per cent to 82 per cent. Rainfall was moderate throughout the period ranging from 3.4 inches to 4.76 inches per month. Barometer reading on the average ranged between 30.1 inches and 30.2 inches. Direction of wind slowly changed to north-east. During the monsoon period (October to December) atmospheric temperature was high, being about 82° F on the average. Humidity was also at its highest, average range being from 82 per cent to 89 per cent. Rainfall ranged 3.49 inches to 5.3 inches per month. Average barometer reading ranged from 30.2 inches to 30.4 inches. Cyclonic weather was met with frequently in October, the wind continuing to be north-east throughout the quarter. The level of water in the estuary increased owing to precipitation and by freshes brought in from the upper reaches of the river. During the post monsoon period (January to March), atmospheric temperature showed a marked rise to 70° F. There was no rainfall. Barometer reading which was steadily on the increase was most in this period, being as much as 30.5 inches. Wind had slowly changed to north-east in the evening.

During the period (April to June) surface water temperature was at its highest ranging on the average from 87° F to 90° F. Specific gravity was also at its highest ranging from 1.021 to 1.026 on the average. The pH varied between 8.3 and 8.4. During the monsoon period (October to December), when the north-east monsoon had set in, the surface water temperature was at its lowest, the lowering being gradual and ranging on the average from 82° F to 80° F. Specific gravity was slowly on the increase as the bar had opened, the increase being from 1.004 to 1.010 on the average. Salinity was highest in the summer period going up to as much as the maximum on the average being 30.28 per cent. In the monsoon period it was very low going down to as little as 4.46 per cent on the average in October. The post-monsoon period showed a gradual increase correspondingly with increase in temperature. Oxygen content was observed to be at its lowest in the summer period being 0.868 in June. A slight increase was shown in the pre-monsoon period. Monsoon and post-monsoon periods had oxygen-contents ranging between 5.2 and 6.7 on the average. The increase in oxygen contents was noticed with the opening of the bar and the out-break of the north-east monsoon.

2. *Plankton of Ennore Estuary.*—The pre-monsoon period showed the highest amount of sediment being as much as 16.3 c.c. in July. There was a decrease of sediment in the monsoon period, it being lowest (13 c.c.) in December. The post-monsoon period

showed a gradual increase while the summer period showed a slight decline. Mysis predominated in the pre-monsoon period whereas copepods, nauplii larvae, *Coscinodiscus* and *Chaetoceras* predominated in the post-monsoon period. Volumetrically, Mysis occupied a greater portion than either copepods or the diatoms. Numerically phytoplankters dominated over the zooplankters.

3. *Biology of Mulletts.*—The following species of mullets were found occurring in the Ennore Estuary:—

(a) *Mugil ocellatus* (*Madavai kendai*), (b) *Mugil speigleri* (*Vella paranda*), (c) *Mugil parsia* (*Sala*), (d) *Mugil dussumieria* (*Paranda*), (e) *Mugil cunnesius* (*Mathseluvankendai*), (f) *Mugil jerdoni* (*Seluvang kendai sala*) and (g) *Kelaarte* (*Karathikendai*).

It is found that male mullets were more abundant in the catches than females and that former attain maturity at a smaller length than the latter. The breeding season was observed to be from December to April when mullet fry and fingerlings were available in large numbers in the shallows of the estuary.

Mulletts were observed to show a preference to plant organisms though there were cases where stomach were gorged with zooplankton such as copepods, *Euglena*, *Tintinnus* and *Prorocentrum*. These fishes were found to show a liking for *Enteromorpha* and *Polysiphonia*. Diatoms consumed by the mullets were *Navicula*, *Closterium*, *Nitzschia*, *Fragillaria*, *Amphora*, *Pleurosigma*, *Coscinodiscus*, *Surirella*, *Diploneis* and *Thalassiosira*. Sand grains formed 50 to 70 per cent of the stomach contents when the rest consisted of diatoms. From these observations it might be deduced that the fish are browsers in the shallow areas. Algal filaments and diatoms play a large role in the nutrition of mullets.

4. *Edible oyster research.*—The spat were found to grow as much as 9 cm. in a period of 3 months. Oysters above this size were not found on the cultch indicating that they detach themselves and get carried away by the current to the more saline areas closer to the sea-mouth. Spat-fall began about the middle of December and was at its peak in January and February and extended up to April. Growth was good as long as the bar remained open, i.e., in the post-monsoon period but was retarded in the summer period.

B. INLAND FISHERIES RESEARCH.

Sri M. Devidas Menon continued to be the Assistant Director of Fisheries (Freshwater Biology) till 7th October 1956 when he was transferred to Kozhikode. Sri R. Venkataraman acted as Assistant Director (Freshwater Biology) from 24th October to 12th November 1956. Sri T. M. Arumugam joined as Assistant Director on 24th December 1956 and continued till the end of the year. Sri S. T. Chari was the Hydrologist till 13th September 1956 and Sri A. Srinivasan from 14th September 1956; and the latter was in

additional charge of the post of Assistant Director of Fisheries (Freshwater Biology) from 8th to 23rd October 1956 and from 13th to 23rd December 1956.

Programme of work.—(1) Experiments on the segregation of carp fry and reduction in mortality.

(2) Bionomical studies of *Wallago attu* and *Catla catla*.

(3) Studies on *Chela chupeoides* and its utility in cyclopsidal work.

(4) Bionomics of *Barbus ticto*.

(5) Culture methods of *Microcystis* and its effect on growth, and survival of *Tilapia*, *Labeo*, *Cirrhina* and Mirror carp.

(6) Effect of manuring on growth and survival of *Hydrilla*.

(7) Experiments on spawning of Mirror carp.

(8) Further studies on *Tilapia*.

(9) Studies on inland fishing gears.

(10) Oxygen requirements of freshwater fishes.

(11) Food value of fresh water fishes.

(12) Analysis of pond bottom deposits.

(13) Effect of poisons of fish life.

(14) Timnology of Bhavanisagar Reservoir.

The progress made under each item is detailed below :—

1. *Experiments on the segregation of carp fry and reduction in mortality.*—The segregation of the economic varieties of the carp fry from the mass of fry collections made in thousands from the rivers, especially in the Cauvery and Bhavani in Coimbatore district, is a major problem in fish cultural operations in this State. The experiments carried out during the year related mainly to (i) the reaction of the different varieties of fry to different coloured lights; (ii) the capacity of the different varieties of fry to tolerate different oxygen tension and (iii) the variability of the fry to swim against different velocities of running water. The results obtained are summarised below :—

(i) *Effect of colour.*—The effect of different coloured lights on the grouping of fry in a tall glass jar was tried with violet, red, green, orange and white lights but the experiments did not clearly reveal as to which species were attracted by each colour. Fry of 10-15 mm. always preferred the surface layers, whatever the colour.

(ii) *Oxygen depletion method.*—Three hundred fry, 9 to 25 mm. of *Nuria*, *Rasbora*, *Chela*, *Barbus* and *Cirrhina reba* were kept to overcrowding in a tall rectangular glass jar and the top was completely closed with a glass plate. It was observed that for the first 10 minutes they remained at the bottom. After 15 minutes, they started moving up and in another 5 minutes a dense crowding at the surface was noted. In another 3 minutes they were found gasping and swooning off. The top layer was ladled out together with 100 dead fry. The jar was closed again. Within 3 minutes the fry came to the surface, and other 100 fry died. These and

the top layer of water were ladled out and jar closed again. All the remaining fry came to the surface in another 10 minutes and died.

The experiments were repeated in a double tin carrier. The carrier was filled to the brim with water and fry, 9 to 25 mm. were put into it, closed with a glass sheet. After one hour crowding of the fry at the surface was noticed, and they could not go down even when disturbed. They were scooped out. In another 10 minutes further crowding at the top was noted and they were removed. Many of the bigger fry were still remaining at the bottom even after 2 hours of first introduction and these were *Barbus* (88 per cent), *Nuria* (6 per cent), *Cirrhina cirrhosa* (6 per cent).

(iii) *Effect of velocity of water.*—Preliminary work carried out last year showed that by varying the velocity of water, the fry could be segregated into the following three groups :—

(1) *B. heterogonolepis*, *B. carnaticus* and *Cirrhina cirrhosa*; (2) *Rasbora*, *Nuria* and *Danio*, and (3) *B. filamentosus*, *B. ticto* and *B. rittatus*.

The observation showed a relationship between the body form of the fishes and the velocity of the water flow. The higher the body, the lesser is the capacity to swim against increased velocity. The fry could be segregated into different groups and the economic ones could be separated from the mixture by skimming out the uneconomic minnows as they come to the surface at the earliest. Further work will be done to study this in detail.

Observations made in the collection centres on the length-frequency distribution of the different species have revealed that the fry and fingerlings collected on any particular day are generally of almost the same size suggesting the spawning of adult fish at regular rhythmic intervals. Hence the size of fry may form an indication of these species and grouping these fry into different size-groups may lead to a successful segregation. A segregation therefore of the different size-groups of the fry collected, may bring about an easy segregation of the different varieties. With this in view, suitable contrivances for this size segregation are under preparation and the work will be followed up on the spot during the next collection season.

Experiments on the mortality of fry showed that food is a major factor in keeping down mortality. Zooplankton seems to be more important than phytoplankton for a better survival of the fry in nurseries. A good growth of *Daphnids* could be obtained by manuring the water with cotton seed meal. Natural nurseries gave better survival than cement nurseries.

2. *Bionomical studies on Wallago attu and Catla catla*—The growth of *Catla* under culture in ponds without artificial feeding was from 12.7 cms. to 22.9 cms. in 4 months. In certain departmental ponds they have grown to about 36 cms. (6 lb.) in

the first year and to about 55 cms. (15 lb.) in the second year. The length-frequency distribution of the commercial catch of Mettur Reservoir revealed 26, 45, 69, 92 cms. size groups. A few specimens about 100 cms. in size were also caught occasionally. For fixing up of the age groups, the scales have been collected and are under examination.

Catla was found to feed on plankton and vegetable matter. Molluscan shells were also seen in the stomach contents probably ingested along with the vegetable detritus. The food composition was *Myxophyceae* (5 per cent), *Chlorophyceae* (10 per cent), *Diatoms* (25 per cent), *Zooplankton* (25 per cent), water-weeds like *Chara*, *Lemna* and *Hydrilla* (40 per cent) and Molluscan shells and others (5 per cent).

The fecundity of *Catla* was found to be about 805,000 ripe ova of 1.05 mm. diameter. It bred in the Mettur Reservoir between the last week of June and first week of July. In the river Cauvery, below Mettur Dam, it spawned later. A major factor for the spawning appeared to be the flow of turbid water. Fry of *catla* started appearing in the river Cauvery in the first week of August. The length-frequency pattern of the fry and young fish indicated the probability of the different stocks from different areas contributing to the annual recruitment. The spawning grounds of *Catla* in River Cauvery appeared to be river area above Upper Anicut and the confluence of river Noyyal and Amaravathy with River Cauvery. Above the Mettur Dam Reservoir, the spawning appeared to take place near the inflow of Thoppayar and Palar. *Catla* caught in the Lower Bhavani Project canal due to closure of shutters were of the size of about 800 cms. and about 25 lb. each. These contained mature ova and spawn. As many as 63 *catla* were caught of which only 4 could be kept alive. These were stocked in Bhavanisagar fish farm ponds for observation. Since the *Catla* caught must have come from fish stocked in Bhavanisagar Reservoir, it is hoped to obtain successful results on breeding habits of this major carp in the course of next few years.

Wallago attu, the fresh-water shark, was found to be more riverine in its distribution. Because of this ecological habit their catches have gradually dwindled in Mettur Reservoir.

Age and growth.—The pectoral spine was selected as an index for a study of its age and growth. A cross section of the spine, 3 to 4 mms. from its base gave the best results. The length-frequency pattern of the commercial catches of Mettur Reservoir revealed 31, 45, 58, 64, 74, 84, 94, 104, 11, 4, 125 and 152 cms. size groups. A pectoral spine of fish of 30 cms. showed one clear ring and in a few an indistinct second ring.

The fish was found to be highly piscivorous. Smaller *wallago* specimens were also found in the stomach of larger fish indicating a cannibalistic habit. *Wallago* was noted to lie in

ambush below dams and regulators to gulp large numbers of carp fingerlings as they try to ascend up. It was also observed during departmental stocking that *wallago* crowded around the place at distance and preyed upon the stocked fry and fingerlings as and when they moved into deeper waters.

The fish bred in the rivers towards the beginning of August. In river Cauvery they migrated up when flow of the old alkaline water took place. When the acidic turbid water started flowing, the migrants started drifting down and spawned in inundated areas on the river banks. Their fry were available in good numbers above Grand Anicut in the Cauvery River.

3. *Studies on Rasbora*.—Specimens from Madras were examined for length frequency, individual weight and volume, sex and fecundity. The gut-contents were also examined. Sixty per cent of the total number of fishes examined showed cyclops and 80 per cent showed crustacean appendages and cyclops. The gut contents of all the size-groups were however identical. They consisted of Cyclops, Planula larvae, Rotifers, Daphnids, Diaptomus, other zooplankton, Diatoms, Desmids and Filamentous algae.

4. *Studies on Barbus stigma*.—Six hundred and ten specimens were examined for individual weight, volume, sex-proportion and gut analysis. The gut contents consisted of Crustacean appendages, Cypris larvae, Rotifers, Scales, other zooplankton, diatoms, insect larvae, Amphipods, Cyclops, Diaptomus, Green algae and Desmids.

5. *Culture methods of Microcystis and its effect on the growth and survival of Tilapia, Labeo, Cirrhina and Mirror Carp*.—Further detailed work on the problem was carried out during the year under report. Culture experiments in inorganic solutions have shown that *Microcystis* thrive in Knop's solution 1/10N and lower dilutions even without substratum. Experiments in water and soil extract media without any substratum have shown that a pH of above 8 is found favourable for the sustenance of *Microcystis*. Addition of Glucose to the soil-water culture medium increased the growth of *Microcystis*. Diffused sunlight appeared to be more favourable for their growth. Experiments on the effect of *Microcystis* on the growth and survival of fish could not be taken up as the culture methods of the algae had not yet been completely worked out so as to make available large quantities of *Microcystis* required for the feeding experiments.

6. *Effect of manuring on the growth and survival of Hydrilla*.—The Macro-vegetation in a piece of water is equally important as the micro-organisms for the cultural operations as the water weeds either themselves form the food of fish or harbour insects and their larvae, etc., which in turn also form food of fishes. Problems in fish management also arise if either there is

excess of vegetation or insufficient quantity. Experiments were therefore taken up to determine the optimum conditions for the growth and survival of one of the most common water weeds, namely *Hydrilla verticellata*. To start with the experiments were confined to a determination of the best manure required to effect good growth of *Hydrilla*. The experiments were conducted under controlled conditions in cement cisterns of 4 by 3 by 2 feet each. A substratum of soil to a depth of 2 inches was provided in each tank. A depth of 18 inches of the water was maintained throughout and ordinary tap water was used before letting in water. Two pounds each of the following manures were applied by mixing it in the substratum of each tank—fish manure, cowdung, groundnut cake, green leaves of *Calotropis*, *Indigofera*, *Glyricidia* and *Dalbergia*. One cement tank was maintained as control. *Hydrilla* branches of the same size with the same number of whorls and weight were planted at the rate of two branches in each tank. The experiments were conducted for a total period of 69 days. Data on the length, number of whorls and weight attained by the plants were gathered once in 20 days. The results showed that fish manure gave the best growth rate over a longer period whereas *Dalbergia* (green leaves) though initially gave a better growth, ultimately showed a decreased growth rate. Groundnut oil-cake and cowdung gave rise to algal blooms on the surface water and the growth rate of *Hydrilla* was poor. *Calotropis* leaves were also found to be not very satisfactory. The leaves of *Glyricidia* gave an uniformly increasing growth rate. As *Glyricidia* leaves were easily available, thanks to the intensive cultivation by the Agriculture Department, it may be used as manure for a good and sustained growth of *Hydrilla*. Further work on the rate and periodicity of the manuring for an optimum growth of *Hydrilla* is under way.

7. *Experiments on spawning of Mirror carp*.—As the Mirror carp grew and bred in profusion in the Nilgiris, attempts were made by the department to introduce them into waters on the plains and the results achieved were successful. Though they grew well in plains, they did not breed. There are two maxima in their spawning in the cold waters of Nilgiris, viz., March-April and September-October, and observations have shown the availability of fingerlings of this fish almost all the year round.

Mirror carp have been observed to breed under the following conditions in the Nilgiris waters: (i) The banks of the tank should get exposed and become dry for a part of the year and should get suddenly inundated, (ii) there should be a good growth of grass over this exposed area; (iii) wherever there is rotting grass, the fish have been noted to be spawning, and (iv) the spawning ground should be free from fine silt and clay which smother the eggs. These conditions were created in a nursery at the Bhavanisagar fish farm but the experiments were not successful. As a part of the experiment, 479 Mirror carp of 100,

145 and 180 cm. size-groups were stocked in Odathurai tank, which had all the favourable conditions for the fish to spawn. Further observations made in September-October revealed that both the males and females had matured gonads but that they had not shed the eggs. The fish had not spawned even in March 1957. Another set of experiments were conducted to induce the fish to spawn in the Bhavanisagar fish farm by injecting pituitary extracts. Though the females developed ova, the eggs were not shed. The work is in progress.

A reported case of the non-breeding of Mirror carp in Kodaikanal lake was investigated. The investigation revealed that the fish had bred once in the Bryant's Park pond when they were first stocked in 1947 and once in the Kodaikanal lake also. The growth rate of the fish was found to be very poor being only about 10 cms. per year, due to the poor planktonic content and low dissolved nutrients in the lake water. The low population of Mirror carp might therefore be due to the poor growth rate and lack of spawning beds and consequent low survival of the eggs. Hence intensive manuring of lake and restocking the waters with more fish from Nilgiris were suggested for further observation.

8. *Further studies on Tilapia mossambica*.—Work on *Tilapia* was continued with reference to the determination of the predator predated ratio that should be adopted in fish cultural practices with *Tilapia*. The experiments were carried out under controlled conditions in cement cisterns of 4 by 3 by 2 feet. A bottom of sand and mud mixture in 1 : 1 proportion was provided in each tank to a depth of 8 inches. Each cistern was manured with 50 gms. of cowdung and water was maintained to the same level. The pond predators selected were *Ophicephalus marulius* and *Glossogobius giuris*. *Tilapia* and predators were introduced in the following proportion:—

Cistern I—*Tilapia* alone—8 numbers (of 59.8 mms. size)

II—*Tilapia*—4 numbers (of 55.5 mms. size) and *O. Marulius*—4 numbers (of 65.6 mms. size).

III—*Tilapia*—4 numbers (of 58.8 mms. size) and *G. giuris*—4 numbers (of 62.8 mms. size).

During the course of the experiments, the predators unfortunately died in cistern III and therefore the results could not be used to determine the exact numerical ratio of the predator-predated survival. The experiment confirmed the earlier view that the population pressure could be controlled by introduction of predators like Murrels and *Gobius*. Field observations made during the survey of the Rural Fishery Demonstration tanks have also shown that in tanks containing predators like *Notopterus*, *notopterus*, *Enteropneustus fossilis* and *Glossogobius giuris*. *Tilapia* culture has not yielded any good results and with no result in certain tanks as in the case of the Gangadheeswarar tank in Madras.

Culture experiments of Tilapia with carps have shown that the growth rate of the carps are not at all affected by rearing Tilapia in combination. Further work on the exact numerical ratio of the predator and predated fishes and with the carps will be followed up.

9. *Studies on fishing gear.*—The work was taken up very late due to want of sanction for the purchase of the required number of nets. Part of the gear was obtained in September and the first series of experiments were commenced with Rangoon nets and Uduvalai. Rangoon nets of 1½ and 3 inches mesh, were used and Uduvalai of 1½, 2, 2½, and 3 inches mesh were operated. In both the types nets made up of cotton and Nylon were operated to ascertain the comparative efficiency. The data gathered so far have revealed that Nylon nets give better results than cotton nets. The experiments are being continued and this work will have to be continued for at least five years to find out the efficiency of each gear.

10. *Oxygen requirements of fresh-water fishes.*—The oxygen requirements of Tilapia, Mirror carp, Barbus machecola and Etroplus maculatus were studied and it was found that the fishes started dying when the oxygen content was reduced to less than 0.3 mg./litre the percentage saturation being less than about 3.5 per cent. This lethal level was found to be almost similar for all the fishes tried. Further work with other fishes is under progress.

11. *Food value of fresh-water fishes.*—The proximate composition of 17 fresh-water fishes were determined during the year. The percentage edibility, moisture, protein, fat, phosphorous, calcium and iron contents of the various fishes are given in Appendix XIV. The salient points are: (i) protein content of Barbus spp. is lower than that of others; (ii) Labeo fimbriatus is highly fatty (18.99 per cent on fresh basis); (iii) the moisture content of L. fimbriatus is correspondingly low (61.87 per cent); (iv) there is not much significant difference in the composition except the lower protein content of Barbus spp; and (v) Tilapia mossambica is found to be as good as any other fish in nutritive value. Further work on these lines for the other fresh water fishes will be continued.

12. *Analysis of pond bottom deposits.*—The following were the salient observations: (i) The bottom soil samples of the Bhavanisagar reservoir from four different areas, viz., the inlets of rivers Moyar and Bhavani, above the confluence of these two rivers and below the confluence, were analysed from weekly collections. A characteristic feature of all the four places was the high sulphate and calcium content. (ii) The five ponds of the Bhavanisagar fish farm were manured with plant and animal matter and the water and soil samples collected from the ponds were analysed from weekly samples. (iii) The pond bottom

samples from the demonstration tanks were collected during the survey of Rural Fishery Demonstration tank and 112 such samples were analysed. More detailed work on this subject would be carried out when a personnel is posted to the newly sanctioned post of Research Assistant (Soil). The post was vacant throughout the year under report as no qualified candidate was available to take up the post.

13. *Effect of poisons of fish life.*—To evoke a practical method of selective killing of predators and unwanted and uneconomical fishes, it was proposed to study in detail the effect of various types of poisons on these fishes.

(i) To start with the effect of soap-lye on Tilapia and Murrel was tried. Low doses did not have any effect. Mortality of Tilapia and Murrel occurred when the concentration was suddenly increased to 5,000 parts per million which in turn increased gradually, the mortality was noted only when the concentration exceeded 6,000 ppm. It was therefore considered uneconomical to use this as a fish poison since a high dosage is required for effecting the mortality.

(ii) The same was found to be the case with rotten potatoes which had been recommended by workers elsewhere as a useful fish-poison. This was found to have no effect up to 500 ppm on *Etroplus maculatus* and carps. Though the pH initially increased on the addition of rotten potatoes it came down within 24 hours.

It was therefore decided to try certain of the poison that are reported to be commonly employed by villagers for illicit fishing.

(iii) The most commonly used indigenous poison, namely, "Karaikkai" (fruit of *Randia dumetorum*) was tried as a selective fish killer. A solution of this poison with 20 ppm was tried on Murrel, *Barbus ticto*, *Danio* spp and carp fry from Tanjavoor for a period of 24 hours. *Barbus ticto* and *Danio* died within 24 hours. It was found lethal to Murrel. But there was no effect on Tanjavoor carp fry. When the concentration was increased to 25 ppm there was 90 per cent mortality. Thus this poison may be capable of yielding good result if an effective concentration is extracted and used. Further work will therefore be continued.

(iv) *Derris powder* which is universally used as a fish poison was found to be effective in selective elimination of murrels without affecting carps. Contrary to the findings of other workers it was noted that murrels died at 1.7 ppm, 90 per cent at 0.43 ppm and 60 per cent at 0.35 ppm. With a combination of murrels and carp fry from Tanjore, Murrels died in 24 hours to the extent of 50 per cent at 1.77 ppm itself and to the extent of 100 per cent at 0.354 ppm while there was no death of carp fry. However 66 per cent of carp fry died at 0.708 ppm. Further work is under progress.

14. *Limnology of Bhavanisagar Reservoir.*—A detailed study on the Limnology of the Bhavanisagar Reservoir was continued during the year. The studies were conducted from weekly samples of water, plankton and soil collected from four ecologically different places in the reservoir, viz., the inlets of the rivers Moyar and Bhavani, above their original confluence and below their confluence. The collections were made from the surface, middle and bottom zones at each station to know the conditions of existence and the inter-reactions of plankton at the different ones of the reservoir.

The chemical studies so far made revealed that the reservoir is not rich in nutrients. Wide fluctuations in the pH and dissolved oxygen content were noted. Carbonates were absent in the reservoir excepting during the first week of November. A characteristic feature of the soil was the high calcium and sulphate content. Ammonia was present from April to July and absent thereafter. Very low phosphate content was noticed throughout the year.

The maxima, viz., one in October and another in March were noted in the phytoplankton of the reservoir as a whole, the latter being greater. Seventeen *phyto-organisms* were noticed. *Ankistrodesmus*, *Staurastrum*, *Ceratium*, *Peridinium*, *Melosira* and *Microcystis* were present throughout the year, the diatom *Melosira* being dominant. Besides, a vertical distribution of plankton changing during different seasons were also noticed. During the months of July–August, the middle zone of the reservoir was found to be the richest in phytoplankton. In September–October, the bottom layer was the richest while the surface was richest during November–January. Again in the month of February, the mid zone became richest but in March the surface layer became richer. Similarly a horizontal distribution of plankton at four stations were also noted. The Moyar river portion was the richest in August and October, the Bhavani river portion during September, January and March. The area above the confluence was the richest in July and December and portion below the confluence in November.

The zooplankton was poorly represented in the reservoir. It was represented by a few Rotifers and Copepods only. Since the productivity of new reservoirs will increase with age, the work is to be continued over longer periods for any definite conclusions.

15. *Other items of work.*—In addition to the programme of work carried out as detailed above, other items of special investigations, etc., were attended to.

(i) *Survey of Rural Fishery Demonstration tanks.*—A detailed survey of the Rural Fishery Demonstration tanks in the entire State was taken with a view to assess their productivity and classification according to the nature of the soil and water and to determine the optimum number and variety of fish to be stocked.

Hundred and twenty-two tanks situated in eleven districts of the State were surveyed as detailed below :—

Name of district.					Number of tanks.
1	Madras	..	..	..	7
2	Chingleput	..	..	..	30
3	North Arcot	..	..	..	6
4	South Arcot	..	..	..	11
5	Tanjore	..	..	..	26
6	Tiruchirappalli	..	..	..	
7	Madurai	..	..	..	14
8	Ramanathapuram	..	..	..	
9	Tirunelveli	..	..	..	11
10	Coimbatore and Nilgiris	..	..	..	6
11	Malabar	..	..	..	11
Total ..					122

This work took away the services of the research staff of this station to a great extent from their normal work. A major portion of the year was spent on the survey and collection of data like hydrobiological conditions, the stocking and exploitation particulars, etc. The volume of data that have been gathered await final consolidation and assessment.

(ii) *Studies on the fisheries of impounded waters.*—The Krishnagiri reservoir project was visited to study the possibilities of fishery development in the reservoir to be formed. Similar studies were conducted on Kundah Hydel Project areas also. The possibility of culturing coarse fishes like Mirror carp, Scale carp, etc., in the latter reservoir and their effect on the trout population of the connected streams and rivers were examined. A survey of the Manimuthar Project revealed the presence of *Barbus curmuca* in the river. The future of this species when lacustrine conditions are effected after the formation of the reservoir is to be examined in detail. The admissibility of introducing Tilapia in large impounded waters like Hydel projects was investigated in Hope Lake and River Tambaraparni. A notable feature observed was that Tilapia introduced above the Lower Dam and below Hope Lake were found to be confining only to the non-flowing stagnant shallow portions. This ecological requirement of the fish, as was expected, is due to its peculiar breeding habits. Further observations will be continued.

(iii) *Investigations on the river Ullar fishery.*—Investigations were carried out to examine the request of the Fishermen Co-operatives of Tanjore to change the closed fishing season of the small stretch of river Ullar to May and June instead of June

and October, to facilitate the migration of Hilsa in the river Coleroon. The results of the investigations yielded valuable data on the migration of other fishes also like the carps and cat fishes which form the bulk of the fishery of the Cauvery system, revealing the necessity to have May, June and July as closed season in the Ullar by-pass. Suitable recommendations were submitted accordingly.

(iv) *Hilsa investigations*.—The Hilsa fishery of the river Coleroon was heavy this year between May and June almost coinciding with the theory of the five-year cycle. The fishery was maximum in the lower stretches of the river. In the mid-stretches, the fish had been caught at the rate of about 4,000 per day on an average for nearly 40 days of peak fishing. The percentage of females was higher in the population of the catches near the sea and the percentage of the males were more in the catches of the upper portions of the river. The males ranged in size from 25–30 cms. and females from 41–44 cms. The presence of small Hilsa of 15–20 cms. was noticed near the Upper Anicut.

(v) *Fish culture in Cholvaram lake*.—At the request of the Water and Sewage Purification Committee, the Cholvaram lake was surveyed to find out the possibilities of fish cultural operations in the lake to keep down the organic growth in the water. The lake is an ideal one for fish culture capable of maintaining a population of more than 30 lakhs of fish of about 435 gm. (1 lb.) size. Suitable recommendations were made. Though proposals were made many times before for stocking, developing and exploiting this lake along with Red Hills, the Government have not ordered the implementation of the scheme since it was a drinking-water source and the Chief Engineer objected to the scheme. Again and again authoritative information of Water and Sewage Board in foreign countries recommending the culture of fish in drinking-water sources was also furnished to the Government but yet the proposals were not sanctioned. The water in such drinking water sources becomes very nutritious and potential, rich in planktonic content. As it gets aged, it becomes an ideal source for culture and maintenance of fish population. Periodical mixing up of bottom and upper waters by plying the nets for fishing will tend to remove, besides grown fish, the unwanted gases and impurities held under pressure in the bottom water and make the water less odorous. Thus fishing in drinking-water source is not harmful but beneficial as anti-fouling mechanism and purification process for removal of unwanted living micro-organisms that are harmful to mankind as the fishes ingest these organisms for their own food leaving the water in a purer condition. Hence the question of utilising the water sources now exclusively reserved as drinking-water source may be examined further to be used for pisciculture. To begin with, the department can be entrusted with some of the major sources for a certain period and the effect of fishing may be studied

in such dereserved water and in reserved water side by side so as to draw definite conclusions on the utility or otherwise of pisciculture.

(vi) *Investigations on Tanthipandal fish farm*.—Special investigations were carried out on the Tanthipandal fish farm on its reported poor productivity. The farm situated as it is in a reserved forest, received its supply of water from two natural springs. The water was very soft and clear, devoid of any planktonic growth. The growth of Gourami was very poor being 2.5 to 12.7 cms. per year. The hydrological studies revealed the acidic nature of the flowing water with low dissolved oxygen and poor nutrients. The nature of the water prevented the good growth of water weeds and also any improvement work by way of fertilization. Since Gourami preferred acidic waters to breed, they were found to be breeding satisfactorily in the farm giving a minimum of about 200 fingerlings every year. Suggestions were made to increase the breeding intensity of the fish by providing suitable materials for it to build more nests and artificial manuring of the pond waters and feeding the fish to improve their growth-rate. Besides the farm compound has to be cleared of undesirable growth of weeds and shrubs, the ponds have to be deepened to retain more water and the water in the ponds have to be retained for longer period instead of allowing it to be drained.

(vii) *Studies on pollution*.—To find out whether the factory authorities follow the recommendations of the station, the Mettur Chemicals, Limited, and the Erode Cauvery Textiles, Limited, were visited and the discharged effluents were checked. It was seen that the effluents were being treated properly as per recommendations before being let into the river.

(viii) *Mortality of fishes in Vellore Fort Moat*.—Following heavy rains, there was heavy fish mortality at Vellore Fort Moat. Though it was not possible to draw any definite conclusions, it was decided to examine the water once in a quarter during the coming year to find out the real cause of mortality in a static water like the Vellore Moat. Such a check up of important departmental waters is necessary to prevent mortalities.

(ix) *Weed control experiment*.—Twelve per cent Pep emulsion (Pentachloro phenol) and Copper fungicide were used to eradicate Hydrilla in cement cisterns and found that they could be used effectively to eradicate Hydrilla without affecting the fish, the effective concentration being 4 ppm in both the cases. The action was however slow as it took about 40–45 days to eradicate a thick and dense growth of Hydrilla. Further work is being carried out to confirm the results.

(x) *Fish population studies in Bhavanisagar Reservoir*.—Studies on the availability of young fish in the upper reaches of Bhavanisagar Reservoir commenced in January 1956, were continued. Fortnightly samples were collected both in the mornings and evenings, to find out the comparative abundance and seasonal

and diurnal changes of young of different species. The studies carried out for eight months revealed the absence of the young of any economic variety. A diurnal variation in the distribution of forage fish was noticed. The plankton feeder was more abundant in the mornings, insectivorous fish in the evenings and those feeding on both plankton and insects being equally distributed. Certain species were found to be completely absent during certain periods being replaced by others.

Studies on *Barbus dubius* and *B. hexagonolepis* of the Bhavanisagar Reservoir were continued. The length-weight particulars of the fishes of the departmental catches for 1954 and 1955 were tabulated. It was seen that the population of *B. hexagonolepis* was getting reduced. In both the species the bigger size-groups were less in 1955 than in 1954.

(xi) *Studies on Bhavanisagar fish farm ponds*.—Plankton, water and soil samples from the five ponds of the fish farm were collected once a week and studied as a routine item of work. There were two maxima in the plankton production, one in September-October and another in February-March. Since the construction of ponds was defective, they did not retain water and considerable seepage occurred making it impossible to retain water for known periods and to study the effects of manuring and growth of plankton and fishes. The soil on which the ponds were constructed was rocky gravel, and it was found difficult to stop the seepage unless the bottom and sides were completely cement concreted and fresh soil with manure were laid on such beds. As this would increase the cost of maintenance it was decided to maintain a regular and unrestricted supply of water to the ponds. The supply of water was, however, stopped during the summer months consequent on the closure of the canal sluices from April to July till the outbreak of the monsoon and the normal supply of water to the reservoir. Thus regular supply of water to the farm ponds was problematical, and therefore the conduct of experiments in them had to be given up.

(xii) *Extension work*.—Several enquiries from the interested pisciculturists and aquarists were answered. Lectures on pisciculture in rural parts were given to the extension trainees at the Orientation Training Centre at Bhavanisagar. Extensive propaganda on the food value of fish was conducted. Exhibits and charts were displayed in five exhibitions in Coimbatore district.

C. FISHERIES TECHNOLOGICAL RESEARCH.

Sri R. Venkataraman continued as Superintendent of the Fisheries Technological Station, Kozhikode, till 15th October 1956 when Sri M. Mukundan Unni took charge. This station was ceded to the Kerala State consequent on reorganization of the States. Sri Venkataraman took charge of the newly started Technological Station at Tuticorin on 15th November 1956. He was also in-charge of the Technological Station at Cape Comorin, which was formerly in the Travancore-Cochin State.

(i) *Technological Station, Kozhikode.*

The following are the salient features of the work done at this station till 1st November 1956 :—

Thermophysical studies.—Experiments of salting of fish was continued. The use of Wadala salt containing 98 per cent Na Cl was found to improve the keeping quality of salted fish. The survey of different fish markets for studying the quality of salted fish sold then was continued. Samples were collected from East Coast Market also. The quality of prawn pulp exported from Cochin was studied. The possibility of packing this in attractive tins and alkathene bags was investigated.

The experiments on the use of infra-red rays for drying fish was continued using sheathed wire type of infra-red heaters. The behaviour of semi-dried prawns packed in alkathene bags and stored at 0°F. was studied. It was observed that prawns got spoiled because of excretion of salt from the prawns muscle. Experiments were also conducted on the use of alkathene lined hessian for storing fish-meal and it was observed that such bags were the best and cheapest for storage and transport of fish-meal.

The use of antibiotic Achromize B1 and Biostat for preservation of iced fish was investigated. It was observed that the antibiotics are quite ineffective when treated with prawns. The effect on different fishes are being investigated.

The data furnished by the fish-curing yard officers regarding the weight of salt stacked in the yards for experiments was compiled and percentage loss in storage up to two years was worked out. It was recommended that the existing system of writing off the losses may be continued.

Biochemical studies.—The first study that was taken up was to evaluate the nutritive quality of self-brine. Since a study of amino-acids composition would reveal the nutritive quality of protein present therein experiments were designed to that effect. Proteins after precipitating from the self-brine from pits containing 'Colombo cured' mackerels were hydrolysed to amino-acids and the extract containing these amino-acids were qualitatively studied using the wellknown 'paper chromatographic technique' and using pure and authentic samples of amino-acids for comparison. These experiments revealed that the protein hydrolysate was a good source of nine out of ten essential amino-acids and that it was deficient in the essential amino-acid tryptophan. For a balanced diet other sources of tryptophan should be added in admixture with self-brine.

Some qualitative tests were performed on the blubber oil of whale stranded alive near Kadalundy which indicated that the oil was deficient in Vitamins A and E, cholesterol, precursor of bile acids, cholic, glycocholic or taurocholic acid. Some colour reactions revealed the presence of ergosterol the precursor of Vitamin D. Intensive investigations to study whether whale oil can be made use of as a source of Vitamin D are necessary.

Vitamin B-12 has recently gained much importance as an anti-premicious anæmia factor and any study made with a view to enhance the production and to decrease the present existing heavy price will have much importance in industry. Hence Vitamin B12 was assayed in shark liver and muscle microbiologically using *Lactobacillus lichmannii* 4797. Of the two phosphate nitrate buffers (pH 5.0 and 26.0) used, it was found that the buffer with pH 5.0 was by far the best and that it extracted B12 almost quantitatively. B12 contents of male shark liver and muscle obtained were (1) 1,068 millimicrograms (mr)/gm wet liver, (2) 1,340 mr/gm dry weight in male shark muscle, (3) 1,349 mr/gm wet weight and (4) 1,730 mr/gm dry weight. The fact that these tissues of shark and probably of other fishes containing such large amount of B12 shows that a method could be evolved to extract and isolate a major portion of B12.

Lastly, experiments were designed to study the effect of additions of (1) shark liver residue, (2) viscera of sardines, (3) sardine fish meal and (4) prawn extract to the basal medium on the yield of Vitamin B-12 by the mould *Streptomyces griseus*. This mould produces Streptomycin and also Vitamin B12 when it grows on a complete medium. When the effect of additions of above supplements were tried on the growth of this mould it was found that the mould grew abundantly consequent on this supplementation by prawn extract which implies a better yield of Vitamin B12 in the culture filtrate.

Bacteriological studies.—It was found that Colombo-cured products were superior to the ordinary dry salted fish. A qualitative study of the different components of Gorka puli was therefore carried out using Chromatographic technique. The puli was tested for the presence of amino acids, fatty acids, sugars, tanins and acides like ascorbic and nicotine acides.

The previous studies on quick freezing of prawns have shown that the shell of prawns contained large numbers of bacteria and that the shell played a dominant role in 'Black spot' formation in prawns. The new process adopted in the cold storage was therefore studied with particular reference to the psychrophillic flora and coliforms.

The water used for making ice in the cold storage at Kozhikode and Mangalore was analysed to study the extent of pollution. The town water-supply in Tuticorin was also analysed for the construction of an ice plant. Although the total solids were within the limits the coliform count was too high.

Chemical studies.—The following studies were made during the year :—

(1) Various salt samples from Tuticorin were analysed to study the extent of contamination by Magnesium and Calcium salts which favour the red discolouration of salted fish.

(2) Various samples of fishery by-products were analysed to estimate their constituent.

(3) A chemical examination of bore water and well water used for the preparation of ice for the storage of fish at Mangalore was conducted.

(4) Studies on the effect of antibiotics in ice used for cold storage of fish were made. The resistance of isolated pure cultures from prawns, towards achromize B1 and biostat was studied.

Analytical studies.—The main work was to do critical analysis of fish and fishery products sent by Government operatives, yards, fish-meal plant and private parties who are engaged in transacting business in fishery products. During the year 75 samples were analysed altogether. They are distributed under the following heads :—Bone meal—2; fish meal—21; fish manure—14; fish oil—7; fish 33; and miscellaneous—1. Among these 75 samples 25 were sent by private parties. Some of the fish meals manufactured by the Government fish-meal plant at West Hill were found to contain a high percentage of protein as much as 80 per cent in certain cases.

Home Economics studies.—The Home Economist continued to evolve new recipes for the various varieties of fish and to popularize them among the fish-eating population. Ten new recipes, namely, windhali, tamarind gravy, puffs, boiled fish, tomato and prawn gravy fry, fish gravy, breaded fillet, pappadam, murukku, etc., were worked out and a tasting panel certified them to be good. In order to spread the knowledge gained, demonstration classes were conducted to the girl students of the Government Fisheries School, Providence School and other local schools.

The Home Economist also studied the different types of vitamin and mineral content in different varieties of fish. She studied also the different methods of cooking and their effect on the nutritive value of fish-flesh. It was found that steaming and frying were better than boiling since much of the nutritive value is retained.

The Home Economist also studied the method of making synthetic vinegar from acetic acid and preparing pickles with it. She also attended the All-India Fisheries Conference at Madras and explained to the visitors the exhibits like pickle, biscuit, cutlet and also about the preparation of recipes cooked by her. The unpleasant odour of fish was not at all predominant in biscuits and a good quantity of biscuits and cutlets was sold during the exhibition.

(ii) Technological Station, Tuticorin.

In place of the Technological Station, Kozhikode, ceded to the Kerala State consequent to the reorganization of States, the Government was pleased to sanction in G.O. Ms. No. 2426, Agriculture, dated 11th October 1956, the establishment of a Technological Station at Tuticorin. Sri R. Venkataraman joined as Superintendent

of this new station on 15th November 1956. As considerable time was required for procuring equipments and for working out preliminaries, detailed investigations could not be conducted during the year. However a programme as shown below has been drawn up and initiated :—

- (1) Study of spoilage of important food fishes of the East coast.
- (2) To work out the presence or absence of Trimethylamine oxide in the fish muscle which is an index of spoilage.
- (3) To estimate the nutritive value of important East coast food fishes.
- (4) To standardise cured-fish products and to improve their quality.
- (5) To work out the proportion of salt for various varieties and sizes of fish for wet and dry periods.
- (6) To work out the quality of chank and pearl oyster flesh and evolve ways and means of utilizing the same.
- (7) Studies on the utilization of sea-weeds as manure and for manufacture of agar-agar, algenic acid, etc.
- (8) To estimate the fat-content of some of the important fatty fishes and to assess their suitability for conversion into meal and oil.
- (9) Study of the bacteriology of the inshore and off-shore waters of the sea off Tuticorin.
- (10) Study of the bacteriology of bottom mud of the pearl banks and chank beds.
- (11) To work out the bacteriological flora of some of food fishes.
- (12) To work out the bacteriological population of the marine salt from the different areas and to assess its implications on the fish-curing industry.
- (13) Study of the 'Red Halophiles' and the role it plays in the fish-curing industry.

(iii) *Technological Station, Cape Comorin.*

This station was added on to this State from the former Travancore-Cochin State on account of the States Reorganization from 1st November 1956. Programme of work was drawn up for this Station as shown below but much progress could not be made during the year as time had to be devoted for preliminary surveys and familiarization of local problems :—

- (1) Study of icing, chilling and freezing of important food fishes in the area with reference to their transport to the interior markets.
- (2) Investigation of adoption of canning for preserving local varieties of fishes.
- (3) To work out details for preparation of byproducts like fish-meal, fish manure and fish oil.

(4) Study of economic utilization of shell-fishes like lobsters and prawns.

(5) Assessment of the quality of salt used in the fish-curing industry and to improve its standard.

(6) To work out standards for various salted products.

(7) To investigate the use of antibiotics in preserving fish.

PART II—EXPANDED TECHNICAL ASSISTANCE PROGRAMME OF THE FOOD AND AGRICULTURAL ORGANIZATION.

During the year under review, the State received the assignment of the services of the following experts :—

- | | |
|------------------------------------|--|
| 1. Mr. Paul Zeiner (Norwegian) | } Naval Architects. |
| 2. Mr. K. Rasmussen (Danish) | |
| 3. Mr. G. S. Illugason (Icelander) | { Fisheries Engineer
(Master Fisherman). |
| 4. Mr. G. R. Bjuke (Swedish) | |
| 5. Mr. C. R. Bjuke (Swedish) | } Harbour Specialists. |
| 6. Mr. P. A. Lusyne (Belgian) | |
| | { Fisheries Engineer
(Training Specialist). |

The number of days of service rendered by these experts is given in Appendix XV.

The Pablo boat designed by Mr. Paul Zeiner was further popularised during the year with the assistance of Mr. G. S. Illugason. The local fishermen were considerably impressed with the results of the operations of these boats; and they began to demand for the supply of such boats. The manufacture and supply of these boats at subsidised rates to fishermen co-operatives were arranged under the Second Five-Year Plan scheme for improvement of fishing crafts (*vide* Part IV).

During his assignment to this State in February-March 1957, Mr. Zeiner, in collaboration with Mr. K. Rasmussen, the second Naval Architect, made efforts to set up the specifications for a boat-building yard at Madras. After a survey, the site at Rayapuram, in the northern outskirts of Madras City, was found most suitable.

Mr. Zeiner made preliminary studies, for design of a tug boat for towing pearl fishing banks. A tour was made to Tuticorin for first-hand study of the conditions under which the tugs should operate. This also gave him the opportunity of inspecting and measuring the old-tow-boats (Sea Scots and Leverett) now condemned, and get information about their advantages and deficiencies when used for the same purpose. Since the end of the year, Mr. Zeiner completed the design and drawings of the tug.

At Tuticorin, Mr. Zeiner made a cruise on the F.A.O. designed 32 feet training boat "Lusyne" for studying its performance. Second Naval Architect, Mr. Rasmussen, also took part in the cruise. Observations made during the trip indicated that improvements can be made for easier trawl operation.

Mr. K. Rasmussen conducted certain experimental modifications to the design of the Pablo boat with a view to reduce the cost by about Rs. 2,000. This work is expected to be completed in 1957-58. He also commenced designing of a 32 feet trawl fishing boat.

Mr. G. S. Illugason conducted exploratory fishing with the two Danish Boats and the two Steel Dories received from the F.A.O. and also with the T.C.M. vessels (Samudra, Sardinella, Meenakshi, Gudion and Dan Boat) and located rich fishing grounds for perches, sharks, horse-mackerels, barracudas, leather-jackets, ribbon fishes, silver bellies and shrimps as shown in Appendix XVI.

Particulars of the number of days of operation, quantity of fish captured, sale proceeds and expenditure are given in Appendix XVII. These results have attracted the attention of the fishermen of both the east and west coasts. Mr. Illugason also trained 85 fishermen belonging to Pulicat, Cuddalore, Pamban, Kilakarai and Tuticorin in handling mechanised boats and the setting of improved types of nylon nets. He hired out the two Danish boats to groups of fishermen of the above centres on condition that 14 per cent of the sale-proceeds of the catches were given to the Department. This instilled enthusiasm and interest among the fishermen, and they captured 9,372 lb. of fish on the whole, and Rs. 1,927-11-3 was realised as department's share.

The Steel Dory No. I, fitted with 36 H.P. Lister engine was moved to Beypore in October 1956; and with it Mr. Illugason conducted trawling operations off Beypore and Mangalore for 24 days employing the fishermen-trainees of the Beypore Training Centre, and landed 30,661 lb. of fish and realised a revenue of Rs. 2,157-3-6. The boat was moved to Pamban in February 1957; and here Mr. Illugason engaged local fishermen on 50 per cent share basis with a view to train them in trawling. The boat operated in this area for 13 days and landed 22,041 lb. of fish and fetched Rs. 576-8-0 as the share of the department.

The Steel Dory No. II, fitted with 24 H.P. Bolinder Swedish engine, was taken delivery at Madras on 15th January 1957 and moved to Pamban by Mr. Illugason, where he engaged local fishermen on 50 per cent share basis for operating it. Fishing was conducted only for 11 days, landing 5,530 lb. of fish and obtaining a revenue of Rs. 450-5-9 towards department's share.

The Harbour Specialists, Messrs. G. R. Bjuke and C. R. Bjuke, completed their surveys for establishment of fishing harbours at Cuddalore and Nagapattinam, and submitted their reports together with plans and estimates in March 1957.

The fishing harbour at Cuddalore is to be located by the side of the coal creek of the Cuddalore Port. According to the Experts, this location has the following advantages :—

(1) The site is central and within easy reaching distance from Cuddalore New Town.

(2) There is a railway siding nearby, which can be easily extended, and the Railway Station is not far away.

(3) It is well connected by road to all the towns in the vicinity.

(4) It will not interfere with the interests of the commercial harbour, since the plans for commercial purposes are in the south of the creek, besides some extension in the coal creek.

(5) The space selected is mostly virgin land not built upon and part of the land is marshy and can, by dredging and reclaiming, be improved to benefit the fishing harbour.

(6) The Port authorities are maintaining the depth in the Uppanar backwater upon the site, and hence dredging in the fishing harbour will be confined to the basins.

It is proposed to divert the creek further north from its position at about 2,000 feet from the mouth so as to get necessary space behind the quays for the activities of the fishing industry. By this diversion, the present mouth of the creek with the coal jetties will be converted into a basin. The proposed fishing harbour will contain 890 feet of landing and outfitting quays and space behind the quay for wholesale market, packing halls, ice and cold storage plant and other buildings, railway sidings, etc. There will be two basins to house 200 boats spaced 10 feet apart. On the northern side of the diverted outlet of the creek, a plot has been reserved for a boat-building yard. The reclaimed area near the basins can be used for providing net-drying and repair-facilities. An area has been reserved for the residence of the fishermen and others, close to the harbour. The area between Mohansingh Street and the existing railway siding is in a very low level and is at present not used for any purpose. It is proposed to reclaim this centrally located area, to be used for market centre, hotel, etc. The new channel will be deepened to 5, up to the entrance of the boat-basins to provide for the movement of boats with the larger drafts. The basins are to be deepened to 4. The diverted creek upstream of the basin is formed to the same section as of the creek. The work on this harbour is suggested to be taken up in two stages costing about 5 and 4 lakhs rupees respectively.

For the proposed fishing harbour at Nagapattinam, the space upstream of the bridge across the Kaduvayar river has been selected by the Experts. As the bridge is provided with a lift span, there is no hindrance for the boats to pass the bridge. In closed position the lift span gives a clearance of about 8 feet so that small boats such as Pablo boats always have free passage. The former Malayan Emigration Depot now not being used offers a very good site for

the fishing harbour. This site has an extensive area and several buildings, which can be utilised for the fishing industry. There is a railway siding closeby, which can be extended to the harbour site. This place has also good road connections to the town centre. A 900 feet long landing and outfitting quay can easily be built on the bank of the Kodamuratti river, which has to be deepened and widened. The unused plot on the western side of the area will be a good location for a boat-building yard. A railway siding can be brought in easily to serve the purpose of the yard. The present buildings in the area can, with minor alterations, be used for packing hall, repair shops, net factory and offices. For the wholesale market, the ice plant and the cold storage, new buildings will have to be erected in good location to the landing quay. The fishing harbour, being near the new bridge, will get a good road connection with the hamlets on the opposite side of Kuduvayar. The beach-landed catches can then conveniently be transported by vehicles to the wholesale market. For housing mechanized boats, three basins are provided; two of them on the upstream side of the bridge and one on the downstream side. The basins can house 260 boats allowing 10 feet space for each boat. There is plenty of space for net drying and repairing near the basins and sheds can also be put up for string nets and other equipments. A well located area can be obtained by reclaiming the present shallow area under the Keechankuppam for putting up modern residence for fishermen. The sea-face wall has to be extended up to the mound in Keechankuppam, to protect the area for cyclones. The construction of the fishing harbour is suggested in two stages, costing 4 and 6 lakhs rupees respectively.

The implementation of the recommendations of the Harbour Specialist is being considered under the Second Five-Year Plan Scheme for development of fishing harbours (vide Part IV).

The services of Mr. P. A. Lusyne were utilised for starting a Trading Centre at Tuticorin with Sri S. Thygarajan, Assistant Director of Fisheries, who acted as Counterpart of the Expert, as its Superintendent. Government accorded sanction for the establishment of the centre for a period of three years in G.O. Ms. No. 1002, Agriculture, dated 17th April 1956; and the centre started functioning from 15th May 1956 onwards. Mr. Lusyne guided the working of the centre till the end of October 1956 when he left India after completion of his assignment.

Only professional fishermen with atleast 5 years of sea-going and fishing experience were made eligible for admission to the course of six months' duration. Due to wide publicity, a large number of candidates applied for admission. For the first batch of trainees 20 candidates were selected after interviewing 126 applicants at Madras and Tuticorin. This batch completed their training on 14th November 1956. The second batch of 20 candidates commenced training on 26th November 1956. The particulars about

the two batches of trainees are given in Appendix XVIII. The pupils were trained in the following items:—

(1) Fishing gears, their utility in different types of fishing and their *modus operandi*.

(2) Theoretical knowledge about the habits of fishes and about elementary oceanography.

(3) Elements of navigation including the compass and its use and charting.

(4) Engines, their upkeep and maintenance.

The first and second batches, during the course of their training, made 52 and 48 trips into the sea for learning actual fishing with modern types of gear as shown below:—

	TRIPS.
First batch—	
1 Trolling lines	12
2 Drift nets	15
3 Bottom set nets	22
4 Long lines	2
5 Trawl nets	1
Second batch—	
1 Trolling lines	25
2 Revolving chains and hooks ..	6
3 Drift nets	3
4 Bottom set nets	15

During these trips, the first batch landed 2,881 lb. of fish and the second batch 2,405 lb. of fish. The trainees are paid a provision allowance of 8 annas per day for the sea-trips.

Two lugger boats intended for the Training Centre and 4 Pablo boats for the Tuticorin Federation of Fishermen Co-operatives were taken from the manufacturers (Messrs. Brunton and Company, Limited at Cochin) and taken to Tuticorin by the first batch of trainees under the guidance of the Expert.

Soon after completion of their training course, the candidates took to fishing operations. Two Pablo boats were operated by eight trainees using bottom set nets made of Terylene twine from November 1956 to February 1957. The eight trainees who operated the boats were given 48 per cent of the sale proceeds of the catches and 52 per cent were credited to the department. Details of this fishing operation are given in Appendix XIX. On the whole 26,341 lb. of fish were landed. The total sale proceeds amounted to Rs. 5,364-9-3. For their share of 48 per cent, each trainee earned about Rs. 150 per month, whereas the local fishermen earned only Rs. 2 per head per day. The benefit of the training was thus demonstrated to the fisherfolk.

Dr. Miyamoto, F.A.O. Gear Technologist, who was on assignment to the Government of India for organizing the Fisheries Gear Technological Station at Cochin, visited this State from 26th March to 6th April 1957. He visited Madras, Pamban and Tuticorin, and had discussions with the departmental officers and F.A.O. Experts working here. The main purpose of his visit was to conduct an initial field survey of the important fishing centres and the gears used there so as to evaluate the present status of the fishing.

PART III—INDO-UNITED STATES TECHNICAL ASSISTANCE PROGRAMME.

Under the Indo-American Technical Co-operation Mission Projects 1952, 1954, 1955 and 1956, a number of fishing vessels, gear and other equipments such as marine diesel engines, cold storage units, ice plants, etc., have been allotted to this State for the development of Marine and Inland fisheries. In G.O. Ms. No. 1973, Agriculture, dated 8th August 1955, Government sanctioned the post of an Assistant Director of Fisheries to attend to the proper utilization of these equipments and to supervise the fishing operations of the vessels received under this programme. The post of Assistant Director which was initially sanctioned for a period of three months was continued for a further period of one year in G.O. Ms. No. 421, Agriculture, dated 17th February 1956 and subsequently for another year as per G.O. Ms. No. 465, Food and Agriculture, dated 13th February 1957. Sri G. Lakshminarayana Rao continued as Assistant Director till 1st October 1956, when he was transferred to Mangalore. Sri A. T. Sheriff succeeded him and continued till the end of the year.

T.C.M. PROJECT, 1952.

The purpose of this Project is to bring about an increase in the quantity of marine fishery products (1) improvement in the existing fishing craft and methods of capture, (2) discovery and exploitation of fishing grounds in offshore waters, (3) testing of different types of crafts and gear not now used but likely to be successful in Indian Fisheries, and (4) training of Indian personnel in modern fishing methods and improvement in methods of preservation and transport.

One purse-seine net set under this Project was received on 25th January 1957. This net was being used by the F.A.O. Fisheries Engineer from the F.A.O. boats for experimental fishing. All the other equipments under this Project were received during the previous years. The equipments so far received and their utilization is shown in Appendix XX.

T.C.M. PROJECT, 1954.

The purpose of this Project is to continue and extend the work in modernization of marine fisheries and to broaden the scope of the project to include the development of inland and estuarine resources of the State.

All the equipments allotted to this State under this Project were received during the previous years, and they are also shown in Appendix XX. Out of the savings of this Project 10 Coventry Victor Diesel Marine engines of 10 h.p. were received during the year; and three of them were fitted in the Pablo boats.

The working of the T.C.A. vessels during the year were as follows :—

M.V. Samudra conducted trawling operations off Mangalore till the end of April 1956, when it was moved to the east coast in anticipation of the outbreak of the south-west monsoon. After certain exploratory trawling operations in the Gulf of Mannar off Tuticorin and Pinnakayal, the vessel moved northwards and conducted trawling along the Coromandel coast from Velanganni to Pondichery. It then moved to Madras and carried operations in this area. On the whole, this vessel conducted fishing on 222 days and captured 87,327 lb. of fish employing over-hang trawls of 40, 45 and 60 feet length. The sale proceeds amounted to Rs. 18,043-11-9. During these surveys good grounds for perches were located off Cuddalore and for shrimps off Mangalore, Ennore and Pulicat (vide Appendix XVI). The discovery of these grounds were given wide publicity and has attracted the local fishermen.

M.V. Sardinella was stationed at Pamban, where it was engaged in fishing for 123 days, landing 23,968 lb. of fish, using nylon and cotton gill nets. The sale-proceeds amounted to Rs. 4,066-11-6. The fishing grounds off Pamban in depths ranging from 5 to 20 fathoms, both on the Gulf of Mannar and Palk Strait sides were surveyed and exploited.

M.V. Meenakshi was stationed at Tuticorin till the end of January 1957, when it conducted exploratory surveys with nylon gill nets and drift nets. It was then moved to Madras when it conducted trawling with hand winch fitted by Mr. Illugason. On the whole, the vessel fished on 143 days and obtained 18,334 lb. of fish, by selling which Rs. 3,889-9-9 was realized.

M.V. Gudjon commenced fishing operations off Tuticorin from August 1956 onwards with the appointment of the Skipper, but had to be withdrawn for repairs from the beginning of September to the middle of October for attending to repairs to her propellor. The vessel was moved to Pamban in January for conducting trawling under the supervision of Mr. Illugason. During the year, the vessel captured 12,510 lb. of fish in 60 days and realized a revenue of Rs. 734-12-0.

The Dan Boat received under T.C.M. aid operated off Mangalore for 39 days in September and October 1956, engaging local fishermen on 14 per cent share to department. A total quantity of 19,070 lb. of fish were landed and Rs. 279-10-0 was realized as Department's share. This boat was transferred to Mysore State on 1st November 1956 due to reorganization of States.

The details of working of these vessels are given in Appendix XVII.

PART IV—SCHEMES INCLUDED IN THE SECOND FIVE-YEAR PLAN.

The fisheries schemes included in the Second Five-Year Plan have been formulated with the following main objectives in view :—

(1) To develop inland, estuarine, offshore and deep sea fishing to improve fishing techniques and technology and to promote fisheries research;

(2) to provide fishermen with modern craft and tackle at subsidized rates and under the hire-purchase system and to provide other equipments like nylon nets, hooks and other facilities like fishing harbours;

(3) to provide fishermen with long-term credit facilities through fishermen co-operative societies in order to extricate them from the clutches of traders and middlemen, to whom they are indebted;

(4) to provide them and their womenfolk with profitable employment;

(5) to improve communications to the fishing hamlets and to provide all facilities for proper preservation and better marketing of their catches; and

(6) to assist them to form themselves into co-operative bodies in order that they may get better credit and trading facilities and thus reap the full benefits of their labours.

The Plan also includes schemes for scientific methods of fish-farming in all the available inland waterspreads in the State, by intensive collection and distribution of fry and fingerlings for culture, by the organization of demonstration farms and by introduction of species of fish which are prolific breeders and quick-growers. A special scheme for estuarine fish-farming, which has not been attempted hitherto, has also been included in the Plan.

Fifteen schemes have been approved for implementation at a total cost of Rs. 84.74 lakhs for the Plan period as shown below :—

Serial number and name of the scheme.	Plan provision, 1956-61. (RS. IN LAKHS.)
1 Intensive seed collection and distribution for stocking inland waters.	7.10
2 Rural fishery demonstration	5.00
3 Development and exploitation of major reservoir fisheries.	4.50
4 Establishment of a model estuarine fish farm.	3.00
5 Improvement of fishing crafts	8.50
6 Development of fishing harbours at suitable river mouths.	7.80
7 Supply of nylon nets and hooks to fishermen at subsidized rates.	6.25
8 Assistance to fishermen co-operative societies for marketing of fish.	20.00
9 Training of personnel	1.07
10 Fishmeal and fish-manure production ..	4.00
11 Quick transport of fish from landing centres to marketing and consuming centres.	1.85
12 Salt subsidy scheme	4.92
13 Fish preservation—provision of ice plant and cold storage facilities.	7.00
14 Fish marketing—construction of model fish markets.	1.35
15 Administration staff at headquarters	2.40
	84.74

The salient features of the working of the different schemes during the first year (1956-57) of the Plan are as follows :—

1. *Intensive seed collection and distribution for stocking inland waters.*

This scheme envisages large-scale collection of spawn, fry and fingerlings of quick-growing varieties of fishes from their natural breeding and nursery areas, and to stock them intensively in inland waters such as reservoirs, lakes, major and minor irrigation tanks, village ponds and wells and thereby to enrich the inland fisheries resources of the State. The scheme is also expected to create an awakening from the public to take to fish-culture in their own waters.

The implementation of this scheme during the year was a success and 3.45 crores of fish-seed were collected and stocked against the target of 3 crores. Details of 58 centres from where collections were made within the State and of the stocking operations are given in Appendices XXI, XXII and XXIII. Tanjore deltaic area was the main source of carp fry and fingerlings, and the tidal creeks near Pamban in Ramanathapuram continued to yield the maximum number of chanos fingerlings. Special mention may be made of the distribution of the exotic cichlid fish, *Tilapia mossambica* in the districts of South Kanara, Malabar, Tirunelveli, Madurai and Ramanathapuram districts, where the fish had proved a great success. Forty thousand fingerlings of the Upper Indian Carps, Rohu and Mrigal, were imported from Bengal and stocked in selected waters.

For this scheme, the plan provision during the year was Rs. 1.03 lakhs, the budget provision Rs. 1.08 lakhs and the actual expenditure Rs. 1.02 lakhs.

A list of 12 motor vehicles that operated under this scheme is given in Appendix LXIV.

2. Rural fishery demonstration.

This scheme is intended to demonstrate to the fishermen and to the public, the advantages of scientific pisciculture, and encourage them to rear fish in their village tanks and ponds. It is expected that by this demonstration all available inland water-spreads now lying neglected will gradually be brought under fish-culture resulting in considerable increase of fish production. Under this scheme it is proposed to take over more tanks, to renovate the existing tanks and to demonstrate the advantages of fish-culture in rural areas.

During the year, this scheme was worked satisfactorily. In the Madurai division, three demonstration units functioned at Madurai, Virudhunagar and Kodaikanal. These units maintained 15 demonstration tanks in which Labeo, Catla, Gourami, Chanos and Tilapia were cultured, yielding 34,402 lb. of fish. In the Vellore division, comprising of North Arcot, South Arcot and Chingleput districts, 30 demonstration tanks were maintained; and these yielded 29,990 lb. of fish. From these demonstration tanks 40,304 fingerlings were supplied to interested pisciculturists. In Salem district one demonstration tank was established in Pennagaram. The Odathurai tank in Bhavani taluk, Coimbatore district, which was fetching an annual rental of only Rs. 18 to the district board and which was taken over by the department in July 1955, was utilized as a demonstration tank this year. This water yielded 11,265 lb. of fish during the year. Five other demonstration tanks were maintained in Coimbatore and Pollachi towns. The Crescent Pond in Ootacamund and the village tank in Masinagudi were the demonstration tanks in the Nilgiris district, in which the

the culture of cold water species like Mirror Carp, Golden Carp and Tench was demonstrated to the public. In Tirunelveli district, a total number of 21,689 fingerlings of Tilapia, Mullet, Labeo, Cirrhina, Barbus, Murels and Eels were stocked in 11 demonstration waters in Tenkasi, Nanguneri and Ambasamudram taluks. These waters yielded 9,030 lb. of fish. In the Tanjore division 23 waters were run as demonstration centres. These yielded 64,967 lb. of fish. Six demonstration ponds were maintained in Madras City, and they yielded 1,439 lb. of fish. Twenty-three demonstration tanks were also maintained in Malabar and South Kanara districts.

The following renovation work to demonstration waters were carried out during the year :—

	RS.	A.	P.
1 Deepening the foreshore and repairs to outlet of the Webster Moat, Tanjore.	981	0	0
2 Construction of outlet and inlet to Baburajapuram tank.	267	3	0
3 Fifty per cent of the estimated expenditure on deepening, inlet and outlet of Sengulam at Mannargudi.	1,390	0	0
4 Construction and renovation of nurseries at Rajagiri.	1,400	4	0
5 Construction and renovation of nurseries at Vennar-Vettar Regulator.	1,345	0	0
6 Construction and renovation of nurseries at Mudikondan.	330	0	0

With the working of this scheme, there is a general awakening among the public for undertaking fish-culture in the private waters. Many of these waters were surveyed, and necessary guidance was given to their owners. Requests for supply of fish seed was complied with as far as possible.

During the year, the plan provision for this scheme was Rs. 1.30 lakhs, budget provision Rs. 1.35 lakhs and actual expenditure Rs. 1.36 lakhs.

3. Development and exploitation of major reservoir fisheries.

A pilot scheme initiated to develop and exploit the Mettur Reservoir fisheries has revealed the potentiality of major reservoir fisheries. With the construction of many major irrigation and hydel projects, there is vast scope to develop fisheries in these large water-spreads and to exploit them judiciously. Hence, under this scheme, it is proposed to develop reservoirs like Bhavani-sagar, Krishnagiri, Manimuthar, Sathanur, Araniar, etc. The

development will consist of intensive stocking initially with suitable young fishes and judicious exploitation subsequently. Fish farms are also proposed to be constructed near these projects to facilitate the stocking operations.

During the year 1956-57, the development of Bhavanisagar Reservoir was taken up. It was stocked with 392,646 fingerlings against a target of 4 lakhs. By trial nettings it was ascertained that the fish were growing satisfactorily and a small quantity of 16,905 lb. was landed and sold to the public for consumption realizing a revenue of Rs. 5,071-3-3.

The plan provision for this scheme was Rs. 0.52 lakh, budget provision Rs. 0.14 lakh and actual expenditure Rs. 0.11 lakh during the year.

4. Establishment of a model estuarine fish farm.

Most of the estuaries of this State which are capable to yielding a fairly rich fishery annually, are at present in a neglected State. In order to demonstrate the possibilities of estuarine fish farming to pisciculturists, one model estuarine fish farm is to be established under this scheme. This will serve not only as a research centre but also as a source of supply for fry and fingerlings of salt water species.

The Inspector of Fisheries sanctioned for the scheme conducted a detailed survey of estuarine areas along the entire east coast from June to August 1956, and finally selected the estuarine creek near Adyar in South Madras for the establishment of the model farm. This area is about 40 acres in extent; and is capable of good production of fish if properly controlled and stocked. The area has also to be properly deepened, bunded and provided with a dyke wall with sluices for control and regulation of water. A series of nurseries, rearing ponds, breeding ponds and marketing ponds are to be constructed with inlets and outlets and sluice gates. A detailed survey of the creek with reference to local topography, nature of bottom and water levels were conducted by the Inspector and the Fisheries Engineering Supervisor. During 1957-58 plans and estimates will be got ready and construction of the farm will be undertaken.

During the year, for this scheme, the plan provision was Rs. 0.06 lakh, budget provision Rs. 0.02 lakh and actual expenditure Rs. 0.02 lakh.

5. Improvement of fishing crafts.

Introduction of motorized craft in the fishing industry is an imminent necessity as the first step in the development of fully mechanised fishing industry.

An engine in the craft will not only reduce the dependence upon nature's forces like wind, current, and tide, but will also save the arduous labour and time which at present is wasted in the trips

to the fishing groups and back and which could well profitably be used for increasing the effort in the actual fishing operations. Under this scheme it was proposed to give the fishermen motorised crafts at subsidised rates. Mr. Paul Zeiner, the Food and Agriculture Organization Naval Architect after a comprehensive survey made certain recommendations for the implementation of the motorization scheme. The Pablo boat designed by him, was equipped with the improved types of gear and demonstrated by the Food and Agriculture Organization Fishery Engineer, Mr. Ill-gason and the local fishermen being well impressed with the results of its operation demanded for the supply of such boats to them. Therefore proposals were submitted to Government for the construction of such boats for disposal to the fishermen on hire purchase system. Accordingly the Government, in their G.O. No. 2792, Agriculture, dated 30th November 1955, sanctioned the construction of 20 Pablo boats each at a cost of Rs. 10,500. The cost of the boat was to be recovered in the course of seven years, and the boat considered the property of the Government until the final instalment is paid by the hirers. The monthly repayment of Rs. 125 was collected from the hirers, before the first week of the succeeding month. The 20 boats were stationed as follows: Two in Kerala State, two in Mysore State, 4 at Tuticorin, 4 in South Arcot district coast and 8 in Madras. Of these 20 boats, seven were fitted up with 10 h.p. Petter diesel engines received under the T.C.M. Aid, and the 13 boats with engines purchased locally from Messrs. Parry & Co., Madras.

During the Second Five-Year Plan period it was proposed to construct 100 boats out of which 11 boats were targetted for the first year 1956-57. Out of these 11 boats, 2 boats are 30 footers and 9 are 25 footers. Two of the 25 footer boats were constructed departmentally under the supervision of the Assistant Director of Fisheries (Craft and Tackle). The construction of the others were entrusted to Messrs. Brunton and Co., Cochin, for the lowest quoted rates.

Seven of the 25 footers were fitted with engines purchased from Messrs. Parry & Co., and the remaining two fitted with the T.C.M. engines. Two Petter 20 h.p. diesel engines were purchased for the two 30 footer boats at a cost of Rs. 15,129-9-0. These boats are eligible for a subsidy of 25 per cent on the hull and 50 per cent on the engine. Based on this principle the repayment cost of each 25 footer works out to Rs. 150-4-3 per monthly instalment and for each thirty footer Rs. 169-4-8 per month. Of the eleven boats constructed during the year, 2 have been supplied to the Colachel Fishermen Co-operative Society and three to the Tuticorin Fishermen Co-operative Federation. The remaining six are proposed to be distributed in Ramanathapuram, Tanjore and Madras districts. With these boats there has been remarkable increase in the average income of the fishermen due to larger catches. Requests for more boats are being received from all centres.

The scheme also provides for the establishment of a boat-building yard wherein the boats required by the Department could be built departmentally. A suitable site for its location in the Madras City is being selected, and plans and estimates are also being prepared.

The plan provision for the scheme during the year was Rs. 2.35 lakhs, budget provision Rs. 1.50 lakhs and actual expenditure Rs. 1.46 lakhs.

6. Development of fishing harbours at suitable river mouths.

The introduction of a large number of mechanized boats in fishing operations raises the need for providing anchorage facilities for these boats. Development of fishing harbours has thus become a necessity. The river mouths, if kept open throughout the year, would provide necessary shelter for these boats, besides aiding the migration of sea fishes into the rivers.

During the year the F.A.O. Harbour Specialists, Messrs. G. R. Bjuke and C. R. Bjuke, completed their surveys of river mouths at Cuddalore and Nagapattinam, and submitted their reports for the establishment of fishing harbours at these places. The fishing harbour at Cuddalore is to be located by the side of the coal creek of the Cuddalore Port. The work on this harbour was suggested to be taken up in two stages costing about 5 and 4 lakhs rupees respectively. For the fishing harbour at Nagapattinam the experts have suggested the space near the junction of Koduvayar and Kodamuratti rivers, to be taken up in two stages, costing 4 and 6 lakhs rupees respectively. The proposed fishing harbours will have facilities like landing and outfitting quays, wholesale market, packing halls, ice and cold storage plants, railway sidings, etc. Full details are given in Part II of this report. The reports of the Experts are being considered by the Government.

In G.O. Ms. No. 2001, Agriculture, dated 14th August 1956, the Government sanctioned one Assistant Engineer and two Supervisors and two Maistries for the implementation of this scheme. The Assistant Engineer, Sri R. K. Mani, B.E., acted as the counterpart to the F.A.O. Experts and also as leader of the survey party. A survey of the natural bay at Leepuram was conducted by the party.

The salient features of this survey is as follows :—

Leepuram is a place about 2 miles east of Cape Comorin. The sea here is between $5\frac{1}{2}$ and 8 fathoms deep at a distance of about a mile from the shore. This area is sufficient for the large vessels and steamers to anchor and it affords also sufficient protection against the severity of the south-west and north-east monsoons. The bed of the sea to a distance of about 100 feet from the shore is firm. The area is calm during most part of the year. There are not any sunken rocks in the sea except very near the shore and the

space for anchorage is very extensive and catamarans can be taken out very easily. There are several thickly populated fisher villages within a radius of 3 miles of Leepuram. Leepuram is also nearer to Colombo than Tuticorin and affords greater facilities for seaborne trades than any other port in the area. Thus the place possesses considerable natural facilities for a good harbour. Further detailed investigations are in progress.

7. Supply of nylon nets and hooks to fishermen at subsidised rates.

A scheme for the distribution of yarn and other fishery requisites was in force in the State during the first two years of the First Five-Year Plan and it was discontinued with effect from 1st April 1953 owing to a fall in the market rates for yarn and to its free availability after decontrol. The scheme was very popular. With nylon nets it has been found that there is a great increase in the catches and the nets are also found to be more durable. Many fishermen have understood the use of nylon nets, but since the cost of each net is nearly Rs. 600 it is beyond their capacity to purchase nylon nets. Therefore to make the nylon net easily available to the fishermen a scheme for the supply of 300 nylon webbing of the strand and size prescribed by the F.A.O. Expert, Mr. Illugason to the fishermen at subsidised rates was submitted to the Government. The specification of the nets prescribed were as follows :—

50 fathoms × 3 fathoms × 6 inches stretched mesh.

50 fathoms × 3 fathoms × 3 inches stretched mesh.

One hundred and fifty nets of the above specifications in each kind was ordered as per G.O. No. 92, Agriculture (Food Production), dated 29th February 1956. Quotations from foreign firms were called for and the lowest of them was that of Messrs. Frank and Bryce, Limited, Glasgow, who were locally represented by Messrs. Gillander's Arbutlath and Company. The Import licence was received from the Chief Controller of Imports, New Delhi, only in November 1956, and a firm order with Messrs. Gillanders was placed in that month itself. The firm began to supply the webbings in piecemeal consignments, and the first consignment of 25 nets was received in the month of March 1957 and the final consignment of 125 nets in June 1957. Of these webbings, 65 have so far been distributed to the following centres at 75 per cent cost price, 25 per cent being subsidy :—

Colachal	...	...	...	...	...	...	24
Tuticorin	...	...	...	...	...	...	25
Madras	...	...	...	...	...	...	16

Since the first consignment arrived only in March 1957, payment of cost of the nets to the firm could not be effected during 1956-57. Hence the whole amount sanctioned in the Government Order had to be carried over to 1957-58.

To fabricate these nets, glass floats of 5 inches diameter were ordered from the Great Grimzby Coal, Salt and Tanning Company, Limited, Great Grimsby, England, in September 1956, as its quotation was the lowest. But the firm expressed its inability to effect supply of the floats due to damage to their ware-house. Hence, the next lowest quotation of Messrs. Naigai Fishing Net Manufacturing Company, Limited, Japan, was recommended to Government. The firm was asked to open a letter of credit or to nominate a local agent. After some delay, the firm nominated Messrs. Pereira and Roache (Private), Limited, Madras, as their agent. Orders were then placed with this firm for the supply of 7,500 glass floats and they are expected to be received soon.

Nylon nets having proved superior to cotton nets in several respects, such as durability, flexibility, strength, non-visibility under water and consequent higher catching capacity, this scheme for supply of 1,000 nylon nets to fishermen at subsidized rate (the subsidy being limited to 33½ per cent of the cost price) under a hirepurchase system is included in the Second Plan. The nets are to be supplied along with the Pablo type boats. The Government G.O. No. 92, Agriculture (Food Production), dated 28th April 1956, sanctioned the import and supply of 260 nets in 1956-57 to the fishermen at a cost of Rs. 1,90,200. In the normal course, these nets also ought to have been imported from the Japanese firm mentioned above. But due to the inevitable but long delay involved in the process of importing the nets, alternate methods of securing them locally were found necessary, especially as the Pablo boats already constructed by the Department could not be put into operation for want of adequate gear.

It was found that "Terylene" manufactured by the Imperial Chemical Industries, England, who are locally represented could be used immediately in the fishing industry. A quantity of 1,000 lb. of Terylene yarn at Rs. 17 per lb., which was the only stock available, with the local firm was purchased and supplied to the fishermen. As this synthetic twine proved quite satisfactory under local conditions, it was proposed to utilize the funds allotted for 260 nets for buying more quantities of Terylene. Hence the firm was asked to quote for a further bulk supply of 5,000 lb. before the end of the year; but they agreed to supply only 4,200 lb. at Rs. 14-8-0 per lb. This quantity was therefore purchased with Government sanction as per their Memo. No. 13780 F1/57-8, Agriculture (Food Production), dated 13th May 1957. Out of this quantity 2,525 lb., 203 have so far been distributed to the various fishermen groups and

fishermen co-operative societies who have taken up Pablo boats, and also to departmental units as shown below :—

	LB.	OZ.
Assistant Director of Fisheries, Training Centre, Madras.	100	0
Ayodhikuppam Fishermen Co-operative Society ..	100	0
Kasimode Fishermen Co-operative Society ..	200	0
Mattankuppam Fishermen Co-operative Society.	210	0
Madras Fishermen Federation	110	0
Sri Balakrishnan, Madras	110	4
Sonankuppam Fishermen Co-operative Society ..	236	0
Portonovo Fishermen Co-operative Society ..	150	0
Tuticorin Federation	632	14
Neelangarai Fishermen Co-operative Society ..	101	0
Superintendent, Fisheries Training Centre, Tuticorin.	200	0
Assistant Director of Fisheries, Training Centre, Nagapattinam.	200	0
Colachel Fisherman Co-operative Society ..	25	0
Killai Fishermen Co-operative Society	150	0
	2,525	2

Orders for the supply of one lakh fishing hooks have been placed with Messrs. Kurban & Co., Madras. The sample hooks have been distributed to fishermen for trial fishing.

An Assistant Director of Fisheries and staff was sanctioned during the year specially for implementing this scheme.

The Plan provision for the scheme during the year was Rs. 1.21 lakhs, budget provision was Rs. 0.51 lakh and actual expenditure Rs. 0.39 lakh.

8. Assistance to fishermen co-operative societies for marketing fish.

The Government have sanctioned a comprehensive scheme of assistance to fishermen to enable them to improve fishing and do marketing through fishermen co-operative societies on the following lines :—

- (a) for clearing their prior debts to money-lenders;
- (b) for purchasing fishing equipments such as crafts and tackles and other requisites for fishing;
- (c) for purchasing motor vehicles for transport of fish;

(d) for purchasing or constructing buildings such as godowns, curing sheds and tanks for the storing or processing of fish or fish products; and

(e) for purchasing, constructing and for erecting machinery, plant or other appliances for demonstration of improved methods of fishing, and for the preservation, processing or marketing of fish or fish products.

Only fishermen, who are members of registered fishermen co-operative societies are eligible for these loans in accordance with special by-laws of the societies framed under the rules governing the grant of long-term loans to fishermen co-operative societies, approved in G.O. Ms. No. 645, Food and Agriculture, dated 28th February 1957. The loan is repayable to Government in easy instalments spread over a period of ten years.

To develop the activities of the fishermen societies, settle matters of common interest, such as procuring facilities, purchasing of yarn, logs, boats, etc. and in common act as agents of the societies, central organizations called District Fishermen Co-operative Federations have been started at Madras, Tanjavor, Ramanathapuram and Tuticorin. One of the main objects of the Federations is to provide facilities for modern methods of marketing which will include quick handling, quick transport, preservation of fresh fish, etc. The societies (about five in each centre) selected and brought under the loan scheme have contributed a sum of Rs. 1,000 to Rs. 2,000 each as share capital to the Federations.

In addition to the above share capital, Government have also granted share capital loan of Rs. 2,000 to each of the Federations repayable after five years in ten half-yearly instalments.

Under the scheme each society has been granted loans to forty members not exceeding Rs. 500 per member or Rs. 2,000 per working unit and not exceeding Rs. 20,000 per society. The loans are granted to fishing units comprising generally of 3 or 4 members of the personal security of two or more members of solvency or on the mortgage of unencumbered immovable property belonging to the borrower or borrowers. The fishing equipments such as crafts and tackles purchased out of the loans shall be mortgaged to the society. The crafts and tackles for purchase of which the loans have been issued shall be purchased within one month from the date of issue of the final instalment or within three months from the date of issue of the first instalment, whichever is earlier. Loans amounting to Rs. 2.70 lakhs have been drawn and disbursed to 26 Fishermen Co-operative Societies; and 832 fishermen have been benefited by the loans in 1956-57 (Details are in Appendix XXIV). Special staff of five Senior Inspectors and nine Junior Inspectors have been sanctioned by the Government for intensive supervision of the societies that have come under the scheme. One Junior Superintendent, one Upper Division Clerk and one Typist were also sanctioned for employment at Head office for work connected with

this scheme. Out of the loan of Rs. 2.70 lakhs a portion has been utilized by the fishermen for discharge of prior debts and a major portion has been utilized for purchasing crafts and tackles. The District Federations assisted the societies in purchasing yarn, sail cloth, etc., in bulk at ex-mill rates and distributing them to the member societies charging a very low commission just enough to meet the handling charges.

A fishermen co-operative marketing society was organized at Mettur Dam and started on 7th October 1956. There are about 200 members with a paid up share capital of Rs. 1,000. For managing the affairs of the society and to attend to the marketing scheme, the services of one Senior Inspector and one Junior Inspector of Co-operative Societies have been placed at the disposal of the society free of cost. Loans amounting to Rs. 13,500 have been issued to 118 members for discharging prior debts and for purchasing crafts and tackles. One hundred and ninety-three members have taken licences for fishing in the reservoir during the year. All the member licensees market their catches through the society from 10th April 1957. The departmental boat and the motor van have been given to the society on hire which were hitherto engaged by the merchants. The catches marketed through the society amount to 1,000 to 1,500 lb. per day. But it is hoped that the entire catches would be marketed only through the society in the course of a few weeks and the production would go up to 2,000 to 2,500 lb. a day or even more. Nearly 90 per cent of the fishermen who fish in the reservoir have joined the society and others will also join shortly. Applications for long term loans for taking out licences, for purchase of craft and tackle are being received in large numbers, but pending allotment of funds for 1957-58 the society has been advised to approach the Salem District Co-operative Central Bank for finance.

Mechanised boats of the Pablo type and Nylon nets have been given to the following societies for fishing:—

Name of society.	Number of Pablo boats given.
Madras Fishermen Co-operative Federation	.. 2
Kasimedu Fishermen Co-operative Society	.. 2
Triplicano Fishermen Co-operative Society	.. 1
Mattankuppam Fishermen Co-operative Society	.. 2
Neelangarai Fishermen Co-operative Society	.. 1
Sonankuppam Fishermen Co-operative Society	.. 2
Killai Fishermen Co-operative Society	.. 1
Porto Novo Fishermen Co-operative Society	.. 1
Tinnevely District Fishermen Co-operative Federation	.. 7
Colachel Fishermen Co-operative Society	.. 7

Terelyne yarn has been issued to all the societies at subsidised rates for making nets under hire-purchase system, the cost being repayable to Government in monthly instalments within a period of two years. The boats also have been given on 75 per cent loan and 25 per cent free subsidy under hire purchase system, the cost being repayable in monthly instalments of Rs. 125 in a period of six years. The fishermen are slowly beginning to realize the advantage of the use of power boats and synthetic nets and there is a clamour for the supply of these modern equipments.

The work done and the results achieved under this scheme during the first year of its implementation are encouraging, and it is hoped that much more will be achieved in the course of the plan period.

The Plan provision for the year was Rs. 0.09 lakh and the budget provision Rs. 2.91 lakhs, and the total expenditure Rs. 2.91 lakhs.

9. Training of personnel.

One of the serious handicaps, for the introduction of mechanized fishing on an extensive scale is the lack of trained personnel for operating modern mechanized vessels and engines. Since it is proposed in the Second Five-Year Plan to give to fishermen mechanized crafts at subsidised rates, it is necessary to train sufficient number of fishermen in the operation of marine engines and in the proper use of the mechanized boats. Hence this scheme has been sanctioned by Government in their G.O. Ms. No. 1072, Agriculture, dated 24th April 1956, for establishing two training centres one at Beypore near Kozhikode for the west coast and the other at Madras and Nagapattinam for the east coast.

The training centre for the west coast was started on 11th September 1956 with 10 literate fishermen belonging to Malabar and South Kanara districts as the pupil-trainees. With the re-organization of States on 1st November 1956, this centre was transferred to the Department of Fisheries of the Kerala State.

The training centre in the east coast started at Madras with effect from 1st October 1956. Ten fishermen from Thiruvannamiyur, Neelangaraikuppam, Ayodikuppam, Nadukuppam, Kasipuram and Royapuram fishing hamlets were taken in the first batch of trainees. The fundamentals of navigation and seamanship with special reference to handling of mariners' compass, mercators' chart reading, use of tide tables, etc., were taught in the first stage. Fishing methods, especially modern types like otter trawling, bull trawling, purse seine netting, gill netting, drift netting and surface trawling were taught in the second stage. Teaching of the principle of internal combustion of marine engines of different types and their running, upkeep, cleaning and overhauling were taught in the next stage. The trainees were also given to learn elements of boat-building and fabrication of nets. In the last stage, the trainees were given

intensive practical training in actual fishing operations with mechanized boats and modern nets under the supervision of Mr. Illugasam, F.A.O. Fishery Engineer at Pamban.

The training of the first batch ended on 31st March 1957 with written and practical tests for them. The trainees have benefited themselves considerably; and it is hoped that they would soon take to mechanized fishing and also train their fellow fishermen to adopt the new methods.

The plan provision for this scheme was Rs. 0.22 lakhs, budget provision Rs. 0.11 lakh and actual expenditure Rs. 0.08 lakh during the year.

10. Fish-meal and fish manure production.

One of the methods of utilizing surplus fish which are not readily marketable in certain seasons and which are spoiled and wasted, is the preparation of fish-meal and fish oil. Fish-meal is very useful cattle and poultry feed and is in great demand in India as well as in foreign countries. Fish oil is useful in leather and other industries. In the process of curing, the guts and gills which are at present wasted can be usefully converted into fish manure. In G.O. Ms. No. 1040, Agriculture, dated 20th April 1956, Government sanctioned the installation of a fish-meal plant of 60 cwt. capacity in a suitable centre on the east coast. But it was realized, on a detailed study of statistics of fish landings that smaller plants would be more economical. Hence, proposals to instal two plants of one ton capacity each at Nagapattinam and Tuticorin are under the consideration of Government; and are expected to go into production in 1957-58.

11. Quick transport of fish from landing centres to marketing and consuming centres.

This scheme which was initiated during the First Five-Year Plan is being continued to the Second Plan also. There is considerable difficulty in the coastal fishing villages to market fish catches, due to lack of adequate quick transport facilities. There are at present nine motor vehicles with the department which are being hired out to fishermen co-operatives for the transport of fish. The hire charges are 31 nP. per mile for small vans, 37 nP. for medium size vans and 44 nP. for big vans. Seven of the vehicles operated around Madras City and outlying fishing centres like Ennore, Arambakkam, Pulicat, Vallembedu, Tiruvannamiyur, Mahabali-puram, Sadras, Navaloor, Kanathur Reddikuppam and Poondi. The other two vehicles operated at Mettur Dam. On the whole these vehicles transported 752 tons of fish as against a target of 900 tons. This is very satisfactory when considering the fact that all the vehicles are more than seven years old and broke down on several occasions and had to be repaired frequently. The quantity of fish transported by these vehicles during the previous year was 642.60 tons.

The scheme continued to be popular with the fisherfolk as it enabled them to quickly transport and market their daily fish catches without spoilage and thus obtain better price. There was therefore a demand for smaller vehicles with low running cost. Hence, Government sanctioned the purchase of five new vehicles for supply to fishermen co-operatives under the hire purchase system. Of these five vehicles, two were allotted to the Kerala and Mysore States consequent to reorganization of States. The other three vans purchased for Madras State were given to the Tirunelveli District Fishermen's Co-operative Societies' Federation, Tanjavor District Federation and the Porto-Novo Fishermen Co-operative Society in South Arcot district. These societies are using these vehicles to transport fish from their landing centres to the various markets in the districts. The vehicle given to the Porto Novo Society lifted 15,000 lb. of fresh fish from the commencement of its operation on 20th February 1957 to 31st March 1957.

The Plan provision for this scheme was Rs. 0.60 lakhs, budget provision was Rs. 0.45 lakh and actual expenditure Rs. 0.44 lakh.

A list of 12 motor vehicles that operated under this scheme is given in Appendix LXIV.

12. *Salt Subsidy Scheme.*

Under this scheme, pure powdered salt is sold in the fish-curing yards, at subsidized rates, as an incentive for the curers to resort to curing of their surplus catches of fish under hygienic conditions.

Consequent to State reorganization 61 fish-curing yards on the west coast were transferred to Kerala and Mysore States. To the eleven yards on the east coast, six more yards were added due to formation of the Kanyakumari district. Details of the working of the yards are given in Part V of this report.

On the whole 25,442.5 tons of cured fish were produced during the year against a target of 20,000 tons. The quantity of cured fish produced on the east coast alone was about 5,130 tons against a target of 5,000 tons.

The plan provision for this scheme was Rs. 2.47 lakhs, budget provision was Rs. 3.78 lakhs and actual expenditure was Rs. 4.24 lakhs during the year.

13. *Fish preservation—Provision of ice plant and cold storage facilities.*

The ice plant and cold storage at Kozhikode and Mangalore, which were erected during the First Plan period continued to work well till 1st November 1956 when they went to the control of the Kerala and Mysore States. The plant at Kozhikode was leased to Messrs. Bombay Ammonia and Refrigeration Company for a period of three years from July 1955 on an annual rental of Rs. 42,000. The lessee was mostly freezing prawns and exported them to the United States of America. The Mangalore plant was

on trial run from October 1955 to June 1956 and thereafter was run departmentally. During the trial period, April-June 1956, the plant sold about 58-tons of ice at an economical rate of Rs. 50 per ton which might have preserved about 100 tons of fish. About 50 tons of fresh fish was also kept in storage during this period. Besides, 14,000 lb. of prawns were frozen and exported to America by the local merchants. This industry in addition to yielding better price to the prawn catches of the local fishermen, gave employment to about 250 people. From 1st July onwards, the plant was put into regular commission departmentally. During the July-October period of four months, the plant produced and sold 159 tons of ice realizing a revenue of Rs. 7,799, stored 251 tons of fish realizing Rs. 772 as receipts and froze 58.5 tons of prawns realising Rs. 10,946.

Since the Madras State was left without any plants from 1st November 1956, it was proposed to instal cold storage and ice plants at important centres. Two plants have been received under T.C.M. Programme, and detailed plans and estimates for erection of these at Mettur Dam and Tuticorin have been prepared and submitted to Government. Each plant has a capacity for a daily output of 5 tons of ice and storage capacity of 15 tons. The cost for the erection of the Mettur plant is estimated to be about Rs. 67,000 and that of Tuticorin plant Rs. 60,000. These plants are expected to commence working in 1957-58.

14. *Fish marketing—Construction of model fish markets.*

Consequent on the development of both inland and marine fishing, marketing and distribution under hygienic conditions of this easily perishable commodity present a serious problem. At present, the fish markets in the State are in a very unsatisfactory condition, and a survey conducted by the Fisheries Marketing and Information Officer has revealed that the following minimum requisites have to be fulfilled by the markets: (1) flooring and platforms for display of fish made of cement and concrete with proper drainage arrangements, (2) pucca roof overhead, (3) stalls sufficiently raised from the ground, (4) sufficient space for each fish monger and customer, (5) adequate supply of water for washing fish implements and for flushing the floor, (6) fly-proofed doors, windows and ventilators and (7) latrines and urinals outside the market. Without these improvements, it will be difficult to attract customers to the markets and to popularise fish as an article of food of nutritional and medicinal importance. The fish markets are either owned or controlled by the various municipalities and local bodies who are not able to effect necessary improvements for want of finance. It is therefore proposed to give financial assistance to selected local bodies to improve their fish markets, and necessary proposals have been submitted to Government. It is expected to implement this scheme in 1957-58.

15. *Administrative staff at headquarters.*

For the successful implementation and effective supervision of all the schemes, it is necessary to have adequate headquarters staff for technical and supervisory work. Accordingly, a Personal Assistant to the Additional Director of Industries and Commerce has been employed. A proposal for additional ministerial staff has been submitted to Government and orders are awaited.

The expenditure on this scheme during the year has been Rs. 0.02 lakhs against a budget provision of Rs. 0.04 lakhs.

PART V—DEVELOPMENT AND EXPLOITATION OF MARINE FISHERIES.

A. PEARL FISHERIES.

1. *Tuticorin pearl fishery.*—The prospect of a pearl fishery in March 1957 was revealed as a result of a detailed inspection of the pearl banks conducted in December 1956 and January 1957. It was estimated that 1.27 lakhs of oysters could be fished. The Government in their Order Ms. No. 499, Food and Agriculture, dated 16th February 1957, sanctioned the conduct of the pearl fishery. The Divers Union was consulted and it agreed to the commencement of the fishery from 1st March. But subsequently the Union made certain demands such as payment of their savings amount and 50 per cent share in the catches of oysters. As a result of this dispute and because of the general elections the pearl fishery was postponed to 15th March. Arrangements were made for the erection of sheds for divers, oyster market, pearl bazaar, Government kottu and auction pandal in the office compound at Tuticorin. Amenities such as canteens, protected water-supply, medical and postal facilities, and police bandobust were provided in the camp area. Thotti sites were located at a place 3 furlongs north of the Government chank godowns. The fishery was widely advertised in the newspapers, and it was finally inaugurated by the Bishop of Tuticorin on 14th March 1957. The fishery was closed on 20th May 1957. The two departmental divers sanctioned in G.O. Ms. No. 2736, Agriculture, dated 24th October 1955, were appointed from 15th February 1957 and they were utilized for the pearl bank inspections and also to conduct regular fishing during the fishery. The working of the fishery was mainly on the same lines as the 1956 pearl fishery. Fifty-eight canoes and 733 divers were admitted to the fishery as against 46 canoes and 457 divers in the previous fishery. The total number of oysters fished was 11,75,211 and the two-thirds share of 47,87,580 oysters were sold in auction. The total revenue from this fishery was Rs. 1,68,807.37 nP.; and expenditure about Rs. 22,264.24 nP. The net revenue was about Rs. 1,46,543.07 nP.

2. *Experiments with aqua-lung.*—Diving experiments with aqua-lung were conducted successfully during the year. Two departmental divers gained such confidence that they were able to remain up to eight minutes at a depth of $9\frac{1}{2}$ fathoms. The drawback in the apparatus was the limited air supply which restricts the duration of stay under water. Correspondence was being carried on with the manufacturers to increase the capacity of the air cylinder.

B. CHANK FISHERIES.

1. *Tirunelveli Chank Fisheries.*—The Chank Fishery which commenced on 14th November 1956 at Tuticorin came to a close on 20th May 1957. Sixty-seven canoes with 733 divers were registered for the fishery as against 58 canoes and 645 divers during the 1955-56 season (Appendix XXV). 660,869 full-sized, 35,045 under-sized and 27,387 wormed chanks were collected during the year. The statistics of chanks fished is furnished in Appendix XXVI. The maximum catch on a day was 22,828 full-sized chanks. The maximum catch of a single diver on a particular day was 221 chanks. As against the rate of Re. 0-6-0 per chank paid previously, an enhanced rate of Re. 0-7-0 per chank was paid as per G.O. Ms. No. 2313, Agriculture, dated 25th September 1956. The compulsory savings fund was continued as usual, retaining Re. 0-1-0 for each full-sized chank fished by the diver, the accumulated savings being paid at the closure of the fishery. A pass-book system has been introduced thereby facilitating the divers to draw money from their savings on urgent needs during the fishery. A lower division clerk was sanctioned by the Government for a period of eight months to cope with the additional work caused by the chank fishery. The construction of two new godowns for storing wormed and under-sized chanks was completed and the godowns were taken possession by the department and put to use. Amenities for the mufassal divers such as providing accommodation, supply of drinking water and lighting facilities were arranged. To entertain the divers returning from the sea, a community radio set was installed in the chank godown, besides facilities provided for selling tea and light refreshments.

The chanks fished during 1955-56 season were disposed as follows :—

1. *West Bengal Government—*

Full-sized chanks	..	450,725	at Rs. 1,337 per 1,000.
Under-sized chanks		32,404	} at Rs. 111 per 1,000 chanks.
Wormed chanks	..	16,871	
Total	..	500,000	

2. A.M.S.S.V.M. & Co., Kilakarai—

Full-sized chanks (Jadhi)—54,953 at Rs. 1,636 per 1,000.

Under-sized chanks—1,462 at Rs. 111 per 1,000.

Full-sized chanks (Pathala)—2,065 at Rs. 813 per 1,000.

Under-sized chanks (Pathala)—1,935 at Rs. 55 per 1,000.

Wormed chanks (Pathala)—118 at Rs. per 1,000.

During the year under report the following deliveries of chanks were effected :—

1953-54 season chanks.	Full-sized.	Under-sized.	Wormed.
K.T.M.T.S. Omar Abdul Quadir & Co., Kilakarai	76,400	6,114	2,418
West Bengal Government	328,935	30,649	22,469
1954-55 season chanks—			
A.M.S.S.V.M. & Co., Kilakarai ...	124,560	9,400	4,700
1955-56 season chanks—			
West Bengal Government	450,725	32,404	16,871

There were no accidents during the fishery this year. Government in their G.O. Ms. No. 836, Food and Agriculture, dated 19th March 1957, sanctioned an ex-gratia grant of Rs. 500 each to Srimathi Mariammal Fernando and Srimathi Muthumeenakshi, the widows of the deceased divers, Sri Arulanandam and Sri K. M. Ibrahim Sahib, who lost their lives during 1955-56 chank fishery season. Sri P. Asana Lebbai, a diver who lost one of his eyes during 1955-56 season and whose case has been recommended to Government for an ex-gratia grant, was posted as a watchman during the pearl fishery this year.

The physical verification of the stock of chanks was taken up from 5th October to 12th November 1956 by the Assistant Director of Fisheries sanctioned in G.O. Ms. No. 2527, Agriculture, dated 28th October 1955. He verified the stock of chanks of 1955-56 and 1956-57 season and also the balance of 1954-55 season chanks.

2. Ramanathapuram Chank Fishery.—The Ramanathapuram district chank beds extend along the coast to a distance of 130 miles and comprises of 2 units, namely, the ex-Ramanathapuram zamindari area (from the south of the Kottar river to Kannirajapuram) and ex-Sivaganga zamindari area (from Sundarapandiarpatnam to Karangadu). Consequent on the Estates Abolition Act the chank fisheries enjoyed by the Ramanathapuram and Sivaganga estates were vested with the Fisheries department.

The Ramanathapuram Estate Chank Fishery was leased by the Raja of Ramnad for a period of ten years from July 1946 to June 1956 to Messrs. A.M.S.S.V.M. & Co., Kilakarai. Even after the abolition of the zamindari the lessee was allowed to continue to enjoy the chank fishery till June 1956 as per the agreement arrived at by the lessees and the Government but on an increased rental of Rs. 42,000 as against the original lease amount

of Rs. 14,000. To safeguard the chank beds from over-fishing and poaching and to enforce the conditions of the lease, a supervisory staff consisting of one Inspector of Fisheries with headquarters at Kilakarai and one Chank Fishery Overseer at Karangadu were appointed. The lessee conducted chank diving operations throughout the year from Kannirajapuram in the south to Karangadu in the north at 11 chief centres. All the under-sized chanks found more than the percentage allowed by the supervisory staff during their inspection were released back into the sea. After the expiry of the original lease on 30th June 1956, tenders were called for a period of five years. The highest tender of Rs. 2,27,887 per annum was accepted by the Government in favour of K. T. M. T. M. Abdul Kayoom Sahib & Co., Kilakarai, for five years from 5th August 1956. During the interval from 1st July to 5th August 1956, the fishery was under departmental working and supervision. There were four Sub-Inspectors in charge of the operations, and the number of chanks collected during the departmental fishing were 29 full-sized, 1 under-sized and 7 wormed chanks. The number of chanks confiscated from the fishermen were 24 full-sized, 27 under-sized and 5 wormed chanks. Thus a total number of 53 full-sized, 28 under-sized and 12 wormed chanks were pending disposal by auction.

The number of chanks fished by the lessee during 1956-57 with comparative figures for the years 1954-55 and 1955-56 are furnished below :—

Year.	Full-sized.	Under-sized.	Wormed.	Returned to sea.
1954-55 ..	325,505	21,678	26,678	7,063
1955-56 ..	349,609	16,853	7,185	5,875
1956-57 ..	392,573	23,747	23,612	6,877

3. Sivaganga Chank Fisheries.—The Sivaganga chank beds extends from Karangadu to Sundarapandianpatnam for a length of 18 miles. Consequent on the decision of the Government to lease the fishery, tenders were called for and the highest tender of Rs. 30,156 per year was accepted and the lease given to Messrs. A.M.S.S.V.M. & Co., Kilakarai, for a period of three years from 1st July 1956. During the months of April and May 1956 till the tenders were accepted, the fishery were worked departmentally and 4,410 full-sized, 440 under-sized and 705 wormed chanks were fished.

The chanks fished departmentally during 1955-56 and in 1956-57 (April and May) totalling 21,077 full-sized, 550 wormed and 3,784 under-sized chanks were sold to Messrs. K.T.M.T.S. & Co., Kilakarai, for Rs. 26,695-4-8 by inviting tenders.

The details of chanks fished by the lessee from 1st July 1956 till the end of the year are furnished below along with comparative figures for the years 1954-55 and 1955-56 :—

Year.	Full-sized.	Under-sized.	Wormed.
1954-55	3,824	374	330
1955-56	6,544	780	1,569
1956-57	124,572	3,478	28,141

4. *Tanjavoor Chank Fishery*.—Departmental fishing of chanks was conducted during the year in the portion lying between Point Calimere and Puthukuda. The comparative figures of chanks fished for these years 1954-55, 1955-56 and 1956-57 are given below :—

Year.	Full-sized.	Under-sized.	Wormed.
1954-55	11,832	4,677	657
1955-56	17,992	7,068	766
1956-57	31,768	13,039	1,566

The chanks of 1955-56 season were sold to a chank merchant at Kilakarai during August 1956 for Rs. 17,842-7-0. In addition the lease of the chank fishery excluding the portion operated departmentally fetched in a lease amount of Rs. 15,875. A statement of the chanks collected departmentally during the year is given below :—

Month.	Full-sized.	Wormed.	Under-sized.	Returned to sea.
April 1956	..	..	..	..
May 1956	960	18	177	..
June 1956	940	59	328	..
July 1956	2,930	223	1,639	..
August 1956	3,807	176	1,268	..
September 1956	3,141	66	598	18
October 1956	2,197	49	216	15
November 1956	3,374	186	1,871	..
December 1956	1,587	67	1,756	..
January 1957	4,201	522	3,418	..
February 1957	3,302	92	842	..
March 1957	5,329	108	926	..
Total	31,768	1,566	13,039	28

5. *Chingleput District Chank Fishery*.—The chank fishery of the Chingleput district coast was leased out to Sri K. T. M. T. M. Abdul Kayoom Hussain Sahib of Kilakarai for a period of three years from 1st July 1954 to 30th June 1957 at an annual rental of Rs. 4,711.

6. *South Arcot Chank Fishery*.—The lease of the chank fishery in this section was leased out to Messrs. A. M. S. S. V. M. & Co., Kilakarai, for a period of three years from 1st July 1954 to 30th June 1957 at an annual rental of Rs. 13,406.

C. FISH-CURING YARDS.

West Coast.

There were 38 fish-curing yards in Malabar district and 23 yards in South Kanara district attached to this State at the beginning of the year. Consequent to the partition of the State all the above 61 yards of the West Coast were transferred to Karnataka and Kerala States with effect from 1st November 1956. Only local method of

curing was adopted in the yards but Ratnagiri and Colombo systems of curing with bazaar salt were done by in a few yards by some local fish merchants. A total quantity of 179,374 maunds of salt was purchased during the year from Tuticorin salt factories for the west coast yards. Of this 105,916 maunds of salt were transported by sea and the balance of 73,458 maunds was transported by rail. The issue price of salt was Re. 1-4-0 per maund.

The transactions in the yards for the period, 1st April 1956 to 31st October 1956, were as follows :—

	Fish let in.		Fish let out.		Salt issued.	
	MDS.	SRS.	MDS.	SRS.	MDS.	SRS.
South Kanara	315,213	20	176,037	34	45,118	23
Malabar	606,381	15	392,757	22	89,245	12

East Coast.

(i) *Tuticorin Division*.—There were four fish-curing yards in this division at the beginning of the year. But with the addition of Kanyakumari district there were now 9 fish-curing yards in actual operation by the end of the year. The four fish-curing yards in the Tirunelveli district, namely, Periathalai, Ovari, Idinthakarai and Kootapuli, were supplied with salt from Tuticorin and the issue price of salt was Re. 1-4-0 per maund till 23rd October 1956 and thereafter. The continuance of these four yards was sanctioned up to 28th February 1958 in G.O. Ms. No. 555, Agriculture, dated 2nd March 1957, with a staff of one Petty Yard Officer and two peons for Idinthakarai, and one Petty Yard Officer and one peon for the other three yards. The particulars of transactions for the year under report are given below :—

Name of the yard.	Salt issued.		Fish let in.		Fish let out.	
	MDS.	SRS.	MDS.	SRS.	MDS.	SRS.
1 Periathalai	322	00	1,877	06	1,196	11
2 Ovari	4,313	10	20,156	37	14,068	18
3 Idinthakarai	7,704	30	32,897	30	24,748	13
4 Kootapuli	876	00	2,842	27	2,098	16

Salt transport.—The supply of salt to West coast fish-curing yards was carried on as in the previous year till 31st October 1956. The system was continued up to 31st March 1957 as per the specific request of the Kerala Government and it was decided to stop the supply with effect from 1st April 1957. The supply of salt to the fish-curing yards in South Kanara district was stopped with effect from 1st November 1956 itself. A total quantity of 4,200 maunds of salt was supplied to the fish-curing yards in Kanyakumari district from 1st November 1956 to 31st March 1957. A total quantity of 179,374 maunds of salt was purchased during the year from Tuticorin and Veppalodai salt factories. The above

quantity consisted of 73,396 maunds of powdery salt, 82,270 maunds of crystal salt and 8,600 maunds of crushed salt. The rate of purchase was as follows:—

Powdery salt	...	...	...	0-7-0 per maund.
Crystal salt	...	...	...	0-7-6 per maund.
Crushed salt	...	...	...	0-8-0 per maund.

A detailed statement showing the particulars regarding the transactions in the 4 yards of the Tirunelveli district are furnished in Appendix XXVII.

The five fish-curing yards of the Kanyakumari district were under the control of this State from 1st November 1956. Each of the yards was in charge of a Sub-Inspector. As the rules and regulations governing the fish-curing yards in the district were completely different from those in this State, a thorough change in the set-up had to be effected. A statement showing the transactions in the yards of Kanyakumari district from 1st November 1956 to 31st March 1957 is furnished in Appendix XXVIII.

(ii) *Tanjavoor Division.*—All the three fish-curing yards in this division were maintained during the year. There was an increase in the transactions at Muthupet consequent to the reduction in the price of salt from Re. 1-4-0 per maund to Re. 0-10-0 per maund with effect from 23rd October 1956. There was a fall in the transactions at Arcotthurai due to unfavourable weather for a period of three months. It is proposed to construct two curing sheds at Adirampatnam for the Adirampatnam and Eripurakarai Co-operative Societies. Applications have been received from the fishermen at Vanagiri, Sethubavachatram and Tranquebar for the reopening of fish-curing yards at the places. The comparative figures of transactions in the three fish curing yards of the division for 1955-56 and 1956-57 are furnished below:—

Yard.	Year.	Fish let in.	Fish let out.	Salt issued.
(1)	(2)	(3)	(4)	(5)
		MDS. SRS.	MDS. SRS.	MDS. SRS.
Adirampatnam	1955-56	4,697 30	3,476 24	1,066 15
	56-57	4,770 15	3,499 37	968 30
Muthupet	1955-56	8,626 11	5,963 13	1,622 10
	56-57	10,665 20	7,421 08	1,962 25
Arcotthurai	1955-56	1,665 17	1,255 05	415 30
	56-57	1,003 65	830 38	275 30

Vellore Division.—The Kadapakkam and Sathankuppam fish-curing yards were maintained in the division. The issue price of salt in the yards continued to be Re. 1-4-0 per maund till 23rd October 1956 when it was reduced to Re. 0-10-0 per maund as per G.O. Ms. No. 429, Agriculture (Food Production), dated 23rd October 1956. This reduction in the issue price of salt gave the fishermen necessary inducement to visit the yards and cure fish with good quality salt under hygienic conditions. The following

is the statement of the transactions in the yards of the division during the year with comparative figures for the previous year:—

Yard.	Year.	Fish let in.	Fish let out.	Salt issued.
(1)	(2)	(3)	(4)	(5)
		MDS. SRS.	MDS. SRS.	MDS. SRS.
Sathankuppam	1955-56	6,077 04	3,878 12	911 10
	1956-57	5,346 35	3,323 10	834 00

General.—On the whole, the maintenance of the fish-curing yards of the East Coast and their transactions during the year were satisfactory. Full details of the operations are given in Appendices XXVII and XXVIII. A list of the fish-curing yards in the State during 1956-57 together with details of those transferred to the Kerala and Mysore States and of those of former Travancore-Cochin State added to Madras State on 1st November 1956 are furnished in Appendix XXIX.

D. SHARK LIVER OIL EXTRACTION.

A list of the centres where procurement of Shark liver and extraction of oil were conducted at the beginning of the year, are furnished in Appendix XXX. There were 64 centres till 1st November 1956, and consequent to reorganisation of States, 9 centres were transferred to Mysore State and 36 centres to Kerala State. Four centres were added to Madras State from the Travancore-Cochin State, and thus there were 19 centres in the residuary State. The details of the operation in these centres are given in Appendix XXXI. A total quantity of 27,426½ lb. of oil was produced in these centres.

E. FISH-MEAL PRODUCTION.

The fish-meal plant at West Hill went into production during the year and till 31st October 1956 a total quantity of 12,153½ lb. of fish-meal was manufactured. Another 2,815 lb. of fish-meal was produced at Tanur till the end of October 1956. The scope for establishing similar economical units on the East Coast at important fishing centres is being examined.

F. FISHERIES DEMONSTRATION FACTORIES.

There were six demonstration factories in the State at the beginning of the year at Tanur, Kozhikode, Malpe, Adirampatnam, Rameswaram and Pulicat. Consequent to the reorganization of States the three factories on the West coast were transferred to Kerala and Mysore States, and the factories at Adirampatnam, Rameswaram and Pulicat were placed under the control of the Superintendent of the newly-started Technological Station, Tuticorin. All the factories were actually engaged in the production of the various bye-products as detailed below:—

Tanur.—During the period, 1st April 1956—31st October 1956, the following were produced at this centre:—

	LB.
Fish meal	2,815
Fish oil	440
Semidried prawns	1,641

Kozhikode.—The production from this centre during the first seven months was as follows :—

	LB.
Fish manure	730
Fish meal	12,153
Brine salt sediment	41
Semidried prawns	1,717½

Malpe.—From this centre, the following were produced up to 31st October 1956 :—

	LB.
Fish manure	6,234
Semidried prawns	60

Adirampatnam.—Fish, manure, Shark liver oil and Skate liver oil were the chief bye-products produced at the unit as shown below :—

	LB.
Fish-manure	5,768
Shark Liver oil	504
Skate Liver oil	646
Sediment oil	10

Rameswaram.—This is the only centre which produced seaweed manure in addition to the other products shown below :—

	LB.
Sea-weed compost manure	5,158
Sea-weed ash	254
Dried sea-weed	397
Sediment	141
Shark-Liver oil	291
Skate-Liver oil	268
Sediment oil	150
Fish scales	90
Fish bones	8½

Pulicat centre.—The unit produced only 21 lb. of semi-dried prawns and 17 lb. of dried prawns owing to paucity of prawn catches.

G. MANUFACTURE OF SEMI-DRIED PRAWNS.

With the reorganization of the States, the chief semi-dried prawns producing centres were lost to Madras State. Hence with a view to explore the possibilities of producing semi-dried prawns economically on the East Coast, a unit was sanctioned in G.O. Ms. No. 68, Food and Agriculture, dated 9th January 1957. All the preliminaries for regular production of semi-dried prawns were attended to during the year.

H. DEEP-SEA FISHING.

The deep-sea fishing activities of the department was much curtailed during the year as the old motor fishing vessels were condemned and disposed of in public auction. M. F. V. Vijayanagar station at Madras was sold for Rs. 5,000 and handed over to the party, Sri K. Gopalan Chetty & Bros. on 25th June 1956. At Tuticorin only M. F. V. Goharkhaleeli and a hired canoe on share system were employed for deep-sea fishing operations as the other four vessels were auctioned for the amounts noted against each—M. F. V. Adirampatnam, Rs. 3,450, M. F. V. Mangalore, Rs. 3,450, M. F. V. Nicholson, Rs. 33,100. The unit at Pamban continued operations with canoes only as M. F. V. Calicut was auctioned away for Rs. 9,500. At Adirampatnam, along the Tanjore coast, operations were conducted with one hired boat. A small unit functioned at Mangalore for a brief period in the beginning of the year. The quantity of fish caught at each centre is given below :—

	LB.
1 Madras	1,200
2 Tuticorin	16,502
3 Pamban	43,904
4 Adirampatnam	21,140
5 Mangalore	7,523
	90,269

The sale proceeds from this quantity amounted to Rupees 12,849-8-10.

Exploratory Deep Sea Fishing was conducted with the F.A.O. boats and T.C.M. vessels as detailed in Parts II and III of this report. The summary of fish caught and receipts are as follows :—

Kind of boat	Weight.	Receipt.		
	LB.	RS.	A.	P.
1 Two F.A.O. Danish boats	9,372	1,927	11	3
2 F.A.O. Steel Dory I	52,702	2,733	11	6
3 F.A.O. Steel Dory II	5,530	450	5	9
4 T.C.M. Vessel, Samudra	87,327	18,043	11	9
5 T.C.M. Vessel, Sardinella	23,968	4,066	11	6
6 T.C.M. Vessel, Gudjon	12,510	734	12	0
7 T.C.M. Dan Boat	19,070	279	10	0
	2,28,813	32,126	3	6

The total quantity of fish caught by the departmental boats and the F.A.O. and T.C.M. vessel is 319,082 (140 tons) and the total revenue realized Rs. 44,975-12-4. The quantity of fish caught in 1955-56 was 109.3 tons.

The overall expenditure on deep-sea fishing operations, including pay and allowances of staff is Rs. 97,735-12-9 and total receipts Rs. 48,481-2-7 during the year.

PART VI—DEVELOPMENT AND EXPLOITATION OF INLAND FISHERIES.

A. LICENSING AND CONSERVATION.

1. *Adyar river, Madras*.—The following were the monthly rates of licence fees charged: (1) Rod and line, 3 annas, (2) Katcha, 3 annas, (3) Castnet, 6 annas, (4) Kondavalai, Rs. 1-11-0, (5) Siruvalai, Rs. 1-11-0 and (6) Boovalai, Rs. 1-11-0. A total number of 2,334 licences were issued and a sum of Rs. 1,307-13-0 was realized during the year as against 3,691 licences issued and Rs. 1,944-14-0 realized during the previous year. The fall in the number of licences issued is due to the fact that the fishermen resorted to fishing in the sea in view of the favourable conditions that prevailed during the year. A statement of licences issued is given in Appendix XXXII. The staff in-charge of the conservancy operations undertook vigorous patrol of the river and prevented unauthorized fishing. Four poaching cases were detected and charge-sheeted; and the offenders were convicted and fined by the Third Presidency Magistrate, Madras.

2. *Ramanathapuram district*.—Fishing by trees (or submerged vegetation) in the inshore waters off Ramanathapuram district in Palk Bay and Gulf of Mannar was controlled by the issue of licences. During the year under review 57 licences were issued at Nambuthalai, Pudupatnam, Karangadu, Tirupalakudi, Verkottu, Olaikuda and Sudukattanpatti and a revenue of Rs. 57 was realized as against 50 licences and Rs. 50 during the previous year.

3. *Kodaikanal lake (Madurai district)*.—Since 1952 the Kodaikanal lake was periodically stocked with **exotic varieties** of fishes like Mirror carp, Golden carp and Tench from Ootacamund. Of the above, only Golden carp has established well in the lake. Though Mirror carp grows well, there has not been evidence of its breeding in the lake. Hence large scale exploitation of Mirror carp was not attempted. A total weight of 224½ lb. of fish was caught by departmental fishing units and sold for Rs. 119-10-9, as against 216 lb. of fish caught and Rs. 110-15-3 realized during 1955-56. Ever since angling was permitted in the lake, it has become very popular with the local public as well as seasonal visitors. During the year 234 licences were issued for angling and a sum of Rs. 403-8-0 was realized as licence fees, as against 95 licences and Rs. 236-8-0 realized during the previous year. In view of the strict watch over the lake there was no illicit fishing during the year. A watchman-cum-store-shed, sanctioned in G.O. Ms. No. 681, Agriculture, dated 12th March 1956, was constructed near Pike Landing on the lake bud.

4. *Hope lake (Tirunelveli district)*.—Fishing in the Hope lake was continued to be permitted under licences at the following rates: (1) Rod and line, Re. 0-8-0 per day or Rs. 2 per month; (2) 25 hooks and line (set), Rs. 2 per month; and (3) Nachu valai, Rs. 2 per month. On the whole 35 licences were issued for fishing and Rs. 75 realized as licence fees. Systematic fishing was conducted

in the lake by the departmental unit with Rangoon nets, hooks, uduvalai and eel traps; and a total quantity of 2,600 lb. of fish was caught and sold for Rs. 969-4-0 as against 2,781 lb. and Rs. 1,038-3-3 during the previous year. The unusual low level of water in the lake during the year and the large number of submerged trees impeded the progress of fishing operations.

5. *Kadamba tank (Tirunelveli district)*.—The Kadamba tank with an area of 1,649 acres is under the control of the department and fishing in it is permitted under the licencing system as sanctioned in G.O. Ms. No. 4114, Development, dated 21st August 1947. The rates of licence fees are as follows:—

(1) Cast net	.. ..	Rs. 7-8-0 for six months,
(2) Nachu valai	.. ..	Rs. 7-8-0 per year and
(3) Ootha	.. ..	Re. 1 per year.

A total number of 457 licences were issued and a sum of Rs. 2,130-8-0 was realized during the year as against 595 licences and Rs. 2,255-8-0 during 1955-56. The decrease is due to the fact that the tank unusually dried up during the year. Departmental fishing was conducted in 3 different places using cast nets, Rangoon nets, uduvalai, eel traps and hooks. The catches for the year amounted to 3,159 lb. and the value realized through sale was Rs. 698-11-0 as against 3,934 lb. and Rs. 580-8-3 in 1955-56.

6. *Back-waters of Tirunelveli district*.—The fishing of immature fry and fingerlings in the back-waters and channels at Idinthakarai, Kulasekharapatnam, Tiruchendur, Punnakayal, Tuticorin and Veppalodai which was prohibited in G.O. Ms. No. 1787, Agriculture, dated 31st May 1954, was enforced during the year. The control which is aimed to prevent destruction of immature fry, fingerlings and breeders is now much appreciated by the fishermen as they are now enjoying the benefits of reaping better harvests of grown up fishes.

7. *Yercaud lake (Salem district)*.—In G.O. Ms. No. 383, Food and Agriculture, dated 15th February 1956 the Government sanctioned the continuance of the staff of one fieldman and one fisherman-cum-watchman employed in connection with the scheme for the exploitation of Yercaud lake for a further period of one year from 1st February 1956. During the year one nursery and a boat basin were formed. The lake was stocked with 2,000 fingerlings of Mirror Carp during the year. The kakabans were checked periodically but no eggs of mirror carp were noticed as evidence of its breeding in the lake. On account of the heavy rains on the Shevroys during the year it was not possible to record any progress in the fishing of the lake. Five hundred and twenty-six pounds of fish were caught and disposed for Rs. 263 as against 602 lb. for Rs. 301 during the previous year. Only few anglers came forward for angling in the lake and Rs. 5 was realized as licence fees, as against Rs. 6-8-0 during 1955-56. Rs. 176 was realized towards hire charges of the departmental boat for pleasure cruise in the lake as against Rs. 80 in the previous year.

8. *Poondi Reservoir (Chingleput district).*—The continuance of the scheme to conserve the fishery of the reservoir and its rational exploitation through licencing system was sanctioned in G.O. Ms. No. 632, Food and Agriculture, dated 27th February 1957, up to 28th February 1958. A total number of 2,304 licences were issued during the year under report as against 1,519 during the previous year. A sum of Rs. 8,432 was realized as licence fees as against Rs. 3,457 during the previous year. The following are the particulars of licences issued in the Poondi Reservoir during the year :—

Serial number and kind of tackle.	Number of licence.	Rate.		Amount realized.	
		RS.	A. P.	RS.	A. P.
1 Picking	261	0	8 0	185	0 0
2 Ootha	211	1	0 0	228	0 0
3 Rod and line	34	1	0 0	40	0 0
4 Mada-valai	37	2	0 0	94	0 0
5 Cast net	399	2	0 0	870	0 0
6 Cast-net with craft	97	12	0 0	1,152	0 0
7 Drag-net	406	(10 hooks at Re. 1).		996	0 0
8 Floating line	46	1	0 0	46	0 0
9 Murrel noose	776	(25' at Re. 1).		4,081	0 0
10 Kanni valai	37	20	0 0	740	0 0
11 Mani valai					
	2,304			8,432	0 0

9. *Kolavoy lake (Chingleput district).*—The continuance of the scheme for licencing fishing in the Kolavoy lake was sanctioned in G.O. Ms. No. 1659, Agriculture, dated 25th June 1955. During the year 223 licences were issued and a sum of Rs. 270 was realized as shown below :—

Serial number and kind of tackle.	Number of licences.	Rate.		Amount realized.	
		RS.	A. P.	RS.	A. P.
1 Cast net	54	1		83	0 0
2 Kanni valai	67	1		74	0 0
3 Kanni kodi	13	1		14	0 0
4 Utha	87	1		97	0 0
5 Angling	2	1		2	0 0
	223			270	0 0

During the previous year 591 licences were issued and Rs. 801 realized. This fall was due to the discontinuance of the issue of licences as per the orders of Collector of Chingleput.

10. *Vellore Fort Moat.*—The Vellore Fort Moat was acquired as per G.O. Ms. No. 3592, Revenue, dated 4th November 1918 and since that it has been maintained by this department. There was restricted issue of licences for fishing in the moat and during the year 59 licences were issued and a sum of Rs. 84 realized as licence fees. An equal number of licences were issued for fishing in the moat during the previous year. The particulars are as below :—

Serial number and kind of tackle.	Number of licence.	Rate.		Amount realized.	
		RS.	A. P.	RS.	A. P.
1 Cast net	21	1	0 0	30	0 0
2 Drag net	11	3	0 0	33	0 0
3 Katcha	2	0	8 0	1	0 0
4 Rod and line	25	0	8 0	20	0 0
	59			84	0 0

11. *Veeranam lake and connected channels (South Arcot district).*—The exploitation of the Veeranam lake in South Arcot district by the issue of licences was carried out for the twelfth year in succession. The departmental staff carried out intensive patrolling of the reservoir to put down poaching of fish and to enforce the regulations. During the year under review a total number of 893 licences were issued and a sum of Rs. 6,175 was realized as against Rs. 8,003 for 1,414 licences during 1955-56. The particulars of the licences issued is furnished below :—

Serial number and kind of tackle.	Number of licence.	Rate.		Amount realized.	
		RS.	A. P.	RS.	A. P.
1 Rangoon net	12	30		360	
2 Kattu valai	48	30		1,440	
3 Cast net	241	3		1,845	
4 Cast net with craft	80	5		421	
5 Ootha	148	2		1,193	
6 Varu valai	44	2		182	
7 Kappur valai	120	1		360	
8 Kanni valai	69	1		165	
9 Rod and line	118	1		171	
10 Hooks and line	12	1		37	
11 Katha valai	1	1		1	
Total	893			6,175	

12. *Vadavar river at lower anicut (South Arcot district).*—The conservancy and licensing in the Vadavar river was controlled by the special staff as in the previous years. During the year 337 licences were issued for fishing in the river and an amount of

Rs. 1,267 was realized as against 347 licences and Rs. 1,381 during 1955-56. Details of licences issued are as follows:—

Serial number and kind of tackle.	Number of licence.	Rate.		Amount realized.
		Rs.	P.	
1 Cast net with craft	10	5		50
2 Cast net without craft	122	3		744
3 Ootha	6	2		22
4 Varu valai	114	2		212
5 Kappu valai	50	1		126
6 Katha valai	6	1		8
7 Rod and line	29	1		35
Total ..	337			1,267

13. *Mettur Reservoir*.—The original licence fee of Rs. 100 was reduced to Rs. 90 as per G.O. Ms. No. 1000, Agriculture, dated 7th April 1955 and a further reduction to Rs. 72 was ordered in G.O. Ms. No. 587, Agriculture, dated 2nd March 1956. A total number of 227 licences was issued for fishing in the reservoir during the year which brought in a total revenue of Rs. 15,515-14-6 as shown below:—

Serial number and kind of licence.	Number of licence issued.	Amount.		
		Rs.	A.	P.
1 Licence for fishing with the aid of coracles ..	215	15,480	0	0
2 English rod and line	6	9	8	0
3 Country rod and line	6	12	0	0
4 Penalty fees collected in the case of two licences at Rs. 7-3-3	..	14	0	6
Total ..	227	15,515	14	6

During the previous year 122 licences were issued and a sum of Rs. 17,445-10-6 was realized. It is evident that more fishermen availed of the reduction in the annual licence fees this year and took to fishing in the reservoir. The large congregations of fish in the supply channels at Mettur, Hogainakkal sanctuary and in the Mettur conserved area were protected by effective patrolling by the staff. During the year 137 cases of illicit fishing were detected, and 86 of them were charge-sheeted. Of these, 83 cases ended in conviction and 3 in acquittal.

14. *Vellar river (South Arcot district)*.—The scheme for conservancy and licencing in the Vellar estuary at Porto Novo with the object of prevention of indiscriminate destruction of young prawns and fry and fingerlings of food fishes was enforced during the year under review as in the previous years. A total number of 635 licences were issued and a sum of Rs. 1,325 was realized as licence fees as against 1,377 licences issued and Rs. 1,176-4-0 realized during 1955-56. The estuary was effectively patrolled and unauthorized fishing was checked.

15. *Nilgiris district waters*.—The Inspector of Fisheries, Ootacamund, continued to issue licences for angling in the Ootacamund lake, Sims Park Pond, Coonoor and in the Moyar and Bhavani rivers. The details of licences issued are given in Appendix. A sum of Rs. 686 was realized during the year by the issue of the licences as against Rs. 648-8-0 realized during previous year. It is proposed to issue licences for angling in the Pykara during the ensuing year. A statement showing the details of licences issued at each centre and the amounts realized are shown in Appendix XXXIII.

16. *Ullar by-pass (Tiruchirappalli district)*.—The Ullar by-pass in Grand Anicut was completely closed for fishing during the months of June and October and the breeders were protected with a special staff of one maistry and two watchers.

17. *Screen fishing in Tanjore Delta*.—Greater emphasis was laid on the removal of the unauthorized erection of saar (fixed engines) in the innumerable channels in the Cauvery Delta, with the co-operation of the District Revenue authorities. As the offenders deserted the saars on approach, only 15 cases were detected and taken to Court. Of these, 13 cases ended in conviction and 2 ended in acquittal.

18. *Bhavanisagar (Coimbatore district)*.—The Bhavanisagar Reservoir and the upper reaches of the Bhavani and Moyar rivers continued to be closed for fishing throughout the year with a view to stabilize their fishery. In G.O. Ms. No. 217, Agriculture, dated 15th May 1956, the scheme for the stocking, development, conservation, and exploitation of the Bhavanisagar Reservoir was sanctioned with a staff of one Inspector of Fisheries, one Assistant Inspector, one Fieldman, two fishermen and five watchers. The Inspector of Fisheries was stationed at Bhavanisagar and the Assistant Inspector at Sirumugai. The conservation of the fishery is a major problem, since the breeding of the fishes in this area will ultimately enrich the lower river streams and connected waters. During the year under review, 94 cases of illicit fishing were detected, and of these 61 cases were charge-sheeted resulting in the conviction of 58 cases.

19. *Rivers in Malabar district*.—A total number of 156 licences for the operation of 616 nets in the Baliapatam and Taliparamba rivers of Chirakkal taluk were issued and a sum of Rs. 2,368 was collected by way of licence fees. Ninety licences were issued for stake net fishing in the Korapuzha river and Rs. 360 was realized. Licences were not issued for fishing in the Chettuvayi river in Ponnani taluk as the ownership of the site was under dispute.

20. *Rivers in South Kanara district*.—Fishing with stake nets in Chervathur river under licencing system was continued during the year and 75 licences for stake nets and one licence for China-net were issued and Rs. 310 was realized by way of licence fees.

B. PROVINCIALIZED WATERS.

1. *Madurai district*.—There were 10 provincialized tanks in the district with a total acreage of 3,509.09 at the beginning of the year—Four in Periakulam two in Nilakottai and four in Madurai taluks. The fishery of six tanks were sold in public auction and of the four tanks in Madurai taluk were leased in favour of the Madurai Fishermen Co-operative Society. All the ten tanks were stocked with 34,856 fingerlings of Tilapia which established very well in all the waters. Four of the tanks which were unremunerative were returned to the Public Works Department as per G.O. Ms. No. 398, Agriculture (Food Production), dated 8th February 1957. The compensation payable to the Vandiyur tank was reduced to Rs. 1,500 from Rs. 3,000 in G.O. No. 2782, Agriculture, dated 27th November 1956. A sum of Rs. 9,361 was realized by the lease of the fisheries in these tanks as against the compensation of Rs. 4,744 payable to the local bodies. The tanks fetched Rs. 9,607-8-0 during the year 1955-56. A detailed statement of the provincialized tanks is given in Appendix XXXIV.

2. *Salem district*.—A list of provincialized waters in the district is given in Appendix XXXV. These waters were stocked with 370,726 fingerlings. A sum of Rs. 741 was realized by the lease of the fishery in them.

3. *Chingleput district*.—The 45 tanks in the district were leased out during the year and fetched Rs. 10,771-4-0 as against Rs. 10,375 realized during the previous year. A list of the tanks with details of rentals, etc., is furnished in Appendix XXXVI. The local fishermen co-operative societies were given preference in the lease based on the average of five years annual rentals. The tanks were also stocked with 200,000 fingerlings during the year.

4. *North Arcot district*.—The 19 tanks in this district were stocked with 80,703 fingerling during the year, and their lease fetched Rs. 3,887-2-0 as against Rs. 3,790 during the previous year. Details of extent, compensation payable and rentals realized are furnished in Appendix XXXVII.

5. *South Arcot district*.—The 26 items of provincialized waters in this district were leased out during the year and they fetched Rs. 10,804-4-0 as rentals. Their details are furnished in Appendix XXXVIII.

6. *Tanjore district*.—This year also the Fisheries of the river system and tanks were disposed of to the fishermen co-operative societies on the average of five years rentals, and the total receipt from these waters was Rs. 91,243 as against Rs. 89,115 obtained last year. A statement of the rentals realized by the disposal of provincialized waters in each tank is furnished in Appendix XXXIX.

7. *Tiruchirappalli district*.—The provincialized items in the district were leased in favour of the fishermen co-operative societies for a sum of Rs. 10,665 as against Rs. 11,018 during 1955-56. Details of rentals fetched are furnished in Appendix XL.

8. *Coimbatore district*.—A statement of the provincialised waters of the district is furnished in Appendix XLI. A sum of Rs. 7,068 was realized by way of rentals from them. The Anantha-sagaram tank in Gobichettipalayam taluk which used to fetch Rs. 150 per annum as rental was taken over by the department for departmental fishing; and it yielded 17,000 lb. of fish and fetched a revenue of Rs. 4,250 during the year.

9. *Malabar district*.—The fishery right of the Vyam Lake was auctioned for Rs. 684. The scheme for the development and exploitation of the Malampuzha reservoir was sanctioned in G.O. Ms. No. 217, Agriculture (Food Production), dated 16th May 1956. Systematic fishing in the reservoir was commenced on 6th October 1956. One thousand three hundred Tilapia fingerlings were stocked as a preliminary measure for the development of fisheries in Walar Reservoir, and 4,918 Tilapia in the Mangalam Reservoir.

10. *South Kanara district*.—There were 27 provincialized waters in the district. The tanks were stocked with fingerlings of Tilapia, Mullet, Etroplus, Labeo and Cirrhina.

11. *Tirunelveli district*.—The Kudamba tank was fished by licensees during the year. Small scale departmental operations were also conducted. A total revenue of Rs. 2,828-3-0 was realized during the year by way of licence fees and sale-proceeds of fish. The Hope Lake was systematically fished by the departmental units. Licences were also issued for fishing in the lake. A total revenue of Rs. 1,044-4-0 was realized during the year. Details are given in Appendix XLII.

C. DEPARTMENTAL WATERS.

1. *Poondi Reservoir*.—This reservoir was stocked with 5,000 Labeo, 6,731 Chanos, 2,050 Bhavani fry and 1,152 mirror carp. Arrangements were made this year to conduct major departmental fishing in the reservoir, but as the water level was maintained at 126 feet M.S.L. this could not be achieved. Only a quantity of 7,466 lb. of fish was landed by conducting fishing operations below the regulator and a sum of Rs. 1,816-7-6 was realized by the sale of catches.

2. *Model Fish Farm at Poondi*.—This fish farm was stocked with 6,128 fingerlings of Labeo, 20,500, Chanos, 6,000 Rohu, 2,050, Bhavani fry 338, Gourami and 100 of Etroplus suratensis. Two hundred and seventy-six and half pounds of fresh-fish was sold to visitors and a sum of Rs. 138 was realized.

3. *Vellore Moat*.—Mirror carp which was stocked in the moat grew to a good size weighing 5½ to 6 lb. each within a period of

ten months of their introduction. The moat was stocked with the following varieties of fish seeds:—

Labeo sp. and Cirrhina sp.	13,271
Catla	1,061
Labeo rohita	305
Chanos	82,284
Ophiocephalus	300
Gourami	9
Mirror carp	989
Total ...	100,297

The quantity of fish caught from the moat was 11,985 lb. out of which 4,386 lb. were given as share to the fishermen and Rs. 3,092-5-9 was realized as sale-proceeds towards the departmental share. A sum of Rs. 710 was realized towards the lease of the grass and lotus in the moat. Thus the total revenue amounted to Rs. 3,802-5-9 for the year.

4. *Chingleput Fort-moat Farm*.—The moat was stocked with 488 catla, 26,171 chanos, 25,123 Tanjore carps, 286 Etroplus, 1,319 murels and 368 Rohu. Four thousand, nine hundred forty-seven pounds of fish were caught from the moat and Rs. 1,176-15-9 was realized by the sale of catches.

5. *Buderi tank*.—A sum of Rs. 33-7-0 was realized by the sale of 100 lb. of fish from the tank.

6. *Thantipandal Fish Farm*.—The Thantipandal Fish Farm was closed with effect from 1st March 1957. All the fish from the farm were removed and transferred to the Satyavedu Fish Farm. During the year 170 Gourami fingerlings were supplied from this farm to other waters in the State.

7. *Sathuvedu tank*.—The tank was intended mainly for breeding Gourami and Etroplus was also stocked with Mrigal during the year.

8. *The Kodaikanal lake*.—This lake was fished by departmental units and 224½ lb. of fish comprising of the indigenous varieties were removed and sold for Rs. 119-10-9 as against 216 lb. of fish and Rs. 110-15-3 realized during the previous year.

9. *Hope lake (Tirunelveli district)*.—Systematic fishing was conducted in the lake by the departmental unit with Rangoon nets, hooks, uduvalai and Eel traps, and a total quantity of 2,600 lb. of fish was caught and sold for Rs. 969-4-0 as against 2,781 lb. and Rs. 1,038-3-3 during the previous year. The unusual low level of water in the lake during the year and the large number of sub-merged trees impeded the progress of fishing operations

10. *Kadamba tank (Tirunelveli district)*.—Departmental fishing was conducted in three different places using cast nets, Rangoon nets, Uduvalai, Eel traps and hooks. The catches for the year amounted to 3,159 lb. and the value realized was Rs. 698-11-0, against 3,934 lb. and Rs. 530-8-3 in 1955-56.

11. *Malabar district*.—There were two departmental waters in the district which were stocked with 77,592 fingerlings.

12. *South Kanara district*.—The Oruvodukeri tank and Kanchi kara Kottakere tank were stocked with Tilapia and Etroplus fingerlings.

13. *Madras district*.—There were 6 ponds in the city. A total quantity of 1,439 lb. of fish was landed and sold for Rs. 676-13-0. Twenty-four thousand and forty-five fingerlings of Chanos, Etroplus, Rohu, Mrigal, Cirrhina, Labeo and Mulletts were stocked in them. A statement of fish caught from each pond is given below:—

Serial number and name.	Weight of fish.	Revenue.		
		RS.	A.	P.
1 Government House Pond	348	164	1	0
2 Chennamaleswaram temple tank	235½	101	3	0
3 Y.M.C.A. Pond, Vepery	273½	129	2	0
4 Government House, A.R.P. Tank I	23	9	0	0
5 Government House, A.R.P. Tank II	8	4	0	0
6 P.W.D. Workshop Static tanks	15	7	8	0
7 Adyar Fish Farm	535½	261	15	0
Total ..	1,439	676	13	0

D. RURAL FISHERY DEMONSTRATION UNITS.

The Rural Fishery Demonstration Scheme which was sanctioned in 1945 with a view to demonstrate the principles and methods of scientific pisciculture with advantage was continued to be implemented. The salient features of the working of the different units during the year were as follows:—

1. *Madurai division*.—Three units stationed at Madurai, Virudhunagar and Kodaikanal functioned in this region under an Inspector of Fisheries, one Sub-Inspector and one Assistant Fishery Demonstrator. All the 15 demonstration tanks in the division were stocked with Labeo, Catla, Gourami, Chanos and Tilapia. The latter bred prolifically and increased the fishery wealth of the tanks. Against a target of 18,150 lb. of fish valued at Rs. 5,853, 38,402½ lb. of fish valued at Rs. 14,226-14-0 was realized from all the demonstration tanks. Details of stocking of these tanks are in Appendix XLIII.

2. *Vellore division*.—Thirty demonstration tanks were maintained in this division (North Arcot, South Arcot and Chingleput districts) during this year. The tanks in Arni were handed over to the Arni Panchayat Board. Another tank at Katchur village which is 12 miles from Tiruvallur was handed over to the Local Panchayat Board. A total quantity of 29,990 lb. of fish were caught from the demonstration tanks and sold for Rs. 6,515-3-9. Details of the tanks and their working are given in Appendix XLIV. During the year 196 waters were surveyed and a total number of 40,304 fingerlings were supplied to interested pisciculturists and a sum of Rs. 677-9-11 was realized as sale proceeds. A total of 31,865 fingerlings consisting of Laboo, Cirrhina, Murrel and Etroplus were supplied to the National Extension Service and Block Development areas of this division.

3. *Salem district*.—The relief tank at Pennagaram with an extent of 0.52 acre was taken up for pisciculture for a period of five years with the permission of the Collector of Salem and stocked with 1,230 fingerlings of *Cirrhina reba*, 436 *Labeo sp.* and 334 *Barbus sp.*

4. *Coimbatore district*.—The Odathurai tank in Bhavani taluk which was taken over on 16th July 1955 as per G.O. No. 3433, Agriculture, dated 27th November 1954, was being utilized for demonstration purposes. During the year 45,570 Bhavani carp fry were stocked in it. A total quantity of 11,265 lb. of fish were landed from it and sold for Rs. 1,646-14-0. The tank previously fetched an annual rental of Rs. 18 when the tank was under the control of the District Board, Coimbatore. A statement showing the details of catches is furnished in Appendix XLV.

A tank belonging to the Pollachi Municipality was taken over by the department with effect from 19th November 1956 for a period of five years. It was stocked with 100 mirror carps on 18th January 1957. Mirror carps were also in the 3 demonstration tanks in Coimbatore town. Fishing was not conducted in these tanks with a view to allow the carp to grow to marketable size. The Ananthasagaram tank in Gobichettipalayam taluk was taken over for demonstration from the Revenue Department on 16th February 1957. A total number of 85,000 carp fry were stocked in it, but was not exploited during the year. As a provincialised tank it fetched a rental of Rs. 150 per annum only. As a demonstration tank it is expected to give a better yield.

5. *Nilgiris district*.—Systematic exploitation of the Ootacamund lake was conducted and fresh fish was sold at 8 annas per pound. During the year under report 6,968 lb. of fish was caught and sold to the public realising a revenue of Rs. 3,484-2-0. The Crescent pond in Ootacamund was used for growing Mirror carp, Golden carp and Tench for observation by the visitors to the Botanical Garden. The Katteri Upper reservoir was mainly used for collection of Mirror carp fingerlings, and during the year 12,140 fingerlings were

collected. Two hundred and eleven pounds of stranded fish were however caught and sold for Rs. 105-12-0. The Masinagudi tank situated in the Masinagudi village did not receive its full supply of water due to the failure of monsoon. During the period 529 lb. of fish were caught and sold for Rs. 261-12-0. The Pykara Reservoir yielded a collection of 50,850 mirror carp fingerlings.

The Sims Part Pond, Coonoor, was reserved for anglers. When the tank was emptied for desilting 180½ lb. of fish were caught and sold for Rs. 90-2-0. The Wellington lake was also reserved for anglers but experimental fishing conducted yielded 69¾ lb. of fish which was sold for Rs. 31-14-0.

6. *Tirunelveli district*.—A total number 21,689 fingerlings of Tilapia, Mullet, Labeo, Cirrhina, Barbus, Catla, Murrels and Eels were stocked in the demonstration tanks. Nine thousand thirty and three-fourth pounds of fish were caught and sold for Rs. 2,176-7-6. A statement showing details of the tanks is given in Appendix XLVI.

7. *Malabar district*.—There were 13 demonstration tanks in this district; and 2,290 lb. of fish were caught from them and sold for Rs. 637-11-3. Intensive propaganda was carried out for Tilapia culture; and 70,410 Tilapia fry were supplied to private parties for stocking their tanks and a sum of Rs. 1,715-5-0 was realized by way of sale proceeds. Three hundred and ninety-nine waters covering an area of 109.06 acres were surveyed by the staff.

8. *Tanjore district*.—Details of water run as demonstration farms are furnished in Appendix XLVII. Against a target of 40,000 lb. the different units landed 64,967 lb. of fish fetching a revenue of Rs. 16,718-6-9 as compared with 42,244 lb. of fish sold for Rs. 10,532-9-9 during 1955-56.

9. *South Kanara district*.—Ten demonstration tanks were maintained in this division, and all of them were stocked with Carps, Tilapia and Etroplus.

F. SURVEY OF WATERS AND SUPPLY OF SEED TO PRIVATE PARTIES.

1. *Madurai division*.—An intensive survey of all cultivable waters both private and public was carried out. The owners of the private waters were contacted and advised on the advantages of pisciculture as a subsidiary occupation. As a result 259,900 fingerlings of various species of food fishes were supplied to them.

2. *Vellore division*.—Hundred and ninety-six water-pieces were surveyed and a total number of 40,304 fingerlings were supplied to interested pisciculturists and a sum of Rs. 677-9-11 was realized towards the sale proceeds.

3. *Salem district*.—Two thousand three hundred and forty-eight fingerlings were supplied to private parties, realizing a revenue of Rs. 144-6-9.

4. *Coimbatore district*.—Ten thousand and forty fingerlings were supplied and a sum of Rs. 340-8-4 was realized towards sale proceeds.

5. *Nilgiris district*.—Twelve thousand seven hundred and thirty-two fingerlings of mirror carp and golden carp were supplied to other States and private parties realizing a revenue of Rupees 6,358-14-0.

6. *Tirunelveli district*.—Three hundred and fifty-four waters were surveyed by the staff and 267 private parties were supplied with 14,447 fingerlings of different species. A sum of Rs. 411-13-0 was realised towards sale proceeds.

7. *Madras*.—Two thousand fifty-two fingerlings comprising of 872 *Etroplus suratensis*, 168 *Chanos*, 1,000 *Ophiocephalus sp.* and 12 Gourami were supplied to private parties realizing a revenue of Rs. 112-8-6.

8. *Tanjore division*.—One hundred and sixty-one pieces of waters with an extent of 2,003.83 acres were surveyed; and private parties were supplied with 83,345 fingerlings.

9. *Malabar district*.—Intensive propaganda was carried out for popularising *Tilapia* culture. A total number of 70,110 fingerlings were supplied to private parties for stocking their tanks, and a sum of Rs. 1,715-5-0 was realized by the sale of fingerlings. Three hundred and ninety-nine waters with an area of 109 acres were surveyed and the owners of the tanks were explained the benefits of pisciculture.

F. METTUR RESERVOIR FISHERIES.

Ever since the Mettur Dam was constructed the department has been making strenuous efforts to improve the fishery in the reservoir. It was intensively stocked with 2,648,663 fingerlings during the year as detailed below. The fish farm below the Dam was maintained for rearing fingerlings before stocking them into the reservoir.

1	<i>Cirrhina reba</i>	..	..	..	..	..	12,64,447
2	<i>Labeo kontinus</i>	..	..	..	..	..	7,79,872
3	<i>Barbus carnaticus</i>	..	..	..	..	..	5,37,906
4	<i>Cirrhina cirrhosa</i>	..	..	..	..	..	43,701
5	<i>Etroplus suratensis</i>	..	..	..	..	..	4,964
6	<i>Labeo (Paral)</i>	..	..	..	..	..	9,081
7	<i>Barbus sarana</i>	..	..	..	..	..	392
8	<i>Rohu and Mrigal</i> (From Calcutta)	..	..	..	..	..	1,817
9	<i>Cirrhina Mrigala</i> („ Samalkot)	..	..	..	..	..	691
10	<i>Chanos chanos</i> („ Pamban)	..	..	..	..	..	4,103
11	<i>Murrels</i> („ Palghat)	..	..	..	..	..	1,889
Total ..							26,48,663

The reservoir fishery was continued to be exploited by licensed fishermen. The licence fee was kept at the reduced rate of Rs. 72 with facilities to pay in easy instalments. This was done to encourage more fishermen to take up licences for fishing. During the year 227 licences were issued. A total quantity of about 400 tons of fish was estimated to be landed during the year (Vide Appendix XLVIII).

Two departmental units also operated during the year under report with a view to study the composition and fluctuations of catches by using different tackles. The total catches of 13,238 lb. were sold at the landing-centre at the rate of 3 annas per pound and a sum of Rs. 2,482-2-0 was realized as sale proceeds.

The water level in the reservoir was 45 feet on 1st April 1956 and it went down to 33 feet at the end of May 1956 and gradually rose up to the maximum full level of 120 feet on 22nd August 1956, and thereafter got reduced gradually. At the close of the year on 31st March 1957 the level was 83 feet. There was a total rainfall of 26.20 inches in Mettur area. The atmospheric temperature ranged from 62° to 106°F. and the water temperature from 20.4° to 29.4°C. Details are given in Appendix XLIX.

Two fish vans which were stationed for transport of fish were hired out to fish merchants and they transported 196.57 tons of fresh fish and 210.59 tons of iced fish as shown below :—

Month.					Raw fish.	Iced fish.
					LB.	LB.
1956.						
April	..	..	..	..	49,561	47,155
May	..	..	..	..	48,397	61,735
June	..	..	..	..	62,481	75,550
July	..	..	..	..	47,795	35,512
August	..	..	..	..	20,304	32,001
September	..	..	..	..	19,522	24,005
October	..	..	..	..	34,014	37,900
November	..	..	..	..	33,720	36,135
December	..	..	..	..	32,012	29,670
1957.						
January	..	..	..	..	32,655	32,144
February	..	..	..	..	31,204	30,630
March	..	..	..	..	28,653	29,400
					4,40,317 lb.	4,71,837 lb.
					= 196.57 tons.	= 210.59 tons.

The two motor luggers were utilised for transport of 192,596 lb. of fish procured by the private merchants from the various fishing centres in the reservoir area to Mettur boat anchorage. These luggers were transferred to the Mettur Exploitation Scheme from March 1957 as per G.O. Ms. No. 165, Food and Agriculture, dated 22nd February 1957.

A fishermen's co-operative marketing society was organized during the year, and it commenced marketing of the catches of its members from April 1957 onwards.

G. GOURAMI POPULARISATION SCHEME.

The Baburajapuram tank at Baburajapuram which was acquired as per G.O. No. 1987, Revenue, dated 25th June 1955, was included under the list of tanks for breeding Gourami. The Thanthipandal farm and Sathiavedu tanks in Chingleput district were specially maintained by the department for breeding Gourami. As the growth of Gourami in Thanthipandal Farm was very poor, the farm was closed with effect from 1st March 1957 and the fingerlings and adults in it were transferred to Sathiavedu tank. During the year 489 Gourami fingerlings were collected in the Sathiavedu and Thanthipandal farms and supplied for stocking other departmental waters and private parties.

H. FISH CULTURE IN WELLS.

Towards the development of fisheries in rural areas and to make fish available in every village situated in the interior, a drive was made for stocking the irrigation and backyard wells with suitable food fishes. The wells were specially found suitable for culture of Murrels, Etroplus and Tilapia. A total number of 1,400 wells were stocked in the Madurai division with 134,101 fingerlings consisting of 128,623 Tilapia, 4,728 Murrels, 720 Chanos, 25 Etroplus and 6 Gourami. In Chingleput district 108 wells were stocked with 18,669 Murrels and 433 Etroplus, in South Arcot district 75 wells were stocked with 12,691 Labeo and Cirrhina, and in North Arcot district 88 wells were stocked with 7,753 Murrels, 162 Etroplus, 648 Chanos and 48 Labeo.

I. MIRROR CARP CULTURE.

The culture of Mirror carp was continued in the Nilgiris with success. The following is a list of waters in the Nilgiris district in which the fish is being cultured:—

Serial number and name of water.					Extent.
					ACRES.
1	Ootacamund Lake	..	..	..	84.00
2	Crescent pond, Ooty	..	..	..	0.25
3	Katteri Upper Reservoir	..	..	..	5.00
4	Maravakandi Lake	..	..	..	121.00
5	Ma inagudi Tank	..	..	..	3.00
6	Pykara Reservoir	..	..	..	3,840.00
7	Snowdon Lake	..	..	..	1.61
8	Stew pond	..	..	..	0.50
9	Sims park, Coonoor	..	..	..	1.00
10	Wellington lake	..	..	..	1.00

During the year 63,000 Mirror-carp fingerlings were collected from Katteri and Pykara Reservoirs. Large scale collection of Mirror-carp fingerlings from Pykara was not possible during the year due to very high level of water in the reservoir. The Regional Assistant Directors were supplied with 46,432 fingerlings as shown below, for stocking waters in their division.

Assistant Director of Fisheries, Bhavanisagar	..	37,360
Do. Mettur Dam	..	2,900
Do. Malabar	.. ..	4,000
Do. Vellore	.. ..	1,000
Do. Madurai	.. ..	1,172
Total	..	46,432

Private pisciculturists in the Nilgiris were supplied with 452 fingerlings realizing a revenue of Rs. 208-14-0.

Mirror-carp fingerlings were also supplied to other States during the year as shown below, and a sum of Rs. 6,150 was realized:—

Name of State.	Number of fingerlings supplied.	Amount realized.
		RS. A. P.
1 Hyderabad	1,000	500 0 0
2 Coorg	5,000	2,500 0 0
3 Kashmir	3,800	1,900 0 0
4 Travancore-Cochin	2,000	1,000 0 0
5 Nepal	500	250 0 0
Total	12,300	6,150 0 0

J. CULTURE OF TILAPIA.

The culture of Tilapia was extended to a larger number of waters in the Madurai, Tirunelveli and Malabar districts and this proved to be a great success. The Vyam Lake in Malabar, Hope Lake in Tirunelveli district and several wells in Madurai district were stocked with this fish. It was reared along with carps in the Webster moat in Tanjore. The growth of Tilapia in this moat was above normal and averaged 1 lb. per fish a year. Out of the 14,085½ lb. of fish landed from this water, 5,325 lb. were composed of Tilapia. There was no adverse effect on the other species. In the Madurai division a total quantity of 11,251 lb. of Tilapia was harvested from the departmental waters and a revenue of Rupees 3,825-6-9 was realized. One lakh, sixty-six thousand, seven hundred and ninety-two Tilapia fingerlings were stocked in private waters of this division during the year. The culture of this fish in the new waters is expected to enrich the inland fisheries considerably and thus make available this protein food to the rural population.

K. HILSA FISHERIES.

There was a revival of Hilsa Fisheries in the Tanjore district. Due to the construction of the Mettur Dam the anadromous migration of this fish into the Coleroon was discontinued. But during

the last two years the Coleroon surplussed due to unusually heavy floods in the Cauvery and this accounted for a fair Hilsa fishery during the past two years. The breeders were located as far as the Lower Anicut and a few migrated even to the Upper Anicut. It was estimated that nearly 20,000 Hilsa, weighing 1 to 1½ lb. each, were landed from the five fishing centres at and below Lower Anicut. Nearly double this number were landed from the fishing centres in and around the Railway bridge near Coleroon Railway Station.

L. PUBLIC HEALTH FISH FARMING.

The Public Health Fish Officer continued to look after the survey of mosquito and guinea-worm affected waters of the State. In consultation with the Research Health Officer of the State Public Health Department, a preliminary survey of some of the guinea-worm affected waters in Gingee and surrounding villages within a radius of 10 miles was taken up for biological control work. Steps were taken to stock the wells and tanks in Gingee, Alampooni and Vallam villages with Public Health Fisheries like *Rasbora* and *Chela* to study their effect on the destruction of cyclops. Fishes were also supplied to Municipalities and Panchayats for stocking waters. One hundred *Etroplus maculatus* were supplied to the Vellore Municipality for stocking the Ottery tank which is used for drinking purposes. One thousand one hundred *Gambusia* collected from the Kodaikanal lake were stocked in the Tengal Pond at Pasumalai near Madurai. The Panchayat Board, Orthanad (Tanjore district) was supplied with 2,500 *Barbus sp.* and *Etroplus maculatus*. The Panchayat Board Chettikulam (Tanjore) was supplied with 500 *Etroplus maculatus* for stocking waters in the Panchayat area. Two thousand and five hundred *Gambusia* were supplied to the B. & C. Mills, Madras.

M. INTRODUCTION OF ROHU AND MRIGAL.

Stocking of the quick-growing Upper Indian carps, Rohu and Mrigal in Madras waters was being done regularly every year, with a view to establishing them in this State. During the year under review the Inspector of Fisheries, Madras, was deputed to Calcutta and he transported 40,000 fingerlings in three consignments. Forty hundies (earthen pots) were used during each trip. There was a casualty of 5,555 fingerlings in transit and the balance of 34,445 fingerlings were distributed to the following divisions for stocking reservoirs and other important water-pieces :—

Tuticorin division	..	..	..	..	7,000
Vellore	..	..	..	..	9,500
Bhavanisagar division	..	..	..	..	9,120
Mangalore division	..	..	..	..	1,440
Mettur division ..	..	..	..	..	2,050
Kozhikode division	..	..	..	..	3,750
Madras division	..	..	..	..	1,585
Total ..					<u>34,445</u>

N. COMMUNITY DEVELOPMENT PROJECT AND NATIONAL EXTENSION SERVICE SCHEMES.

The departmental staff bestowed special attention to fisheries development in Community Development Project and National Extension Service areas. The main work in these areas was supply of fish seed to owners of ponds and tanks for culturing fish in their waters and thus to make fish-food available in the rural areas. The Assistant Directors of the Department attended the Block Advisory Committee meetings as far as possible. The details of work done in the various divisions are given below :—

1. *Tanjavoor Division*.—There are 19 Community Project and National Extension Service Blocks in this division. A total of 44,652 fingerlings of Catla and Labeo were supplied to 15 private parties for culture in their waters. Besides, 451, 5,621 fingerlings were stocked in Revenue and provincialised tanks in Thiruthurai-pundi, Vedaranyam, Kumbakonam, Mayuram, Papanasam, Pattukottai, Thottiam, Perambalur and Pudukkottai blocks in Tanjavoor and Tiruchirappalli districts.

2. *Tuticorin Division*.—Private parties in Cheranmahadevi Kuruvikulam, Sankarankoil and Valliyoor blocks were supplied with 14,447 fingerlings for rearing in their waters.

3. *Madurai district*.—Seven blocks were attended by the department for development of fisheries as shown below :—

Madurai Block.—Three thousand three hundred and thirty Tilapia seeds were supplied to private parties in this block. Thirty thousand six hundred and twenty-four and a half pounds of fish were produced in the demonstration tanks and sold in fresh condition to the public, realizing Rs. 11,163 as sale proceeds. One lakh seventy thousand and seventy-five Tilapia seeds were collected from this block and distributed in other areas in the district.

Melur Block.—In their order G.O. Ms. No. 3770, Public (Rural Development Planning) Projects, dated 19th December 1955, the Government sanctioned subsidies to the Panchayat Boards, Melur and Navinipatti for undertaking pisciculture. Each of the panchayat board had been paid Rs. 1,752-8-0 as subsidy in July 1956 by the Project Executive Officer of Periyar Community Project, Gandhigram. The department supplied Tilapia to the Melur Panchayat Board and 18,000 Tilapia to the Nivinipatti Panchayat Board. The Tilapia stocked in their tanks have bred prolifically and is contributing to a profitable fishery. Besides, 6,502 fingerlings were supplied to private parties for stocking their wells, ponds and tanks. The whole Periyar-fed area in the block was covered for fisheries development.

Nilakottai Block.—There is one demonstration tank at Vadugapatti in this block. It was stocked with Tilapia for demonstrating the usefulness of fish culture to the public. One thousand six hundred and fifty-one Tilapia were supplied to private parties for stocking their wells.

Athoor Block.—In this block area the Extension Officer (Agriculture) evinced keen interest in developing fisheries in wells and through him 34 private parties were supplied with 3,252 young Murrels for stocking in 42 wells.

Usilampatti Block.—Ten thousand six hundred and fifty Tilapia seeds were supplied to private parties.

Kallupatti Block.—A Fieldman was stationed in this Block area and he was in charge of three demonstration tanks at Kallupatti. He contacted several private parties through the Extension Officers and supplied 6,225 Tilapia to private parties. From the three demonstration tanks 957½ lb. of fish were caught and sold to public for Rs. 366-11-9.

Tirumangalam Block.—The Block Development Officer was contacted and supplied 932 Tilapia and Murrels to private parties.

4. *Ramanathapuram district.*—Fisheries development was carried on in nine blocks in this district as shown below :—

Kariapatty Block.—There is one demonstration tank in this block, in which Tilapia is cultured. One hundred and eight and a quarter pound of fish was caught and sold for Rs. 40-9-6.

Rajapalayam Block.—Three thousand nine hundred and eighty-four Tilapia and Labco were supplied in this area to private parties and through the Block Development Officer, Rajapalayam, for stocking their waters.

Devakottai Block.—In this block there is one demonstration tank at Karaikudi. It was stocked with Tilapia, and 1,668¾ lb. of fish was caught and sold for Rs. 698-3-6.

Kamudi Block.—Seven thousand five hundred and sixty-two Tilapia were supplied to private parties.

Virudhunagar Block.—There are three demonstration tanks at Virudhunagar, under the control of one Sub-Inspector. He supplied 288 seeds in this block and caught 495½ lb. of fish and sold for Rs. 235-12-6.

Sivakasi Block.—Three thousand three hundred and fifty fish seeds were supplied and stocked in private waters.

Singampunari Block.—One thousand one hundred and seventy-five Murrel were supplied in this block area through the Block Development Officer.

Aruppukottai Block.—Private parties were contacted and supplied 741 seeds for stocking their waters.

Paramakudi Block.—Four thousand Tilapia seeds were supplied to private parties in this block area.

5. *Mettur Dam Division.*—Ten thousand and forty Murrel fingerlings were supplied to interested ryots in Kangam, Palladam and Kundadam Blocks in Coimbatore district.

PART VII—FISH MARKETING, STATISTICS, INFORMATION, PROPAGANDA AND AQUARIUM.

The post of Fisheries Marketing and Information Officer, originally sanctioned for a period of six months in G.O. Ms. No. 93, Agriculture, dated 12th January 1956, was continued till 28th February 1957 in G.O. Ms. No. 198, Agriculture, dated 13th August 1956, and for another year from 1st March 1957 in G.O. Ms. No. 404, Food and Agriculture, dated 9th February 1957. Sri P. I. Chacko continued to be in charge of the post throughout the year.

The following is the main programme of work of the Marketing and Information Officer :—

(1) Survey of the existing fish marketing situation in the State; and periodical appraisal of the same.

(2) Organization of marketing and distributing agencies at important centres, especially on a co-operative basis, and thus consolidate and improve the fishery industry in each area.

(3) Raising the output of the primary producer and thereby increasing the present levels of fish production. Appraising him of the scope for increasing production by introduction of the skills and equipment required.

(4) Improving facilities and channels of distribution and thereby increasing flow of production—Introduction of motor vans, carrier boats, refrigerated wagons, road communications, etc.

(5) Improvement of the existing practices in the methods of handling, packing and storage.

(6) Bettering conditions of fish markets through Corporations, Municipalities, Panchayats and other local bodies—market premises, location and layout, water-supply, sanitation, installations and management.

(7) Consumer education—Stimulation of the demand for fish and fish-products.

(8) Attending to effectively tackling the problems inherent in the socio-economic condition of the fisherfolk and thus giving incentive to increase fish production and marketing—Removal of traditional ignorance and illiteracy, unfamiliarity and prejudice, chronic indebtedness, disorganization, technical backwardness, etc. Formulation of financial and assistance schemes and welfare activities.

(9) Popularization of the formation of marketing co-operative societies in all important fishing centres and their federation on district or regional basis.

(10) Improving processing facilities—adequate preservation materials like salt, ice, etc.

(11) Increasing fish supply to Madras City—fresh fish from surrounding centres, iced fish, frozen fish, etc.

(12) Stepping up pooling and distribution units at selected areas.

(13) Increasing production, harvesting and distribution from select inland water resources like Mettur reservoir, Bhavanisagar, etc.

(14) Systematic publicity of departmental activities, popularization of fish-seeds and fish farming techniques, conservancy measures, etc.

(15) Preparation of propaganda pamphlets, trade slogans and advertising displays.

(16) Editing of departmental publications.

(17) Maintenance of central museum of exhibits, charts, reference collections, etc.

(18) Participation in exhibitions and demonstrations.

(19) Maintenance of Central Fisheries Library.

(20) Maintenance of Aquarium.

(21) Answering enquiries from fishery workers, scientists and the public.

The salient features of the work by the Marketing and Information Officer are given below :

A. MARKETING.

1. *Overall production of fish in the State.*—By surveys and computations it was estimated that the total fish landings along the entire coastline of 620 miles of the reorganized Madras State in 1956-57 was 60,000 tons valued about Rs. 500 lakhs, the chief varieties being as follows :—

						TONS.
Ribbon fish	..	..	..	..	..	16,800
Cat fishes	..	..	..	..	..	13,200
Sharks	..	..	..	..	..	4,200
Sabre-fish	..	..	..	..	..	7,200
Big-Jawed Jumper	..	..	..	..	..	4,800
Sardines	..	..	..	..	..	4,800
Flying fish	..	..	..	..	..	1,200
White Baits	..	..	..	..	..	3,000
Perches	..	..	..	..	..	3,000
Other varieties	..	..	..	..	..	1,800
Total ..						60,000

Landings of inland fishes from the various inland waters (about 4 lakhs areas in extent) was estimated to be about 38,600 tons valued about Rs. 225 lakhs, the important varieties being as follows :—

						TONS.
Carp	..	..	..	..	..	13,510
Cat-fishes	..	..	..	..	..	7,720
Murrels	..	..	..	..	..	4,632
Eels	..	..	..	..	..	772
Gobius	..	..	..	..	..	386
Mullet	..	..	..	..	..	1,930
Chanos	..	..	..	..	..	386
Lates and Polynemus	..	..	..	..	..	1,158
Hilsa	..	..	..	..	..	386
Prawns	..	..	..	..	..	3,088
Other varieties	..	..	..	..	..	4,632
Total ..						38,600

The total production of both sea and inland fishes was thus 98,600 tons.

2. *Utilization of fish catches.*—It was ascertained that the fish-catches were utilized as follows :—

(a) 30,000 tons of fish used for curing.

(b) 5,000 tons of fish retained by fishermen for their use.

(c) 50,000 tons of fish consumed by the general population.

(d) 1,600 tons used for miscellaneous purposes like preparation of manure, extraction of oil, etc.

3. *Per capita consumption in the State.*—The per capita consumption of fish in the State was estimated to be 10·5 pounds, which though satisfactory when compared with the All-India average of 3·9 pounds, is far below the nutritional standards and much less than that of many other countries.

4. *Export trade.*—There is considerable export of cured and dried fish from Madras to Ceylon and other countries. It was ascertained from the Customs Department that in 1955-56 about

17,256 tons of cured and dried fish, valued at Rs. 341 lakhs were exported from Madras as shown below :—

	TONS.
To Ceylon	15,826
Burma	1,400
Malaya and Singapore	27
U.K.	3

The ports of export are Tuticorin, Dhanushkodi, Madras, Nagapattinam, Kilakkarai and Tondi; and the statistics of quantity of fish exported from these ports in 1955-56 were as follows :—

Port.	Weight. TONS.	Value. RS.
Tuticorin	15,070	2,92,96,550
Dhanushkodi	400	7,31,670
Madras	1,430	33,20,000
Nagapattinam	345	7,28,050
Kilakkarai	9	25,370
Tondi	2	5,600
	<u>17,256</u>	<u>3,41,07,240</u>

5. *Cured and dried fish trade within the State.*—As a large quantity of processed fish is exported, it is apparent that a fair quantity of cured and dried fish from other States, chiefly Kerala is either consumed in the State or shipped abroad through the export centres in this State. As details were not available an attempt was made to study this dried fish-trade; and this was highly commended by the F.A.O. Fish Marketing Economist, who visited this State recently.

A survey of dried fish transported to Madras City was conducted. It was ascertained that 744 maunds of dried fish was brought to Madras City by rail in 1956 from 17 centres from the east coast fishing centres, 3 centres from the west coast and one centre (Bapatla) in the Andhra State. The chief centre of supply by rail was Cochin from where 270 maunds were obtained. But the main means of supply of dried fish to the city is by boat plying along the Buckingham Canal, through which about 600 tons of the commodity are brought from Nellore district and Pulicat lake fishing centres in a year. A small quantity of 50 tons are also brought from fishing villages along the Chingleput and South Arcot district coast.

Thus, about 700 tons of cured and dried fish are consumed in Madras City in a year. The consumption of this commodity in some

of the other centres, as ascertained by a preliminary survey, is as follows :—

Centre.	Quantity of cured fish consumed in a year. TONS.
Coimbatore	8
Ootacamund	20
Chingleput	30
Kancheepuram	18
Cuddalore	20
Tanjore	25
Salem	10
Vellore	20
Kumbakonam	10
Nagapattinam	20
Tiruchirappalli	40
Pudukkottai	8
Madurai	100
Ambasamudram	5
Tindivanam	10
Srivaikuntam	8
Adirampatnam	10
Tiruvannamalai	4
Tiruvallur	8

The price of wholesale and retail price fluctuations in some of the centres are given in Appendix L.

Several enquiries about availability, price structure and transport facilities of cured fish from traders were answered during the year. Further investigations of the cured and dried fish trade and arrangements for its expansion will be undertaken in 1957-58. A pilot project for internal and foreign trade is being prepared for the Federation of Fishermen Co-operatives in Tuticorin.

6. *Fish marketing in Madras City.*—(a) *Supply.*—The City of Madras is 50 square miles in area and has a population of about 17 lakhs of which 65 per cent are said to be fish consumers. The Marketing Officer conducted a detailed survey of the fish supply to the city and ascertained that fresh fish is received into the city from 28 fishing villages along Madras and Chingleput coast, 15 centres in Kerala State coast, 5 in South Arcot district, 3 in Tirunelveli district, 8 in Ramanathapuram district, 2 in Madurai district, 2 in

Tiruchirappalli district and 13 in Tanjore district. The total annual supply of fresh fish to the city was estimated to be 9,122 tons as shown below :—

	TONS.
1 From 28 local coastal fishing villages within a radius of 20 miles.	6,000
2 Transported by departmental vans from outlying places.	632
3 Transported by one private-owned van from Mahabalipuram area.	50
4 From Pulicat lake	800
5 Catches of fisheries departmental boats.	20
6 From various centres along the east and west coasts transported by rail.	1,620
Total ..	9,122

(b) *Price structure.*—There are 46 fish markets in the various parts of the city where fresh and cured fish are sold. Of these only five are owned by the Municipal Corporation and the rest are private-owned. Wholesale of fish is chiefly done in two markets only, namely, the Chintadripet Market and the Zam Bazaar Market in Triplicane. The auctioneer gets 1 anna per rupee of the gross amount. The monthly variations in the wholesale and retail price structure are given in Appendices LI and LII.

(c) *Increasing supply.*—The Marketing Officer was in frequent contact with the city merchants. He appraised them frequently of the availability of fish in other areas like murels in the Tanjore delta, carps and catfishes in Mettur reservoir, sea fishes in Pamban, Dhanushkodi, Porto Novo, Cuddalore and Tuticorin, and freshwater fishes in inland lakes in Chingleput district. The requirements of the merchants were promptly transmitted to the regional officers, fish merchants and fishermen co-operatives in the producing areas, and thus agencies were fixed for fish of various types.

(d) *Model fish stall.*—A model fish stall was opened in the Moore Market, Park Town, in August in 1956, to be worked by the Federation of Fishermen Co-operative Societies in Madras. This stall has mosaic flooring, polished pials, adequate water-supply and drainage, good ventilation, sufficient moving space and fly-proof enclosures and doors. The hygienic handling and sale of fish in this stall are much appreciated by the public. The price is also moderate and fixed unlike in other markets where the public has to do much bargaining with the vendors. Till 31st March 1957, 8,050 lb. of fish have been sold, realizing a sale-proceeds of Rs. 3,801-83 nP. The stall is thus becoming popular.

(e) *House delivery.*—Another new step was taken in November 1956 by organizing delivery of fresh fish to house of customers through a cycle-carrier. An extra charge of one anna per pound was levied for this. Nineteen customers took advantage of this. The Banu Hindu Military Restaurant and Ramanyalu also supplied with fish. This venture, though done on a small scale, is becoming popular, and will have to be expanded by employing a motor van.

(f) *Per capita consumption in the city.*—The per capita consumption of fish in the city is estimated to be about 18.4 lb.

7. *Fish supply to Madurai town.*—Madurai is a large city with a population of about 6 lakhs. Its present fish supply is meagre as shown below :—

Season.	Source.	Daily supply. LB.
April—June	Freshwater fish from irrigation channels and tanks within a radius of 20 miles.	3,600
Do.	Sea-fish from Pamban area..	400
		4,000
July—September ..	Freshwater fish	400
	Sea-fish	400
		800
October—March ..	Freshwater fish	400
	Sea-fish	2,000
		2,400
Throughout the year ...	From fisheries departmental tank.	80

The possibilities of improving the situation was explored and the following plan was formulated: (1) stock and developing fisheries in the four departmental waters in Madurai and sale of fish from them every day; (2) intensive stocking of tanks, about 100 in number, within a radius of 20 miles of Madurai town, and (3) increasing transport of fish consignments from Pamban and Dhanushkodi through fish merchants and fishermen co-operative societies. This programme was given effect to from the beginning of 1957; and consequently the average daily supply of fish to the town has risen to 7,000 lb. from 4,000 lb. But there is still scope for improvement; and further steps are being made to increase the supply of fish to this important town.

The price of fresh fish in Madurai town is given in Appendix LIII.

8. *Fish marketing in Tanjore town.*—Tanjore is a municipal town with a population of about one lakh. The annual supply of fish to this town has been estimated to be about 550 tons as detailed below :—

Season.	Kind of fish.		Source.	Total supply.
(1)	(2)	(3)	(4)	
				LB.
January-March ..	Sea fish ..	Coastal areas of the district.		9,000
April-June ..	Do. ..	Do.		22,500
March-August ..	Freshwater fishes ..	Tanks and canals.		450,000
Do. ..	Murrels ..	Do.		135,000
May-July ..	Prawns ..	Malabar ..		1,500
September-January ..	Sardines ..	Do. ..		7,000
November-February ..	Freshwater fishes ..	Tanks and canals.		600,000
				1,228,500

The retail and wholesale prices are much favourable when compared with those of other centres (Appendix LIII); and the per capita consumption of fish is about 24.5 lb. which is satisfactory. However, there is considerable scope for improving both the supply and marketing procedures. The local fishermen co-operative society, though having a membership of over a thousand, has not undertaken marketing of fish. The society has therefore been contacted and induced to make a beginning. The society has since taken a van from the department and started procurement, assembly and sale. In due course this activity is expected to expand, and thus improve the fish marketing situation in the town.

9. *Fish marketing in Cuddalore town.*—Cuddalore town, the headquarters of South Arcot district has a population of about 80,000. Being a coastal town of commercial importance, it receives a steady supply of marine and brackish-water fish for the consumption of fish-eating population. The annual supply of fresh fish to the town has been estimated to be about 400 tons. The retail and wholesale price of fish is given in Appendix LIII. The present supply seems to be adequate; and the per capita consumption is 14.8 lb.

10. *Fish supply to Tiruchirappalli town.*—This important town has a population of about 1½ lakhs. It receives the bulk of its fish supply from the river and canal sections of the Cauvery river and connected tanks within a radius of 10 miles. It receives sea fish also from Nagapattinam. The total annual supply of fish to the town has been estimated to be about 870 tons; and the per capita consumption to be 19.5 lb. The price of fish is given in

Appendix LIII. The problem of fish supply to this town is lack of adequate transport facilities for procurement of fish from the inland and coastal centres. It has been suggested to the Federation of Fishermen Co-operatives in Tanjore district to undertake the supply of fish to this town.

11. *Fish marketing at Mettur Dam.*—All the eight fish merchants in Mettur were assisted in the procurement, assembly and despatch of the reservoir catches. Agencies were fixed in various centres for Mettur fish with average daily supplies as shown below :—

Coimbatore ..	50 to 100 lb.
Salem ..	300 „ 500 „
Erode ..	200 „ 300 „
Vellore ..	300 „ 500 „
Madras ..	100 „ 700 „
Tirupur ..	50 „ 100 „
Ranipet ..	50 „ 100 „
Vaniyambadi ..	50 „ 100 „
Chittoor ..	50 „ 100 „
Jalarpet ..	50 „ 100 „
Bangalore ..	1,000 „ 1,500 „

The total landings from the reservoir during the year was 400 tons, and the entire catch was marketed successfully. The fish merchants were given two motor luggers and two motor vans for the quick transport of fish. They were also given facilities for booking and transshipment of fish consignments at Mettur Dam and Salem Junction Railway stations by contacting the Railway authorities.

A fishermen's co-operative marketing society was started on 7th October 1956, and all spade work for the proper organization and functioning of the society were done during the year. Since 10th April 1957 all the member-licencees commenced marketing of their catches through the society.

12. *Development of live fish trade.*—As murrels sold in living condition are very popular in Madras, a special study of this live fish trade was undertaken with a view to improve it. These fish are available in large quantities in Tiruthuraiyandi and Nagapattinam taluks in Tanjore district when the water level in the pools in the river sections and in the several tanks become low. The murrels are caught with cast nets, encircling nets and traps, and kept for 3 to 4 hours in enclosed water holes before placing them in baskets covered with wet gunny and transported to the nearest railway station, where the murrels are transferred into zinc drums containing water. The mouth of these drums are covered with wicker or gunny. They are then booked for Madras

and other places. On the whole there are 14 important centres from where murrel consignments are sent to 23 stations in Tanjore, Tiruchirappalli, Madurai, Ramanathapuram, South Arcot, North Arcot, Chingleput and Madras districts. The total quantity of murels transported in 1956 was 270 tons, the bulk being to Madras (118 tons) and Tiruchirappalli (80 tons).

The Marketing Officer contacted both the consignors and consignees of murrel drums and gave them suggestions to avoid mortality. Suggestions like careful netting and handling of fish, rejection of injured fish from booking, non-inclusion of small murels with large ones which are pugnacious, using of clear water instead of muddy water, etc., were accepted and adopted by the traders; and this resulted in considerably reducing the mortality during transit. The fish were usually kept for sale in the markets in rusty drums and there was frequent incidence of fungus disease; and therefore the use of earthen vessels or cement vats with clean water was suggested to the vendors. This was readily followed by most of the sellers; and this resulted not only in keeping of fish alive for longer periods but also in reducing mortality. The traders complained that there was no regularity in the transshipment of the murrel drums into the connecting trains at Mayavaram junction, resulting in the detention of the consignments for more than 12 to 15 hours and that the railway porters tipped off water in the containers resulting in heavy mortality. These were investigated and brought to the notice of the railway authorities, who issued necessary instructions to the railway staff concerned. This was much appreciated by the fishermen and merchants and resulted in a larger volume of trade in murels during this year.

13. Marketing through Fishermen Co-operatives.—Special efforts were made by the Marketing Officer in collaboration with the co-operative staff of the department to organize fish marketing through fishermen co-operatives. As already stated under item 6 above, the Federation of Fishermen Co-operative Societies in Madras has been initiated to run a model stall in the Moore Market and to undertake house delivery of fish in the city. During the year a fishermen co-operative marketing society and three district Federations of Co-operative in Tirunelveli, Tanjore and Ramanathapuram districts were newly organized; and these commenced marketing of fish catches of its members and primary societies. The societies at Ennore, Vallambedu, Pulicat, Neelankarai, Sadras, Mahabalipuram and Kanathur Reddikuppam which now use departmental vans for affording facilities to the fisherfolk were advised to undertake collective fish marketing on co-operative basis. The Alandur Society and the Chingleput Society were assisted to obtain the lease of the local fish markets. The Uppalavadi Society at Cuddalore which owns its own fish market was given assistance to improve its market. Several other societies like those at Kancheepuram, Poondi, Kunnathur,

Chidambaram, Lalpet, Killai, Porto Novo, Villupuram, Sonankuppam, Tanjore, Kumbakonam, Madurai, Rameswaram, Paramakudi, Dhanushkodi, Thangachimadam, Kilakarai, Pamban, Tuticorin and Colachel were assisted during the year to undertake fish marketing. Under the hire-purchase system three transport vans were given to the federations at Tuticorin and Tanjore to the society at Porto Novo. It is to be noted here that the fishermen co-operatives, though in existence for many years, have not done independent business in marketing of fish so far. The members have got to surrender their catches to the money-lenders and owners of boats and nets to whom they are indebted. Hence until such time they are removed from the clutches of the middlemen there will be difficulties for proper marketing of fish by the societies themselves. However a good beginning has been made, and with the implementation of the Second Five-Year Plan Scheme for issue of long-term loans to fishermen (detailed under item 8 in Part IV) more progress can be expected in the near future.

14. Quick transport facilities.—Nine motor vehicles were hired out to fishermen co-operatives for transport of fish from landing centres to consuming centres. During the year these vehicles transported 752 tons of fish. Three vehicles were also given under the hire-purchase system to the federations at Tuticorin and Tanjore and to the Porto Novo Society. These facilities are appreciated by the fisherfolk who otherwise have to walk long distances, with head-loads of fish exposing them to spoilage. By marketing their catches in important cities and towns, they are able to earn a better return to their efforts. More details of the scheme under which these facilities are given are furnished under item II of Part IV of this report.

15. Improvements to handling, assembling and transport procedures.—The existing methods of handling, assembling and transport of fish were studied at various centres and steps were taken to improve them. At Mettur suggestions were given to the fishermen for the proper handling of their catches and handling them without any injury so that spoilage during transit was reduced. The fish merchants there were advised on the proper proportion of ice to be used in packing of fish intended for transport to long distances. The railway staff at Mettur and Salem junctions were given suggestions on the proper loading and unloading of fish baskets as damaged fish get putrid quickly. As stated in paragraph 12 above, the murrel fish traders were advised regarding handling, transport and sale of the live fishes. The railway authorities were approached to obtain better transport facilities for fish consignments from the West Coast and from Tanjore area, and for expeditious clearing of the consignments at Madras Central and Egmore Stations. The question of introduction of refrigerated vans was discussed with the railway officials on several occasions; and final arrangements are expected to be made soon.

16. *Improvements to fish markets.*—A survey of the various fish markets in the State was started during the year. A copy of the questionnaire used for this purpose is given in Appendix LIV. Information on the 46 markets in the City and 30 markets in the districts have been gathered. It was ascertained that almost all the markets require improvements by fulfilling the following requisites: (1) flooring and platforms for display of fish, made of cement and concrete, with proper drainage arrangement; (2) pukka roof overhead, (3) platforms (stalls) sufficiently raised from the ground, (4) sufficient space for each fishmonger and customer, (5) abundant supply of water for washing fish and implements and for flushing the stalls, (6) all doors, windows and ventilators to be made fly-proof, and (7) latrines and urinals outside the limit of the market.

The local bodies in charge of these markets were contacted and given necessary suggestions. The Madras Corporation was assisted to draw up a scheme for improving the five fish markets owned by it (Theagarayanagar market, Saidapet market, Aynavaram market, market at the junction of Poonamallee High Road and McNichols Road and Smithfield market at Choolai) at a cost of Rs. 30,000. The Corporation has applied to the Government for the sanction of the amount as half loan and half subsidy. The Corporation Engineer was assisted to draw up a plan for a new fish market to be constructed in the new fishermen colony near Kuppam Road in Tondiarpet. The majority of the markets in the City are private owned; and these owners are unwilling to improve them. However attempts were made to persuade them to effect at least essential improvements. The Trustees of the Thousand Lights Mosque agreed to remodel their market; and have recently taken up the work on the lines suggested by the Marketing Officer. Mention may also be made of a small and neat fish market constructed by the Balasubramania Sami Devasthanam, Eldams Road, Vannia Teynampet. The construction of this fish market commenced in October 1956 and was completed in August 1957 at a cost of Rs. 9,000. The Corporation authorities are also taking all possible action to get the private-owned markets improved or remodelled. They are also taking steps to enforce sanitary regulations and prevention of sale of bad fish.

Some of the municipalities like those at Tuticorin, Madurai, Tanjore and Salem have carried out some improvements to their fish markets. These and other local bodies are now anxious to improve their fish markets by availing of the financial aid under the Second Plan Scheme for improvement of fish markets. Type designs were given to several of the municipalities and panchayats; and applications are being received from them together with plans and estimates. It is expected that the entire Plan provision of Rs. 1.35 lakhs for this scheme can be utilized advantageously.

Sketches of type designs of a typical fish market, that can be adopted and modified to suit individual local conditions are appended to this report.

17. *Popularization of fish and fish products.*—Efforts were made to popularize departmental products like semi-dried prawns, fish manure, fish meal and shell grit; and several orders were executed through the Technological Station and the Biological Station at Ennore. Two thousand two hundred and forty-eight lb. of semi-dried prawns were sold in Madras City itself. The products were displayed in all exhibitions for attracting the notice of the public. Advertisements were also published in the Ind-Com Journal. In collaboration with the Fisheries Technological Station, Kozhikode and the Refrigeration Engineer, Mangalore, trial consignments of iced fish treated with antibiotics (aureomycin) and frozen fish were brought to Madras and made available to the public; but were not appreciated by them because of the yellowish tinge imparted by the antibiotic and the hardness of the frozen product. But it may be expected that the public may realise the advantages of these new processing methods gradually. Two consignments of Bonito were also brought from Tuticorin and sold in Madras; but only a few people liked the product.

18. *Fish trade enquiries.*—Seventy-five trade enquiries from various parts of India and also from West Germany, Singapore, United States of America and Hong Kong were attended to by the Marketing Officer during the year. These enquiries pertained to various aspects of the industry, such as fish meal, shell grit, agar, corals, fresh fish, dry and cured fish, frozen fish, sea weeds, pearl oyster shells, fancy shells, fresh and processed prawns, land and air transport facilities, price variations, marketing facilities, fish oil, fish skin and leather, shark fins, biological specimens, statistics of fish landings, lime shells, snail shells, fish glue, refrigeration facilities, lobsters and pearl essence (Fide Appendix I A).

B. STATISTICS.

1. *Marine fisheries statistics.*—Statistics of fish landings along the coast were continued to be collected during the year. Collation and compilation of the statistics of the east coast for 1955-56 was completed and sent to the Government Press for printing. Of the statistical reports from 1950-51 pending in the Press, only one report on fish statistics of west coast for 1950-51 was got printed during the year.

2. *Inland fisheries statistics.*—The inland fisheries statistical statement for 1956 was compiled and edited during the year.

3. *Fishing calendars.*—Basing on statistical observations made during the previous years, two fishing calendars one for the west coast and another for the east coast were published during the year.

In these calendars, the fisheries that can be expected in the inshore waters of the important fishing centres during each of the twelve months of the year are given. They are therefore useful to fishermen and others engaged in the fishing industry. Wide publicity about these calendars were made through the Madras Information published by the Director of Information and Publicity and also local newspapers; and many copies were distributed to all those who required them.

4. *Statistical survey of the Kanyakumari district.*—As this is a new area added to Madras State consequent on reorganization of States on 1st November 1956, a special statistical survey was conducted to have a preliminary assessment of the fisheries resources and their potentialities and to formulate developmental programmes.

This district has a coastline of 42 miles along which there are 35 fishing villages with a total population of 62,208 of which 22,989 are active fishermen. The chief craft is the catamaran of which there are 10,024 in number. There are also 1,252 boats. The gear employed by the fishermen consists of 2,340 boat-seine nets, 533 shore-seine nets, 10,406 gill nets and drift nets, and 2,783 hooks and lines. The sea off this district coast is rich in fisheries. The Wadge Bank, about 4,000 square miles area, is located about 35 miles south-west of Cape Comorin. Generally, boat seine nets are operated from April to October, and the shore-seine nets from September to June. Gill nets are operated from August to April and drift nets from August to November. Long lining is conducted almost daily. The total landings along the entire coast is estimated to be about 13,040 tons a year. There is considerable scope for improving the fish catches from this area by introduction of mechanised fishing.

A fishing calendar for this district coast has been prepared and is given in Appendix LVI.

Statistics of weekly price variations.—Weekly variations in the price of fish in Madras City are compiled and regularly furnished to the Director of Statistics for incorporation in statements of weekly wholesale and retail prices of commodities, published in the Statistical Supplements to the *Fort St. George Gazette*. The data are also included in the periodical price reports sent to the Economic and Statistical Adviser to the Government of India in the Ministry of Food and Agriculture.

C. INFORMATION AND PROPAGANDA.

Dissimination of information and publicity were given much attention by the Marketing and Information Officer during the year as recounted below:—

1. *Publicity.*—Close liaison was maintained with the Director of Information and Publicity and with representatives of the Press and periodical information was furnished to them. Relief and

rehabilitation works and progress of implementation of the Five-Year Plan Schemes were announced regularly through the local newspapers. The representatives of the leading papers like the *Hindu*, the *Mail* and the *Indian Express* were frequently invited and appraised of the progress in the activities of the Department. Special mention may be made of the wide publicity about the pearl fishery. Articles on Fisheries of Madras State were supplied to the Asylum Press Almanack Directory and to the Times of India Directory and Year Book.

2. *Propaganda.*—The Propaganda Unit visited various fishing hamlets and explained to them the department's activities, with special reference to the socio-economic rehabilitation of the fishermen and the objectives and benefits of the Five-Year Plan Schemes. Such meetings enabled the department to gain first-hand knowledge about the requirements of the fishermen and to take necessary steps to ameliorate them.

3. *Lectures.*—A lecture on the fishing industry of Madras was delivered to the Geography Association of the Queen Mary's College, Madras, by Sri P. I. Chacko.

4. *Audio-visual methods.*—With the co-operation of the United States Information Service, the British Council, and the F.A.O. Fisheries Experts, periodical film shows were arranged for the benefit of the fishermen and the public. The following fisheries films were shown during the year: (1) Silver Haul, (2) Fish and Seine Net, (3) Drifters, (4) Kuralon fishing, and (5) Neva Scotia fisheries. These films depicted the important fisheries and modern fishing methods of the European waters (particularly the North Sea), Newfoundland, east coast of Canada and Japan. Slides about the pearl fishery were projected in important theatres in Madras, Coimbatore, Tiruchirappalli and Tuticorin with a view to attract people to the fishery. Since the end of the year a kaleidoscope worked with the aid of a petromax together with two sets of slides on fish culture have been acquired. With these and an audio-visual van expected from America under the T.C.M. Aid, it would be possible to initiate a regular programme of propaganda with audio-visual methods.

5. *Advertisements.*—Advertisements about departmental products like semi-dried prawns and shell grit were published in the *Ind-Com Journal*. Advertisements about the pearl fishery were also made in important papers throughout India. Advertisements were also made inviting enquiries on fisheries matters to the Marketing and Information Officer.

6. *Enquiries.*—Several enquiries from the public and institutions were answered during the year; and important among them are shown in Appendix LVII. These pertained to varied subjects like fish-farming methods, carp spawning, socio-economics, statistics, flora and fauna of lakes, aquarium maintenance, culture of selected varieties of fishes like Gourami, Bektī, Mirror Carp and

Tilapia, life history of Gastropods, river valley projects, control of aquatic vegetation, fish-processing methods, research facilities, edible oysters, bionomics and growth rate of fishes, crocodiles, and air transport of fish.

7. *Library*.—The Fisheries Library in Madras continued to cater to the needs of departmental officers, trainees, students, research workers and the public. During the year 603 additions were made to the library; and 853 books and journals were issued for reference and return; and 285 readers actually attended the library. A monthly list of additions was regularly issued to all, including officers of the Central Fisheries Research Stations at Mandapam and Calcutta and the Director of Animal Husbandry and Fisheries of Andhra Pradesh, to keep them informed of the improvements to the library. Regular exchange was also maintained with fisheries libraries and institutions in India and other countries.

8. *Museum*.—The Fisheries Museum in Madras continued to be popular and as an effective medium of propaganda for the various activities of the Department. During the year the following new exhibits were added :—

- (1) A show case of South Indian crabs.
- (2) A show case of South Indian molluscs.
- (3) A set of 43 mounted biological specimens.
- (4) Model of Coracle.
- (5) Model of pearl oyster farm craft and raft.
- (6) A case of pearl oyster shells.
- (7) Model of surf boat.
- (8) Model of Pablo boat.

Exhibits from the museum were loaned to the Regional Assistant Directors for participating in exhibitions in their areas. The Assistant Directors were also assisted to build up their own regional museums.

9. *Charts and posters*.—The following charts and posters were prepared and framed during the year for propaganda work :

- (1) Chank fishery exploitation.
- (2) Quick transport facilities.
- (3) Socio-economic work—Education.
- (4) Socio-economic work—Fishermen co-operatives.
- (5) Types of inland waters.
- (6) Inland fisheries.
- (7) Census of marine fisherfolk and their crafts and gear.
- (8) Census of inland fisherfolk and their crafts and gear.
- (9) Fish seed collection centres.
- (10) Statistics of seed collection work.
- (11) Fish-curing.
- (12) Set up of Madras State Fisheries.
- (13) Marine fish landings.

(14) Second Five-Year Plan.

(15) Set of 13 photos of iceplant and cold storage, Kozhikode.

(16) Set of 13 photos pertaining to training of fishermen in mechanised fishing.

10. *Exhibition*.—During the year, the department participated in 55 exhibitions held at various towns and villages in the State and popularized activities of the department and the fishing industry. Special mention may be made by the Madras University Centenary Exhibition held in January-February 1957. A special exhibition was also organized in connection with the First All-India Fisheries Conference held at Madras in September 1957. Live and preserved specimens, models, charts, photographs and products like semi-dried prawns, fish-meal, fish biscuits and shell-grit, etc., were exhibited; and culinary preparations like fish cutlets and seaweed jellies were popularized. In all these exhibitions the departmental stalls attracted the public and were therefore overcrowded. The Department received awards like certificates of merit in some of the exhibitions. A list of all the exhibitions in which the Department participated is given in Appendix LVIII.

Publications.—During the year 59 scientific and popular articles prepared by departmental officers were published. These publications are listed in Appendix LIX. Special mention may be made of (1) the booklet on fish-farming which is intended to guide the public in fish-farming, (2) the booklet entitled "Madras Fish Facts" brought out in connection with the First All-India Fisheries Conference held in Madras in September 1956, and (3) the two fishing calendars for the east and west coasts, in which the monthly fisheries of important fishing centres are given for the use of the fishermen and others interested in the industry. These booklets were in considerable demand from the public. The departmental publications are deposited in the three National Libraries at Bombay, Calcutta and Madras and in the Gandhi Smriti, Bhavanagar. They were also supplied to libraries of all Universities in the country and to fisheries institutions in India and abroad on exchange basis.

D. AQUARIUM.

The freshwater aquarium on the Marina continued to be one of the foremost popular resort in Madras. The number of visitors increased from 79,456 in 1955-56 to 117,332 during the year under report. The record attendance was on Kannupongal day when 957 people visited the aquarium. The daily average attendance was 351.29. A statement of number of visitors, in one anna and two annas tickets is furnished in Appendix LX. The gate collection amounted to Rs. 11,608.72 against Rs. 8,087.61 in 1955-56.

In G.O. Ms. No. 2380, Agriculture, dated 5th October 1956, the Government sanctioned the deputation of Sri K. J. Joseph, Curator of the Aquarium, to Singapore to bring new kinds of exotic fishes for the aquarium. The Curator left for Singapore on 24th October 1956 by steamer and returned on 13th November 1956 by air with a good collection of 51 kinds of fishes. The fishes were transported in pressurized sealed plastic bags containing sufficient water and oxygen. Each bag contained 50-500 fishes according to size; and weighed 9 kilos. The method proved a great success as there was not any mortality during transit.

A list of the 51 varieties of fishes brought from Singapore, giving their common and scientific names and as to how they have adapted to the local conditions is given in Appendix LXI. Additional tanks, to accommodate these fish were set up in two new rows mounted with plywoods in such a way that the fishes exhibited are seen from both sides at a cost of Rs. 1,200 sanctioned in G.O. Ms. No. 2359, Agriculture, dated 4th October 1956.

In G.O. Ms. No. 958, Agriculture, dated 4th April 1956, the Government approved the site opposite to the University Buildings for the construction of the new marine aquarium. The preliminary plans and estimates prepared by the Public Works Department have been approved by the Government, and details are being worked out. The work is expected to commence in 1957-58.

PART VIII--SOCIO-ECONOMIC WORKS.

• A. FISHERMEN CO-OPERATIVE SOCIETIES.

There were 259 societies at the beginning of the year, 116 on the west coast and 143 on the east coast. Those on the west coast were transferred to the Kerala and Mysore States on 1st November 1956. At the end of the year there were 175 fishermen co-operative societies including four District Fishermen Co-operative Federations and one Inland Fishermen Co-operative Marketing Society as shown in Appendix LXII. The total number of members in these societies were 17,779; and the total paid-up share capital was Rs. 1,55,269. Loans and advances issued during the year were (a) Central Bank loan of Rs. 63,950 and (b) Government loan of Rs. 2.70 lakhs.

During the year there was an increase in the number of fishermen societies on the east coast from 143 to 175. This was mainly due to the fact that three new District Federations were organized in Tanjavor, Ramanathapuram and Tuticorin and one marketing society at Mettur Dam. There was an increase in the number of members in the societies and in the share-capital paid-up by the members. There was also considerable improvement in the issue of loans and advances during the year; mainly due to the fact that Government came forward to finance the fishermen co-operative societies under a scheme in the Second Five-Year Plan.

In G.O. Ms. No. 1045, Agriculture, dated 20th April 1956, Government approved a scheme for the grant of long-term loans to the societies repayable in ten years. Under this scheme 25 societies were selected for intensive work on the marine side in Madras, Chingleput, Tanjavor, Ramanathapuram, Tirunelveli and Kanyakumari districts and the Mettur Dam Fishermen Co-operative Marketing Society in Salem district on the inland side. In each society, 40 members were selected and were given loans not exceeding Rs. 500 per member or Rs. 2,000 per working unit. On the whole loans amounting to Rs. 2.70 lakhs were drawn and disbursed to 26 fishermen co-operative societies and 832 fishermen were benefited by the loans during the year. Full details of this scheme are given in Part IV of this report and in Appendix XXIV. The Government sanctioned specific staff of 5 Senior Inspectors and 9 Junior Inspectors for intensive supervision of the societies and one Junior Superintendent and one Upper Division Clerk and one Typist for employment at the head office for the work connected with the scheme. The fishermen who were granted loans utilized a portion of the loan amount for discharging their prior debts and a major portion was utilized for purchasing crafts and tackles. The District Federations assisted the societies in purchasing yarn, sail cloth, coir, etc., in bulk at ex-mill rates and in distributing them to the member societies, charging a very low commission. After the introduction of various development schemes for the fishermen under the Second Five-Year Plan in 1956-57 and especially after the grant of Government loans, supply of Pablo type mechanised boats, Nylon nets, Terylene yarn, motor vans, etc., on hire-purchase and subsidy basis, the fishermen have come to realize the importance of co-operative societies. This is also one of the reasons for the increase in the number of societies. Due to intensive supervision and the periodical review of their working many societies which were dormant due to lack of interest on the part of their panchayatdars were revived and many of them were recommended for sanction of loans by the Central Co-operative Banks concerned.

The Madras Fishermen Co-operative Federation started on 30th November 1955 had 20 members on its roll with a paid-up share capital of Rs. 3,600. The Federation purchased yarn for Rs. 6,660-12-9 and sold for Rs. 6,446-14-6 with a stock in trade valued Rs. 615. This federation opened a model fish stall in the Moore Market in August 1956 and sold fish to the value of Rs. 3,781 during the year. It was granted a free subsidy of Rs. 500 for purchase of a bicycle for getting fish from the sea shore and to arrange delivery of fish from door to door to the customers. Utensils like plates, gutting knife, weighing machine, fish boxes, name boards, etc., were purchased out of this grant. The federation was also granted a Government loan of Rs. 2,000 repayable after five years in ten half-yearly instalments. The federation was also granted a cash credit accommodation of Rs. 6,400 by the Madras District Co-operative Central Bank for purchasing yarn, sail cloth, etc., in

bulk and selling them to its feeder societies. The federation purchased yarn of various counts 20, 16, 14, 10 and 6. Sail cloth specially manufactured for use with catamarans by the Anglo-French Textile Mills, Pondicherry, was purchased and sold by the federation. The federation collected a sum of Rs. 140 from the fishermen towards the Distress Relief Fund. It also obtained milk powder, butter oil, etc., from the Guild of Service, Madras, and arranged their distribution to the fishermen through the member societies. The federation has taken two pablo-boats from the department by the end of the year for conducting fishing operations. On the whole the federation earned a net profit of Rs. 408 during the year.

Tanjavoor District Fishermen Co-operative Federation had 17 societies as members with a paid-up share capital of Rs. 850. It was inaugurated by the Collector of Tanjore on 5th February 1957. The federation has got a working capital of Rs. 5,000 including the Government loan of Rs. 2,000 towards share capital. The federation has been given the free services of a Senior Inspector. With a van taken from the department on hire-purchase, this federation has commenced transport and marketing of fresh fish in Tiruchirappalli and Tanjavoor towns.

The Ramanathapuram District Fishermen Co-operative Federation was inaugurated on 17th February 1957 by Sri S. Aruldas, I.A.S. There were 15 members with a paid-up share capital of Rs. 4,950. The federation purchased yarn, coir and rope for Rs. 9,819 and sold them to fishermen for Rs. 9,385 with a closing stock of Rs. 345. The federation has also started a fish stall in the Ramanathapuram town fish market. The federation has also taken two pablo-boats. The federation earned a net profit of Rs. 193 during the year.

The Tirunelveli District Fishermen Co-operative Federation was started on 12th October 1956. It has 10 fishermen societies and three individuals admitted as its members with a paid-up share capital of Rs. 3,600. It was sanctioned a share capital loan of Rs. 2,000 by the Government. During the year the federation took four pablo-boats with the required Terylene nets and a Tuticorin-type mechanised boat (Marit) and a pick-up type fish van (MSY 7050) on hire-purchase system. The pablo-boats are operated by the trainees of the Tuticorin Fisheries Training Centre. 48 per cent of the catches being given to them and the remaining 52 per cent being taken by the federation. Fish to the value of Rs. 5,292 was caught and the Federation obtained a sum of Rs. 2,717 as its share.

The Mettur Dam Fishermen Co-operative Marketing Society was started on 7th October 1956. It has been granted a Government loan of Rs. 2,000 towards its working capital. There were 125 members with a paid-up share capital of Rs. 975 at the end of the year. The society has been granted the free services of a Senior Inspector to work as its Manager and a Junior Inspector as

Accountant. The Assistant Director of Fisheries, Mettur Dam, is the ex-officio President of the society. All the member-licensees market their catches through this society from 10th April 1957. The departmental boats and the motor vans have been hired to the society, which were hitherto engaged by the merchants. Nearly 90 per cent of the licensees, who fish in the reservoir have joined the society as members. During the year 118 members were granted long-term loan of Rs. 13,500 for discharging their debts and for purchasing craft and tackles. Applications are received in large numbers from the remaining fishermen for grant of Government loans for paying licence fees, discharge of prior debts and for purchasing crafts and tackles. These applicants will be given loans in 1957-58.

Mechanised boats and Nylon nets have been given to the following societies for intensive fishing operation :—

Name of the society.	Number of boats given.
Madras District Co-operative Federation ..	2
Kasimedu Fishermen Co-operative Society ..	2
Mattankuppam Fishermen Co-operative Society.	2
Triplicane Fishermen Co-operative Society ..	1
Neelangari Fishermen Co-operative Society ..	1
Sonankuppam Fishermen Co-operative Society.	2
Killai Fishermen Co-operative Society ..	1
Porto Novo Fishermen Co-operative Society ..	1
Tinnevely District Fishermen Co-operative Federation.	7
Colachel Fishermen Co-operative Society ..	2

The boats have been given on 75 per cent loan and 25 per cent free subsidy under hire-purchase system. The cost being repayable in monthly instalments of Rs. 125 in a period of six years. The Terylene yarn has been issued to the above societies for making nets under hire-purchase system, the cost being payable to Government within a period of two years. The fishermen have begun to realize the advantages of the use of power boats and synthetic nets; and there is now clamour for the supply of these modern equipments to the fishermen all over the State.

Co-operative work in the Divisions—1. Madras Division.—There were 24 fishermen co-operative societies including the District Federation in the Madras Division. There were 3,572 members with a paid-up share capital of Rs. 25,552 at the end of the year. The societies in this division were granted Government loan of Rs. 82,000 and short-term and medium term loans of Rs. 35,400 by the Madras District Co-operative Central Bank. General body meetings and panchayat meetings were held periodically by the

societies and fresh set of panchayatdars were elected wherever necessary. Special by-laws as approved by the Registrar of Co-operative Societies, Madras, were introduced in five societies, which were granted long-term loans. Three societies continued to run motor van for transport of fish from landing centres to the markets in the city on hire basis. The Kayapuram Fishermen Co-operative Society is running a fair price shop for the sale of raw and boiled rice to the fishermen in the locality. It has been granted a cash credit of Rs. 1,000 by the Central Co-operative Bank for this purpose.

2. *Vellore Division.*—There were 50 societies with 1,812 members and a paid-up share capital of Rs. 20,873. The societies were granted Central Bank loan of Rs. 7,750 of which a sum of Rs. 2,792 was repaid during the year. Most of the societies in this division are inland societies which depend on the lease of tank fisheries.

The Mahabalipuram Society was granted a Government loan of Rs. 18,000 in 1955-56 under the Community Development Scheme. Of this a sum of Rs. 17,567 was outstanding at the beginning of the year and a sum of Rs. 876-11-0 was collected during the year leaving a balance of Rs. 16,690. A Junior Inspector sanctioned to the society free of cost continued to work as its Secretary.

In the Sadras Society there were 191 members with a share-capital of Rs. 1,429 at the end of the year. This society was granted a Government loan of Rs. 8,000 under the Community Development Scheme for the purchase of catamarans and nets. One Junior Inspector has been sanctioned free of cost in G.O. Ms. No. 3191, Public (R.D.P.), dated 25th September 1956, to work as its Secretary for a period of one year.

In the Pudupattanam Society there were 107 members with a paid-up share capital of Rs. 2,155. This society was granted a Government loan of Rs. 14,000 under Community Development Scheme in G.O. Ms. No. 3233, Public (R.D.P.), dated 27th September 1956; and the amount was drawn and disbursed by the Block Development Officer in March 1957. The Junior Inspector working in Sadras has been ordered to work as the Secretary of this society also.

The Chingleput Inland Fishermen Co-operative Society was organized at Chingleput. This society has taken the lease of the Chingleput fish market for Rs. 5,035 for the year 1957-58. The society has been granted a Government loan of Rs. 1,000 to pay advance for the lease amount due to the municipality. The fish market is being run successfully by the fishermen. There were 57 members with a paid-up share capital of Rs. 535 at the end of the year.

The Alandur Fishermen Co-operative Society collected rental of a sum of Rs. 8,660 from the Alandur Fish Market and paid lease of Rs. 6,820 to the Alandur Panchayat Board. The society incurred a sum of Rs. 1,605 towards establishments and contingencies in the maintenance and running of the market. This society applied to the Government for the grant of lease of the fish market on the rental of the previous year without bidding in public auction. Government orders are awaited. The market is now run by a private individual on a higher rental due to unhealthy competition in the public auction and this is causing harassment to the fishermen and fisherwomen.

3. *Tanjore Division.*—There were 6 inland societies, and 22 marine societies with a total membership of 5,209 and paid-up share capital of Rs. 31,582 as against 4 inland and 21 marine societies in the previous year. All the six inland societies obtained lease of fisheries in the water-courses in Tanjore district and distributed them to their members. The value of leases taken by these societies are given below :—

Name of societies.	Amount. RS.
1 Parvatharajakula Fishermen Co-operative Society. Tanjavoor.	60,000
2 Kumbakonam Fishermen Co-operative Society ..	28,500
3 Papanasam Fishermen Co-operative Society ..	8,622
4 Thirumullaivasal Fishermen Co-operative Society..	4,082
5 Naluvadapathi Fishermen Co-operative Society ..	265

Most of the fishermen were given employment by the distribution of the leases of the rivers and tanks. The Chandrapady Society was granted a loan of Rs. 2,000 by the Kumbakonam Co-operative Central Bank. The Kodiakarai and Kodiakadu Sea Fishermen Co-operative Societies whose entire share capital was misappropriated by the Secretary was revived during the year. Fresh share capital was collected from the members and more fishermen were admitted as members. The society purchased 500 bags of cement and distributed among its members for construction and repairs of their houses.

As per G.O. Ms. No. 2366, Agriculture, dated 4th October 1956, the fishermen co-operative societies in Tiruchirappalli district were transferred from the control of the Co-operative Department to the administrative control of the Assistant Director of Fisheries, Tanjavoor. There were 335 members with a paid-up share capital of Rs. 2,502 in the three societies in this district. The affairs of the Srirangam Society which were very bad and for which an enquiry under section 38 of the Madras Co-operative Societies Act was ordered, has considerably improved. The society obtained leases and remitted the rentals due to the Government promptly. During the year the Tanjore Parvatharajakula Fishermen Co-operative Society celebrated its Silver Jubilee and the function was attended by the Minister for Fisheries.

4. *Madurai Division*.—There were 32 fishermen co-operative societies including the Ramanathapuram Federation at the end of the year as against 23 societies in the previous year. There were 2,073 members with a paid-up share capital of Rs. 37,391 at the end of the year. The societies obtained a loan of Rs. 12,400 from the Central Bank and repaid Rs. 10,831 during the year. The Inland Societies obtained the lease of tanks and river fisheries in the district as shown below :—

Name of Societies.			Lease amount:
			Rs.
1	Rameswaram Society	.. ..	1,135
2	Kilakarai Society	.. ..	150
3	Palani Society	.. ..	3,935
4	Tirupavanam Society	.. ..	1,800
5	Rajapalayam Society	.. ..	282
6	Madurai Taluk Society	.. ..	8,090
7	Manamadurai Society	.. ..	1,500

5. *Tuticorin Division*.—There were 16 fishermen co-operative societies and one District Federation with 2,668 members with a paid-up share capital of Rs. 90,823 as against 14 societies with 2,100 members and share capital Rs. 14,453 during the previous year. The Periatthalai Society was granted a Government loan of Rs. 15,000 repayable within six months for purchase of yarn and other materials for net making, and a subsidy of Rs. 2,000 to be paid to members for net webbings and a further sum of Rs. 1,000 for supply of grains to the fishermen as famine relief measures under G.O. Ms. No. 1704, Agriculture, dated 10th July 1956. The members made 200 vala valai mal and 200 kola valai webbings out of yarn supplied. The society discharged Government loan of Rs. 15,000 in time. The Government loan and subsidy were responsible to organize a net making industry in the village on co-operative basis.

Twenty-four fishermen of Kilvaipar were supplied with 3 catamaram logs each on 50 per cent loan and 50 per cent subsidy under cyclone relief measures. Out of the four inland societies in the division one society at Malapavoor obtained the lease of tank fisheries in Veerakeralampoodur Estate on the five years' average rentals. It is reported that the society incurred a loss of Rs. 2,276 in the lease due to the interference by the villages.

6. *Kanyakumari district*.—With the reorganization of States in November 1956, the control of the fishermen co-operative societies in Kanyakumari district came to this department. There were 16 societies with 2,301 members with a paid-up share capital of Rs. 18,580 at the end of the year. Government loan of Rs. 1,38,638 granted by the former Travancore-Cochin State was outstanding at the end of the year. These loans were granted for construction of houses on hire-purchase system. During the year long-term loan of Rs. 3,000 was granted to Ezhindesam Society for purchase

of catamarams, nets and other implements by its members. Government sanctioned for services of a Senior Inspector for the supervision of the societies in the district. The area of operation of some of the societies is vast; therefore steps are being taken to reorganize the societies with compact areal jurisdictions and to start new societies wherever necessary. The Colachel Society was given two pablo boats with required nets and other implements for fishing. This society has shown very good progress in this line. It has applied for a Government loan of Rs. 1 lakh for purchase of more mechanised boats and Terryline and nylon nets. The application has been recommended for sanction.

B. DISTRESS RELIEF FUND.

A scheme for the constitution of the fishermen Distress Relief Fund modified and approved by the Registrar of Co-operative Societies, Madras, was implemented through the District Fishermen Co-operative Federation. The object of the fund is to grant relief to a member or members of the fishermen families who meet with accidents disabling them totally to carry on the profession or if he dies while engaged in fishing. The members who join the fund are eligible for cash relief not exceeding Rs. 250 in each case. The federations have been advised to frame a subsidiary regulation under by-law 13 for implementing the scheme.

C. CYCLONE RELIEF WORK.

The scheme drawn for the relief of fishermen affected by the cyclone which struck the Tanjavoor, Ramanathapuram and Tirunelveli coasts in November 1955, was continued during the year as narrated below :—

1. *Tanjavoor district*.—One big boat, three medium boats and 19 small boats belonging to the fishermen were replaced during the year. The Minister for Agriculture and Fisheries inaugurated the launching of the first set of completely replaced wrecked boats at Siruthalaikadu on 5th April 1956. Another boat newly constructed was launched at Muthupet by Sri V. Karthikeyan, I.A.S., Collector of Tanjore, on 4th July 1956. A total subsidy of Rs. 3,197-8-0 and a loan of Rs. 2,300 were also given to the fishermen. The purchase and distribution of yarn at subsidised rate was continued; and the following varieties of yarn were distributed at a cost of Rs. 74,596-11-5 :—

No. 20 count	.. ..	55 bales
No. 10 count	.. ..	28 „
No. 6 count	.. ..	11 „
Kohinoor 30 count	.. ..	72 gross.
Kohinoor 10 count	.. ..	100 „

A quantity of 2,970 yards of sail cloth were got manufactured during the year and these are being distributed to the fishermen.

The Government approved the proposals for the import of catamaran logs from Ceylon and the contract was entrusted to Messrs. Mercandan, Limited. The contractors were however very slow in the execution of the contract and by the year end they were able to supply only 19 logs. The distribution of these logs was inaugurated by the Governor, Sri A. J. John, at Vedaranyam on 10th February 1957.

2. *Ramanathapuram district*.—Twenty-four bales, 11 bundles and 5 skeins of yarn costing Rs. 9,453-12-10 were issued at 50 per cent subsidised cost to the fishermen. Three fishermen were supplied with three yards of sail cloth each.

3. *Tirunelveli district*.—Proposals for the supply of catamarans to the fishermen of Kilavaippar who were affected by the cyclone were submitted and accordingly 96 logs were supplied by the Marcandan, Limited, Colombo. Twenty-four fishermen were supplied with three logs each on 50 per cent loan and 50 per cent subsidy basis as per G.O. Ms. No. 219, Agriculture, dated 18th May 1956. The loan will be recovered in easy monthly instalments spread over a period of five years.

As per G.O. Ms. No. 1810, Agriculture, dated 24th July 1956, Sri S. Viswasam Fernando of Tuticorin who lost his canoe along with his two sons due to the cyclone, was sanctioned an interest-free loan of Rs. 500 recoverable in five years and Rs. 400 as subsidy for construction of a fishing boat. By the end of the year he has completed the construction of the boat and has commenced fishing regularly.

In G.O. Ms. No. 847, Agriculture, dated 18th March 1957, a subsidy of Rs. 50 and a loan of Rs. 100 recoverable in two equal monthly instalments were sanctioned to each of the eight fishermen families at St. George street, Tuticorin.

D. REHABILITATION OF FISHERMEN RENDERED HOMELESS BY SEA-EROSION.

Government in G.O. Ms. No. 1909, Agriculture, dated 30th July 1955, sanctioned a sum of Rs. 4,14,500 for the rehabilitation of fishermen rendered homeless by sea-erosion in North Madras. This sum of Rs. 4,14,500 is made up of Rs. 2,59,400 for the acquisition of private sites and Rs. 1,55,100 for the provision of amenities. In G.O. Ms. No. 2801, Agriculture, dated 29th November 1956, Government have also sanctioned an additional amount of Rs. 70,000 towards the cost of land acquisition. In G.O. Ms. No. 238, Agriculture, dated 29th January 1957, Government have sanctioned a further additional amount of Rs. 8,530 to be adjusted as loan to the Corporation. Two hundred and eighty-two fishermen families were granted house-sites for their residence, 169 families in Chockalinga Gramani Colony and 113 families in the Albert Jesudasan Colony.

The reclamation work for filling in the ponds, raising the level of the area and levelling of the two sites, sewer laying work and provision of individual flush-out latrines and gully connexions, laying of cables and fixing of electric lamp posts, laying water main and giving public fountain connexion, and in both the construction of pump room and an overhead tank and given connexion to the existing water mains have been completed in both the colonies. An electrical pump set has also been erected and action is being taken for giving electric connexions to the above pump set. Formation of roads with laterite and gravel have been completed in both the colonies. Asphaltting of the above roads is to be taken up after consolidation. There is also provision for a model fish market in R.S. No. 3618. The approximate cost for constructing this marked as per the revised estimate prepared by the Corporation Engineer in consultation with the Fisheries Marketing Officer is about Rs. 20,000.

E. REHABILITATION OF FISHERMEN EVICTED FROM MILITARY LAND.

The land bearing R.S. No. 461 in Tondiarpet belongs to the Defence Department. This has been encroached upon by some fishermen families in the past. They have now been evicted from the land for erecting a battery radar set by the Defence Department. To provide the evicted persons with alternative site, proposals were submitted to Government on 4th December 1956 for the acquisition of private sites. In G.O. Ms. No. 1382, Food and Agriculture, dated 30th April 1957, Government have sanctioned a sum of Rs. 1,61,250 for acquisition of private sites for accommodating 258 fishermen families. The acquisition is now pending with the Collector of Madras.

F. RELIEF MEASURES TO FISHERMEN AFFECTED BY FIRE ACCIDENTS.

1. *Fire accident at St. George street, Tuticorin*.—A serious fire broke out in St. George street, Tuticorin, on 29th November 1956 at midday, in which eight houses of fishermen were gutted. Government in G.O. Ms. No. 847, Food and Agriculture, dated 18th March 1957, have sanctioned a loan of Rs. 100 and a subsidy of Rs. 50 to each of the eight fishermen families who were affected by the fire accident. The loan is repayable in two annual instalments of Rs. 50 each with an interest at 4½ per cent per annum. A parcel interest at 7½ per cent per annum is also to be charged on all overdue payments.

2. *Fire havoc in Kasikoil Kuppam*.—A serious fire broke out in Kasikoil Kuppam near Ennore on 1st August 1956 and 28 houses were burnt. One child of about four years was burnt alive. In G.O. Ms. No. 2402, Agriculture, dated 23rd August 1956, the Government sanctioned a sum of Rs. 3,850 for supplying yarn, sarees, dhoties, cloth and boiled rice to the fishermen affected by the fire havoc. The above articles were supplied to all the families affected by the accident.

3. *Fire havoc in Mattankuppam.*—A fire broke out in Mattankuppam, Triplicane, Madras, on 12th March 1957, at about 5 p.m. which resulted in loss of nine houses involving 12 fishermen families. Twenty-five nets, clothes, provisions, thatched roofing, etc., were burnt out. The cost of the articles destroyed by this account amounted to Rs. 1,500. In G.O. Ms. No. 1170, Food and Agriculture, dated 10th April 1957, the Government sanctioned a sum of Rs. 1,000 for supplying cloth, yarn and building materials, etc. These articles were purchased and distributed to all the families affected.

4. *Fire accident in Kanathur Reddikuppam.*—A fire accident took place in Kanathur Reddikuppam, Chingleput district, on 20th March 1957 at about 10 p.m. Thirteen fishermen families were affected by this and their fishing implements were lost. In order to replenish the equipments lost, proposals were submitted for the purchase of yarn and distribution among these fishermen so that they may carry on their livelihood. Since the close of the year, in G.O. Ms. No. 2175, Food and Agriculture, dated 18th July 1957, Government sanctioned a sum of Rs. 1,000 towards the purchase and supply of yarn to the fishermen affected by fire. Yarn was purchased and supplied to all the fishermen affected.

G. FAILURE OF FISHING SEASON IN PERIATHALAI.

Due to failure of the fishing season in Periathalai village, Tirunelveli district, from November 1955 to April 1956, the fishermen who work under the owners of boat and net were put up to great hardship and starvation. In G.O. Ms. No. 1704, Agriculture, dated 10th July 1956, the Government sanctioned the following relief to the affected fishermen :—

1. *Free supply of gruel and clothes.*—Rs. 1,000 for supply of foodgrains as grain or in the form of gruel.

2. *Payment of subsidy as wages.*—Rupees two thousand for giving subsidy to the fishermen as wages for knitting nets and for making fish baskets.

3. *Loan to Periathalai Fishermen Co-operative Society.*—A loan of Rs. 15,000 to the fishermen co-operative society at Periathalai. The loan was utilized for purchase of yarn and other materials required for providing the fishermen with alternative employment. The Government also sanctioned the free services of Junior Co-operative Inspector for a period of three months.

H. HOUSING FOR FISHERMEN.

In G.O. Ms. No. 794, Industries, Labour and Co-operation, dated 26th February 1957, a sum of Rs. 51,000 was sanctioned for the construction of 102 houses for fishermen at the rate of 74 houses in Mallikuppam near Santhome and 28 houses at Kasikoilkuppam near Tiruvottiyur in Chingleput district. The Government have requested the Chairman, City Improvement Trust, to combine Housing Scheme for Mullikuppam along with the Slum Improvement Scheme of the City Improvement Trust.

In G.O. Ms. No. 2367, Industries, Labour and Co-operation, dated 17th July 1957, the Director of Harijan Welfare was asked to proceed with all preliminaries such as selection of places and beneficiaries and await the sanction of the Government of India for Central assistance.

I. CONSTRUCTION OF FEEDER ROADS TO FISHING HAMLETS.

In consultation with this department, the Chief Engineer (Highways) prepared a scheme for providing feeder roads to 23 fishing hamlets at a total cost of Rs. 4.39 lakhs as shown below :—

Name of fishing village.	Length of proposed road.		Approximate cost.
	M.	F.	RS.
<i>I. South Arcot District.</i>			
1 Alagankuppam ..	1	0	5,620
2 Vasanankuppam ..	2	0	11,240
3 Kaparikuppam ..	2	0	11,240
4 Eggiakuppam ..	3	6	19,670
5 Jagannathapuram ..	2	0	11,240
6 Kuppam ..	0	6	4,200
7 Ammandaikuppam ..	0	6	4,200
3 Kuppam ..	0	6	4,200
9 Kadarkarai Sembodanarkuppam.	0	6	4,200
10 Thampakkam ..	3	0	16,860
For land acquisition			17,330
			1,10,000
<i>II. Tanjavor District.</i>			
11 Kozhayur ..	3	0	75,000
12 Pillaiperumanallur ..	3	0	30,000
13 Chandrapadi ..	1	0	10,500
14 Vadakkupoyyur ..	3	0	75,000
			1,90,500
<i>III. Ramanathapuram District.</i>			
15 Pudumadam	3	0	20,000
16 Thoppavalasar	1	0	7,000
17 Parappanna Nalasai ..	1	6	10,000
18 Muchuvani	2	0	12,000
19 Chanmivappa Darga ..	1	4	9,000
20 Vedalai and Kanchanvolasa ..	1	0	7,000
21 Pungudi	1	4	3,000
22 Vadakkodu	3	0	15,000
23 Mookaiyur	3	0	55,500
			1,38,500

Of these, only one work, namely, forming a road from Pudukmadam to Mandapam costing Rs. 20,000 is specially included in the Second Five Year Plan of Ramanathapuram district (vide item 15 of the above list). The Chief Engineer represented that as the access roads to be provided for, are purely in the interest of and benefiting the fishing industries, the scheme may have to be implemented only with the aid of special grant.

A further list of fishing hamlets requiring feeder roads was prepared by the department as given below :—

I. Ramanathapuram district.

1. Vedalai to Theedai—Forming a road from Ramnad-Mandapam road to Theedai.
2. Karangadu to Thondi—forming road from Uppurchatram Road (Sethu Rastha) to Karangadu.
3. Tiruppalakudi—Forming road from Ramnad-Tiruvadanai road to Tiruppalakudi village.

II. Salem district.

4. Hogainakkal Chatram to Ootamalli—The existing forest track of about a mile to be metalled.
5. Keerakaranur to Koonandiyur—about 5 miles in length.
6. Kolathur to Pannavadi fish landing centre—about 5 miles in length.

III. Tanjavor district.

7. Arcottu street fishing village to Thopputhurai railway station—Estimated to cost Rs. 1.0 lakh including Rs. 70,000 towards construction of a bridge across Vedaranyam canal.

IV. Tirunelveli district.

8. Anthoor to Punnakayal village, estimated to cost 1.50 lakhs, including construction of four culverts and one causeway.

It is proposed to take up the construction of these feeder roads in collaboration with the Highways Department and the District Collectors.

J. FISHERIES SCHOOLS.

At the beginning of the year the department maintained 617 fisheries schools comprising of 4 high schools, 14 higher elementary schools and 48 lower elementary schools. Of these 64 schools were on the West Coast; and these were transferred to the Fisheries Department of Kerala and Mysore States with effect from 1st November 1956. Thus the Madras State had only three lower elementary fisheries schools at Sathankuppam in Chingleput district, Alambaraikuppam in South Arcot district and at Kaveripatnam in Tanjore district. These schools were continued during the year as per Government sanction granted in G.O. Ms. No. 1326, Agriculture, dated 26th May 1956. The Santhankuppam school had 42 boys

and 44 girls on its roll. In the school at Alambaraikuppam, 66 boys and 30 girls were on the roll. An Adult Literacy School was opened at Sathankuppam on 15th January 1957; and an average of 11 students attended the night classes daily. In the Kaveripatnam school, there were 76 boys and 21 girls. An Adult Literary School with an attendance of 23 continued to function at this centre. A statement of the schools and their staff and strength of students is given in Appendix LXIII.

PART IX—GENERAL.

A. BIOLOGICAL SUPPLY STATION, ENNORE.

The Biological Supply Station at Ennore, near Madras, continued to supply biological specimens to colleges and universities throughout India and in Ceylon. During the year 75 orders were executed, realizing a revenue of Rs. 10,390-10-0 as against 75 orders and revenue of Rs. 9,554 during the previous year.

During the year 37,619 edible oysters were supplied to hotels, clubs and private individuals, realizing a revenue of Rs. 1,234-0-3. The number of oysters sold and receipts obtained last year were 34,940 and Rs. 1,083-13-0.

Sixty-one parties were supplied with 84 maunds of shell grit realising a revenue of Rs. 647-4-9, as against 41 parties, 56 maunds and Rs. 427-7-6 last year.

B. ALL-INDIA FISHERIES CONFERENCE.

The first All-India Fisheries Conference was held at Rajaji Hall, Madras, on 19th and 20th September 1956. All the arrangements for the conference were done by the department in accordance to G.O. Ms. No. 2200, Agriculture, dated 13th September 1956; and these were appreciated by the delegates as well as the Government of India. About 100 delegates representing the various States in India, the Food and Agricultural Organization and the Technical Co-operation Mission, as well as the Norwegian fisheries experts in India participated in the conference. The delegates from Madras were (1) Sri P. P. I. Vaidyanathan, I.C.S., Secretary, Agriculture Department, (2) Sri P. Sivasankaran Pillai, I.A.S., Secretary, Board of Revenue, (3) Sri P. Arumuga Mudaliar, B.A., Deputy Secretary, Agriculture Department, (4) Sri S. Aruldoss, I.A.S., Additional Director of Industries and Commerce, (5) Sri V. John, B.A., Deputy Director of Fisheries (Marine), and (6) Sri S. Varadarajan, M.A., Deputy Director of Fisheries (Inland). The Government were pleased to permit all the gazetted officers of this department to witness the conference.

Shri Sri Prakasa, His Excellency the Governor of Madras, inaugurated the conference at 10.30 a.m. on 19th September. Sri M. Bhaktavatsalam, State Minister for Agriculture and Fisheries, welcomed the delegates. Dr. P. S. Deshmukh, Union Minister for Agriculture, presided over the Conference. Shri M. V. Krishnappa, Union Deputy Minister for Food, was also present.

The conference discussed several phases of the fishing industry and made several recommendations for the proper conservation, development and exploitation of the fisheries resources of the country. The proceedings of the conference has since been published by the Government of India.

A special exhibition was organized by the department on this occasion.

The delegates visited the Madras harbour to see the Pablo type of mechanised boats designed by Mr. Paul Zeiner, F.A.O., Naval Architect, and the new types of fishing gear and equipment demonstrated by Mr. G. S. Ilugason, F.A.O., Fishery Engineer. The delegates visited also the Corporation Cold Storage where fish, meat, fruits and vegetables are stored, and the freshwater aquarium on the Marina.

Dr. P. S. Deshmukh gave a luncheon to the delegates on 19th September 1956 at the Connemara Hotel at Madras. His Excellency the Governor also attended. Sri M. Bhaktavatsalam, Minister for Agriculture and Fisheries, gave a dinner party on 20th at Hotel Oceanic. The Mayor of Madras invited the delegates at a civic reception on 19th September.

A party of 30 delegates visited Mettur Dam to see the various methods employed systematically for exploitation of the fisheries in the reservoir and the marketing of the catches.

C. INDIAN SCIENCE CONGRESS.

The forty-fourth session of the Indian Science Congress held at Calcutta in January 1957 was attended by Sri S. Aruldoss, Additional Director of Industries and Commerce, Sri P. I. Chacko, Assistant Director of Fisheries (Marketing and Information), Sri R. Venkataraman, Superintendent, Fisheries Technological Station, Sri B. Krishnamurthi, Research Assistant. Their deputation was sanctioned in G.O. Ms. No. 60, Food and Agriculture, dated 8th January 1957, G.O. R. No. 40, Public (Special), dated 9th January 1957 and G.O. Rt. No. 1127, Food and Agriculture, dated 24th December 1956. Besides participating in the proceedings of the Congress, they read five papers before the section of Zoology and Entomology. The opportunity was also availed of to meet and discuss fisheries matters with the Central and State Fisheries Officers and to visit the Central Inland Fisheries Research Station, Fisheries Technological Station, deep-sea fishing vessels, fish markets in Calcutta city, lake fisheries at Kanchrapara and Kalyani, sewage irrigated fish farm at Dattabad,, and chank artisans colony near Baghbazaar.

D. CENTRAL FISHERIES RESEARCH COMMITTEE.

Sri P. I. Chacko, Assistant Director of Fisheries, attended the second and third meetings of the Central Fisheries Research Committee of the Government of India in the Ministry of Food and Agriculture, held at Mandapam Camp on 27th and 28th April 1957 and at Calcutta on 16th and 17 January 1957. At both these meetings, Sri Chacko pressed for approval of the Committee for culture of Tilapia in this State with a view to increasing fish production in all inland waters, especially situated in the rural areas. At the third meeting, the Committee agreed to the culture of this fish in peninsular India, fixing river Pennar as the northern limit. This is bound to double the production of inland fisheries in the State during Second Plan period.

E. DEPARTMENTAL OFFICERS' CONFERENCE.

The annual conference of the departmental officers was held at Madras on 11th and 12th July 1957, as approved by Government in their G.O. Ms. No. 1565, Agriculture, dated 22nd June 1956. Sri S. Aruldoss, Additional Director of Industries and Commerce, presided. In the conference, several matters relating to implementation of the schemes included in the Second Five-Year Plan, development of marine and inland fisheries and administrative procedures were discussed.

F. DEPUTATIONS.

Sri P. K. Jacob, Assistant Director of Fisheries, Kozhikode, who was deputed in October 1955 to undergo training in Fish Marketing and Salesmanship in Norway, returned in June 1956 and was posted as Assistant Director of Fisheries (Marine Biology), West Hill.

The Government sanctioned the deputation of Sri S. T. Chari, Assistant Director of Fisheries, Vellore, to Canada for training in Fish Processing under the Colombo Plan in G.O. Ms. No. 513, Food and Agriculture, dated 18th February 1957. He left for Canada in the third week of March 1957.

G. MOTOR VEHICLES.

A list of the motor vehicles owned by the department during the year is given in Appendix LXIV. Of the 27 vehicles on the whole, two vehicles were transferred to Kerala State and another two to Mysore State on 1st November 1956 and consequently the Madras State had only 23 vehicles at the end of the year.

H. FISHING FLEET.

A list of the boats, launches and vessels owned by the department is given in Appendix LXV.

I. GAZETTED OFFICERS.

Including the Personal Assistant to the Additional Director of Industries and Commerce, there were 17 gazetted officers in the department at the end of the year as shown in Appendix LXVI.

J. FINANCE.

The total expenditure and receipts of the department for the year 1956-57 (vide Appendix LXVII for details are as follows) :—

Expenditure.			Receipts.			Profit and loss.		
RS.	A.	P.	RS.	A.	P.	RS.	A.	P.
32,34,530	7	2	28,05,963	13	6	—	5,28,566	9 8
<i>Deduct --</i>								
9,39,479	1	9	..			+	9,39,479	1 9
23,95,051	5	5	28,05,963	13	6		4,10,912	8 1

It will be seen that the total expenditure and receipts was more when compared to the expenditure of Rs. 25,80,063-3-5 and receipt of Rs. 23,23,258-11-8 in 1955-56. The increased expenditure was mainly due to the implementation of the several schemes under the Second Five-Year Plan. The charges on account of supervision, education, welfare, engineering and research schemes came to Rs. 9,39,479-1-9. Deducting this expenditure on purely developmental scheme, the department worked on a profit of Rs. 4,10,912-8-1.

K. GLOSSARY.

A glossary of technical, popular and local names of fishes, prawns, crabs, oysters and sea-weeds mentioned in this report is given in Appendix LXVIII.

C. P. KELU ERADY,

Additional Director of Industries and Commerce, Madras.

APPENDIX I.

METEOROLOGY OF KOZHIKODE COAST.

Month.	Atmospheric		Rainfall, inches.	Humidity per cent.	Current direction.	Wind. direction.
	Temperature.					
°F.						
1956.						
April ..	..	87	73.5	84	N—S	NW—SE
May ..	..	82	71	83	N—S	NW—SE
June ..	..	78	70.5	90.5	N—S	NW—SE
July ..	..	77	71	92.5	N—S	NW—SE
August	..	79.5	72	88.5	N—S	NW—SE
September	..	79.5	72.5	88.5	N—S	NW—SE
October	..	80.5	73.5	88.5	N—S	NW—SE
November	..	81.5	72.5	86.5	S—N	SE—NW
December	..	81.5	72.5	86.5	S—N	SE—NW
1957.						
January	..	80	68.5	79.0	S—N	SE—NW
February	..	83	73.5	85	N—S	SE—NW
March	..	84	74	79	N—S	SE—NW

APPENDIX II.

HYDROGRAPHY OF KOZHIKODE COAST.

Month.			Surface tempera- ture of sea water, average, °C.	Specific gravity average.	pH average.
1956.					
April	..	..	29.6	1.027	8.6
May	..	..	27.45	1.026	8.5
June	..	..	25.65	1.025	8.4
July	..	..	24.0	1.022	8.2
August	..	..	25.1	1.023	8.0
September	..	..	24.95	1.023	8.0
October	..	..	27.2	1.022	8.4
November	..	..	28.5	1.023	8.2
December	..	..	26.7	1.025	8.4
1957.					
January	..	..	27.2	1.025	8.6
February	..	..	28.8	1.027	8.5

APPENDIX III.

PERCENTAGE SIZE FREQUENCY (CM.) OF MACKEREL POPULATION OF MALABAR COAST IN 1956-57.

Months.	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
1956.																					
April	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17	42	21	8	8	4	..
May	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	49	38	8	1	..
June	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40	60	..	..
July	..	..	..	1	..	4	31	13	17	4	2	..	..	12	8	2	..	2	2	1	..
August	..	..	..	..	..	1	6	5	6	6	14	16	7	2	4	6	7	7	16	2	..
September	..	..	..	..	..	..	..	..	5	15	13	6	7	19	18	7	2	3	3	2	..
October	..	..	..	..	..	..	..	..	..	..	1	6	9	19	20	18	8	5	3	3	..
November	..	..	..	1	..	..	..	..	..	..	..	..	..	7	..	4	19	33	28	9	..
December	..	..	..	..	..	..	..	..	..	..	..	..	1	8	32	36	18	4	1	2	0.5
1957.																					
January	..	..	..	..	..	..	..	..	..	..	..	..	..	2	6	22	52	10	1	5	3
February	..	..	..	..	..	..	..	..	..	..	..	..	..	1	7	16	41	31	4	1	1
March	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	40	39	13	..	..

APPENDIX IV.

PERCENTAGE LENGTH FREQUENCY (CM.) OF OIL-SARDINE OF MALABAR COAST IN 1956-57.

Month.	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
1956.																			
April ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	70	..	..	..	..
May ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..
June ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44	31	..	..	..
July ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	47	13	..	..	..
August ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	47	13	..	..
September ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	13	42	16	3
October ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	27	13	3	..
November ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17	38	23	..	..
December ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	4	6	1	..
1957.																			
January ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	3	2	1	..
February ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	2	1	..	..
March ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

No record of landing.

Do.

APPENDIX V.

STATISTICS OF MARINE FISH LANDINGS ON THE WEST COAST IN 1956-57.

Serial number and name of fish.	Total landings on the West Coast (South Kanara and Malabar together) from 1st April to 31st October 1956.		Total landings in Malabar alone from 1st April 1956 to 31st March 1957.	
	(2)	(3)	(4)	(5)
(1)	WEIGHT IN KILOGRAMS.	VALUE IN RUPEES.	WEIGHT IN KILOGRAMS.	VALUE IN RUPEES.
1 Sharks and Dog fish.	559,276	1,24,996	745,224	1,86,178
2 Skates and Rays.	1,225,865	2,47,592	1,450,299	3,07,604
3 Cat fish ..	3,121,488	8,44,521	3,253,157	9,31,494
4 Sabre fish ..	7,908	1,694	15,293	3,286
5 Oil sardine ..	149,163	42,595	12,116,569	21,92,796
6 Other sardines ..	1,584,467	3,88,449	3,238,349	5,90,450
7 Clupea lile ..	542,454	74,505	681,881	1,00,306
8 Dussumieria spp.	239,615	47,072	225,143	34,310
9 Engraulis spp. ..	362,593	35,785	141,852	16,550
10 White bait ..	1,989,246	2,15,923	2,934,018	3,46,565
11 Silver bellies ..	10,128,106	15,07,347	8,955,767	13,97,613
12 Sciaenidae ..	2,623,048	2,98,726	2,428,678	2,84,401
13 Ribbon fish ..	217,310	34,394	144,015	23,997
14 Horse mackerel.	23,163	5,638	72,810	15,649
15 Chamban ..	28,260,084	34,83,978	27,992,270	33,54,443
16 Caranx hippos ..	2,052	245	102,463	13,582
17 Chorinemus spp.	47,185	12,298	58,337	15,675
18 Lactarius ..	8,616	1,896	..	..
19 Pomfret ..	441,930	1,03,463	380,647	95,317
20 Mackerel ..	6,826,907	13,36,407	7,982,350	20,72,476
21 Bonito or Tunny.	3,341,483	1,36,114	242,674	47,959
22 Seer ..	716,608	1,30,227	1,097,515	2,15,931
23 Young grey mullet.	..	..	31,892	6,010
24 Soles ..	7,133,177	11,70,955	3,226,450	8,47,228
25 Butter fish (Neimeen).	560	128	5,073	1,284
26 Indian salmon ..	746	360	746	360
27 Prawns ..	6,805,273	11,59,281	6,061,698	13,22,456
28 Miscellaneous ..	2,771,391	33,09,834	23,632,907	38,46,594
Total ..	104,171,514	1,47,94,323	107,219,077	1,82,70,402

APPENDIX VI.

MONTHLY AVERAGES OF METEOROLOGICAL AND HYDROGRAPHICAL DATA RECORDED AT KRUSADAI, 1956-57.

Month.	Sea water.			Atmosphere.			General condition of weather.				
	Surface temperature C.	Specific gravity.	P — H value.	Current direction.	Maximum temperature F.	Minimum temperature F.	Relative Humidity.	Pressure of air in inches.	Total rain fall in c.c.	Wind directions.	Wind speed in mile per hour.
1956.											
April ..	30.29	1.0231	8.34	W.E.	91.2	82.9	77	29.575	Nil.	S SW	6.55
May ..	29.29	1.0237	8.32	W.E.	90.7	82.4	79	29.883	Nil.	S-SE	8.32
June ..	28.62	1.0242	8.37	E.W.	88.7	79.8	77	29.953	3,000	S-W	7.41
July ..	28.20	1.0243	8.39	W.E.	87.7	79.1	77	29.983	Nil.	S-W	4.82
August ..	28.59	1.0248	8.38	W.E.	87.3	78.9	76	29.984	Nil.	W-SW	5.85
September ..	28.42	1.02457	8.45	W.E.	87.1	78.8	77	29.989	Nil.	S-W	6.71
October ..	28.99	1.0244	8.45	W.E.	86.6	76.9	79	30.029	1,571	S-SW	5.78
November ..	27.74	1.0208	8.45	W.E.	84.2	76.3	85	30.104	5,600	N-E	10.60
December ..	25.91	1.0175	8.40	W.E.	81.7	74.5	85	30.145	2,400	N-E	11.55
1957.											
January ..	25.65	1.0183	8.38	W.E.	82.1	74.5	78	30.135	Nil.	N-E	9.10
February ..	26.56	1.0225	8.40	E.W.	84.1	75.4	81	80.131	60	W-E	5.90
March ..	27.46	1.0224	8.45	E.W.	86.9	76.4	73	30.127	Nil.	E	4.65

APPENDIX VII.

APPENDIX VII.

FISH LANDINGS AROUND RAMESWARAM ISLAND IN MAUNDS,—1956-57.

	April	May	June	July	August	September	October	November	December	January	February	March	Total
<i>Sardinella</i>	631	666	392	265	148	130	83	281	1,255	578	675	1,173	6,277
<i>Dusumieria</i>	381	457	45	22	4	2	1	31	167	312	292	..	1,614
<i>Anchoiella</i>	18	67	41	35	31	6	6	3	35	6	12	40	300
<i>Lactarius lactarius</i>	79	102	35	381	318	311	174	11	52	12	25	..	1,500
<i>Leiognathus</i>	325	1,486	880	1,235	1,003	906	379	41	615	663	534	410	8,477
<i>Sillago sihama</i>	153	197	30	17	5	2	1	2	19	5	8	10	449
<i>Sciæna</i> ..	162	167	47	15	20	18	4	5	..	..	..	..	438
<i>Chirocentrus</i>	863	1,262	957	113	25	49	12	221	297	501	498	269	5,067
<i>Serranus</i>	46	23	..	..	..	..	..	..	79	..	38	..	186
<i>Lutjanus</i>	52	..	10	13	15	18	21	14	10	..	..	..	153
<i>Lethrinus</i>	60	40	8	22	51	49	44	9	..	..	15	..	298
<i>Stromateus</i>	58	146	203	107	32	13	4	5	109	..	16	128	821
<i>Cybbium</i> ..	521	1,547	157	226	120	109	63	98	185	124	368	883	4,401
<i>Caranx</i> ..	265	12	93	112	124	88	69	72	83	84	157	215	1,374
<i>Chorinemus</i>	197	..	9	18	31	20	39	2	87	..	15	..	418
<i>Otolilhus</i>	148	..	13	4	4	3	3	3	37	97	14	..	326
<i>Carcharias</i>	238	1,121	113	248	202	130	102	288	..	425	308	113	3,288
<i>Pristis</i> ..	42	..	..	..	..	..	..	..	..	..	..	..	42
<i>Rhynobatus</i>	86	69	45	296	264	79	67	82	..	351	162	47	1,548
<i>Sphyræna</i>	58	..	..	..	102	73	60	12	..	..	..	..	305
<i>Arius</i> ..	..	..	6	4	9	5	5	3	144	48	56	94	374

<i>Teuthis</i> ..	..	..	5	5	7	5	4	6	..	..	..	..	51
<i>Gerres</i> ..	..	..	3	7	2	2	2	2	..	..	..	..	18
<i>Therapon</i>	..	..	49	52	29	36	17	6	..	..	..	..	189
<i>Upeneoides</i>	..	..	13	2	3	3	2	1	..	..	..	..	24
<i>Chanos chanos</i>	..	..	11	15	5	3	2	..	37	14	18	50	105
<i>Julius</i> ..	..	..	2	3	1	1	1	..	..	..	..	..	8
<i>Rastrelliger</i>	..	..	..	..	9	16	13	7	..	..	..	..	45
<i>Hemirhamphus</i>	..	..	..	..	..	..	1	22	115	54	85	195	471
<i>Mullet</i> ..	..	..	..	..	..	..	..	..	..	..	..	25	25
<i>Miscellaneous species</i>	91	..	134	150	32	26	16	46	45	18	24	32	614
Total ..	4,474	7,162	3,391	3,387	2,597	2,073	1,196	1,279	3,375	3,327	3,326	3,684	39,341

APPENDIX VIII.

STATISTICS OF FISH CAUGHT (IN LB.) FOR THE DEEP SEA UNIT AT PAMBAN, 1956-57.

Name of the fish.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total.
Sharks ..	2,778	960	1,862	2,815	2,638	1,866	984	752	1,026	2,068	185	304	18,238
Pristis ..	2,185	763	6	1,276	2,091	898	75	93	152	1,408	29	..	8,986
Rhynchobatus ..	155	103	53	447	328	57	863	188	170	355	136	..	2,855
Rays ..	1,257	240	876	1,553	782	556	764	606	403	1,386	510	338	9,211
Chirocentrus dorab ..	2,667	4	552	323	228	222	135	582	1,232	953	126	..	7,024
Chorinemus ..	5,232	173	206	139	953	259	16	10	142	36	7	30	7,203
Cybbium ..	1,876	9	702	363	260	76	159	72	32	83	20	..	3,652
Arius ..	825	281	223	416	493	641	403	233	86	349	51	16	4,017
Sphyræna ..	21	..	14	3	..	101	..	15	..	7	2	..	163
Stromateus ..	162	9	53	2	7	14	4	7	..	97	..	..	355
Serranus ..	487	181	22	148	36	561	36	125	43	146	..	..	1,785
Caranx ..	555	114	18	98	137	451	3	3	..	6	..	..	1,385
Hiles ilisha ..	10	..	10	20	..	..	..	..	..	5	..	..	45
Zygeena ..	113	..	..	..	..	..	..	..	..	..	..	..	113
Elacate nigra ..	5	..	2	8	21	39	22	2	..	..	..	..	99
Polynemus ..	6	..	23	27	80	110	30	168	39	3	11	10	507
Chanos Chanos ..	18	..	..	18	..	..	..	..	..	..	..	..	36
Drepane punctata ..	265	43	..	25	106	370	1	1	..	..	4	..	815
Lethrinus ..	..	..	..	7	..	..	..	..	..	..	..	..	7
Lates Calcarifer ..	..	..	..	60	37	58	28	1	..	..	..	..	194

APPENDICES

APPENDICES

Hemirhamphus ..	..	..	..	5	..	..	..	..	..	..	..	..	5
Diagramma ..	..	..	..	271	..	..	..	..	..	..	..	..	271
Sardinella ..	..	..	..	..	47	124	19	..	..	..	..	..	190
Lutjanus ..	..	..	..	..	1,159	..	..	..	..	..	..	..	1,169
Otolithus Ruber ..	..	..	..	..	..	61	..	..	1	..	..	..	62
Rastrelliger Kanagurta ..	..	..	..	..	..	..	73	76	7	..	..	..	156
Scatophagus ..	..	..	..	..	..	..	..	..	..	66	..	..	66
Lactarius lactarius ..	..	..	..	..	..	..	..	..	..	71	..	..	71
Galeocerdo ..	..	..	..	..	..	..	..	..	..	17	..	..	17
Miscellaneous ..	..	40	462	299	375	166	138	213	1,417	548	76	196	4,428
Total ..	19,135	2,920	5,084	8,323	9,778	6,640	3,743	3,147	4,750	7,544	1,157	894	73,115

APPENDIX IX. METEOROLOGY OF THE TUTICORIN BAY.

Months.	Pressure (cms.)			Temperature (°c.)			Humidity percentage.			Wind speed (Kilometer).			Rainfall (cm.)
	Max.	Min.	Aver.	Max.	Min.	Aver.	Max.	Min.	Aver.	Max.	Min.	Aver.	
January	76.642	76.241	76.481	27.78	23.33	25.59	85.0	60.0	73.0	22.5	6.4	12.9	3.2
February	76.495	76.293	76.489	29.4	25.0	27.4	83.0	58.0	72.0	25.7	9.7	13.3	..
March	76.495	76.281	76.439	31.7	26.7	29.0	81.0	61.0	70.0	19.3	6.4	11.3	Drizles.
April	76.398	75.971	76.166	33.9	25.0	30.9	80.0	56.0	68.0	26.7	7.5	15.0	..
May	76.363	75.845	76.124	35.6	28.0	32.5	71.0	37.0	56.0	35.3	6.4	16.4	0.076
June	76.348	76.012	76.186	34.4	26.6	31.3	67.7	52.0	60.0	30.4	8.0	18.0	..
July	76.398	76.019	76.209	34.4	27.7	30.05	64.0	49.0	58.0	32.5	10.0	18.0	..
August	76.403	76.001	76.279	34.4	30.0	32.5	75.0	48.0	62.0	33.0	7.5	18.0	..
September	76.378	75.982	76.258	35.0	28.9	31.1	78.0	48.0	63.0	35.3	6.4	18.1	Drizles.
October	76.450	76.025	76.224	33.3	26.7	29.8	75.0	64.0	70.5	19.3	3.2	9.3	7.44
November	76.799	76.450	76.626	31.1	25.0	28.4	83.0	70.0	78.0	25.7	3.2	12.0	30.124
December	76.799	76.599	76.756	30.0	26.7	28.4	86.0	61.0	76.0	45.0	9.0	18.0	10.64

APPENDIX X

APPENDIX X. SHOWING TEMPERATURE, SPECIFIC GRAVITY, pH AND VISIBILITY OF THE INSHORE WATERS OF THE TUTICORIN BAY.

Months.	Temperature. (°C).					Specific Gravity.				
	Surface.					Bottom.				
	Max.	Min.	Aver.	Max.	Aver.	Max.	Min.	Aver.	Max.	Aver.
January	25.8	24.3	25.04	25.80	24.25	25.6	20.0	23.0	25.6	23.0
February	26.6	23.2	25.3	26.6	23.4	26.0	23.0	25.0	26.0	25.0
March	29.2	25.4	27.7	29.0	25.4	25.5	23.5	24.5	25.5	24.5
April ..	29.4	26.0	28.2	29.3	26.0	25.0	23.5	24.3	25.0	24.3
May ..	29.4	26.8	28.5	29.3	26.75	24.5	23.5	24.0	24.5	24.0
June ..	28.8	27.0	28.0	28.8	27.1	25.0	23.0	24.0	25.0	24.0
July ..	28.5	26.5	27.6	28.6	26.4	24.5	23.0	23.8	24.5	23.8
August	29.0	27.0	28.50	28.9	27.0	25.0	24.0	24.5	25.0	24.5
September	29.1	28.3	28.80	28.95	28.35	25.0	23.0	24.0	25.0	24.0
October	29.8	28.5	28.9	29.8	28.40	25.5	24.5	25.0	25.5	25.0
November	29.5	25.4	27.0	29.4	25.4	24.5	24.0	24.3	24.5	24.3
December	26.5	23.5	25.0	26.45	23.5	23.5	23.0	23.3	23.3	23.0

Months.	pH.					Depth.					Visibility.				
	Surface.					Bottom.					Meter.				
	Max.	Min.	Aver.	Max.	Aver.	Max.	Min.	Aver.	Max.	Aver.	Max.	Min.	Aver.	Max.	Aver.
January	8.4	8.3	8.36	8.4	8.35	8.4	8.35	8.40	4.0	3.7	3.8	1.10	0.50	0.90	0.90
February	8.4	8.3	8.37	8.45	8.30	8.40	8.30	8.40	4.10	3.70	3.90	1.25	0.78	0.98	0.98
March	8.5	8.3	8.4	8.5	8.3	8.4	8.3	8.4	4.00	3.80	3.90	1.30	1.00	1.15	1.15
April	8.5	8.3	8.4	8.5	8.3	8.4	8.3	8.40	4.00	3.75	3.90	1.40	1.05	1.25	1.25
May	8.4	8.3	8.35	8.4	8.30	8.35	8.30	8.35	3.90	3.60	3.75	1.50	1.20	1.35	1.35
June	8.4	8.3	8.35	8.4	8.30	8.35	8.30	8.35	3.90	3.60	3.80	1.50	1.10	1.30	1.30
July	8.4	8.3	8.35	8.45	8.30	8.35	8.30	8.35	3.80	3.50	3.65	1.30	1.00	1.15	1.15
August	8.4	8.25	8.35	8.35	8.25	8.30	8.25	8.30	4.00	3.60	3.80	1.50	1.30	1.40	1.40
September	8.40	8.20	8.30	8.40	8.20	8.30	8.20	8.30	4.00	3.50	3.75	1.60	1.35	1.48	1.48
October	8.55	8.40	8.30	8.50	8.40	8.45	8.40	8.45	4.10	3.8	3.95	2.0	1.1	1.6	1.6
November	8.5	8.2	8.35	8.45	8.30	8.40	8.30	8.40	4.0	3.7	3.85	2.2	1.1	1.7	1.7
December	8.4	8.2	8.3	8.4	8.25	8.35	8.25	8.35	3.8	3.6	3.7	2.4	1.0	1.8	1.8

APPENDIX XI. SHOWING SALINITY, ALKALINITY, DISSOLVED OXYGEN AND CURRENT OF INSHORE WATERS OF THE TUTICORIN BAY.

Months	Salinity o/oo.				Alkalinity mg/L.			
	Sur.		Bot.	Average.	Sur.		Average.	
	Maximum.	Minimum.			Maximum.	Minimum.		
January	31.67	31.45	31.56	31.73	31.45	31.60	70.5	69.8
February	32.63	31.70	32.15	32.70	31.70	32.20	70.5	70.0
March	34.39	32.86	33.45	34.45	32.90	33.54	70.0	69.5
April	34.75	33.00	34.00	34.75	33.10	34.05	70.5	70.3
May	34.95	34.00	34.95	34.95	34.05	34.50	71.5	70.8
June	34.75	34.00	34.40	34.80	34.08	34.45	71.5	70.8
July	34.38	33.90	34.24	34.68	34.00	34.30	72.5	71.0
August	34.45	34.00	34.25	34.75	34.15	34.45	72.5	71.5
September	35.12	34.90	35.00	35.30	35.00	35.15	77.5	77.0
October	36.30	35.90	35.20	36.30	35.90	36.20	70.5	69.0
November	35.10	33.50	34.75	35.10	33.50	34.75	70.5	67.5
December	32.00	29.00	30.00	32.07	29.00	30.10	69.0	68.0

Months	Alkalinity mg/L				Dissolved oxygen ml/L.				Current.	
	Bot.		Sur.	Average.	Bot.		Sur.	Average.	Sur.	Bot.
	Maximum.	Minimum.			Maximum.	Minimum.				
January	71.5	69.5	3.5	3.0	3.25	3.3	3.0	3.20	N-S	N-S
February	70.5	69.5	3.8	3.0	3.3	3.70	3.0	3.35	N-S	N-S
March	70.5	69.0	3.6	2.8	3.2	3.50	2.80	3.15	N-S	W-S
April	70.5	70.0	3.45	2.90	3.30	3.30	2.80	3.15	N-S	N-S
May	71.5	70.0	3.00	2.75	3.85	3.00	2.60	2.80	N-S	N-S
June	71.5	70.5	3.00	2.65	2.75	3.00	2.45	2.70	S-N	S-N
July	72.5	71.0	3.25	2.25	2.55	3.00	2.50	2.70	S-N	S-N
August	72.5	71.5	3.15	2.70	2.95	3.00	2.50	2.80	S-N	S-N
September	77.5	75.0	3.10	2.65	2.80	2.90	2.50	2.75	S-N	S-N
October	70.5	69.0	3.90	3.70	3.80	3.75	3.60	3.70	S-N	S-N
November	71.5	68.5	4.15	3.90	4.05	4.05	3.80	3.90	S-N	S-N
December	69.0	67.5	3.80	3.50	3.65	3.65	3.50	3.55	S-N	S-N

APPENDIX XII.

SHOWING CALCIUM, SILICATE AND PHOSPHATE OF THE INSHORE WATERS OF THE TUTICORIN BAY.

Months.	Calcium—Ca/u. gm. at/L.					Silicate/u. gm. at/L.				
	Sur.			Bot.		Sur.			Bot.	
	Max.	Min.	Av.	Max.	Min.	Max.	Min.	Av.	Max.	Min.
January	11,300	11,030	11,170	11,300	11,040	11,180	11,150	11,180	1,62	0,90
February	11,430	11,110	11,230	11,450	11,120	11,250	11,100	1,70	2,08	1,42
March	11,490	11,170	11,430	11,500	11,200	11,440	11,200	1,92	2,50	1,33
April	11,480	11,200	11,440	11,480	11,200	11,440	11,200	1,88	2,20	1,25
May	11,350	11,200	11,300	11,350	11,200	11,300	11,200	1,80	1,80	1,60
June	11,200	11,150	11,180	11,200	11,150	11,180	11,150	1,65	1,90	1,05
July	11,200	11,050	11,100	11,200	11,050	11,100	11,050	1,20	1,40	1,00
August	11,080	11,000	11,040	11,100	11,000	11,050	11,000	1,50	2,00	1,00
September	11,000	10,980	10,990	11,000	10,980	10,990	10,980	1,86	2,75	1,25
October	11,250	11,120	11,180	11,260	11,120	11,200	11,120	1,50	1,78	1,35
November	11,150	11,080	11,100	11,160	11,100	11,120	11,100	2,80	2,85	2,70
December	11,080	11,000	11,050	11,080	11,020	11,060	11,020	2,75	2,85	2,60

Months.	Silicate/u. gm. at L.					Phosphate—P/u. gm. at/L.				
	Sur.			Bot.		Sur.			Bot.	
	Max.	Min.	Av.	Max.	Min.	Max.	Min.	Av.	Max.	Min.
January	1,65	0,90	1,30	0,158	0,105	0,128	0,105	0,162	0,160	0,105
February	2,10	1,42	1,75	0,210	0,105	0,158	0,105	0,210	0,210	0,105
March	2,50	1,35	1,95	0,189	0,105	0,147	0,105	0,150	0,190	0,105
April	2,20	1,20	1,85	0,175	0,105	0,150	0,105	0,150	0,180	0,105
May	1,80	1,10	1,65	0,125	0,090	0,105	0,095	0,110	0,125	0,095
June	1,90	1,05	1,70	0,138	0,100	0,120	0,100	0,120	0,138	0,100
July	1,50	1,00	1,25	0,105	0,084	0,094	0,090	0,105	0,120	0,090
August	2,00	1,00	1,50	0,180	0,105	0,140	0,105	0,145	0,180	0,105
September	2,80	1,30	1,95	0,205	0,125	0,165	0,130	0,170	0,210	0,130
October	1,80	1,35	1,50	0,0908	0,0900	0,0904	0,0900	0,0904	0,0908	0,0900
November	2,85	2,65	2,75	0,118	0,098	0,106	0,100	0,108	0,125	0,100
December	2,85	2,55	2,70	0,128	0,108	0,118	0,100	0,120	0,130	0,100

APPENDIX XIII.

SHOWING REVIEW OF CHANK MARKING EXPERIMENTS
FROM 1932 TO 1956.

Year.	Good chanks fished.	Under- sized ch. nks fished.	Wormed chanks fished.	Number of chanks marked.	Number recovered in the year.
1932	309,943	62,711	17,016	113	2
1933	309,226	79,971	27,438	485	3
1934	441,520	79,010	26,069	551	15
1935	326,199	68,892	13,187	429	5
1936	323,475	145,081	20,781	511	16
1937	398,782	58,526	6,364	375	25
1938	309,257	37,187	13,256	365	27
1939	363,960	36,578	6,547	387	15
1940	539,662	58,224	7,987	484	63
1941	436,627	47,882	13,509	432	38
1942	495,403	46,113	20,377	499	12
1943	458,894	29,918	46,421	..	..
1944	430,274	29,541	24,500	..	..
1945	268,318	21,033	13,664	600	2
1946	476,302	19,622	13,598	25	4
1947	666	475	120	225	6
1948	683,919	25,859	27,021	140	6
1949	599,103	39,783	28,368	1,796	18
1950	1,034,667	56,826	30,225	54	3
1951	1,83,815	63,345	30,831	1,012	26
1952	681,006	42,025	19,189	..	41
1953	944,666	64,380	30,843	..	62
1954	900,345	83,997	61,438	279	14
1955	1,346,680	28,305	9,987	84	19
1956	1,503,365	32,338	16,838	..	5

APPENDIX XIV.

SHOWING THE NUTRITIVE VALUE OF FRESH-WATER FISHES OF MADRAS.

Name of fish.	Approximate per cent edibility.	Moisture.	Ash.	Fat.	Protein.	Calcium.	Phosphorus.	Iron in mg. in 100 gms.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1 Barbus hexagonolepis ..	..	46.6	1.172	1.158	18.80	0.1290	0.8892	14.860
2 Barbus dubius ..	..	45.16	1.616	2.150	15.92	0.2500	0.4819	5.175
3 Barbus carnaticus ..	..	31.30	1.323	1.00	16.89	0.1788	0.6243	6.201
4 Barbus tor ..	..	48.46	3.929	1.914	14.35	0.2775	0.6092	9.625
5 Cirrhina reba ..	..	36.11	1.227	1.184	19.49	0.2642	0.5334	6.286
6 Cirrhina mrigala ..	..	40.54	1.689	4.176	18.12	1.008	0.7228	9.640
7 Cirrhina latia ..	..	47.78	1.234	1.606	18.22	0.1782	0.5418	7.721
8 Scale carp ..	..	48.97	1.177	2.510	18.11	0.2110	0.5266	5.207
9 Labeo fimbriatus ..	..	19.05	1.052	18.990	17.24	0.2007	0.4794	11.560
10 Labeo kontius ..	..	47.30	1.682	0.991	15.85	0.2748	0.6873	6.274
11 Catla catla ..	..	..	1.924	0.780	17.83	0.1903	0.7661	16.980
12 Scaphiodon brevidorsalis ..	..	..	1.290	4.235	19.09	0.1667	0.2652	10.070
13 Macrones aor ..	..	47.7	1.109	2.482	18.45	0.1401	0.5330	5.067
14 Wallago attu ..	..	40.0	1.449	0.970	18.93	0.1623	0.6039	5.832
15 Mastacembelus ..	..	48.57	1.172	1.797	16.62	0.2083	0.5178	5.632
16 Tilapia mossambica ..	..	44.8	1.464	2.055	19.10	0.2612	0.6369	4.350
17 Opticephalus marulius ..	..	42.5	3.739	1.648	19.42	0.1669	0.4609	9.760

APPENDIX XV.

SHOWING THE NUMBER OF MANDAYS RENDERED BY F.A.O. EXPERTS DURING 1956-57.

Serial number, name of expert and designation.		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	Total.
			April 1956.	May 1956.	June 1956.	July 1956.	August 1956.	September 1956.	October 1956.	November 1956.	December 1956.	January 1956.	February 1956.	March 1956.		
1	Mr. G. S. Illugason ..	23	..	..	..	..	..	14	31	30	31	31	28	31	21	21
2	Mr. Paul Zeiner ..	17	..	..	..	..	..	..	..	..	..	..	24	31	72	72
3	Mr. K. K. Rasmussen ..	17	..	..	..	..	..	..	..	..	..	15	28	31	9	9
4	Mr. G. R. Bjuke ..	..	..	..	..	23	31	30	16	7	12	..	2	7	12	12
5	Mr. C. R. Bjuke ..	..	..	..	..	..	..	..	..	4	12	..	..	4	2	2
Total ..		57	..	..	..	23	31	44	47	41	55	46	82	104	530	530

APPENDIX XVI.

SHOWING FISHING GROUNDS LOCATED IN 1956-57.

Serial number and name of vessel.	Period of fishing.	Fishing ground located.	Type of fish available.	Average catch per day.	Type of tackle employed.
(1)	(2)	(3)	(4)	(5)	(6)
1 M. V. Samudra	.. April 1956	Off Mangalore 12° 46' N.	Shrimps.	LB. 385	40 feet cotton flat trawl.
3 Do.	.. October 1956 to February 1957.	Off Madras— (a) Lat. 13° 10' N Long. 80° 20' E 80° 22' 4" E. (b) Lat. 13° 16' N Long. 80° 22' 3" E 80° 24' 5" E.	Shrimps and miscellaneous fish.	487	40 feet cotton and 45 ft. nylon trawls, without overhand trails.
3 Do.	.. June 1956	SE off Cuddalore light house in 8½-10 fathoms depth.	Perches.	1,000	Do.
4 Danish boat	.. March-May 1956	NE & SE off Pulicat light house in 5-7 and 3-11 fathoms.	Sharks, horse mackerels and barracuda.	550	Nylon set gill nets of 3 and 6 inches straight mesh—10 numbers.
5 Steel Dory No. II and Danish Boat No. II.	March-May 1957	Palk Strait— Lat. 9° 19' N 9° 22' N. Long. 79° 22' E 79° 25' E.	Leather jackets, barracuda and ribbon fish.	825	Nylon set gill nets.
6 Steel Dory No. I	.. March-April 1957.	Palk Strait— (a) Lat. 9° 19' N Long. 79° 17' 2" E 79° 18' 5" E (b) Lat. 9° 18' 3" N 9° 02' 5" N Long. 79° 17' E 79° 23' 3" E.	Silver bellies.	2,300	Larsen wing trawl.

APPENDIX XVII.

SHOWING DETAILS OF WORKING OF T.C.A. AND F.A.O. FISHING VESSELS IN 1956-57.

Name of fishing vessel.	(1)	Number of days engaged in fishing.	(2)	Quantity of fish caught.	Amount realised.			Expenditure incurred in fishing operation.	Remarks.
					(3)	(4)	(5)		
				LB.	RS.	A.	P.		(6)
T.C.A. vessels—									
M.F.V. Samudra ..	..	..	222	87,327	18,043	11	9	10,189 10 0	
M.F.V. Sardinella ..	..	..	123	23,963	4,066	11	6	6,673 5 0	
M.F.V. Meenakshi ..	..	..	143	13,334	3,889	9	9	5,270 10 0	
M.F.V. Gudjon ..	..	..	60	12,510	734	12	0	12,062 12 0	
Dan Boat ..	..	..	39	19,070 *	279	10	0	Nil.	* Relates to 14 per cent share.
F.A.O. boats—									
Danish boat I ..	..	..	147	33,142	† 914	14	3	Nil.	† 14 per cent share.
Danish boat II ..	..	..	133	26,230	† 1,012	13	0	Nil.	† 14 per cent.
Steel Dory No. I ..	..	..	37	52,702	§ 2,733	11	6	888 0 0	§ Relates to 50 per cent.
Steel Dory No. II ..	..	..	11	5,530	|| 45	5	9	..	|| Share 50 per cent.

APPENDIX XVIII.

SHOWING PARTICULARS OF FISHERMEN CANDIDATES TRAINED IN THE TRAINING CENTRE AT TUTICORIN IN 1956-57.

Serial number and name in full.	Father's name.	Address in full.			Age.	Educational qualification.	See and fishing experience	
		(1)	(2)	(3)				
								(4)	(5)	(6)
First Batch of Trainees.								
1 Selvaraj ..	..	..	Muthumanikam Chettiar	..	Tiruvannaiyoor Post, Adyar, Madras-20.	19	V Standard	5
2 Thangasamy ..	..	..	Govindasamy Chetty ..	..	No. 12, Muniappa Chetty Street, Rayapuram, Madras.	23	VI Standard	10
3 M. Raman ..	..	..	K. Manickasamy Chettiar	..	19, Corporation Model Line, Rayapuram, Madras.	21	V Class ..	5
4 T. V. Swaminathan ..	..	..	T. M. Venugopal Chettiar	..	Tiruvannainkuppam, Adyar, Saidapet taluk, Madras.	34	III Form	12
5 G. Maridoss ..	..	..	S. Gnanapragasam ..	..	52, 3rd Line, Domminkuppam, Santhome, Mylapore.	23	II Form ..	10
6 E. Narayanan ..	..	..	Ethiraj Chettiar	..	Odarikuppam, Tiruvannaiyam Post, Madras-20.	22	III Form	8
7 Nainiappan ..	..	..	Murugappa Nadar	..	Akkarapettai, Nagapattinam ..	24	IV Form	5
8 N. Arumugam ..	..	..	Narayanasaamy Chettiar	..	Do.	23	II Form ..	5
9 B. Vincent ..	..	..	Baratha home ..	..	43, Emperor Street, Tuticorin ..	24	S.S.L.C. ..	5
10 S. Rajendran Fernando ..	..	..	Sesai Michel Fernando	..	Kootapuli (via) Panagudi ..	28	VIII Standard	10
11 S. Benjamin Machado ..	..	..	Thomiah Fernando	..	Palayakayal, Ratchanyapuram, Srivakuntam taluk	26	II Form ..	9
12 Theresa Paul Pandian ..	..	..	Sripala Nadar	..	Thamvaikulam Post, Kovilpatti taluk, Tirunelveli district.	27	V Form ..	10
13 Joseph Gaspar Fernando.	..	..	Isaac Fernando	..	St. Antony Street, Manaiapad ..	22	II Form ..	5
14 Santheram Fernando ..	..	..	Devadasan Fernando	..	41, Mookanadar Compound, George Road, Tuticorin.	23	I Form ..	5

APPENDIX XVIII—cont.

SHOWING PARTICULARS OF FISHERMEN CANDIDATES TRAINED IN THE TRAINING CENTRE AT TUTICORIN IN 1956-57—cont.

Serial number and name in full.	Father's name.	Address in full.	Age.	Educational qualification.	Sea and fishing experience.
(1)	(2)	(3)	(4)	(5)	(6)
YEARS.					
<i>First Batch of Trainees—cont.</i>					
15 C. Peter Fernando	..	Sinhathurai Fernando	..	..	6
16 T. I. Michael	..	Thommai Innasi	..	..	15
17 Antony Bencilas	..	Antony ..	..	..	12
18 Alphouse Mastin	..	Eswaminai	..	..	8
19 J. Carlos	..	Joris Antony	..	..	5
20 M. Leon	..	Michael ..	..	..	5
<i>Second Batch of Trainees.</i>					
1 Rayappan Fernando	..	Arulanandam Fernando	..	..	11
2 Thomas Fernando	..	Gnanapragasam Fernando	..	..	8
3 Emiliyan Fernando	..	S. Manuel Fernando	..	..	6
4 Antony Marian Fernando	..	Michael Antony Fernando	..	..	7
5 T. I. Jesiah	..	Thommai Innasi	..	..	10
6 A. Imilaya Raj Fernando	..	C. Antony Fernando	..	..	6
7 Dradysian Fernando	..	Maria Innasi Fernando	..	..	15
8 Balthasar	..	Pelisan ..	..	..	10

9 Jelastin Cruz	..	S. Cruz	..	..	12
10 Nagasamy	..	Seenai ..	..	..	9
11 O. Michel Fernando	..	Devassagayam Cruz	..	..	10
12 T. Rajierkaniyalan	..	Diego Fernando	..	..	6
13 Soosimanikam Fernando	..	T. Savari Pichai Fernando	..	..	10
14 T. Cyrilvillavanayer	..	M. Thangaiyah Fernando	..	..	5
15 M. Quintin Victoria	..	Michael Antony Victoria	..	..	14
16 X. N. Dasan Silva	..	K. Muniandy ..	..	..	7
17 M. Muniandy	..	B. Antony Cruz Nadar	..	..	5
18 A. Alangarasamy	..	Murugesan ..	..	..	15
19 M. Kumaravelu	..	Kuttiandy ..	..	..	1
20 J. Jeyapalan	..	..	..	..	5

APPENDIX XIX.

SHOWING DETAILS OF FISH CATCHES OBTAINED IN PABLO BOATS
BY THE FISHERMEN TRAINEES OF TUTICORIN TRAINING
CENTRE.

Particulars and months.	Number of days operated.	Weight of fish caught.	52 per cent of catches to the Department.	48 per cent of catches to the trainees.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
			RS. A. P.	RS. A. P.	RS. A. P.
Pablo Boat No. I—					
November 1956 ..	8	550	68 7 0	63 2 0	131 9 0
December 1956 ..	22	8,908	763 15 10	705 2 2	1,469 2 0
January 1957 ..	21	5,440	598 11 6	552 7 9	1,151 3 3
February 1957 ..	11	1,351	186 14 9	172 6 0	359 4 9
	62	16,249	1,618 1 1	1,493 1 11	3,111 3 0
Pablo Boat No. II—					
December 1956 ..	14	2,370	318 11 9	294 0 0	612 11 9
January 1957 ..	23	5,875	633 2 3	584 1 9	1,217 4 0
February 1957 ..	11	1,847	220 3 9	203 2 9	423 6 6
	48	10,092	1,172 1 9	1,081 4 6	2,253 6 3

APPENDIX XX.

SHOWING EQUIPMENTS RECEIVED UNDER T.C.M. PROJECTS.

Serial number and name of the equipment.	Quantity received.	Date of receipt.	Utilization.
<i>T.C.M. 1952 Project.</i>			
1 Reel Gill net boat 'Samudra'.	1	10th May 1955.	Conducted exploratory fishing both in east and west coast. Allotted to Kerala State.
2 Ring net boat 'Sardinella'.	1	1st May 1955	Engaged in exploratory work off Palk Bay and Tuticorin. Allotted to Mysore State.
3 Reel Gill net 'Meenakshi'.	1	Do.	Do.
4 Purse Seiner 'Gudjon'.	1	29th May 1955.	Engaged in Trawl fishing. This has been allotted to Mysore State and will be transferred as soon as the Purse Seine Technicians arrive.
5 Petter AV2 Diesel engines 10 H.P.	10	..	All the ten engines have been fitted in the Pablo boats.
6 Mustad Hooks ..	3,98,000	7th May 1954.	There is a stock of 2,62,490 at Madras. There is no demand from the fishermen for 1/10 and 2/0 hooks which form the major portion of the stock. Maritime states have been addressed for their exchange.
7 Insulated vans ..	3	27th May 1954.	None of the vans are now in this State. They are now in Kerala, Mysore and Andhra States.
8 Lampara Seine nets.	2	24th June 1954.	Webbings of one of the nets have been used departmentally. Other webbings are in stock. Government have been addressed for their disposal.
9 Cotton bouy lines ..	67 units.	18th June 1954.	Used up completely in fishing operations.
10 Line hauler ..	1	Do.	To be fitted in departmental boat.
11 Nylon twine ..	4,000 lb.	13th July 1954.	Major portion of the stock used departmentally.
12 Nylon nets ..	12	4th October 1954.	Used in departmental operations.
13 Flat trawl work otter boards.	2 sets.	5th August 1954.	The nets have been used from T.C.M. vessels.
14 Trolling wire ..	100 lb.	26th May 1954.	Being used at the Training Centres at Tuticorin.
15 Ice plant (5 ton ice plant and 15 ton cold storage).	1	April to August 1955.	This is to be installed at Tuticorin. Government have sanctioned the construction of the building to house this plant.
16 Purse Seine ..	1 set ..	25th January 1957.	Used by Mr. Illugason in his experimental fishing operations.

APPENDIX XX—*cont.*SHOWING EQUIPMENTS RECEIVED UNDER T.C.M. PROJECTS—*cont.*

Serial number and name of the equipment.	Quantity received.	Date of receipt.	Utilisation.
<i>T.C.M. 1954 Project.</i>			
17 Ice plant (5 ton with 15 ton cold storage capacity).	1	July 1955 to December 1956.	This is to be installed at Mottur Dam. Government have sanctioned the construction of the building to house this plant.
18 Insulated containers.	20	May 1955 ..	These are found to be heavy for transport of fish in fresh condition. Government have been addressed for their disposal to local merchants for preservation of fish.
19 Dan boat	1	28th December 1955.	Conducted experimental fishing. Transferred to Mysore State on 1st November 1956.
20 Yan Mar Marine Diesel engine 11 h.p.	1	3rd August 1955.	Being utilized at the Training Centre at Tuticorin.
21 Dauja Marine Diesel engine 11 h.p.	1	8th December 1956.	Will be fitted in the Pablo boats under construction.
22 Winches—Multipurpose winches and long line winches.	2 units each.	2nd May and 18th December 1956.	Being used in the Tuticorin Training Centre boats.
23 Saving from 1954 Project— Coventry Marine Diesel engine 10 h.p.	10	26th February 1957.	Being utilized in the Pablo boats.

APPENDIX XXI.

FISH-SEED COLLECTION CENTRES IN THE RESIDUARY
MADRAS STATE.

Name of the centre.	Kind of fish-seed available.	
<i>Vellore division.</i>		
<i>Chingleput district—</i>		
1 Palar river	Cirrhina and Barbus sp.	
2 Poondi reservoir	Murrels.	
3 Buderu tank	Gourami.	
4 Sathiavedu nursery	Do.	
5 Tirupporur backwaters	Mullet.	
6 Cheyyar river	Cirrhina and Barbus sp.	
7 Chunampet	Chanos.	
8 Ennore backwater	Mullet and Gobius.	
<i>North Arcot district—</i>		
9 Tiruvannamalai	Murrel	
10 Vellore moat	Murrel and Etroplus.	
<i>South Arcot district—</i>		
11 Portonovo	Mullet and Etroplus	
12 Veeranam tank and channels	Etroplus, Cirrhina and Barbus sp	
13 North Rajan Lower Anicut	Labeo sp, Murrel.	
<i>Tanjore Division.</i>		
<i>Tanjore district—</i>		
14 Vonnar Vettar Regular	Labeo, Cirrhina, Barbus and Cat	
15 Rajagiri		
16 Mudikondan		
17 Cauvery-Arasalar Dam		
18 Kora vaikal		
19 Chakkottai		
20 Nanancheri		
21 Tirukkattupalli		
22 Tiruvelangadu		
23 Mandai		
24 Kadagambadi		
25 Puttar-Valappan Head		
26 Koradaocheri		
27 Mulliar Head		
28. Korayar Head		
29 Harischandranadi		
30 Serankulam		
31 Nettamadugadi		
32 Kallukudi		
33 Nasunniar		
34 Vettikadu		
<i>Tiruchirappalli district—</i>		
35 Grand Anicut		
36 Chintamani Swamp		
37 Vattalai		
38 Marudur		
39 Kulittalai		
40 Mayanur		
41 Pettai-Vattalai		

APPENDIX XXI—cont.

FISH-SEED COLLECTION CENTRES IF THE RESIDUARY
MADRAS STATE—cont.

Name of the centre.	Kind of fish-seed available.
<i>Madurai Division.</i>	
42 Kodaikanal Lake	Golden Carp.
43 Madurai	Tilapia, Murrel.
<i>Ramanathapuram district—</i>	
44 Pamban	Chanos.
45 Virudhunagar	Tilapia.
46 Kilakarai	Chanos.
<i>Tuticorin Division.</i>	
<i>Tirunelveli district—</i>	
47 Tuticorin	Chanos.
48 Kadamba tank	Etroplus, Murrels, Cirrhina sp.
49 Srivaikuntam	Eels.
50 Kruvithurai	Chanos, Etroplus.
51 Jesu Krusadai	Chanos.
<i>Mettur Dam Division.</i>	
52 Bhavani	Fry and fingerlings of carps.
53 Bhavamsagar Reservoir	Do.
<i>Nilgiris district—</i>	
54 Ootacamund	Mirror Carp, Golden Carp Tench.
55 Katteri Upper Reservoir	Mirror Carp.
56 Pykara Reservoir	Do.
<i>Salem district—</i>	
57 Mettur Dam area	Labeo, Cirrhina, Catla, Barbus.
58 Hogainikal	Do.

APPENDIX XXII.

STATEMENT OF INTENSIVE SEED COLLECTION AND DISTRIBUTION IN THE MADRAS STATE DURING 1956-57.

Division.	Target fixed (in lakhs).	Fish seed collected.			Fish seed distributed and stocked.					Kept in nurseries.
		Collected.	Received.	Total.	In departmental waters.	In provincialized waters.	Supplied to other officers.	Supplied to private parties.	Mortality.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Madurai	20	3,134,800	42,143	3,176,943	422,812	2,034,056	351,742	259,900	70,311	38,122
Vellore	20	2,738,361	394,130	3,132,551	617,250	2,301,967	11,468	60,548	134,937	6,381
Tuticorin	20	2,048,187	180,601	2,228,788	78,717	1,933,924	852	14,447	123,432	77,416
Mettur Dam	70	9,902,926	13,428	9,916,354	1,879,146	7,249,762	345,182	25,120	410,020	7,124
Madras	5	241,610	4,085	245,695	28,045	44,357	125,500	4,552	10,797	32,444
Tanjavoor	150	16,436,762	..	16,436,762	454,962	1,479,202	755,991	83,345	273,232	77,206
	300	34,502,646	634,447	35,137,093	3,480,932	28,356,092	1,590,735	447,912	1,022,729	238,693

APPENDIX XXIII.

STATEMENT OF KIND-WAR FISH SEED COLLECTED IN THE MADRAS STATE DURING 1956-57.

Division.	Cirrhina.	Labeo.	Barbus.	Catla.	Chanos.	Bhavani carps.	Mirror carps.	Mullets.	Palar carp.	Tilapia.	Ekroplus suratensis.	Eels.	Gourami.	Murels.
Madurai ..	..	..	..	..	14,73,456	..	..	5,50,550	..	6,50,810	2,01,045	..	..	2,58,939
Vellore ..	..	..	..	..	10,110	..	..	79,800	17,21,116	..	11,696	..	482	9,15,957
Tuticorin ..	80	..	..	..	9,24,965	..	..	5,71,945	..	2,780	2,70,225	2,19,242	..	..
Mettur Dam ..	24,22,070	7,33,986	5,38,298	..	..	60,81,200	63,000	..	..	..	1,770	..	..	..
Madras ..	..	..	..	..	..	..	..	75,599	..	..	10,827	..	..	..
Tanjavoor ..	97,89,897	65,63,299	..	21,907	52,161	..	..	..	..	..	..	..	..	..
	122,12,047	73,47,285	5,38,298	21,907	28,74,876	60,81,200	63,000	12,77,094	17,21,116	6,53,540	4,95,563	2,19,242	482	11,96,996

APPENDIX XXIV.

APPENDIX XXIV.

STATEMENT SHOWING THE DISTRIBUTION OF GOVERNMENT LONG-TERM LOANS DURING 1956-57.

Serial number and name of the Fishermen Co-operative Society.	(1)	Division.	(2)	Amount of loan sanctioned.	(3)	Amount of loan drawn.	(4)	Number of members benefited by the scheme.	(5)
				RS.		RS.			
1 Ennore Fishermen Co-operative Society	..	..	..	20,000-00	..	20,000-00	..	40	..
2 Thiruvottiyoar Fishermen Co-operative Society	..	..	..	22,000-00	..	22,000-00	..	65	..
3 Kaimeedu Fishermen Co-operative Society	..	..	..	18,000-00	..	18,000-00	..	36	..
4 Mattankuppam Fishermen Co-operative Society	..	..	..	20,000-00	..	20,000-00	..	40	..
5 South Madras Fishermen Co-operative Society	..	..	..	15,700-00	..	..	..	..	..
6 Madras Fishermen Co-operative Federation	..	..	..	2,000-00	..	2,000-00	..	..	..
7 Mettur Dam Fishermen Co-operative Marketing Society, Limited.	..	..	..	15,500-00	..	15,500-00	..	118	..
8 Eripurakara Sea Fishermen Co-operative Society	..	..	..	10,000-00	..	10,000-00	..	22	..
9 Karaiyoar Sea Fishermen Co-operative Society	..	..	..	11,050-00	..	11,050-00	..	36	..
10 Kodaikarai and Kodaikadu Fishermen Co-operative Society	..	..	..	11,200-00	..	11,200-00	..	37	..
11 Nambiaraiyar Fishermen Co-operative Society	..	..	..	14,125-00	..	14,125-00	..	50	..
12 Akkaraipettai Fishermen Co-operative Society	..	..	..	10,725-00	..	4,075-00	..	16	..
13 Tanjore District Fishermen Co-operative Federation	..	..	..	2,000-00	..	2,000-00	..	..	..
14 Mandapam Fishermen Co-operative Society	..	..	..	16,000-00	..	16,000-00	..	32	..
15 Irumeni Fishermen Co-operative Society	..	..	..	13,250-00	..	13,250-00	..	30	..
16 Athankarai Fishermen Co-operative Society	..	..	..	12,000-00	..	11,000-00	..	22	..
17 Pamban Fishermen Co-operative Society	..	..	..	13,400-00	..	13,400-00	..	44	..
18 Pudumadam Fishermen Co-operative Society	..	..	..	10,350-00	..	9,850-00	..	41	..
19 Ramnad District Fishermen Co-operative Federation	..	..	..	2,000-00	..	2,000-00	..	..	..

20 Kilvaippar Fishermen Co-operative Society	..	..	..	12,000-00	..	12,000-00	..	54	..
21 Punnakayal Fishermen Co-operative Society	..	..	..	12,550-00	..	12,550-00	..	62	..
22 Overy Fishermen Co-operative Society	..	..	..	12,000-00	..	12,000-00	..	46	..
23 Periahalai Fishermen Co-operative Society	..	..	..	12,000-00	..	12,000-00	..	32	..
24 Ezhudeyan Fishermen Co-operative Society in Kanyakumari	..	..	..	3,000-00	..	3,000-00	..	9	..
25 Tirunelveli District Fishermen Co-operative Federation	..	..	..	2,000-00	..	2,000-00	..	..	..
26 Chingleput Inland Fishermen Co-operative Society	..	..	..	1,000-00	..	1,000-00	..	..	..
				2,93,850-00		2,70,000-00		832	

APPENDIX XXV.

SHOWING NUMBER OF DIVERS REGISTERED FOR CHANK
FISHERY IN 1956-57.

1 Tuticorin	240
2 Periapattanam	172
3 Kilakarai	164
4 Tiruppalakudi	28
5 Karangadu	2
6 Devipattanam	1
7 Vedalai	19
8 Pamban	1
9 Mankkudu	1
10 Pudupattanam	4
11 Akkalmadam	1
12 Mandapam	1
13 Rameswaram	7
14 Ahamadpuram	1
15 Sudukkottanpatty	1
16 Kankollanpattinam	3
17 Patnamarudur	1
18 Kodiapattanam	43
19 Kodimunnai	17
20 Colachel	21
21 Kurumpanai	4
22 Muttam	1
Total	<u>733</u>

APPENDIX XXVI.

STATISTICS OF CHANKS FISHED OFF TIRUNELVELI COAST
IN 1956-57.

Name of chank bed.	Number of full-sized chanks.	Number of under-sized chanks.	Number of wormed chanks.
(1)	(2)	(3)	(4)
1 Kathithirakai	3,429	190	535
2 Saithanbathu par	19,239	812	1,099
3 Goduthu par	630	40	128
4 Kanamaram pidika par	466	47	92
5 Vadai Thundan	1,75,243	12,941	8,884
6 Arumugam par	1,927	145	354
7 Nagan par	1,855	146	381
8 Melanbathu par	95,019	2,341	2,453
9 Janaihu par	35,043	1,206	1,041
10 Siluvai par	13,044	671	571
11 Kadian par	4,896	3,321	316
12 Vailai Thundan par	46,239	3,796	2,227
13 Aluva par	39,842	1,798	849
14 Patharai par	29,771	1,400	1,092
15 Devi par	8,685	169	352
16 Athanbathu par	1,32,468	7,427	4,030
17 Pulipoondi par	19,643	581	632
18 Vetrakal par	5,891	430	199
19 Thollaiumpar	13,200	189	715
20 Kollamuthi par	8,604	231	796
21 Rajavuku chippi chouthitha par	2,212	28	169
22 Karuval	355	5	50
23 Saithu Thondan	2,548	125	422
Total	<u>6,60,869</u>	<u>35,045</u>	<u>27,387</u>

APPENDIX XXVII.

TRANSACTIONS IN THE FISH-CURING YARDS OF THE EAST COAST DURING 1956-57.

Name of yard.	(1)	(2)	MS. SRS.	(4)	Salt consumed.	(6)	Value of salt realized.	(8)	MS. SRS.	(9)	Fish let out.
Tirunelveli district—											
1 Perialalai	..	53	152 00	300 00	322 00	130 00	212 8 0	1,877 06		1,196 11	
2 Ovari	..	551	1,363 00	4,650 00	4313 10	1,699 30	3,790 10 0	20,156 37		14,068 18	
3 Idinthakalai	..	858	1,608 00	7,120 00	7,704 30	1,023 10	7,631 9 0	32,877 30		24,748 13	
4 Kottapulli	..	74	524 00	600 00	676 00	200 00	633 12 0	2,842 27		2,098 16	
Ramanathapuram district—											
5 Attankarai	..	511	198 00	1,368 00	1,060 30	505 10	3,013 8 6	4,255 28		3,139 38	
6 Mookur	..	301	135 35	2,320 00	2,389 15	164 20	....	14,258 11		8,531 11	
Tanjore district—											
7 Arcotthurai	..	243	43 10	350 00	275 30	117 20	260 10 0	1,104 25		830 38	
8 Muthupet	..	980	189 00	2,000 00	1,962 25	225 15	1,828 2 0	10,665 20		7,421 08	
9 Adirampatnam	..	740	324 30	800 00	968 30	156 00	970 0 0	4,770 15		3,499 37	
Chingleput district—											
10 Kadappakam	..	364	194 00	700 00	630 00	146 20	628 7 0	2,951 10		2,466 25	
11 Sathankuppam	..	518	128 30	900 00	834 00	155 20	858 14 6	5,346 45		3,323 10	

APPENDICES

APPENDIX XXVIII.

STATEMENT SHOWING FISH-CURED AND REMOVED, SALT CONSUMED, PRICE REALIZED, ETC., FROM THE FISH-CURING YARDS IN KANYAKUMARI DISTRICT FROM 1ST NOVEMBER 1956 TO 31ST MARCH 1957.

Name of the fish-curing yards.	(1)	Quantity of fish cured. MDS.	(2)	Fish removed. MDS.	SRS.	(3)	Salt consumed. MDS.	(4)	Price realized. RS. A. P.	(6)	Miscellaneous collections. RS. A. P.	(7)	Total. RS. A. P.
1. Cape Comorin	..	..	10,990	8,264 0	1,956	1,283 10 0	57 12 0	0 12 0	57 12 0	404 4 0	2,074 3 0	57 12 0	404 4 0
2. Muttam	..	..	348	246 0	88	404 4 0	28 14 0	490 10 0	404 4 0	28 14 0	490 10 0	404 4 0	28 14 0
3. Kadiapatnam	..	..	2,724	1,829 0	616	490 10 0	590 19 0	3,155 11 0	490 10 0	590 19 0	3,155 11 0	490 10 0	590 19 0
4. Colachel	..	..	264	184 32	44	2365 2 0	0 12 0	2365 2 0	2365 2 0	0 12 0	2365 2 0	2365 2 0	0 12 0
5. Thoothur	..	..	5,250	4,198 0	900	14,721 32	3,604	19,576	14,721 32	3,604	19,576	14,721 32	3,604
Total	..	..	19,576	14,721 32	3,604	2,365 2 0	0 12 0	2,365 2 0	2,365 2 0	0 12 0	2,365 2 0	2,365 2 0	0 12 0

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* (The sum of Rs. 789-13-0 includes a security deposit of Rs. 100 received from the merchants for taking on rent the store rooms at Cape Comorin).

APPENDIX XXIX.

LIST OF FISH-CURING YARDS IN THE MADRAS STATE DURING
1956-57.

1. South Kanara Division.

1	Tharpathi	..	..	..	Petty Yard Officer.
2	Marwanthe	..	..	..	Do.
3	Gangoli	..	..	..	Sub-Inspector.
4	Ilungarcutta	..	..	..	Do.
5	Malpe	..	..	..	Do.
6	Udiavar	..	..	..	Do.
7	Polippu	..	..	..	Petty Yard Officer.
8	Kaup	..	..	..	Do.
9	Moolki	..	..	..	Do.
10	Hosabettu	..	..	..	Do.
11	Baikampadi	..	..	..	Do.
12	Thannirbhavi	..	..	..	Do.
13	Bukapatnam	..	..	..	Do.
14	Mangalore	..	..	..	Do.
15	Ullal	..	..	..	Sub-Inspector.
16	Manjeshwar	..	..	..	Petty Yard Officer.
17	Kumbal	..	..	..	Do.
18	Adakathabail	..	..	..	Do.
19	Kizhur	..	..	..	Do.
20	Bekal	..	..	..	Do.
21	Hosdrug	..	..	..	Sub-Inspector.
22	Poonjavi	..	..	..	Petty Yard Officer.
23	Thaikadapuram	..	..	..	Do.

2. Malabar Division.

24	Palacode	..	..	..	Petty Yard Officer.
25	Madai	..	..	..	Sub-Inspector.
26	Mattool	..	..	..	Petty Yard Officer.
27	Azhikode	..	..	..	Do.
28	Cannanore	..	..	..	Sub-Inspector.
29	Edakad	..	..	..	Petty Yard Officer.
30	Tellichery	..	..	..	Sub-Inspector.
31	Thalay	..	..	..	Petty Yard Officer.
32	Madaaskara	..	..	..	Do.
33	Madapalli	..	..	..	Do.
34	Badagara	..	..	..	Sub-Inspector.
35	Melati	..	..	..	Petty Yard Officer.
36	Quilandy	..	..	..	Sub-Inspector.
37	Elathur	..	..	..	Petty Yard Officer.
38	Padiappa	..	..	..	Do.
39	Kozhikode	..	..	..	Sub-Inspector.
40	Naduvattam	..	..	..	Peon.
41	Beypore North	..	..	..	Do.
42	Beypore South	..	..	..	Petty Yard Officer.
43	Kadalundi	..	..	..	Do.

APPENDIX XXIX—cont.

LIST OF FISH-CURING YARDS IN THE MADRAS STATE DURING
1956-57—cont.

2. Malabar Division—cont.

44	Parappanangadi	..	..	..	Sub-Inspector.
45	Tanur	..	..	..	Do.
46	Pudiyakadapuram	..	..	..	Petty Yard Officer.
47	Paravanna	..	..	..	Do.
48	Kottayi	..	..	..	Do.
49	Ponnani	..	..	..	Sub-Inspector.
50	Puduponnani	..	..	..	Petty Yard Officer.
51	Veliangode	..	..	..	Do.
52	Palapetty	..	..	..	Sub-Inspector.
53	Mannalamkunnu	..	..	..	Petty Yard Officer.
54	Edakanzhiyur	..	..	..	Do.
55	Puthankadapuram	..	..	..	Do.
56	Blangad	..	..	..	Do.
57	Kadapuram	..	..	..	Sub-Inspector.
58	Vadanapally	..	..	..	Petty Yard Officer.
59	Nattika	..	..	..	Do.
60	Kodumbi	..	..	..	Peon.
61	Karimpuram	..	..	..	Petty Yard Officer.

3. Vellore Division.

62	Sathankuppam	..	..	..	Petty Yard Officer.
63	Kadapakkam	..	..	..	Do.

4. Tanjore Division.

64	Adirampatnam	..	..	..	Petty Yard Officer.
65	Muthupet	..	..	..	Do.
66	Arcoth Thurai	..	..	..	Do.

5. Madurai Division.

67	Attankarai	..	..	..	Petty Yard Officer.
68	Mookur	..	..	..	Do.

6. Tuticorin Division.

69	Ovari	..	..	..	Petty Yard Officer.
70	Periathalai	..	..	..	Do.
71	Idinthakarai	..	..	..	Do.
72	Kotapuli	..	..	..	Do.
73	Colachel	..	..	..	Sub-Inspector.
74	Cape Comorin	..	..	..	Do.
75	Muttom	..	..	..	Do.
76	Kadiapatnam	..	..	..	Do.
77	Thoothur	..	..	..	Do.

Number of fish curing yards in the State at the beginning of the year. 72

Number of fish curing yards transferred to Mysore State .. 15 (Nos. 1-15)
Do. Do. Kerala State .. 46 (Nos. 16-61)
Do. added to Madras State from former Travancore-Cochin. 5 (Nos. 73-

Number of fish curing yards in the residuary Madras State at the end of the year. 16

Yards under Sub-Inspector
Do. Petty Yard Officer.. .. .

APPENDIX XXX.

LIST OF SHARK LIVER OIL EXTRACTION CENTRES IN
MADRAS STATE, 1ST APRIL TO 31ST OCTOBER 1956.

WEST COAST.

I. Mangalore.

1 Gangolli.	9 Ullal.
2 Hungarcutta.	10 Manjeswar.
3 Malpe I.	11 Kumbha.
4 Polippu.	12 Addkathbail.
5 Kaup.	13 Kizhur.
6 Moolky.	14 Bekal.
7 Baikampadi.	15 Hosdrug.
8 Mangalore.	

II. Malabar.

16 Palacode.	31 Beypore South.
17 Madai.	32 Kadalundy.
18 Mattol.	33 Parapanangadi.
19 Cannanore.	34 Tanur.
20 Tellicherry.	35 Kottayi.
21 Thalayi.	36 Ponnani.
22 Madakkara.	37 Puduponnani.
23 Madapalli.	38 Palapetti.
24 Badagara.	39 Mannalamkunnu.
25 Melady.	40 Edakkazhiyur.
26 Quilandy.	41 Puthankadapuram.
27 Elathur.	42 Blangad.
28 Pudiappa.	43 Kadapuram.
29 Calicut.	44 Nattika.
30 Beypore North.	45 Karimpuram.

EAST COAST.

III Tuticorin.

46 Tuticorin.	49 Idinthakarai.
47 Periatthalai.	50 Kottapuli.
48 Ovari.	

IV. Madurai.

51 Nambuthalai.	53 Pamban.
52 Athanekarai.	54 Mukkur.

V. Tanjore.

55 Adirampatnam Yard.	58 Ammapatnam Oil Centre.
56 Kaveripatnam School.	59 Arcotthurai Yard.
57 Akkarapettai Oil Centre.	60 Sethubavachetram Chank Centre.

IV Vellore.

61 Kadapakkam.	63 Devanampatnam.
62 Sathankuppam.	64 Porto-Novo.

Number of Shark Liver Oil centres in the beginning of the year	..	64
Do. Oil centres transferred to Mysore State (Nos. 1-9)	..	1
Do. centres transferred to Kerala State (Nos. 10-45)	..	24
Do. Oil centres in the residuary Madras State (Nos. 46-64)	..	11

APPENDIX—XXXI.

STATEMENT OF SHARK LIVER OIL PRODUCTION IN THE
RESIDUARY MADRAS STATE DURING THE YEAR 1956-57.

Division.	Number of centres.	Shark liver obtained, lb.			Weight of liver treated, lb.	Weight of oil extracted, lb.
		Departmental supply.	Local purchase.	Total.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Vellore ..	4	1,250	7,272	8,522	8,522	4,236
Tanjore ..	6	3,520	10,350	13,870	13,870	6,833½
Madurai ..	4	Nil.	2,521	2,521	1,521	1,425
Tuticorin ..	5	1,196	24,943	26,139	26,139	12,684
Madras ..	1	..	5,733	5,733	5,733	2,248
Total ..						27,426½

APPENDIX XXXII.

PARTICULARS OF LICENCES ISSUED AT ADYAR, 1956-57.

Month.	Rod and line.	Cast net.	Katcha valai.	Konda valai.	Siru valai.	Boo valai.	Total amount.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) RS. A. P.
April	16	117	116	47	11	7	178 14 0
May	27	126	13	29	11	6	132 9 0
June	21	98	49	15	3	6	91 11 0
July	76	83	8	18	6	6	98 1 0
August	36	68	3	13	9	..	72 12 0
September	17	94	37	4	5	7	74 10 0
October	9	101	19	18	5	5	92 7 0
November	28	72	35	15	6	7	89 7 0
December	55	117	28	11	8	7	106 8 0
January	12	94	26	20	8	6	122 4 0
February	35	145	34	16	10	5	135 0 0
March	6	104	22	21	11	5	113 10 0
Total	338	1,219	390	227	93	67	1,307 13 0

APPENDIX XXXIII.

FISHING LICENCES ISSUED IN THE NIGRIS DISTRICT IN 1956-57.

Month.	Ooty lake.		Coonoor pond.		Moyar and Bhavanl.		Total.	
	Number of licences. (2)	Amount. (3) RS. A. P.	Number of licences. (4)	Amount. (5) RS. A. P.	Number of licences. (6)	Amount. (7) RS. A. P.	Number of licences. (8)	Amount. (9) RS. A. P.
1)								
April	25	65 0 0	23	11 8 0	..	..	48	76 8 0
May	30	51 0 0	31	15 8 0	..	..	61	66 8 0
June	6	3 0 0	42	31 0 0	..	..	48	24 0 0
July	2	1 0 0	57	28 8 0	..	..	59	29 8 0
August	9	25 0 0	42	21 0 0	..	..	51	46 0 0
September	21	38 8 0	15	7 8 0	..	..	36	46 0 0
October	30	75 0 0	..	..	..	..	30	75 0 0
November	36	90 0 0	..	..	1	4 0 0	37	94 0 0
December	16	26 8 0	..	..	3	30 0 0	19	56 8 0
January	19	42 0 0	..	..	2	50 0 0	21	92 0 0
February	17	31 0 0	..	..	..	..	17	31 0 0
March	23	49 0 0	..	..	..	..	23	49 0 0
Total	234	497 0 0	210	105 0 0	6	84 0 0	450	686 0 0

APPENDIX XXXIV.
SHOWING LIST OF PROVINCIALISED WATERS IN MADURAI DIVISION IN 1956-57.

Serial number and name of the tank.	(1)	Taluk.	(2)	Village.	Extent.		Number of Tiliapia stocked.	Compensation payable.	(7)	(8)	Rents.		Average rental.
					Acres.	Cents.					RS.	A. P.	
1 Thamaraikulam	..	Uthama-palayam.	183	05	3,600	100	RS.	Panchayat Board, Uthama-palayam.	By auction.	Do.	91	0	91 0 0
2 Karunkattankulam.	Do.	Chinna-manur.	190	59	4,800	400	RS.	Panchayat Board, Chinna-manur.	Do.	Do.	132	0	132 0 0
3 Odaikulam ..	Do.	Do.	74	05	1,600	180	RS.	Do.	Do.	Do.	95	0	95 0 0
4 Naranasamudram ..	Do.	Kottur	76	61	1,000	81.11	RS.	Panchayat Board, Kottur.	Do.	Do.	14	0	14 0 0
5 Nachikulam	..	Nilakottai	122	20	1,403	132	RS.	District Board, Madurai.	Do.	Do.	120	0	310 0 0
6 Vadagarai tank	..	Shola-vandam.	757	67	5,964	2,839	RS.	Panchayat Board, Shola-vandan.	Do.	Do.	6,040	0	4,560 0 0
7 Thanur tank	..	Madurai district.	195	39	2,300	120	RS.	Panchayat Board, Thanur.	Leased to Fisheries Co-operative Society, Madurai.	Do.	489	0	488 8 0

8 Vandiyur tank	..	Do.	Vandiyur	572	25	5,900	3,000	Panchayat Board, Vandiyur.	Do.	Do.	2,467	8	2,467 8 0
9 Kunnathur tank	..	Do.	Kunnathur.	1,066	25	4,800	142	Panchayat Board, Kunnathur.	Do.	Do.	331	0	312 0 0
10 Varichunjoor tank	..	Do.	Varichoor	271	53	3,489	11	District Board, Madurai.	Do.	Do.	53	8	53 0 0

NOTE.—Item 1, 2, 3 and 4 were returned to Executive Engineer, Periyar Division as per G.O. Ma. No. 398, Agriculture (H.P.), dated 8th February 1957. Compensation for item 8 was refixed at Rs. 1,500 in G.O. No. 2782, Agriculture, dated 27th November 1956.

APPENDIX XXXV.

SHOWING DETAILS OF PROVINCIALISED WATERS IN SALEM DISTRICT.

Serial number and name of the water.	Rents realised.		
	Conserved area.		
1. Mettur Dam to Norinajpet (Cauvery)	Below conserved area licensed.		
2. Norinajpet to Perumpallam			
	RS.	A.	P.
3 Barur tank	170	0	0
4 Elupai Kuttai	11	0	0
5 Barur tank—Surplus Channel	8	8	0
6 Ponukondapuram tank	200	0	0
7 Pungampatti eri	No bid.		
8 Raja channel			
9 Komarapalayam channel			
10 Mohanur channel			
11 Cauvery Lot I (Tiruchengode taluk)	45	0	0
12 Cauvery Lot II	29	0	0
13 Cauvery Lot III	15	0	0
14 Mettur Canal (Right bank)	200	0	0
15 Mettur Reservoir	Licensed for fishing.		
16 Kumbalapadi Jabuku	2	8	0
17 Nagavathy River in Arjanahalli	11	0	0
18 Hanumantharayapallam	3	4	0
19 Sikkilagudupallam	3	4	0
20 Nagavathy River in Chinnamyalli	8	8	0
21 Chikkiligudupallam in Chinnampalli	1	2	0
22 Nagavathy River in Perumbalai	7	8	0
23 Nagavathy River in Kendanahalli	11	0	0
24 Thoppiar in Thoppur	3	8	0
25 Thoppiar River in Kaumampatty	8	0	0

APPENDIX XXXVI.

SHOWING DETAILS OF PROVINCIALISED WATERS IN CHINGLEPUT DISTRICT.

Name of water.	Tank.	Extent.	Amount of compensation payable.	Average rental for five years.			Rents realised.			Name of lessee.			
				ACS.	CTS.	RS. A. P.	1955.		1956.				
							(3)	(4)	(5)		(6)	(7)	(8)
Perumbedu tank	Ponneri	414	17	16	0	0	563	0	0	800	0	0	P. T. Doraiswamy Reddy, Perumbedu.
Kattur tank	"	231	67	12	8	0	34	0	0	42	0	0	Chinnaraja Mudaliar.
Medur tank	"	309	97	10	0	0	24	0	0	27	0	0	"
Thattamanji	"	227	80	4	0	0	18	8	0	25	0	0	Sri Nachappa Mudaliar.
Nayar tank	"	300	54	150	0	0	71	0	0	92	0	0	Sri Chinnasamy Naidu.
Rallakuppam tank	"	10	00	0	14	0	4	12	0	Not auctioned.			No bid.
Kambakkam tank	"	183	66	6	0	0	17	4	0	18	0	0	Sri Venkatakrishna.
Neidavoyal tank	"	126	75	30	0	0	169	0	0	500	0	0	"
New Gummidiundi tank.	"	83	42	4	0	0	34	4	0	65	0	0	Sri Nemmach.
Old Gummidiundi tank.	"	46	11	4	10	0	33	0	0	40	0	0	Sri Rathna Reddiar.
Chunambedu tank	"	1,161	62	2	0	0	63	8	0	66	0	0	Poondi Fishermen Co-operative Society.
Alamvelli tank	"	"	"	1	8	0	45	12	0	160	0	0	"
Santhavelur tank	"	"	"	2	0	0	12	8	0	"	"	"	"
Karunkazhi waters	"	482	67	785	0	0	721	4	0	450	0	0	Sathankuppam Fisheries Co-operative Society.
Nagalapuram Karuperi.	Tiruvallur	361	58	32	0	0	181	12	0	207	0	0	Poondi Fisheries Co-operative Society.
Vadamadurai	"	512	08	130	0	0	307	0	0	450	0	0	Vadamadurai Harijan.
Kannigai pair	"	593	92	26	0	0	241	0	0	310	0	0	Sri Ranganatha Mudaliar.
Poondi Reservoir	"	"	"	"	"	"	"	"	"	"	"	"	"
Coom River	"	"	"	"	"	"	"	"	"	"	"	"	"
Tinnanore	Sripurambudur.	765	62	615	0	0	642	8	0	410	0	0	Poondi Fisheries Co-operative Society.
eman Hissa tank	"	1,579	06	288	0	0	648	8	0	530	0	0	Do.

APPENDIX XXXVI—cont.

SHOWING DETAILS OF PROVINCIALISED WATERS IN CHINGLEPUT DISTRICT—cont.

Name of wa. r.	Tank.	Extent.	Amount of compensation payable.	Average rental for five years.	Rentals realized.		Name of leasee.
					1955.	1956.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Marimangalam tank ..	Sripurumbudur.	ACS. 877	RS. A. P. 28 12 0	RS. A. P. 320 0 0	RS. A. P. 425 0 0	RS. A. P. 275 0 0	Sri V. Kailasa Mudaliar.
Sripurumbudur ..	"	806	15 23 0	443 3 0	500 0 0	319 0 0	Sri Kandasamy Thevar.
Chembarambakkam tank ..	"	"	1,967 0 0	1,960 0 0	1,800 0 0	2,000 0 0	Poonamalli Fisheries Co-operative Society.
Veliyar Perla Eri ..	Kancheepuram.	388	69 2 10 0	13 6 0	15 0 0	20 0 0	Sri V. Balakrishnan.
Parandoor tank ..	"	777	77 5 0 0	815 12 0	75 0 0	95 0 0	Kancheepuram Fisheries Co-operative Society.
Tenneri tank ..	"	922	36 32 0 0	217 0 0	275 0 0	275 0 0	Walajabad Fisheries Co-operative Society.
Kuthirambakam ..	"	523	33 1 0 0	18 4 0	25 0 0	25 0 0	Kancheepuram Fisheries Co-operative Society.
Nirvalur tank ..	"	327	31 2 4 0	30 0 0	30 0 0	30 0 0	Do.
Uthiramerur tank ..	"	1,282	42 903 0 0	1,065 0 0	1,200 0 0	1,200 0 0	Uthiramerur.
Edamacheri tank ..	"	407	76 23 12 0	78 8 0	100 0 0	35 0 0	Kancheepuram Fisheries Co-operative Society.
Govindavadi Peria Eri.	"	372	61 1 12 0	14 0 0	15 0 0	15 0 0	Do.
Valathur tank ..	"	"	68 17 4 0	111 8 0	150 0 0	150 0 0	Do.
Sevilamedu tank ..	"	610	61 6 1 0	141 12 0	152 0 0	105 0 0	Sri Damodaran Naidu.
Damal tank ..	"	"	16 2 0	17 0 0	20 0 0	20 0 0	Kancheepuram Fisheries Co-operative Society.
Kuram tank ..	"	"	"	"	"	"	"
Thenambakam ..	"	76	228 0 0	98 12 0	2,500 0 0	112 12 0	Departmental fishing.
Madurantakam tank ..	"	2,412	"	2,120 0 0	"	1,600 0 0	Karukuzhi Fisheries Co-operative Society.
Orathi tank ..	"	389	40 ..	32 12 0	10 0 0	80 0 0	Sri T. Govindaraj.
Kolavoy tank ..	Chingleput ..	1,731	65 20 0 0	364 ..	425 ..	490 0 0	"
Gurummedu tank ..	"	38	00 2 0 0	21 0 0	16 0 0	40 0 0	"
Opayadum tank ..	"	175	00 2 0 0	30 0 0	42 0 0	22 0 0	Sri K. Annamalai.
Sirukundram tank ..	"	295	86 3 0 0	109 4 0	115 0 0	68 0 0	Sri Velai.
Kondangi tank ..	"	881	36 20 0 0	"	"	"	"

APPENDIX XXXVII.

SHOWING PARTICULARS OF PROVINCIALISED WATERS IN NORTH ARCOT DISTRICT.

Number and name of water.	Tank.	Extent.	Amount of compensation payable.	Average rental for five years.	Lease for		Name of leasee.
					1955.	1956.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 Vakkadei Mukkur ..	Cheyyur ..	ACS. 635-77	RS. A. P. 191 8 0	679 0 0	RS. A. P. 250 0 0	RS. A. P. 400 0 0	Ukkal Fisheries Co-operative Society.
2 Purasai Peria Eri ..	Do.	457-79	225 0 0	602 8 0	600 0 0	600 0 0	Ayyankulam Fisheries Co-operative Society.
3 Dusimamandur Tank ..	Do.	1,012-49	1,088 3 6	2,381 0 0	2,500 0 0	2,500 0 0	Society.
4 Keelvedhi Tank ..	Arkonam ..	437-00	32 13 0	30 12 0	30 4 0	50 0 0	Kaveripakkam Fisheries Co-operative Society.
5 Mahendravadi Tank ..	Do.	293-00	70 13 0	25 4 0	20 4 0	50 0 0	Do.
6 Paranjiperia Eri ..	Do.	300-00	5 9 0	5 1 0	50 0 0	7 2 0	Sri Varadappan.
7 Velayathur Tank ..	Walajah ..	659-67	6 5 0	28 4 0	50 0 0	50 0 0	Muppalthuvetti Fisheries Co-operative Society.
8 Kaveripakkam Tank ..	Do.	5,073-42	1,506 0 0	1,876 4 0	"	"	"
9 Nallathannikulam ..	Vellore ..	2-00	"	"	"	"	"
10 Chatarakulam ..	Do.	"	"	"	"	"	"
11 Bhoomathachettykulam.	Wardiwash ..	5-00	6 14 0	"	"	5 0 0	"
12 Surdamedukulam ..	Chengam ..	0-80	"	5 0 0	"	"	"
13 Arni Fort-moat ..	Arni ..	6-00	89 9 7	37 0 0	"	175 0 0	"
14 Tamarakulam ..	T. V. Malai ..	20-66	"	15 0 0	"	15 0 0	"
15 Agnithoertham ..	Do.	0-80	"	15 0 0	"	15 0 0	"
16 Chettykulam ..	Do.	0-83	"	"	"	"	"
17 Parayankulam ..	Do.	0-60	"	"	"	"	"
18 Indrathoertham ..	Do.	"	"	"	"	"	"
19 Isaniyakulam ..	Do.	1-80	"	20 0 0	"	20 0 0	Sri K. Perumal.
Total ..					3,887 2 0		

APPENDIX XXXVIII.

SHOWING DETAILS OF PROVINCIALISED WATERS IN SOUTH ARCOT DISTRICT.

Serial number and name of water, (1)	Taluk. (2)	Amount of compensation payable. (3)	Average rental for five years. (4)	Lease for 1955. (5)	Lease for 1956. (6)	Name of lessee. (7)
1 New Coleroon from mile 92/6 ..	Chidambaram.	..	RS. 80	RS. A. P. ..	RS. A. P. ..	..
2 Killai, Pichavaram and Alamelu- puram back waters.	Do.	..	..	666 0 0	1,044 0 0	..
3 Killai, Pichavaram, New Cole- eroon up to sea.	Do.	..	..	700 0 0	700 0 0	Sri Velu Nattar.
4 Ellischoultry anicut in taluk ..	Do.	..	..	320 0 0	350 0 0	Sri Kasimani.
5 Eralu main channel ..	Tirukoyilur	..	..	No bid.	..	..
6 New Alangal channel ..	Villupuram	..	..	..	202 0 0	Sri Kuppuswamy.
7 Maragathapuram channel ..	Do.	..	..	..	2 0 0	Sri Sundaramurthy.
8 Kandaupakam channel ..	Do.	..	..	..	6 0 0	Sri Murugesan.
9 Markanam back waters ..	Tindivanam	..	..	..	..	..
10 Perumal eri ..	Cuddalore	..	..	401 0 0	401 0 0	..
11 New Coleroon ..	Chidambaram.	..	..	..	2,688 0 0	..
12 North Rajan channel ..	Do.	..	..	1,080 0 0	..	..
13 Toludur anicut ..	Vridhachalam.	..	..	64 0 0	72 0 0	..
14 East and West Toludur anicut.	Do.	..	..	150 0 0	155 0 0	..
15 Tirukoyilur anicut ..	Tirukoyilur	..	..	496 8 0	141 0 0	..
16 Gourepot channel ..	Chidambaram.	..	..	..	5 0 0	..
17 Khansaheb channel ..	Do.	..	..	..	5 0 0	..
18 Vridhachalam anicut and sluice.	Vridhachalam.	..	..	65 0 0	275 0 0	..

Pelandurai anicut and sluice ..	Do.	..	..	155 0 0	275 0 0	Chidambaram Fisheries Co- operative Society.
20 Vellar and other items ..	Chidambaram.	..	..	..	1,046 0 0	Vallambadugai Fisheries Co-operative Society.
21 Old Coleroon ..	Do.	..	..	..	162 0 0	Agaram Fisheries Co- operative Society.
22 Vellar (2 stretches) ..	Cuddalore	..	..	..	600 0 0	Sri Ramnagar Fisheries Co-operative Society.
23 Melattar river ..	Do.	..	..	..	2,179 0 0	Co-operative Society.
24 Thiruvathur anicut channel ..	Do.	..	..	81 0 0	54 0 0	Thiruvathur Fisheries Co-operative Society.
25 Marudur channel ..	Tirukoyilur	..	..	53 8 0	13 0 0	Do.
26 Pambai channel ..	Do.	..	..	119 4 0	119 4 0	Do.
27 Thuriinjalan channel ..	Do.	..	..	34 0 0	34 0 0	Do.
28 Raghavan channel ..	Do.	..	..	394 0 0	185 0 0	Do.
29 Melattar channel ..	Do.	..	..	62 0 0	62 0 0	Sri Madurai.
30 Siddalingamedu channel ..	Do.	..	..	63 5 0	29 0 0	Sri Marimuthu.
Total ..	..	..	..	10,804 4 0	..	..

APPENDIX XXXIX.

SHOWING PROVINCIALISED WATERS IN TANJORE DISTRICT.

Taluk. (1)	Lease amount fetched for fashi 1366. (2)			Comparative figures of fashi 1365. (3)		
	RS.	A.	P.	RS.	A.	P.
1 Tanjore.. .. .	17,729	0	0	18,320	0	0
2 Papanasam	6,000	0	0	6,000	0	0
3 Kumbakonam .. .	11,487	0	0	11,593	13	0
4 Mayuram	7,400	0	0	8,000	0	0
5 Nannilam	7,060	0	0	6,800	0	0
6 Sirkali	3,820	0	0	3,520	0	0
7 Nagapattinam .. .	2,500	0	0	2,500	0	0
8 Pattukkottai .. .	1,550	0	0	550	0	0
9 Arantangi	150	0	0	150	0	0
10 Tiruturaipundi ..	26,047	0	0	24,182	0	0
11 Mannargudi .. .	7,500	0	0	7,500	0	0
Total	91,243	0	0	89,115	13	0

APPENDIX XL.

SHOWING PROVINCIALISED WATERS IN TIRUCHIRAPPALLI DISTRICT.

Taluk. (1)	Lease amount fetched for fashi 1366. (2)			Comparative figures of fashi 1365. (3)		
	RS.	A.	P.	RS.	A.	P.
1 Tiruchirappalli ..	6,663	0	0	6,663	0	0
2 Karur	1,029	0	0	1,029	0	0
3 Kulittalai	1,050	0	0	1,110	0	0
4 Musiri	123	3	0	123	3	0
5 Lalgudi	1,200	0	0	1,200	0	0
6 Udaiyarpalaiyam ..	..	..	..	93	12	0
Total	10,665	3	0	11,018	15	0

APPENDIX XLI.

SHOWING STATEMENT OF PROVINCIALISED WATERS IN COIMBATORE DISTRICT.

Serial number and name of the water. (1)	Taluk. (2)	Extent. (3)	Government Order in which provincialised. (4)	Whether leased, fish-d or licensed. (5)	Amount of lease. (6)	Average rental. (7)	
						RS.	A. P.
1 Sultur tank	Palladam	230 96	G.O. No. 520, Development, dated 5th April 1921.	Leased.	21 0 0	26	0 0
2 Oddarpalayam .. .	Do.	80 68	Do.	Do.	..	..	..
3 Mannarai	Do.	25 79	Do.	Do.	..	..	..
4 Adipalayam	Do.	78 80	Do.	Do.	..	..	..
5 Semmandapalayam ..	Do.	26 44	Do.	Do.	..	..	..
6 Bhavani river (Vyachanam- Avanashi palayam).	Do.	..	..	..	..	..	..
7 Moyar river	Do.	..	..	..	..	..	..
8 Bhavani river (from Sirumugai to Moyar Junction)	Do.	..	..	..	..	..	..
9 Bhavani river (from Thalamalai to Sirumugai).	Do.	..	..	..	..	..	..
10 Bhavani river (from Mudukan- thurai to Koduveri).	Gobichettipala- yam.	..	..	..	..	..	..
11 Arakkankottai channel ..	Do.	..	..	..	..	725	0 0
12 Nagaombapallam	Do.	..	..	..	..	133	0 0
13 Elathur	Do.	..	..	..	..	25	0 0
14 Koduveri to Peyanthura ..	Do.	..	..	..	..	26	0 0
15 Peyanthurai to Nanjampuliam- patti.	Do.	..	..	..	..	670	0 0
16 Nanjampuliampatti to Perun- dalayur.	Do.	..	..	..	..	793	0 0
17 Tadapalli channel	Do.	..	..	..	..	490	0 0
						353	0 0

APPENDIX XLI—cont.

SHOWING STATEMENT OF PROVINCIALISED WATERS IN COIMBATORE DISTRICT—cont.

Serial number and name of the water.	Taluk.	Extent.	Government Order in which provincialised.	Whether leased or licensed.	Amount of lease.	Average rental.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		ACS.			RS. A. P.	RS. A. P.
18 Lower Bhavani channel (Miles 1 to 10).	Gobichettipalayam.	..	G.O. No. 520, Development, dated 5th April 1921.	Leased.	1,100 0 0	606 0 0
19 Lower Bhavani channel (Miles 11 to 20).	Do.	..	Do.	Do.	..	286 0 0
20 Lower Bhavani channel (Miles 21 to 30).	Do.	..	Do.	Do.	..	118 0 0
21 Lower Bhavani channel (Miles 31 to 40).	Do.	..	Do.	Do.	..	110 0 0
22 Two odaipallams	Do.	..	Do.	Do.	100 0 0	132 0 0
23 Cauvery river (from K. Kuttai Erode .. to Erode R.S.)	Erode ..	..	Do.	Do.	125 0 0	123 0 0
24 Kalingersayan channel	Do. ..	..	Do.	Do.	475 0 0	840 0 0
25 Bhavani river (from Perun-daliyar to Oricheri).	Bhavani ..	..	Do.	Do.	11 0 0	15 0 0
26 Oricheri to Seethapalayam ..	Do. ..	..	Do.	Do.	12 0 0	13 0 0
27 Sithar river	Do. ..	..	Do.	Do.	91 0 0	77 0 0
28 Nerinjepet to Sudampatti ..	Do. ..	..	Do.	Do.	1,060 0 0	767 0 9
29 Sudampatti to Peyana ..	Do. ..	..	Do.	Do.	400 0 0	315 0 0
30 Mettur West Bank canal (from 83 mile to 21).	Do. ..	..	Do.	Do.	365 0 0	..
31 Mettur West Bank Canal (from 21st mile to end).	Do. ..	..	Do.	Do.	205 0 0	..

APPENDIX XLII.

SHOWING DETAILS OF PROVINCIALIZED WATERS IN TIRUNELVELI DISTRICT.

Name of provincialized water.	Taluk.	Extent.	G.O. in which provincialized.	Licensed or	Amount realized.
(1)	(2)	(3)	(4)	(5)	(6)
					RS. A. P.
1 Hope lake.	Ambasamudram.	28 square miles.	G.O. No. 119, dated 10th January 1949.	Ms. 119, and also licensed and also departed mentally.	1,044 4 0
2 Kadamba tank.	Srivaikuntam.	1,649 acre.	G.O. No. 411, Development, dated 21st March 1947.	Do.	2,829 3 0

APPENDIX XLIII.

SHOWING DETAILS OF DEMONSTRATION TANKS IN MADURAI DIVISION.

Serial number and name of the water.	District.	Taluk.	Extent.		Authority for taking over.
			(4)	(5)	
1 Mariaman teppam	..	Madurai	..	17 00	G.O. Ms. No. 1978, Agriculture, dated 9th August 1955.
2 Valaiveesi teppam	..	Do.	..	00 75	G.O. Ms. No. 785, Development, dated 19th February 1952.
3 Tirumakkulam	..	Do.	..	4 00	G.O. Ms. No. 4625, Development, dated 4th November 1952.
4 Racecourse pond	..	Do.	..	..	G.O. Ms. No. 786, Development, dated 19th February 1953.
5 Mandai Oorani	..	Do.	..	2 24	G.O. Ms. No. 2423, Development, dated 25th May 1953.
6 Kallukatti teppam	..	Do.	..	0 19	G.O. Ms. No. 1456, Revenue, dated 6th May 1955.
7 Peria teppam	..	Do.	..	1 45	G.O. Ms. No. 257, Development, dated 7th April 1953.
8 Kammam Oorani	..	Do.	..	1 28	Do.
9 Agneswar temple tank	..	Do.	..	0 05	Do.
10 Kallukatti teppam	..	Ramanathapuram	..	1 00	G.O. Ms. No. 27, Agricultural, dated 7th November 1953.
11 Quarry pools	..	Do.	..	2 64	G.O. Ms. No. 91, Agricultural, dated 15th December 1956.
12 Chettinad farm	..	Do.	..	1 00	..
13 Chettineeravi taluk	..	Do.	..	3 52	G.O. No. 2932, Agricultural, dated 15th December 1956.
14 Pillayar taluk	..	Do.	..	1 32	Additional Director of Industries and Commerce—R. Dis. 2—2, dated 9th March 1956.
15 Tengal pond (Pasumalai)	..	Madurai	..	0 74	G.O. Ms. No. 2050, Revenue, dated 30th June 1955.
16 Kodaikanal lake	..	Do.	..	96 63	G.O. Ms. No. 2063, Development, dated 8th May 1953.

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	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Number of seed stocked during the year.	Whether leased or departmentally fished.	Number of licences issued.	Total amount of license fees collected.	Weight of fish caught (lb.)	Value of fish sold.	Total receipts.
				Rs. A. P.		Rs. A. P.	Rs. A. P.
1 Mariaman teppam	..	Gourami 24.	..	..	20,363½	11,169 2 6	11,169 2 9
2 Valaiveesi teppam	..	Tilapia, 2650.	..	..	409½	94 10 9	94 10 9
3 Tirumakkulam	..	..	..	..	1,705½	541 3 0	541 3 3
4 Racecourse pond	..	..	..	..	..	..	..
5 Mandai Oorani	..	Catla 36 Tila- pia 2682.	..	..	2	0 12 0	0 12 0
6 Kallukatti teppam	..	..	..	..	..	..	..
7 Peria teppam	..	..	..	..	380½	336 11 6	335 11 6
8 Kammam Oorani	..	..	..	..	96½	37 0 0	37 0 0
9 Agneswar temple tank	..	..	..	..	89½	33 14 3	33 14 3
10 Kallukatti teppam	..	Tilapia 500.	..	..	3,306½	1,323 12 6	1,323 12 6
11 Quarry pools	..	..	..	..	1027	458 3 0	458 3 0
12 Chettinad farm	..	Chanos 400.	..	..	..	..	..
13 Chettineeravi tank	..	..	..	..	297½	112 7 6	112 7 0
14 Pillayar tank	..	..	..	..	..	..	..
15 Tengal pond (Pasumalai)	..	Gambusia 100.	..	..	..	..	..
16 Kodaikanal lake	..	Mirro carp 859.	234	408 8 0	224½	119 10 9	523 2 9
		Licensed for angling and Departmentally fishing.					

APPENDIX XLIV.

SHOWING DETAILS OF WORKING OF DEMONSTRATION TANKS IN
VELLORE DIVISION.

Serial number and name of the tank.	Extent.	Number of seed stocked.	Weight of fish caught.	Amount realized.
(1)	(2)	(3)	(4)	(5)
ACS. CTS.				RS. A. P.
<i>North Arcot district.</i>				
1 Suriakulam	..	9,001	530	108 11 3
2 Vellaikulam	..	200	30	3 12 0
3 Nallathannikulam ..	..	..	..	..
4 Ayyankulam	3 27	25,349	2,553	924 14 3
5 Ellaipillayarkulam ..	1 50	1,195	397	61 4 9
6 Boomathachettykulam ..	5 00	..	..	..
<i>South Arcot district.</i>				
7 Cuddalore O.T. tank ..	0 75	25,000	3,532½	104 6 0
8 Theerthakulam tank ..	3 00	1,897	1,814½	368 9 0
9 Anaikulam	0 32	7,895	113½	17 13 0
10 Chakkaraikulam	0 47	1,100	183½	18 8 3
11 Chettykulam	2 89	12,348	2,063	168 8 3
12 Venkateswara tank ..	0 82	..	65½	4 7 6
13 Kamalakanni Amman tank.	0 20	1,000	..	..
<i>Chingleput district.</i>				
14 Chettykulam	..	3,426	133	45 9 6
15 Vellaikulam	..	5,000	28½	9 10 0
16 Rangaswamykulam ..	7 12	..	956½	286 2 6
17 Thamaraiikulam	}	11,401	617	100 1 0
18 Palakulam				
19 Kuttaikulam				
20 Eswarankoilikulam ..				
21 Ponniammankulam ..				
22 Anaiammankulam ..				
23 Seethakulam				
24 Thamaraiikulam ..				
25 Thimmirajakulam ..	..	10,807	69½	19 7 6
26 Karpurachettykulam ..	..	16,396	301½	72 8 0

APPENDIX XLV.

SHOWING THE VARIETY-WAR DETAILS OF CATCHES OBTAINED
FROM THE ODATHURAI TANK IN 1956-57.

Date of catch.	Barbus betagoma- lepis.	Labeo amblyatus.	Cirrhinareba.	Miscellaneous.	Mystus sp.	ambalus sp.	Notopterus.	Murrela.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
28th July 1956 to 31st August 1956.	378½	..	..	1,644½	28½	761½	..	29
1st to 25th September 1956.	458½	147	110	3,023	356½	87½	75	189½
Total ..	837½	147	110	4,667½	385½	848½	75	218½
Fished and sent for Research purposes on 10th and 15th September 1956.	..	..	..	..	..	..	..	3½
Grand total ..	837½	147	110	4,667½	385½	848½	75	222½

	Europlus suraten- sis.	Mirror carp.	Golden carp.	Glossogobius.	Total weight of fish caught.	Departmental share.	Sale proceeds.
	(10)	(11)	(12)	(13)	(14)	(15)	(16)
28th July 1956 to 31st August 1956.	371	121	..	441	3,774½	2,637½	630 2 0
1st to 25th September 1956.	780	806½	658	670½	7,491	4,928	1,011 8 0
Total ..	1,151	927½	658	1,111½	11,265½	7,565½	1,641 10 0
Fished and sent for Research purposes on 10th and 15th September 1956.	4½	103	..	..	..	..	..
Grand total ..	1,155½	1,030½	658	1,111½	11,265½	7,565½	1,641 14 0

APPENDIX XLVI.

SHOWING DETAILS OF WORKING OF RURAL FISHERY DEMONSTRATION UNITS IN TIRUNELVELI DISTRICT.

Serial number and name of water.	Taluk.	Extent.	Authority.	Number of seed stocked.	Weight of fish caught in the tank.	Value of fish sold.	Total receipts.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 Kodayanallur—							
(a) Tanaraikulam ..	Tenkasi	..	{ G.O. Ms. No. 6326, Development, dated 25th December 1951.	12,139	3,443½	1,293 5 9	..
(b) Annamalai Poigai.	Do.	..					
(c) Visalakshi Tank ..	Do.	..					
(d) Attakulam ..	Do.	..					
2 Kalakad—							
(a) Koilpathu Teppakulam.	Nanguneri ..	..	{ G.O. Ms. No. 3779, Development, dated 17th August 1953.	4,050	39½	33 7 3	2,176 7 6
(b) Ayathurai ..	Do.	..					
(c) Sethiamandapam Tank.	Do.	..					
3 Gopalasamudram—							
(a) Nambuneri Tank.	Ambasamudram	..	{ G.O. Ms. No. 2981, Development, dated 1st October 1954.	5,500	5,547½	849 10 6	..
(b) Vagarkulam ..	Do.	..					
(c) Velankulam ..	Do.	..					
(d) Kothankulam ..	Do.	..					

APPENDICES

APPENDICES

APPENDIX XLVII.

SHOWING PARTICULARS OF DEMONSTRATION TANKS IN TANJORE DIVISION.

Serial number and name of the tank.	Stocking.		Exploitation.		Weight of fish landed.	Receipts, RS. A. P.	Expenditure, RS. A. P.
	Kind.	Number.	Kind.	Number.			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 Webster moat			Labao	15,186	Labao and Cirrhina.	10,310 1 3	1,168 14 0
			Cirrhina	.. ..	Catla ..	40,085½	
			Catla ..	1,000	Chanos	16,580	
			Chanos	30	Mirror Carp	169	
			Mirror Carp	.. ..	Tilapia	5,325	
2 West moat			Labao	18,955	Labao	710 15 6	227 12 0
			and Cirrhina.	.. ..	.. ..	3,800½	
			Catla ..	1,506	Catla ..	683	
			Chanos	.. ..	Chanos	1,087	
3 Ayyankulam			Labao	.. ..	Labao ..	431 5 0	203 8 0
			Chanos	.. ..	Chanos	563	
			Catla ..	.. ..	Catla ..	1,920	
						700	
4 Pattaraikulam			Catla ..	528	Catla ..	141	
			Labao ..	13,500	Labao and Cirrhina	7,544	
			Cirrhina	1,650	.. ..	2,205	426 12 0
5 Sekkadykulam			Labao	225	Chanos	455 6 0	
			Chanos	500	Labao	200 0 0	0 12 0
			Catla ..	250	.. ..	700	
							
6 Aladikulam ..			Labao	725	Murrel	1,201½	..
			Chanos	500	Chanos	350 10 0	
			Catla ..	243	Labao	480	
						950	
7 Pillaikulam ..			Labao	58	Tilapia	125 0 0	42 8 0
			Catla ..	340	.. ..	400	
			Chanos	1,000	.. ..	.. ..	

Number and name of water.	Tank.	Extent.	Number of fish.	Remarks.

(1)	(2)	(3)	Extent.	Authority.	Number of seed stocked.	Weight of fish caught in the tank.	Value of fish sold.	Total receipts.
		(3)		(4)	(5)	(6)	(7)	(8)
		ACS.				LB.	RS. A. P.	RS. A. P.
1 Kadayanallur—								
(a) Tamarakulam ..	..	..	..	G.O. Ms. No. 6326,				
(b) Annamalai Poigai ..	..	..	..	Development,				
(c) Visalakshi Tank ..	..	..	..	dated 25th Decem-				
(d) Attakulam ..	..	..	..	ber 1951.	12,139	3,443½	1,293 5 9	
2 Kalakad—								
(a) Kolipathu Toppa-								
kulam.	..	..	..	G.O. Ms. No. 3779,				
(b) Ayacheri ..	..	..	..	Development,				
(c) Sathamandapam	..	..	..	dated 17th				
Tank.	..	..	..	August 1953.	4,050	39½	33 7 3	2,176 7 6
3 Gopalasamudram—								
(a) Nambuneri Tank.	..	..	..	G.O. Ms. No. 2981,				
(b) Vagaikulam ..	..	..	..	Development,				
(c) Velankulam ..	..	..	..	dated 1st October				
(d) Kothankulam ..	..	..	..	1954.	5,600	5,547½	849 10 6	

SHOWING PARTICULARS OF DEMONSTRATION TANKS IN TANJORE DIVISION.

Serial number and name of the tank.	Stocking.		Exploitation.		Weight of fish landed.	Receipts.	Expenditure.
	Kind.	Number.	Kind.	Number.			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 Webster moat			Labao .. Cirrhina .. Catla .. Chanos .. Mirror Carp ..	15,186 1,000 30	Labao and Cirrhina. Catla .. Chanos .. Mirror Carp .. Tilapia ..	12,991 1,468 16,580 169 5,325	1,168 14 0
2 West moat			Labao and Cirrhina. Catla ..	18,955 1,506	Labao .. Catla .. Chanos ..	2,618 683 1,087	227 12 0
3 Ayyankulam					Labao .. Chanos .. Catla ..	68 1,920 700	203 8 0
4 Pattaraikulam			Catla .. Labao .. Cirrhina ..	528 13,500 1,650	Catla .. Labao and Cirrhina ..	141 7,544	436 12 0
5 Sekkadykulam			Labao .. Chanos .. Catla ..	225 500 250	Chanos .. Labao ..	480 900	0 12 0
6 Aladikulam ..			Labao .. Chanos .. Catla ..	725 500 243	Murrel .. Chanos .. Labao ..	10 480 950	.. ..
7 Pillaikulam ..			Labao .. Catla .. Chanos ..	58 340 1,000	Tilapia .. Labao ..	600 900	42 8 0

APPENDIX XLVII—cont.

SHOWING PARTICULARS OF DEMONSTRATION TANKS IN TANJORE DIVISION—cont.

Serial number and name of the tank. (1)	Stocking.		Exploitation.		Weight of fish landed. (6)	Receipts.		Expenditure. (8)
	Kind. (2)	Number. (3)	Kind. (4)	Number. (5)		RS. A. P. (7)	RS. A. P. (8)	
8 Sengulam	Catla .. Labeo	610 3,800	Tilapia Catla .. Labeo	1,058 85 1,111	4,450	1,025 11 0	616 15 6	
9 Eachengulam	Catla .. Chanos	380 8,638	Catla .. Chanos	250 4,200	1,026	214 10 0	115 4 0	
10 Panchamuthukulam	Catla .. Chanos	320 20,597	Catla .. Chanos	220 1,570	1,189	262 6 0	153 12 0	
11 Katcheri Tank	Catla ..	100	..	..	120	27 0 0	43 0 0	
12 Ayi Tank	Catla .. Labeo	588 4,050	Catla .. Labeo	32 899	447 466	140 8 0 145 11 6	48 14 0 ..	
13 Pidari Tank	Catla ..	445	Catla ..	8	340	93 12 0	5 0 8	
14 Anayadi Tank	Catla .. Labeo and Cirrhina.	80 2,000	Labeo and Cirrhina.	464	..	..	..	
15 Baburajapuram Tank	Catla ..	477	..	..	150	37 8 0	16 0 0	
16 Tiruvaniikol Tank	Labeo and Cirrhina.	7,000	Labeo and Cirrhina.	3,270	1,420	334 10 0	311 9 0	
17 Kumundankulam	Catla .. Catla ..	30 300	Catla and Labeo.	666	662½	221 4 0	88 13 0	
18 Palaniyandiurani	Labeo and Cirrhina.	4,250	Labeo and Cirrhina.	1,714	1,637½	553 12 0	207 5 3	
19 Kilanaieri	Catla .. Labeo	400 4,200	Catla Cabeo	104 1,575	1,865	663 2 0	255 9 0	
20 Servarayankulam	Labeo and Cirrhina.	2,300	Labeo	73	880	290 13 0	119 1 0	
21 Vairavanachurani	Catla .. Labeo .. Catla .. Chanos	250 1,500 365 400	Catla .. Labeo and Cirrhina.	150 749	.. 267	.. 89 9 0	.. 52 4 9	
22 Thirukulam	Catla .. Labeo and Cirrhina.	210 1,200	Labeo ..	158	81	30 7 6	10 2 0	
23 Sivankoil Pushkarini	Labeo and Cirrhina.	2,700	Catla ..	10	111	4 5 0	....	

APPENDIX XLVIII.

STATEMENT OF QUANTITY OF FISH ESTIMATED TO BE
LANDED FROM THE METTUR RESERVOIR, 1956-57.

Month.	Approximate quantity of fish landed by licences.	Quantity of fish landed by the Departmental units in.
	TONS.	LB.
April	41	1,852
May	45	3,293
June	50	1,422
July	44	1,055
August	35	459
September	20	343
October	40	887
November	30	846
December	20	526
January	25	1,610
February	20	494
March	20	451
Total ..	800	13,238 lb. = 5.9 tons.

APPENDIX XLIX.

STATEMENT OF METEOROLOGICAL AND HYDROGRAPHICAL
CONDITIONS OF METTUR RESERVOIR,
APRIL 1956-MARCH 1957.

Month.	Range of reservoir water level in feet.	Range of maximum air tempe- rature °F.	Range of minimum air tempe- rature °F.	Range of reservoir water tem- perature °C.	in Rainfall inches.
April	39.50—45.60	87—106	70—85	23.3—29.4	0.82
May	33.95—39.20	83—104	75—87	26.0—29.2	0.99
June	33.95—63.90	77—100	73—85	27.4—28.6	0.30
July	63.90—110.00	83—97	72—80	25.1—28.5	1.15
August	110.30—120.00	85—97	70—80	26.2—29.6	..
September	107.45—117.90	85—97	71—77	20.4—29.4	3.14
October	107.45—120.20	82—92	70—76	21.4—27.5	11.68
November	120.00—..	78—90	70—76	23.2—24.7	7.74
December	109.85—120.00	80—85	65—75	21.4—24.7	0.38
January	92.65—109.85	83—93	62—77	22.1—25.1	..
February	88.05—92.45	87—97	65—78	22.1—24.6	..
March	83.60—87.95	91—98	71—77	21.2—24.5	..

APPENDIX L.

SHOWING RETAIL AND WHOLESALE PRICE OF CURED FISH, 1956-57.

(Compiled by P. I. Chacko, Fisheries Marketing and
Information Officer.)

Marketing centre.	Retail per lb.	Wholesale per maund.
	RS. A. P.	
1 Adirampatnam ..	Cured fish— Mulletts 0 8 0 Lates 0 8 0 Skates and Sharks. 0 4 0	Rs. 20. " 10.
2 Vellore	Seer Pomfrets Sardines	1 0 0 Rs. 50.
3 Ooty	Mackerels Silver bellies Sardines	0 10 0 No wholesale market.
4 Cuddalore	Lates Prawns Silver bellies Mulletts	0 8 0 to 0 10 0 Rs. 30. to Rs. 35.
5 Coimbatore	Cat fish Sardine Soles Shark Prawns	1 2 0 0 12 0 0 10 0 0 12 0 0 12 0
6 Trivellore	Silver bellies Ribbon fish Sharks Seer	0 14 0 0 12 0 0 10 0 0 12 0 No wholesale.
7 Srivaikuntam	Mulletts Chanos Sharks	0 6 0 0 6 0 0 8 0
8 Trichy	Pomfrets Sharks Prawns	0 10 0 Rs. 40.
9 Tanjore	Carfos Prawns Seer Pomfret	0 6 0 to 0 8 0 0 8 0 0 10 0 0 12 0 Rs. 30 to 50.
10 Tindivanam	Mulletts Prawns Sharks Pomfrets Chanos	0 10 0 to 0 14 0 No wholesale.
11 Madurai	Seer Horse Mackerel Cat fish Mackerels Sharks	0 12 0 0 10 0 0 10 0 0 10 0 No sale in wholesale cured fish.
12 Nagapattinam	Pomfrets Silver bellies Skates and Rays Ribbon fish	0 6 0 0 6 0 0 6 0 0 7 0 Rs. 20 to 35.

APPENDIX L—*cont.*

SHOWING RETAIL AND WHOLESALE PRICE OF
CURED FISH, 1956-57—*cont.*

Marketing centre.		Retail per lb.			Wholesale per maund.	
		RS.	A.	P.		
13 Ambasamudram ..	Pomfrets ..	..	0	8	0	No wholesal.
	Silver bellies ..	..	to			
	Skates and Rays ..	..	0	14	0	
	Ribbon fish ..	..				
14 Madras	Mackerels ..	..	0	5	0	Rs. 20.
	Sudumbu ..	..	0	6	0	„ 25.
	Ribbon fish ..	..	0	5	0	„ 20.
	Seer ..	..	0	10	0	„ 42.
	Pomfrets ..	..	0	8	0	„ 34.
	Sharks ..	..	0	2	0	„ 8.

APPENDIX XLVI.

APPENDIX LI.

WHOLESALE PRICE OF FRESH FISH, PER 100 LB. SOLD IN MADRAS CITY IN 1956-57.

(Compiled by P. I. Chacko, Fisheries Marketing and Information Officer.)

Serial number and kind of fish.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.
<i>Fresh water fish.</i>												
1 Carps	38	37	38	33	30	33	33	30	30	30	30	30
2 Cat fish	40	39	40	38	38	40	33	35	35	38	35	35
3 Prawn	45	43	48	40	40	45	43	43	43	48	40	43
<i>Marine fish.</i>												
4 Cat fish	35	40	40	40	35	35	33	38	35	38	35	40
5 Prawn	50	50	50	38	43	45	48	45	48	45	45	45
6 Mackerel	35	..	35	35	..	..	30	28	28	30	33	35
7 Pomfret	60	50	55	48	50	50	50	50	50	50	50	50
8 Halsa	50	40	48	38	38	40	35	35	..	35	38	35
9 Seer	70	60	65	60	60	63	60	60	60	60	60	60
10 Perch	..	40	48	43	43	45	43	38	38	40	45	45
11 Indian Salmon ..	45	40	45	38	38	43	38	38	38	40	40	40

APPENDIX LIII.

RETAIL AND WHOLESALE PRICE OF FRESH FISH SOLD AT
15 CENTRES IN 1956-57.(Compiled by P. I. Chacko, Fisheries Marketing and
Information Officer.)

Centre.	Kind of fish.	Retail per lb.		Wholesale per maund.	
		RS.	A. P.	RS.	A. P.
(1)	(2)	(3)	(3)	(4)	(4)
1 Adirampatnam ..	Skates ..	0	4 0	..	..
	Sharks ..	0	5 0	..	..
	Cybiurn ..	0	6 0	..	..
	Lates ..	0	8 0	..	..
	Cat fish ..	0	4 0	..	..
	Murrels ..	0	8 0	..	..
	Carps ..	0	5 0	..	..
2 Pudukotta ..	Carps ..	0	4 0	12	..
	Murrels ..	0	6 0	20	..
	Skates ..	0	4 0	12	..
3 Vellore ..	Murrels ..	0	3 0	to 0 12 0	..
	Carps ..	0	12 0	..	..
	Pomfret ..	0	12 0	..	..
4 Ootacamund ..	Carps ..	3	10 0	..	..
5 Cuddalore ..	Lates ..	0	6 0	to 0 10 0	20-30
	Prawns ..	0	6 0	to 0 10 0	..
	Silver bellies ..	0	6 0	to 0 10 0	..
	Mullet ..	0	6 0	to 0 10 0	..
	Chanos ..	0	6 0	to 0 10 0	..
6 Coimbatore ..	Cat fish ..	0	6 0	to 0 10 0	..
	Prawns ..	0	3 0	to 0 8 0	..
	Mackerels ..	0	4 0	to 0 7 0	..
	Sardines ..	0	2 0	to 0 6 0	..
	Jaw fish ..	0	4 0	to 0 8 0	..
	Sharks ..	0	6 0	to 0 8 0	..
	Pomfret ..	0	6 0	to 0 10 0	..
	Ribbon fish ..	0	6 0	to 0 8 0	..
	Seer ..	0	8 0	to 0 14 0	..
	White bait ..	0	3 0	to 0 6 0	..
7 Tiruvellore ..	Carps ..	0	3 0	..	10
	Murrels ..	0	8 0	..	27
	Etroplus ..	0	6 0	..	22
	Prawns ..	0	5 0	..	18
8 Srivaikuntan ..	Carps ..	0	4 0	..	15
	Eels ..	0	8 0	..	35
	Etroplus ..	0	4 0	..	15
	Tilapia ..	0	4 0	..	15
	Mullet ..	0	4 0	..	15
9 Trichirappalli ..	Carps ..	0	6 0	to 0 8 0	28 to 35
	Pomfrets ..	0	10 0	..	40
	Sharks ..	0	10 0	..	..
	Prawns ..	0	10 0	..	..
10 Tanjore ..	Carps ..	0	5 0	to 0 7 0	25
	Murrels ..	0	7 0	to 0 9 0	28
	Cat fish ..	0	6 0	to 0 8 0	26
	Eels ..	0	4 0	to 0 6 0	18
	Seer ..	0	10 0	to 0 12 0	50
	Pomfret ..	0	10 0	to 0 12 0	50

APPENDIX LIII—cont.

RETAIL AND WHOLESALE PRICE OF FRESH FISH SOLD AT
15 CENTRES IN 1956-57—cont.

Centre.	Kind of fish.	Retail per lb.		Wholesale per maund	
		RS.	A. P.	RS.	A. P.
(1)	(2)	(3)	(3)	(4)	(4)
11 Tindivanam ..	Mullet ..	0	5 0	to 0 6 0	..
	Prawns ..	0	4 0	to 0 5 0	..
	Sharks ..	0	4 0	to 0 5 0	..
	Pomfrets ..	0	6 0	..	..
	Chanos ..	0	6 0	..	..
	Lactarius ..	0	4 0	..	..
12 Madurai ..	Carps ..	0	6 0	..	25
	Chanos ..	0	6 0	..	25
	Tilapia ..	0	7 0	..	28
	Murrels ..	0	12 0	..	45
	Pomfrets ..	0	7 0	..	27
	Seer ..	0	7 0	..	27
	Skates and Rays ..	0	4 0	..	23
	Mackerels ..	0	5 0	..	24
13 Negapatnam ..	Sharks ..	0	3 0	..	10
	Pomfret ..	0	4 0	..	18
	Lactarius ..	0	4 0	..	18
	Silver bellies ..	0	3 0	..	11
	Skates and Rays ..	0	3 0	..	11
	Carps ..	0	3 0	..	11
14 Ambasamudram ..	Carps ..	0	6 0	..	..
	Sharks ..	0	6 0	to 0 8 0	..
	Skate ..	..	..	Do.	..
	Ribbon fish ..	..	..	Do.	..
	Prawns ..	0	8 0	to 0 12 0	..
15 Mettur Dam ..	Carps ..	0	4 0	to 0 6 0	..
	Cat fish ..	0	6 0	to 0 8 0	..

APPENDIX LV—cont.

LIST OF FISH TRADE ENQUIRIES ATTENDED BY THE MARKETING OFFICER IN 1956-57—cont.

38. Sri Somshekhar Rao, Madras—fish landings at Nagapattinam.
39. The Director of Industries and Statistics Authority, Bombay—sea shells.
40. Indian Standard Institute, Delhi—marine oil.
41. Moyer Fish Produce Co., New York—shrimp fisheries.
42. Lime Shells Supplying Co., Kozhikode—lime shells.
43. General Export Co., Tuticorin—seaweeds.
44. R. B. Raja & Co., Bombay—green snail shells.
45. Indo-Burma Purchase Agency, Calcutta—dried prawns.
46. Veterinary Officer, Fatehpur, Uttar Pradesh—shark liver oil.
47. Parshuram Tanneries, Sholapur—commercial fish oils.
48. Principal, University College of Veterinary Science, Osman's—shell grit.
49. The Western Tanneries, Ltd., Bombay—fish oil.
50. Omkar Nath Jagadish Prasad, Agra—fish meal.
51. Sri P. K. Patel, Surat—fish oil for leather industry.
52. Sri G. F. Gerard, Peilargunj, New Delhi—prawns.
53. Poultry Development Officer, Delhi State—fish meal.
54. Superintending Engineer, Offshore Fishing Station, Bombay—price of prawns at Bepore.
55. Peterson & Co., Importers and Exporters, Bombay—fish meal.
56. Mysore Bee-brand Honey Products Co., Mysore—shark liver oil.
57. Aruna & Co. (India) Ltd., Calcutta—availability of prawns for export.
58. Sri G. W. Sundara Raj, Kovur—sale of semidried prawns and Mettur fish.
59. Southern Fisheries Corporation, Ernakulam—marketing of fish from Kanyakumari district.
60. Joint Controller of Exports, Madras—Statistics of prawn catches and frozen prawns.
61. Sri V. P. Mohamed Omer Muyan Saheb, Madras—price of shark fins.
62. Director of Agriculture, Tripura—fish meal production.
63. Chief Superintendent of Development, Ministry of Defence, Government of India—manufacture of fish glue.
64. Varde Industries, Bombay—fancy shells.
65. Director-General, Department of Commercial Intelligence and Statistics, New Delhi—fish skin trade.
66. Northern Indian Refrigeration & Air Conditioning Trades Association—refrigeration facilities in Madras.
67. Sri P. Arumainayagam, Muttom—foreign markets for frozen lobster and markets for fresh fish.
68. Shri B. D. Nivas, Firuzabad, U.P.—manufacture of pearl essence.
69. Sri C. T. Ramanujam, Vijayapur North—dried and cured fish sources in Madras.
70. Sri V. N. Vadivelu, Jalarpur—fish supply sources.
71. Sri M. Kuppuswamy Chetty, San Thome—availability of fresh prawns.
72. Sri Syed Hussain, Shenoyanagar, Madras—semidried prawns and fish meal.
73. The Drugs Controller, New Delhi—import of cod liver oil and output of shark liver oil.
74. The President, Charchika Fish Co-operative Society, Balugan, Orissa—transport of fish.
75. The Sindia Engineering Company, Madras—requirements of ice plant and cold storages.

APPENDIX LVI.

APPENDIX LVI.

A FISHING CALENDAR FOR THE KANYAKUMARI DISTRICT COAST.

Prepared by P. I. Chacko and S. George.

Name of fishing centre. (1)	January. (2)	February. (3)	March. (4)	April. (5)	May. (6)	June (7)
Cape-Comorin ..	Seer. Shark. Cat fish. Dussumeria. Lactarius. Ribbon fish. Lobster. Lates.	Seer. Cat fish. Perches. Shark. Chorinemus. Lobster. Sea-bream.	Lactarius. Seer. Cat fish. Perches. Tunny. Sea-bream.	White bait. Lactarius. Shark. Caranx. Ribbon fish.	White bait. Lactarius. Shark. Caranx. Ribbon fish.	Ribbon fish. Caranx. Shark. Prawns. Rock Cod.
Mutton ..	Shark. Cat fish. Dussumeria. Lates. Sea-bream. Lobster. Balistes. Perches.	Perches. Cat fish. Lobster. Caranx. Balistes. Rock Cod.	Lactarius. Perches. Caranx. Pomfret. Shark. Perches. Rock Cod.	White bait. Shark. Lactarius. Ribbon fish. Caranx.	White bait. Shark. Lactarius. Ribbon fish. Caranx.	Ribbon fish. Shark. Caranx. Prawns. Rock Cod.
Kadiapattinam ..	Lates. Sea-bream. Sharks. Rock Cod. Lobster. Balistes.	Seer. Cat fish. Perches. Shark. Caranx. Lobster. Balistes.	Lactarius. Perches. Shark. White-bait. Sea-bream. Balistes. Rock Cod.	White bait. Pomfret. Lactarius. Shark. Perches. Rock Cod.	White bait. Lactarius. Ribbon fish. Caranx. Shark.	Shark. Ribbon fish. Caranx. Prawns. Rock Cod.
Cochel ..	Sea-bream. Seer. Shark. White bait. Lobster. Balistes.	Perches. Cat fish. Rock Cod. Sea-bream. Caranx. Tunny. Lobster. Balistes.	Seer. Perches. Rock Cod. Sea-bream. Rock Cod. White bait. Tunny.	White bait. Lactarius. Pomfret. Shark. Perches. Rock Cod.	White bait. Ribbon fish. Lactarius. Caranx. Shark.	Ribbon fish. Shark. Caranx. Prawns. Rock Cod.

Name of fishing centre.	July. (8)	August. (9)	September. (10)	October. (11)	November. (12)	December. (13)
Enyamputhenthura.	Sea-bream. Shark. Rock. Dussumeria. Lobster. Balistes.	Perches. Seer. Cat fish. Sea-bream. Lobster. Rock Cod. Balistes.	Seer. Lactarius. Perches. Rock Cod. Sea-bream. Tunny.	Lactarius. White bait. Shark. Pomfret. Perches. Rock Cod.	Ribbon fish. White bait. Caranx. Lactarius. Shark.	Shark. Ribbon fish. Prawns. Caranx. Perches.
Thutdoor ..	Rock Cod. Seer. Mackerel. Shark. Perches. Balistes.	Rock Cod. Seer. Tunny. Perches. Sea-bream. Balistes.	Perches. Rock Cod. Sea-bream. Tunny. Lactarius. Shark.	Lactarius. Shark. White bait. Pomfret. Perches. Rock Cod.	Ribbon fish. Caranx. White bait. Lactarius. Shark.	Ribbon fish. Shark. Prawns. Caranx.
Mutton ..	Ribbon fish. Sabre fish. Cat fish. Caranx. Shark. Prawns.	Ribbon fish. Lactarius. Sabre fish. Shark. Cat fish.	White bait. Ribbon fish. Seer. Sabre fish. Shark.	White bait. Lactarius. Ribbon fish. Seer. Sabre fish.	White bait. Seer. Silver bellies. Lobster. Lactarius.	White bait. Seer. White bait. Seer. Dussumeria. Lobster. Perches.
Kadiapattinam ..	Sabre fish. Ribbon fish. Cat fish. Caranx. Shark. Prawns.	Lactarius. Ribbon fish. Sabre fish. Cat fish.	Ribbon fish. White bait. Sabre fish. Seer. Shark.	Lactarius. White bait. Ribbon fish. Seer. Sabre fish.	White bait. Lobster. Silver bellies. Seer. Lactarius.	Shark. White bait. Seer. Dussumeria. Lobster. Perches.

APPENDIX LVI—cont.

A FISHING CALENDAR FOR THE KANYAKUMARI DISTRICT COAST—cont.

Name of fishing centre.	July. (8)	August. (9)	September. (10)	October. (11)	November. (12)	December. (13)
Colechel ..	Ribbon fish. Sable fish. Caranx. Cat fish. Prawns. Shark.	Sable fish. Ribbon fish. Lactarius. Cat fish. Shark.	White bait. Ribbon fish. Sable fish. Seer. Lactarius. Shark.	White bait. Lactarius. Seer. Sable fish.	White bait. Seer. Lobster. Silver bellies. Lactarius.	White bait. Shark. Seer. Lobster. Dusumeria. Perches.
Enyamputhenthura.	Sable fish. Caranx. Ribbon fish. Cat fish. Shark. Prawns.	Ribbon fish. Sable fish. Lactarius. Cat fish. Shark.	White bait. Sable fish. Ribbon fish. Seer. Lactarius.	Sable fish. White bait. Seer. Lactarius.	White bait. Lobster. Seer. Lactarius. Silver bellies.	White bait. Seer. Shark. Lobster. Dusumeria.
Thattoor ..	Sable fish. Ribbon fish. Cat fish. Caranx. Prawns. Shark.	Ribbon fish. Sable fish. Cat fish. Lactarius. Shark.	White bait. Sable fish. Ribbon fish. Lactarius. Seer.	White bait. Sable fish. Lactarius. Seer.	White bait. Seer. Lobster. Silver bellies. Lactarius.	White bait. Dusumeria. Seer. Lobster. Shark.

APPENDIX LVII.

LIST OF TECHNICAL ENQUIRIES ATTENDED BY THE MARKETING AND INFORMATION OFFICER IN 1956-57.

1. Sri B. V. Ratnam, Landholder, Madanapalli—fish farming techniques.
2. Sri Sultan Mohideen Sahab, Nungambakkam—fish culture.
3. Dr. L. S. Ramaswami, Central College, Bangalore—inducing spawning of carps in confined waters.
4. Sri G. N. Mitra, Director of Fisheries, Orissa—socio-economics and statistics.
5. Director of Animal Husbandry, Uttar Pradesh, Lucknow—culture of Gourami.
6. Secretary, Bombay Natural History Society, Bombay—avian fauna of Pulicat Lake.
7. Brigadier S. T. Apear, Ootacamund—angling in Ooty lake.
8. Mr. R. J. Harvey, Bangalore—aquarium fishes.
9. Srimathi Ramanatha Iyer—maintenance of aquarium fishes.
10. Mr. S. Perry, Madras—fish farming techniques.
11. Sri Jawad Ahmad Sahib, Bangalore—piscicultural procedures.
12. Dr. Mrs. D. Silva, Adyar, Madras—rearing of aquarium fishes.
13. Sri M. N. Ramachandran, Madras—aquarium fishes.
14. Sri B. S. Rawat, Dohra Dun—rearing and breeding of aquarium fishes.
15. The Deputy Warden of Fisheries, Himachal Pradesh—artificial feeding of mirror carp.
16. Sri A. P. N. Singh, Hardi, Bihar—Tilapia culture.
17. Messrs. A. P. Dutt and Co., Mazzaffarpur, Bihar—Tilapia culture.
18. Sri M. K. Raja Mohideen Rowther, Hereford Estate, Shencottah—carp culture.
19. Sri N. V. Kannappan, Tiruvottiyur—fish cultural procedures.
20. Sri R. Chakravarty, Jamshedpur—carp culture.
21. K. K. Lakshmi, Calcutta—life history of marine gastropods.
22. Fishery Officer, Kutch—Occurrence and distribution of marine fishes.
23. Dr. B. S. Bhimachar, Chief Research Officer, Central Inland Fisheries Research Station, Calcutta—fisheries of river valley projects.
24. Dr. M. T. Philippos, Algologist, Central Inland Fisheries Research Station, Cuttack—Control of aquatic vegetation.
25. Sri D. P. Chopra, Ambala—fish cultural procedures.
26. Sri G. A. Singara Rajan, Tuticorin—methods of preservation of fish.
27. Prof. Dr. Fritz Bartz, Bonn University, Germany—fisheries and fishermen of Madras State.
28. Mrs. Anne Mansden, Glenmorgan, England—facilities for marine biological researches in Madras State.
29. Sri A. N. Tondulkar, Bombay—biology and culture of edible oyster.
30. Sri K. Ranganathan, Srivanthadu—fish cultural procedures.
31. Dr. P. N. Ganapati, Andhra University—bionomics and growth rate of Hilsa.
32. Director, Central Leather Research Institute, Madras—nomenclature and distribution of Indian crocodiles.
33. Sri A. G. K. Menon, Zoological Survey of India, Calcutta—fauna and fisheries of Vellar estuary.
34. Sri B. K. Singh, Imphal, Assam—transport of Etroplus fingerlings by air.
35. Sri N. Venkata Reddy, Mica Mines, Maddurupalli, Nellore district—fish farming procedures.
36. Dr. S. Sarbahi, Fisheries Biologist, Lucknow—culture of Bektu in fresh waters.
37. Sri S. Rajan, Research Scholar, Zoological Survey of India, Calcutta—references on South Indian fish fauna.
38. Sri P. K. Elangal, Kothamangalam—fish cultural procedures.
39. The Head Master, Egnore High School, Madras—maintenance of aquaria.
40. Sri Jawad Ahamed Sahib, Bangalore—fish farming methods.

APPENDIX LVIII.

LIST OF EXHIBITIONS IN WHICH THE DEPARTMENT
PARTICIPATED IN 1956-57.

1. Madras—Madras University Centenary Exhibition—28th January to 20th February 1957.
2. Madras—All India Fisheries Conference—September 1956.
3. Chingleput district—Rural exhibition, Ikkadu village, Tiruvellore taluk—7th April 1956.
4. Chingleput district—Tirukalikundram Block Development—Exhibition—18th to 24th April 1956.
5. Chingleput district—Second Five-Year Plan Publicity Week, Tiruvellore—5th July 1956.
6. Chingleput district—Cattle show, Ponneri—7th July 1956.
7. Chingleput district—N.E.S. Block Inauguration.
8. Chingleput district—Village Leaders' Training Camp, Kallampakkam Kandili—22nd to 24th February 1957.
9. Chingleput district—Agricultural Exhibition and Cattle Show, Sriperumbudur—10th April 1956.
10. Chingleput district—Second Five-Year Plan Publicity Exhibition, Tirukalikundram—3rd to 8th July 1956.
11. North Arcot district—District Board High School Anniversary, Arni—11th to 13th April 1956.
12. North Arcot district—Five-Year Plan celebration exhibition, Ranipet—April 1956.
13. North Arcot district—Kalusapakkam Block Exhibition, Melurri—31st July to 1st August 1956.
14. North Arcot district—Vallam Exhibition, Vallam—19th to 20th August 1956.
15. North Arcot district—All India Swadeshi and Agricultural Exhibition, Tiruvannamalai—1st February to 3rd July 1956.
16. North Arcot district—Second Five-Year Plan Exhibition, Vellore—1st to 3rd July 1956.
17. North Arcot district—Government Pentland Hospital, Vellore—19th to 21st January 1957.
18. South Arcot district—Agricultural Exhibition, Gingee—13 and 14th April 1956.
19. South Arcot district—Second Five-Year Plan Exhibition, Gingee—9th and 10th July 1956.
20. South Arcot district—Second Five-Year Plan Exhibition, Tindivanam—11th January 1956.
21. South Arcot district—Inauguration of Block Development Scheme, Gingee—20th October 1956.
22. South Arcot district—Handloom Week Exhibition, Cuddalore—25th December 1956.
23. South Arcot district—Community Development Seminar, Cuddalore—7th January 1957.
24. Tanjore district—Tamilnad Congress Exhibition, Nagapattinam—April 1956.
25. Tanjore district—Art Gallery Exhibition, Tanjore.
26. Tanjore district—Cattle Show, Orthanad.
27. Tanjore district—Cattle show and Milk Day, Tanjore.
28. Tanjore district—Masimakam Exhibition, Kumbakonam.
29. Tanjore district—Tula Exhibition, Mayuram.
30. Tanjore district—Seminar Exhibition, Tiruvengadu.

APPENDIX LVIII—cont.

LIST OF EXHIBITIONS IN WHICH THE DEPARTMENT
PARTICIPATED IN 1956-57—cont.

31. Tiruchirappalli district—Municipal Exhibition, Karur.
32. Tiruchirappalli district—Agricultural Exhibition, Perambur.
33. Madurai district—Chitrai Exhibition, Madurai.
34. Madurai district—Second Five-Year Plan Publicity Week, Madurai.
35. Madurai district—Community Project Exhibition, Alagarkoil.
36. Ramanathapuram district—All India Industrial Exhibition, Virudhunagar—April 1956.
37. Ramanathapuram district—Pathrakaliamman Exhibition, Sivakasi.
38. Ramanathapuram district—Second Five-Year Publicity Week Exhibition, Trivilliputhur.
39. Ramanathapuram district—Second Five-Year Publicity Week Exhibition, Virudhunagar.
40. Salem district—All India Khadi, Swadeshi, Handloom and Industrial Exhibition, Salem—August 1956 (Received Gold Medal Certificate).
41. Salem district—Five Year Plan Publicity Week Exhibition, Mettur dam—11th July 1956 (Received certificate of merit).
42. Salem district—Five Year Plan Publicity Week Exhibition, Attur—6th and 7th July 1956. (Received certificate of merit).
43. Coimbatore district—Sixth Regional Basic Conference, Bhavanisagar.
44. Coimbatore district—Agricultural Farmers' Day, Bhavanisagar.
45. Coimbatore district—All India Swadeshi and Industrial Exhibition, Coimbatore—April 1956.
46. Coimbatore district—Block Development Meeting, Perundurai.
47. Coimbatore district—Five Year Plan Publicity Exhibition, Pollachi—July 1956.
48. Nilgiris district—Market Fair Exhibition, Ooty—5th May 1956 (Received certificate of merit).
49. Nilgiris district—Flower show, Ooty—19th May 1956.
50. Nilgiris district—Fruit show, Coonoor—25th and 26th May 1956.
51. Nilgiris district—Tribal show and exhibition, Ooty—October 1956.
52. Malabar district—Health, Education and Industrial Exhibition, Kozhikode—April 1956.
53. Malabar district—Five Year Plan Publicity Week, Kozhikode—August 1956.
54. Tirunelveli district—The Indian Industries Exhibition, Tuticerin—26th July to 15th August 1957 (Received certificate of merit).

APPENDIX LIX.

LIST OF PUBLICATIONS IN 1956-57.

1. An overland transshipment of the pearl oyster. By P. I. Chacko and C. Malu Pillai. *Ind-Com Journal*, XI, 2, 145-146, 1956.
2. A record of sun-fish, *Ranzania trunata* (Retzius) near Beypore, Malabar Coast. By P. I. Chacko and M. J. Mathew, *Journ. Bombay Nat. Hist. Soc.*, 53, 4, 724-725, 1956.
3. Booklet on fish farming by P. I. Chacko. *Madras Fisheries Information Bureau*, pp. 26, 1956.
4. Madras Fish Facts, 1956. By P. I. Chacko. *Madras Fisheries Information Bureau*, pp. 12, 1956.
5. A fishing calendar for the West Coast of Madras State. By P. I. Chacko and S. George. *Contrib. Marine Biological Station, West Hill, Malabar Coast*, 3, 1-30, 1956.
6. A fishing calendar for the East Coast of Madras State. By P. I. Chacko and S. George. *Ibid.*, 4, 1-16, 1956.
7. The first pearl fishery in Independent India. By P. I. Chacko. *Ind-Com Journal*, 11, 280-283, 1956.
8. Annual Report of the Marine Biological Station, West Hill, 1954-55. By P. I. Chacko. *Madras Fisheries Station Reports and Year Book*, 1954-55, 3-22, 1956.
9. Annual Report of the Marine Biological Station, Krusadai Island, Gulf of Manaar, 1954-55. By P. I. Chacko. *Ibid.*, 23-36, 1956.
10. Annual report of the Marine biological Station, Tuticorin, 1954-55. By P. I. Chacko. *Ibid.*, 37-56, 1956.
11. Annual report of the Marine Biological Station, Ennur, 1954-55. By P. I. Chacko. *Ibid.*, 57-68, 1956.
12. Biology and fisheries of the sprat, *sardinella albella* (Cuv. and Val.) in the West Coast of Madras State. By P. I. Chacko and M. J. Mathew. *Ibid.*, 103-108, 1956.
13. A preliminary study of the fisheries of the Korapuzha estuary in Malabar. By P. I. Chacko, M. J. Mathew and S. George. *Ibid.*, 109-124, 1956.
14. Collection and culture of the milkfish, *Chanos chanos* (Forsk.) in and around Krusadai and Rameswaram Island, with notes on its biology. By P. I. Chacko and S. Mahadevan. *Ibid.*, 145-154, 1956.
15. Offshore fishing experiments in the Palk Bay and Gulf of Manaar around Rameswaram Island. By P. I. Chacko and S. Mahadevan. *Ibid.*, 155-163, 1956.
16. Studies on the seasonal fluctuations of alginic acid and dry matter contents of Phaeophyceae around Krusadai Island in the Gulf of Manaar. By C. Malu Pillai and P. I. Chacko. *Ibid.*, 165-173, 1956.
17. A survey of the fishing industry of Tuticorin, Gulf of Manaar. By P. I. Chacko and A. D. Isaac Rajendran. *Ibid.*, 175-193, 1956.
18. Experimental line fishing in the offshore waters off Tuticorin. By P. I. Chacko and A. D. Isaac Rajendran. *Ibid.*, 195-198, 1956.
19. Surface temperature of the coastal waters of Madras State, India, during the sexennium, 1941-44. By P. I. Chacko, *Ibid.*, 199-201, 1956; and also in *Science and Culture*, 21, 458-459, 1956.
20. The commercial marine fish catch of Madras State for the year 1953-54. By P. I. Chacko. *Madras Fisheries Station Reports and Year Book*, 1954-55, 203-242, 1956.
21. Statistics of inland fisheries of Madras State, January-December 1954. By P. I. Chacko and S. George. *Ibid.*, 243-246, 1956.
22. Observations on the biology and ecology of the inland water fishes of Madras with special reference to their suitability for culture. By P. I. Chacko. *Ibid.*, 247-270, 1956.
23. Notes on a survey of the fishing industry of the Laccadive and Amidivi Islands. *Ibid.*, 125-138, 1956.

APPENDIX LIX—cont.

LIST OF PUBLICATIONS IN 1956-57—cont.

24. Age and rate of growth of the freshwater fishes of Madras State I—*Tinca tinca* by M. D. Menon and B. K. Murthi, II. *Mastacembalus armatus* by B. K. Murthi and M. D. Menon, and III *Labeo fimbriatus* by B. K. Murthi, M. D. Menon and P. I. Chacko, *Ibid.*, 271-288, 1956.
25. On the possible forage fish, *Tilapia mossambica* I. Its Food by M. D. Menon and B. K. Murthi. *Ibid.*, 289, 302, 1956.
26. Thermal studies of the Chetpat fish farm ponds, Madras. By S. V. Ganapathi and R. Srinivasan. *Ibid.*, 303-322, 1956.
27. Limnology of Bhavanisagar reservoir—I. Hydrology by K. A. Dora Rajah, and II Phytoplankton by N. Pankajam. *Ibid.*, 323-350, 1956.
28. A survey of the Araniar river with reference to fishery development in the Araniar valley, by P. I. Chacko and Gemma Evangeline. *Ibid.*, 351-367, 1956.
29. An investigation into the pollution of the Vellar estuary by waste waters from the South India Starch Products Company, Limited, at Porto Novo and their effects on the Vellar river estuaries. By R. Srinivasan and K. A. Dorai Rajah, *Ibid.*, 369-376, 1956.
30. Further experiments on the control of aquatic vegetation with 2, 4-D. i By R. Srinivasan and P. I. Chacko. *Ibid.*, 377-384, 1956.
31. A survey of the helminth fauna parasitic in the freshwater fishes of the Madras State *Nicollodiscus bhavani* and *Isoparorchis hypselobagri*. By P. D. Achar, *Ibid.*, 385-390, 1956.
32. Annual report of the Freshwater Biological Research station, Bhavanisagar, Coimbatore district, 1954-55. By M. D. Menon and R. Srinivasan *Ibid.*, 69-85, 1956.
33. Occurrence of Paracolon bacteria in a tropical marine environment and their classification. By A. Srinivasan and R. Venkatraman. *Nature*, 176, 547, 1956.
34. Marine denitrifying bacteria from South India. By A. Srinivasan and R. Venkatraman. *Journ. Microbiology*, 18, 241, 1956.
35. A hydrobiological investigation of large scale fish mortality in a temple tank by R. Venkatraman, S. T. Chari and A. Srinivasan. *Proc. Indian Acad. Sci.*, 44, 35, 1956.
36. Media for the study of Red Halophile Bacteria. By A. Srinivasan and R. Venkatraman. *Journ. Sci. and Ind. Res.*, 15, c, 210, 1956.
37. *Pseudomonas tuticorinnensis* n.sp., a marine denitrifying bacteria. By A. Srinivasan and R. Venkatraman. *Curr Sci.*, 25, 294, 1956.
38. Importance of hydrographical investigations in the Gulf of Manaar in relation to its fisheries. By P. I. Chacko and C. Malu Pillai. *Ind-Com Journal*, XII, 2, 194-197, 1957.
39. Fish statistics of West Coast of Madras State for 1950-51. By P. I. Chacko and S. George. *Madras Fisheries Statistics Report*, 42, 1-141, 1957.
40. The pearl fishery conducted off Tuticorin in 1956. By P. I. Chacko. *Ind-Com Journal*, XII, 3, 328-321. (Abstract in *Proc. 44th Indian Sci. Congr.*, 3, 322, 1957).
41. Annual report of the Fisheries Technological Station, Kozhikode, (1954-55., By R. Venkatraman. *Madras Fisheries Station Reports and Year Book*, 1954-55, 87-102, 1956.
42. Salt curing of marine fishes of the West Coast, Madras State. By R. Venkatraman A.G. Vasavan. *Ibid.*, 391-416, 1957.
43. Common salt—Its bacteriology and chemical compositions with special reference to the red halophilic bacteria causing spoilage of salted fish. By R. Venkatraman and A. Sreenivasan. *Ibid.*, 417-422, 1956.
44. Survival of coliform bacteria from town sewage and Harvey effluents let into the sea at Tuticorin. By R. Venkatraman and A. Sreenivasan. *Ibid.*, 423-424, 1956.

APPENDIX LIX—cont.

LIST OF PUBLICATIONS IN 1956-57—cont.

45. A. preliminary note on the bacteriology of shark spoilage by R. Venkatraman and A. Sreenivasan. *Ibid.*, 425-426, 1956.
46. Use of fish-biscuits to fish protein malnutrition. By R. Venkatraman, A. G. Vasavan and Kumari S. Timothy. *Ibid.*, 427-430, 1956.
47. Transport of edible oysters of distant places. By R. Venkatraman and S. T. Chari, *Ibid.*, 431-432, 1956.
48. Transport of iced fish from Calicut to Madras. By R. Venkatraman and S. T. Chari, *Ibid.*, 433-434, 1956.
49. Proximate composition of trace elements content of operculum of chank (*Xancus pycnum*), by R. Venkatraman and S. T. Chari. *Ibid.*, 435-436, 1956.
50. Fish recipes by Kumari S. Timothy *Ibid.*, 437-441, 1956.
51. Chemical investigations on the formation of pearls in the Indian pearl oyster, *Margaritifera vulgaris*, by R. Venkatraman and S. T. Chari. *Journ. Sci. and Ind. Res.*, 15-C, 9a, 212-213, 1956.
52. Red halophilic bacteria—the identity of some well known species. By R. Venkatraman and A. Srinivasan. *Proc. Indian Acad. Sci.*, 43-B, 261-270, 1956.
53. The effect of aureomycin, nitrite and ricinoleate on red halophilic bacteria. By R. Venkatraman and A. Sreenivasan. *Cur. Sci.*, 25, 190, 191, 1956.
54. Spoilage of canned food—two instances of gaseous spoilage. By R. Venkatraman, A. G. Vasavan, S. T. Chari and A. Sreenivasan. *Ind.-Com Journal, Annual*, 1957.
55. Aminoacid composition of some marine fishes. By R. Venkatraman and S. T. Chari. *Indian Journ. Med. Res.*, 45, 77, 84, 1957.
56. Semi-drying of prawns and its effect on the aminoacid composition. By S. T. Chari and R. Venkatraman. *Ibid.*, 1957.
57. Large scale mortality of fish in a pond, by S. V. Ganapati. *Ind.-Com Journ.*, XI, 4, 285-295, 1956.
58. Palghat fort. By V. Achuthan Nair, *Ibid.*, 296-300, 1956.
59. Marketing of fish by S. Thangiah, *Ibid.*, XI, (3), 214-219, 1956.

APPENDIX LX.

STATEMENT SHOWING THE NUMBER OF VISITORS TO THE AQUARIUM IN ONE-ANNA AND TWO-ANNA TICKETS DURING 1956-57.

Month.	Number of visitors in one-anna tickets.	Number of visitors in two-anna tickets.	Total number of visitors in each month.
(1)	(2)	(3)	(4)
April	3,233	6,518	9,751
May	4,972	9,016	13,988
June	3,778	6,600	10,378
July	3,202	5,340	8,542
August	3,270	4,090	7,360
September	4,815	5,149	9,964
October	4,475	6,302	10,777
November	3,842	4,312	8,154
December	4,999	5,981	10,980
January	5,425	5,823	11,248
February	4,028	4,545	8,573
March	2,885	4,732	7,617
Total ..	43,924	98,408	117,332

APPENDIX LXI.

LIST OF AQUARIUM FISHES IMPORTED FROM SINGAPORE IN NOVEMBER 1956 AND THEIR PRESENT CONDITION.

Number and common name. (1)	Scientific name. (2)	Present condition. (3)
1 Hockey stick ..	<i>Thayeria obliqua</i> ..	.. All living but have not bred.
2 Flame tetra ..	<i>Hyphessobrycon tinniei</i> ..	.. All died in May 1957 due to white spot disease.
3 Oligolepis ..	<i>Moenkhausia oligolepis</i> ..	.. All are living but have not bred.
4 Sword tail ..	<i>Xiphophorus helleri</i> ..	.. All living and gave birth to 100 young ones.
5 Snakeskin Gourami ..	<i>Trichogaster pectoralis</i> ..	.. All living but have not bred.
6 Archer ..	<i>Toxotes jaculator</i> ..	.. Do.
7 Scissors tail ..	<i>Rasbora trilineata</i> ..	.. Do.
8 Black comet ..	<i>Carassius auratus</i> ..	.. Do.
9 Kissing Gourami ..	<i>Helostoma temminckii</i> ..	.. Few died due to fungus.
10 Lion Head ..	<i>Carassius auratus</i> ..	.. All living but have not bred.
11 Telescopic eye-f ..	.. Do. ..	.. Do.
12 Shubunkin ..	.. Do. ..	.. Do.
13 Serpa tetra ..	<i>Hyphessobrycon Serpae</i> ..	.. All died due to sudden chillness.
14 Head and tail lights ..	<i>Hemigrammus ocellifer</i> ..	.. All living—had attack of white-spot—cured by Methylene blue treatment.
15 Widow tetra ..	<i>Gymnocharacinus tetrali</i> ..	.. All living but have not bred.
16 Pulcher ..	<i>Hemigrammus pulcher</i> ..	.. All living but have not bred. Had attack of white-spot but were cured by Methylene blue treatment.
17 Riddle tetra ..	<i>Pristella riddlei</i> ..	.. All living and bred—but only 4 young ones are surviving.
18 Sumatra barb ..	<i>Barbus tetrazona</i> ..	.. All living but have not bred.
19 Angel ..	<i>Pterophyllum eimkei</i> ..	.. Do.
20 Platy ..	<i>Xiphophorus maculatus</i> ..	.. All living and bred and 100 young ones are surviving.
21 Apistogramma ..	<i>Apistogramma ramirezi</i> ..	.. All living but have not bred.
22 Golden barb ..	<i>Barbus semifaciliatus</i> ..	.. All living but have bred.

23 Glow light tet ..	<i>Hyphessobrycon gracilis</i> ..	.. All died due to white-spot disease in May 1957.
24 Rosy tetra ..	.. Do. ..	.. Do.
25 Clown loach ..	<i>Betta macracantha</i> ..	.. Do.
26 Blood fin ..	<i>Aphyocaran rubripinnis</i> ..	.. All died in March 1957 due to white-spot.
27 Lemon tetra ..	<i>Hyphessobrycon pulchripinnis</i> ..	.. Two died due to egg binding and two due to leishmaniasis.
28 Pearl scale ..	<i>Carassius auratus</i> ..	.. Two died due to egg binding and two due to leishmaniasis.
29 Calico ..	.. Do. ..	.. Nineteen living after 6 died due to leishmaniasis.
30 Black moor ..	.. Do. ..	.. Six due to attack of leishmaniasis; and the rest cured by methylene blue and Mercurochrome treatment.
31 Blackline tetra ..	<i>Hyphessobrycon scholzei</i> ..	.. Fifteen died due to white spot; and 10 are living.
32 Neon tetra ..	.. Do. ..	.. Twelve dead due to old age; rest are living but have not.
33 White cloud ..	<i>Tanichthys albonubes</i> ..	.. Fifteen died due to fungus (disease) rest are living bred; but have not bred.
34 Cherry barb ..	<i>Barbus tetra</i> ..	.. All died due to fin rot in March 1957.
35 Malayan loach ..	<i>Acanthophragmus semicinctus</i> ..	.. Died due to sudden change of temperature in December 1956.
36 Red tetra ..	<i>Hyphessobrycon flammeus</i> ..	.. All died due to fin rot in May 1957.
37 Jack dempsy ..	<i>Cichlosoma biocellatum</i> ..	.. All living and bred twice but only 25 young ones have survived.
38 Moonplaty ..	<i>Platydocilus maculatus</i> ..	.. All died in March 1957, but reason could not be diagnosed.
39 Calico telescopie ..	<i>Carassius auratus</i> ..	.. Four dead due to attack of leishmaniasis parasitic attack, others are living.
40 Celestial ..	.. Do. ..	.. Only 2 are living—the rest died due to parasitic attack.
41 Roopkin ..	.. Do. ..	.. All died due to parasitic attack.
42 Chocolate Gourami ..	<i>Cichlosoma Coryphaenoides</i> ..	.. Fifteen are living, the rest died due to attack.
43 Clown barb ..	<i>Barbus everetti</i> ..	.. All were attacked by leeches and were treated with salt, and Methylene blue—10 died and 10 survived.
44 Saddle cichlid ..	<i>Aequidens tetramerus</i> ..	.. Four died due to fin rot and 8 survived and bred; but only few young ones lived.
45 Blue acara ..	.. Do. ..	.. All living and bred 3 times; 55 young ones are now living.
46 Buenosires tetra ..	<i>Hemigrammus caudorittatus</i> ..	.. Lived till September 1957 when all died due to old age.
47 Australien rainbow ..	<i>Melanotainianigrans</i> ..	.. All died due to fungus.
48 Do. ..	<i>Nannostomus axonotus</i> ..	.. All died in January 1957 due to climate changes.
49 Sail fin ..	<i>Mallinaria latipinna</i> ..	.. All living and bred; 50 young ones are surviving.
50 Harlequin ..	<i>Rasbora heteromorpha</i> ..	.. All died in February 1957 due to attack of fungus.

APPENDIX LXII.

LIST OF FISHERMEN CO-OPERATIVE SOCIETIES IN MADRAS
STATE DURING 1956-57.*Chingleput district.*

1. Pulicat Fishermen Co-operative Society (Marine).
2. Vallambedu Bharathavar Fishermen Co-operative Society (Marine).
3. Ennore Fishermen Co-operative Society (Marine).
4. Thiruvottiyur Fishermen Co-operative Society (Marine).
5. Tiruchirakuppam Fishermen Co-operative Society (Marine).
6. Tiruvanniyoor Fishermen Co-operative Society (Marine).
7. Neelakarai Fishermen Co-operative Society (Marine).
8. Kanthu Reddikuppam Fishermen Co-operative Society (Marine).
9. Padur Fishermen Co-operative Society (Inland).
10. Mahabalipuram Fishermen Co-operative Society (Marine).
11. Uyyalur Kuppan Fishermen Co-operative Society (Marine).
12. Sadras Fishermen Co-operative Society (Marine).
13. Padupatnam Fishermen Co-operative Society (Marine).
14. Kadalar Periakuppam Fishermen Co-operative Society (Marine).
15. Kadupakkam Alamburo Fishermen Co-operative Society (Marine).
16. Karunguzhi Fishermen Co-operative Society (Inland).
17. Uthiramerur Fishermen Co-operative Society (Inland).
18. Tenpakkam Fishermen Co-operative Society (Inland).
19. Iyengarkulam Fishermen Co-operative Society (Inland).
20. Kancheepuram Fishermen Co-operative Society (Inland).
21. Walajabad Fishermen Co-operative Society (Inland).
22. Sriperumbudur Fishermen Co-operative Society (Inland).
23. Poonamallee Fishermen Co-operative Society (Inland).
24. Poondi Fishermen Co-operative Society (Inland).
25. Kalpakkam Fishermen Co-operative Society (Marine).
26. Chutipeling Fishermen Co-operative Society (Inland).
27. Magorel Fishermen Co-operative Society (Inland).
28. Sadras Kuppan Fishermen Co-operative Society (Marine).
29. Sathankuppam Fishermen Co-operative Society (Marine).
30. Alundur Fishermen Co-operative Society (Inland).
31. Kunnathur Fishermen Co-operative Society (Inland).

Madras district.

32. Madras Fishermen Co-operative Federation (Marine).
33. Kasipuram Fishermen Co-operative Society (Marine).
34. Uroorkuppam Fishermen Co-operative Society (Marine).
35. Narayanaswamy Garden Inland Fishermen Co-operative Society (Inland).
36. Mattankuppam Fishermen Co-operative Society (Marine).
37. Royapuram Fishermen Co-operative Society (Marine).
38. Kasimode Fishermen Co-operative Society (Marine).
39. Nochikuppam Fishermen Co-operative Society (Marine).
40. Triplicane Fishermen Co-operative Society (Marine).
41. South Madras Fishermen Co-operative Society (Marine).

APPENDIX LXII—cont.

LIST OF FISHERMEN CO-OPERATIVE SOCIETIES IN MADRAS
STATE DURING 1956-57—cont.*South Arcot district.*

42. Chidambaram Parvatharajakulam Fishermen Co-operative Society (Inland).
43. Vallampadugu Fishermen Co-operative Society (Inland).
44. Kurinjipadi Fishermen Co-operative Society (Inland).
45. Lalpet Fishermen Co-operative Society (Inland).
46. Kattumannargudi Fishermen Co-operative Society (Inland).
47. Udayangudi Fishermen Co-operative Society (Inland).
48. Killai Fishermen Co-operative Society (Marine).
49. Thandavaraya Soligarpettai Fishermen Co-operative Society (Marine).
50. Portonovo Fishermen Co-operative Society (Marine).
51. Tindivanam Fishermen Co-operative Society (Inland).
52. Kaipankuppam Fishermen Co-operative Society (Marine).
53. Hanumanthakuppam Fishermen Co-operative Society (Marine).
54. Koonimedu Fishermen Co-operative Society (Marine).
55. Mudaliarchavadi Fishermen Co-operative Society (Marine).
56. Kinjampettai Fishermen Co-operative Society (Marine).
57. Siru Madurai Fishermen Co-operative Society (Inland).
58. Tirukoilur Fishermen Co-operative Society (Inland).
59. Uppalavadi Fishermen Co-operative Society (Inland).
60. Mel Malayanur Fishermen Co-operative Society (Inland).
61. Villupuram Fishermen Co-operative Society (Inland).
62. Tiruveethi Fishermen Co-operative Society (Inland).
63. Chellankuppam Fishermen Co-operative Society (Marine).
64. Sonankuppam Fishermen Co-operative Society (Marine).
65. Tiruppapuliyur Fishermen Co-operative Society (Inland).
66. Ilinjanpettai Fishermen Co-operative Society (Inland).
67. Sivanarpuram Fishermen Co-operative Society (Inland).
68. Uyyalakuppam Fishermen Co-operative Society (Marine).

North Arcot district.

69. Polur Sembadayar Fishermen Co-operative Society (Inland).
70. Kaveripak Fishermen Co-operative Society (Inland).
71. Walajapet Fishermen Co-operative Society (Inland).
72. Vengalathur Fishermen Co-operative Society (Inland).
73. Ukkal Fishermen Co-operative Society (Inland).
74. Muppilivetti Fishermen Co-operative Society (Inland).

Salem district.

75. The Mettur Dam Fishermen Co-operative Marketing Society, Limited (Inland).

Tanjore district.

76. Thirumalaivasal Fishermen Co-operative Society (Inland).
77. Kaveripatnam Sea Fishermen Co-operative Society (Marine).
78. Koolaiyur Sea Fishermen Co-operative Society (Marine).
79. Tiruvanagiri Sea Fishermen Co-operative Society (Marine).

APPENDIX LXII—*cont.*LIST OF FISHERMEN CO-OPERATIVE SOCIETIES IN MADRAS
STATE DURING 1956-57—*cont.**Tanjore district—cont.*

80. Madathukuppam Sea Fishermen Co-operative Society (Marine).
81. Tranquebar Sea Fishermen Co-operative Society (Marine).
82. Perumalpettai Sea Fishermen Co-operative Society (Marine).
83. Chandrapadi Sea Fishermen Co-operative Society (Marine).
84. Akkaraipettai Sea Fishermen Co-operative Society (Marine).
85. Nambiarnagar Fishermen Co-operative Society (Marine).
86. Sambandanpottai Sea Fishermen Co-operative Society (Marine).
87. Thuraikadu Fishermen Co-operative Society (Marine).
88. Vedaranyam Arcot Street Sea Fishermen Co-operative Society (Marine).
89. Kodiakarai and Kodaikadu Sea Fishermen Co-operative Society (Marine).
90. Pottai Jambuvanodai Sea Fishermen Co-operative Society (Marine).
91. Eripurakarai Sea Fishermen Co-operative Society (Marine).
92. Karayur Fishermen Co-operative Society (Marine).
93. Muthukuda Sea Fishermen Co-operative Society (Marine).
94. Kattamavadi Jambuga Mahadevapatnam Sea Fishermen Co-operative Society (Marine).
95. Pudukudi Sea Fishermen Co-operative Society (Marine).
96. Pudupatnam Sea Fishermen Co-operative Society (Marine).
97. Tanjore Parvatharajakulam Fishermen Co-operative Society (Inland).
98. Kumbakonam Parvatharajakulam Fishermen Co-operative Society (Inland).
99. Papanasam Parvatharajakulam Fishermen Co-operative Society (Inland).
100. Maravakadu Fishermen Co-operative Society (Marine).
101. Kodiampalayam Fishermen Co-operative Society (Marine).
102. Pandal Siruthaikaladu Fishermen Co-operative Society (Marine).
103. Tanjore District Fishermen Co-operative Federation.
104. Naluvolapathy Fishermen Co-operative Society.

Madurai district.

105. Madurai Taluk Fishermen Co-operative Society (Inland).
106. Palani Taluk Fishermen Co-operative Society (Inland).
107. Periakulam Fishermen Co-operative Society (Inland).

Ramanathapuram district.

108. Ramanath District Fishermen Co-operative Federation, Ramanathapuram.
109. Rajapalayam Fishermen Co-operative Society.
110. Rameswaram Fishermen Co-operative Society.
111. Watrap Fishermen Co-operative Society.
112. Tirupathur Fishermen Co-operative Society.
113. Paramakudi Fishermen Co-operative Society.
114. Manamadurai Fishermen Co-operative Society.
115. Tiruppuvannam Fishermen Co-operative Society.
116. Dattushikodi Fishermen Co-operative Society.
117. Tangachinnadam Fishermen Co-operative Society.

APPENDIX LXII—*cont.*LIST OF FISHERMEN CO-OPERATIVE SOCIETIES IN MADRAS
STATE DURING 1956-57—*cont.**Ramanathapuram district—cont.*

118. Anthoiaiparaim Fishermen Co-operative Society.
119. Mandapam Fishermen Co-operative Society.
120. Lannei Fishermen Co-operative Society.
121. Athankudi Fishermen Co-operative Society.
122. Parambikulam Fishermen Co-operative Society.
123. Devipattam Fishermen Co-operative Society.
124. Tiuppakudi Fishermen Co-operative Society.
125. Mellumalai Fishermen Co-operative Society.
126. Karungudi Fishermen Co-operative Society.
127. Kavkollapattam Fishermen Co-operative Society.
128. Nambuthalai Fishermen Co-operative Society.
129. Thondi Fishermen Co-operative Society.
130. Parthibur Fishermen Co-operative Society.
131. Pasipattam Fishermen Co-operative Society.
132. Pudumadam Fishermen Co-operative Society.
133. Muthupettai Fishermen Co-operative Society.
134. Kilakrai Fishermen Co-operative Society.
135. Mookur Fishermen Co-operative Society.
136. Pamban Fishermen Co-operative Society.

Coimbatore district.

137. Harale Fishermen Co-operative Society (Inland).
138. Kilvane Fishermen Co-operative Society (Inland).
139. Dharmaparam Fishermen Co-operative Society (Inland).
140. Kulumam Fishermen Co-operative Society (Inland).

Tirunelveli district.

141. Tuticori Fishermen Co-operative Society (Marine).
142. Pinaktyal Fishermen Co-operative Society (Marine).
143. Veerapandi patnam Fishermen Co-operative Society (Marine).
144. Alanthurai Fishermen Co-operative Society (Marine).
145. Manapad Fishermen Co-operative Society (Marine).
146. Perithalai Fishermen Co-operative Society (Marine).
147. Overy Fishermen Co-operative Society (Marine).
148. Kootapuli Fishermen Co-operative Society (Marine).
149. Tonkasi Fishermen Co-operative Society (Inland).
150. Periasamipuram Fishermen Co-operative Society (Inland).
151. Torku Kulikulam Fishermen Co-operative Society (Inland).
152. Seruthumangalam Fishermen Co-operative Society (Inland).
153. Melupavoor Fishermen Co-operative Society (Inland).
154. Tirunelveli District Fishermen Co-operative Federation (Inland).
155. Kilvaippar Fishermen Co-operative Society (Inland).
156. Ratchayapuram Fishermen Co-operative Society (Inland).

APPENDIX LXII—cont.

LIST OF FISHERMEN CO-OPERATIVE SOCIETIES IN MADRAS STATE DURING 1956-57—cont.

Kanyakumari district.

157. Ezhudesam Fishermen Co-operative Society (Marine).
158. Melamnakudy Fishermen Co-operative Society (Marine).
159. Kadiapatnam Marketing Co-operative Society (Marine).
160. Kanyakumari Fishermen Co-operative Society (Marine).
161. Pudukadai Fishermen Co-operative Society (Marine).
162. Colachel Fishermen Co-operative Society (Marine).
163. Kollipad Fishermen Co-operative Society (Marine).
164. Midalam Fishermen Co-operative Society (Marine).
165. Puthoor Fishermen Co-operative Society (Marine).
166. Rajakkamangalam Fishermen Co-operative Society (Marine).
167. Kodimunai Fishermen Co-operative Society (Marine).
168. Kovalam Fishermen Co-operative Society (Marine).
169. Kellengode Krishi Fishermen Co-operative Society (Marine).
170. Kollengode Coastal Relief Co-operative Society (Marine).
171. Enayam Fishing Co-operative Society (Marine).
172. St. Phelomonas' Moenpudi Thozhilalar Co-operative Society (Marine).

Tiruchirappalli district.

173. Karar Fishermen Co-operative Society (Inland).
174. Kodali Karuppam Fishermen Co-operative Society (Inland).
175. Sri Rangam Fishermen Co-operative Society (Inland).

APPENDIX LXIII.

STATEMENT OF FISHERY SCHOOLS IN MADRAS STATE AS ON 31ST MARCH 1957.

Serial number and district.	Location.	Type of school.	Strength of pupils.			of teachers.
			Boys.	Girls.	Total.	
1 Chingleput ..	Suthan-kuppam.	Lower Elementary.	42	44	86	2
2 Do. ..	Alambari-kuppam or Kada-pakam.	Do.	66	30	96	2
3 Tanjore ..	Kaveri-patnam.	Do.	76	21	97	2

APPENDIX LXIV.

LIST OF MOTOR VEHICLES OWNED BY THE DEPARTMENT IN 1956-57.

Serial number and registration number.	Description.	Location.
<i>I. Quick Transport Scheme (hire system).</i>		
1 MSZ 2539	Ford	Madras.
2 MSZ 2712	Bedford	Do.
3 MSZ 2968	Fordson	Do.
4 MSZ 2752	GMC Pickup	Do.
5 MSZ 3589	Chevrolet	Do.
6 MSZ 1262	Do.	Do.
7 MSZ 1335	Do.	Do.
8 MSZ 1550	Bedford	Mettur Dam.
9 MSZ 3102	GMC Pickup	Do.
<i>II. Quick Transport Scheme (hire-purchase system).</i>		
10 MSY 7049	Studebaker Pickup ..	Porto Novo.
11 MSY 7050	Do.	Tanjore.
12 MSY 7051	Do.	Tuticorin.
<i>III. Intensive Seed Collection Scheme.</i>		
13 MSZ 2713	Land Rover	Madurai.
14 MSZ 2763	Do.	Bhavanisagar.
15 MSZ 2789	Do.	Tuticorin.
16 MSZ 2744	Do.	Tanjore.
17 MSZ 2762	Do.	Kozhikode.
18 MSZ 2788]	Do.	Mangalore.
19 MSZ 1540	Ford	Tuticorin.
20 MSZ 2748	Austin Truck	Tanjore.
21 MSZ 3351	Chevrolet	Do.
22 MSZ 3524	Do.	Do.
23 MSZ 3158	Commer	Vellore.
24 MSZ 3771	Dodge	Mettur Dam.
<i>IV. Fish Preservation Scheme.</i>		
25 MSZ 0290	Insulated Van	Kozhikode.
26 MSZ 0291	Do.	Mangalore.
<i>V. Information and Propaganda Scheme.</i>		
27 MSZ 2937	Chevrolet Station Wagon.	Madras.

NOTE.—Of the 27 vehicles, numbers 17 and 25 were transferred to Kerala State and numbers 18 and 26 to Mysore, with effect from 1st November 1956; and therefore at the end of the year there were 23 vehicles in Madras State.

APPENDIX LXV.

LIST OF BOATS, LAUNCHES AND VESSELS OWNED BY THE
DEPARTMENT IN 1956-57.

Name of craft. (1)	Vessel number. (2)	Remarks. (3)
T.C.A. Vessels—		
1 Sardinella * ..	M.F.V. 9 ..	Operated at Pamban and Tuticorin and later moved by Mysore State.
2 Samudra † ..	M.F.V. 9 ..	Operated at Madras and later moved to Kerala State.
3 Gudjon ..	M.F.V. 10 ..	Operated at Tuticorin and Pamban.
4 Moenakshi ..	M.F.V. 11 ..	Operated at Tuticorin and Madras.
5 Skiff ..	M.F.V. 10 ..	Used as tender boat for M.V. Gudjon.
Pablo Boats (25 footer)—		
6 Boat No. 1 † ..	P.B. 1 ..	First prototype boat, transferred to Kerala State.
7 Vatsala ..	P.B. 2 ..	Issued to Porto novo Fishermen Co-operative Society.
8 Sathya ..	P.B. 3 ..	Issued to Sonankuppam Fishermen Co-operative Society.
9 Arul ..	P.B. 4 ..	Sri G. Balakrishnan and fishermen group.
10 Murugesha ..	P.B. 5 ..	Issued to Sonankuppam Fishermen Co-operative Society.
11 Jon † ..	P.B. 6 ..	Transferred to Kerala State.
12 Pedro † ..	P.B. 7 ..	Do.
13 Palani ..	P.B. 8 ..	Issued to Killaj Fishermen Co-operative Society.
14 Boat No. 9 ..	P.B. 9 ..	Issued to Tirunelveli District Fishermen Co-operative Federation.
15 Do. 10 ..	P.B. 10 ..	Issued to Neelankarai Fishermen Co-operative Society.
16 Do. 11 ..	P.B. 11 ..	Issued to Tirunelveli District Fishermen Co-operative Federation.
17 Do. 12 ..	P.B. 12 ..	Do.
18 Do. 13 ..	P.B. 13 ..	Do.
19 Do. 14 * ..	P.B. 14 ..	Transferred to Kerala State.
20 Do. 15 * ..	P.B. 15 ..	Do.
21 Do. 16 ..	P.B. 16 ..	Issued to Kasimode Fishermen Co-operative Society.
22 Do. 17 ..	P.B. 17 ..	Do.
23 Do. 18 ..	P.B. 18 ..	Issued to Ayodhiakuppam Fishermen Co-operative Society.
24 Do. 19 ..	P.B. 19 ..	Issued to Mattankuppam Fishermen Co-operative Society.
25 Do. 20 ..	P.B. 20 ..	Do.
26 Do. 21 ..	P.B. 21 ..	Issued to Madras Fishermen's Co-operative Federation.

* Vessels transferred to Mysore State with effect from 1st November 1956.

† Vessels transferred to Kerala State with effect from 1st November 1956.

APPENDIX LXV—cont.

LIST OF BOATS, LAUNCHES AND VESSELS OWNED BY THE
DEPARTMENT IN 1956-57—cont.

Name of craft. (1)	Vessel number. (2)	Remarks. (3)
Pablo Boats (25 footer)—cont.		
27 Boat No. 22 ..	P.B. 22 ..	Issued to Tirunelveli District Fishermen Co-operative Federation.
28 Do. 23 ..	P.B. 23 ..	Do.
29 Do. 24 ..	P.B. 24 ..	Do.
30 Lourdammal ..	P.B. 25 ..	Issued to the Colachel Fishermen Co-operative Society.
31 Simon ..	P.B. 26 ..	Do.
32 Boat No. 27 ..	P.B. 27 ..	Issued to Ramanathapuram District Co-operative Fishermen Federation.
33 Do. 28 ..	P.B. 28 ..	Issued to Tanjavoor District Co-operative Fishermen Federation.
34 Do. 29 ..	P.B. 29 ..	Do.
35 Do. 30 ..	P.B. 30 ..	Issued to the Pulicat Fishermen's Co-operative Society.
Illugason Boats (30 footers)—		
36 Boat No. 1 ..	I.B. 1 ..	Issued to the Ramanathapuram District Fishermen Co-operative Federation.
37 Do. 2 ..	I.B. 2 ..	Issued to the Madras Fishermen Co-operative Federation.
F.A.O. Boats (property of F.A.O. and worked by F.A.O. Engineer). At Pamban.		
38 Steel Dory 1 ..	..	Do.
39 Do. 2 ..	..	Do.
40 Danish boat No. 1 ..	M.F.L. 17 ..	Operated by group of fishermen at Kilakarai on share basis.
41 Do. 2 ..	M.F.L. 18 ..	Operated by group of fishermen at Pamban.
42 Surf Boat No. 1 ..	..	Engine not erected.
43 Do. 2 ..	..	Do.
44 Do. 3 ..	..	Operated at Madras.
Motorized indigenous crafts—		
45 Mari ..	M.I.C. 1 ..	In operation at Tuticorin and handed over to Tirunelveli Fishermen Co-operative Federation.
Motor Fishing Vessels—		
46 Goher Khaleeli ..	M.F.V. 1 ..	Fishing operations and Pearl Fishery work at Tuticorin.
47 M.F.V. Calicut ..	M.F.V. 5 ..	Fishing operations at Pamban and Mandapam.
Motor Launches—		
48 Sea Scout ..	M.L. 1 ..	Condemned in G.O. No. 1802, Agriculture, dated 20th July 1956.
49 Leverette ..	M.L. 2 ..	Do.
50 Swami ..	M.L. 3 ..	At Krusadai Biological Station for Plankton. Collection and other oceanographical research.

APPENDIX LXV—*cont.*LIST OF BOATS, LAUNCHES AND VESSELS OWNED BY THE
DEPARTMENT IN 1956-57—*cont.*

Name of craft. (1)	Vessel number. (2)	Remarks. (3)
Motor Luggers—		
51 Durga	M.F.L. 1 ..	Operated at Porto novo and handed over later to Nagapattinam training centre.
52 Saraswati	M.F.L. 2 ..	Operated at Tuticorin and later handed over to Training Centre, Tuticorin.
53 Devika *	M.F.L. 3 ..	Operated at Beypore and transferred to Kerala State.
54 Madhu *	M.F.L. 4 ..	Do.
55 Nandana †	M.F.L. 5 ..	Handed over to Mysore State.
56 Kumaraswamy	M.F.L. 6 ..	Training Centre, Nagapattinam.
57 Victoria	M.F.L. 7 ..	Operated at Tuticorin.
58 M.L. 1	M.F.L. 8 ..	Used for fish transport in Mettur Reservoir.
59 M.L. 2	M.F.L. 9 ..	Do.
60 Ponni	M.F.L. 10 ..	Do.
61 M.L. 3	M.F.L. 11 ..	Operated at Pamban.
62 Ajit	M.F.L. 12 ..	Condemned and sold during the year.
Lusyne Type boats—		
63 Lusyne	L.B. 1 ..	Purchased as per G.O. Ms. No. 1327, Agriculture, dated 26th May 1956—used by Training Section, Tuticorin.
64 Sarojini	L.B. 2 ..	Do.
Tender boats attached to vessels—		
65 Life boat of M.F.V. Calicut.	F.B. 20 ..	In use at Pamban.
66 Life boat of Lady Nicholson.	F.B. 26 ..	Condemned.
67 Life boat of M.F.V. Adirampattanam.	F.B. 23 ..	Broken to pieces and auctioned.
68 Life boat of M.F.V. Mangalore.	F.B. 24 ..	Do.
69 Life boat of M.F.V. Tuticorin.	F.B. 25 ..	Do.
70 Gig boat of Lady Nicholson.	F.B. 21 ..	Condemned.
71 Clinker built Gig boat of M.F.V. Tuticorin.	F.V. 22 ..	Attached to M.F.V. Gouher Khaleeli.
Row Boats and out-board Motor Boats—		
72 Gobi	F.B. 1 ..	Used in Bhavanisagar Reservoir.
73 Stella Maris	F.B. 27 ..	Transferred from Old Training School, Calicut—unserviceable.
74 Irena	F.B. 2 ..	Used at Kodaikanal lake—Since condemned and disposed off.
75 Subhashini	F.B. 3 ..	In use at Kodaikanal lake.
76-82 Dinghies (7)	F.B. 4 to 10 ..	Taken over from Ooty Municipality as per G.O. Ms. No. 2047, Development, dated 1st June 1949 for use in Ooty lake

* Vessels transferred to Kerala State with effect from 1st November 1956.
† Vessels transferred to Mysore State with effect from 1st November 1956.

APPENDIX LXV—*cont.*LIST OF BOATS, LAUNCHES AND VESSELS OWNED BY THE
DEPARTMENT IN 1956-57—*cont.*

Name of craft. (1)	Vessel number. (2)	Remarks. (3)
Row Boats and out-board Motor Boats— <i>cont.</i>		
83-84 Dinghies (2)	F.B. 11 and 12 ..	For use in Ooty lake.
85-86 Do. (2)	F.B. 13 and 14 ..	Do.
87 Salmo	F.B. 15 ..	Do.
88-89 Pleasure Boats (2) ..	F.B. 16 and 17 ..	Do.
90-91 Do. (2)	F.B. 18 and 19 ..	Do.
92 Meenakshi	F.B. 28 ..	For use in Poondi Reservoir.
93 Pleasure Boat	F.B. 29 ..	Used in Vellore moat.
94 Three boats of Cheeni Wood.*	F.B. 30 to 32 ..	Kadapuram F.C. Yard.
95 Four boats purchased in 1945.*	F.B. 33 to 36 ..	Tanur F.C. Yard.
96 One boat of Mango wood.*	F.B. 37 ..	At Calicut.
97 One boat of Cheeni wood.*	F.B. 38 ..	Chowghat Ferry boat.
98 One boat at Hejmadi Kodai.†	F.B. 39 ..	Stationed at Hejmadi Kodi School.
99 Two boats at Mangalore yard.†	F.B. 40 and 41 ..	Stationed at Mangalore yard.
100 One boat at Kumbha yard.†	F.B. 42 ..	Used as Ferry crossing boat.
101 Two boats at Nileswar†	F.B. 43 to 44 ..	Used for collection of fingerlings.
102 One boat at Malpe † ..	F.B. 45 ..	D.S.F. Boat.
103 Three boats at Kodit†	F.B. 46 to 48 ..	Fish farm work.
104 Boat at Veeranam † ..	F.B. 49 ..	Used for patrol work in Veeranam lake.
105 One boat at Karkali† ..	F.B. 50 ..	Karkali Fish Farm boat.
106 One boat at Udiawar†	F.B. 51 ..	Ferry Boat.
107 One gig boat	F.B. 52 ..	Used by Research Assistant, Krusadai.
108 Do.	F.B. 53 ..	Used by Research Assistant, Ennore.
109 One flat bottom boat.	F.B. 54 ..	Used for oyster collection at Pulicat.
Dug-out canoes—		
110 One Dug-out canoe ..	F.C. 1 ..	At Tuticorin—unserviceable.
111 Do.	F.C. 2 ..	Do.
112 Silver arrow	F.C. 3 ..	At Tuticorin in use as tender to reach T.C.M. vessel.
113 Dug-out canoe	F.C. 4 ..	In use at Tellichery.
114 Dug-out canoes	F.C. 5 to 9 ..	In use as tender boat at Mandapam and Pamban.
115 Country canoe	F.C. 10 ..	Under Research Assistant, West Hill.
116 Malabar canoe	F.C. 11 ..	Under Research Assistant, Krusadai.
117 Do.	F.C. 12 ..	Do.
118 Malabar Dug-out canoe.	F.C. 13 ..	Under Superintendent, Ennore.

* Vessels transferred to Kerala State with effect from 1st November 1956.
† Vessels transferred to Mysore State with effect from 1st November 1956.

APPENDIX LXVI.

LIST OF GAZETTED OFFICERS OF THE FISHERIES DEPARTMENT
ON 31ST MARCH 1957.

1. Sri D. D. Peter Devadas, Deputy Director (Marine), Madras.
2. Sri S. Varadarajan, Deputy Director (Inland), Madras.
3. Sri V. D. Spurgeon, Assistant Director (Nylon), Madras.
4. Dr. P. I. Chacko, Assistant Director (Marketing and Information), Madras.
5. Sri N. V. Choodamani, Assistant Director, Tuticorin.
6. Sri V. Ranganathan, Assistant Director, Tanjore.
7. Sri R. Venkataraman, Superintendent, Fisheries Technological and Biological Stations, Tuticorin.
8. Sri G. K. Kuriyan, Assistant Director (Craft and Tackle), Madras.
9. Sri S. Thiagarajan, Assistant Director (Training Centre), Tuticorin.
10. Sri J. Solomon, Assistant Director, Mettur Dam.
11. Sri D. A. S. Gnanadas, Assistant Director, Vellore.
12. Sri S. H. Hussainy, Assistant Director (Training Centre), Nagapattinam.
13. Sri S. X. Arokiaswamy, Assistant Director, Madurai.
14. Sri A. Taher Saif, Assistant Director (T.C.A.), Madras.
15. Sri T. M. Arumugam, Assistant Director (Freshwater Biology), Bhavanisagar.
16. Sri S. Joachim Fernando, Skipper of Gadgon, Tuticorin.
17. Sri R. K. Mani, Assistant Engineer, Madras.
18. Sri A. Srinivasan, Hydrologist, Bhavanisagar.
19. Sri P. Venkatraman, Personal Assistant to the Additional Director of Industries and Commerce, Madras.

APPENDIX LXVII.

STATEMENT OF EXPENDITURE AND RECEIPTS OF THE FISHERIES
DEPARTMENT FOR THE YEAR 1956-57.

40. Agriculture—XXIX Agriculture.

Head of account. (1)	Expenditure 'm' Fisheries. (2)			Receipts 'b' Fisheries. (3)		
	RS.	A.	P.	RS.	A.	P.
(a) Direction	95,296	9	11	..	..	..
(b) Pearl and Chank Fisheries ..	4,02,646	0	6	17,33,618	13	3
(c) Westcoast Fisheries	35,124	2	8	..	..	..
(d) Technological Institute, Tuticorin.	8,574	13	0	..	..	..
(e) Inland Fisheries	1,71,624	4	1	1,68,613	5	5
(f) Exploitation of Mettur reservoir fisheries.	16,358	9	0	5,078	0	3
(g) Inland Fisheries Research including Chetpat Farm and Statistical Section.	32,971	6	6	..	..	..
(h) Oyster Farm, Pulicat	1,225	1	0	2,199	13	9
(j) Marine Biological Station and Aquarium.	54,108	8	1	17,512	12	9
(k) Manufacture of semidried prawns	5,444	13	9	7,817	11	9
(l) Mirror Carp Fish Farm, Ootacamund.	13,506	0	9	18,810	7	..
(m) Fish preservation and transport ..	10,960	3	9	48,637	15	0
(n) Fishery marketing and information.	50,641	11	9	..	..	..
(p) Fishery Schools	3,63,596	5	0	6,766	13	0
(r) Madras Rural Piscicultural Research (R.W.B. Station).	18,739	11	6	..	..	..
(s) Scheme for Marine Fishery Development with T.C. Aid.	12,960	9	11	1,510	1	3
(t) Scheme financed wholly or partly by I.C.A.R.—collection of Marine Fishery Statistics.	1,695	12	3	..	..	..
(u) Scheme for provision of Technical assistance by F.A.O.	26,980	15	4	2,168	0	0
(v) Internal audit staff	10,204	15	0	..	..	..
(w) Establishment of a training centre at Tuticorin under T.C.M. Aid.	68,543	4	10	..	..	..
(x) Scheme for the Mahabalipuram Fishermen Co-operative Societies.	453	4	0	..	..	..
N. Works.						
Rehabilitation of fishermen rendered homeless by sea erosion in North Madras.	4,03,733	9	6	2,46,405	4	0
O. Development schemes.						
(iii) Fish-curing yards	4,93,097	3	3	2,22,513	12	5
(iv) Intensive seed collection and distribution for stocking inland waters (H.Q.).	5,500	12	0	..	..	..
(v) I.S.C. and Distribution for stocking inland waters.	1,07,386	5	11	13,946	6	1

APPENDIX LXVII—cont.

STATEMENT OF EXPENDITURE AND RECEIPTS OF THE FISHERIES
DEPARTMENT FOR THE YEAR 1956-57—cont.

40. Agriculture—XXIX Agriculture—cont.

O. Development schemes—cont.

Head of account. (1)	Expenditure ‘m’ Fisheries. (2) RS. A. P.	Receipts ‘b’ Fisheries. (3) RS. A. P.
(vii) Supply of yarn and other essential materials at subsidised rates to fishermen.	44,694 9 5	4,360 2 9
(viii) Provision of quick transport facilities.	43,714 14 9	30,095 5 0
(x) Training of personnel in the use of new type of operation of engines.	12,025 11 3	..
(xi) Scheme for development of major reservoir fisheries.	11,679 6 1	2,146 9 1
(xii) Assistance to fishermen co-operative societies for the marketing of fish.	21,821 13 6	..
(xiii) Establishment of an Estuarine Fish Farm.	2,808 14 6	..
(xv) Construction of mechanised fishing boats.	81,709 8 0	..
(xvi) Rural fishery demonstration units.	1,41,954 9 5	42,502 14 6
Development of fishing harbours at suitable river mouths.	6,599 8 6	..
Ice plant-cum-cold storage at Mettur.	..	13,000 0 0
Recovery towards cost of mechanised boats.	..	148 10 0

Other departmental schemes.

(i) Public Health Fish Unit ..	5,927 2 3	1,628 12 11
(ii) F.T.S., Kozhikode ..	32,965 13 4	..
(iii) Fisheries Engineering staff ..	4,529 0 0	..
(iv) Fisheries Demonstration Factories.	16,058 14 4	16,210 3 0
(v) Fisheries Welfare Scheme ..	50,398 0 6	..
(vi) Provision of fish transport facilities.	49,519 2 6	3,266 11 0
(vii) Deep sea fishing operations ..	97,735 12 9	48,481 2 7
(viii) Improvement of indigenous craft and tackle.	2,26,886 2 5	12,334 13 7
(ix) Installation of icemaking plant for provision of cold storage for fish.	53,432 13 5	..
(x) Fisheries Technological Station at Tuticorin.	8,283 0 9	..

APPENDIX LXVII—cont.

STATEMENT OF EXPENDITURE AND RECEIPTS OF THE FISHERIES
DEPARTMENT FOR THE YEAR 1956-57—cont.

Other departmental schemes—cont.

Head of account. (1)	Expenditure ‘m’ Fisheries. (2) RS. A. P.	Receipts ‘h’ Fisheries. (3) RS. A. P.
Nilgiris Fisheries	..	7,848 3 9
Scheme for Development of pisciculture in community project area.	4,290 12 0	..
Research Station Cape Comorin ..	271 0 0	..
Charges in England	43 11 8	..
Rents of buildings	..	1,067 10 4
Miscellaneous	..	1,01,842 11 9
<i>Grants from Government of India for schemes in second five year plan.</i>		
Rural Fishery Demonstration Units ..	..	4,581 4 0
C. Recoveries of overpayments— Fisheries	..	19,787 5 7
Other receipts— Fisheries	..	1,052 1 0
Deduct—Refunds	..	— 4,129 0 0
	33,34,530 7 2	28,05,963 13 6
	— 5,28,566 9 3	
Deduct—Charges on supervision, education welfare, engineering and research schemes which are only developmental schemes and not profit making.	9,39,479 1 9	..
	+ 9,39,479 1 9	
Hence net profit	23,95,051 5 5	28,05,963 13 6
	+ 4,10,912 8 1	

APPENDIX LXVIII.

GLOSSARY OF TECHNICAL, POPULAR AND LOCAL NAMES OF FISHES,
PRAWNS, CRABS, OYSTERS AND SEA WEEDS MENTIONED IN
THIS REPORT.

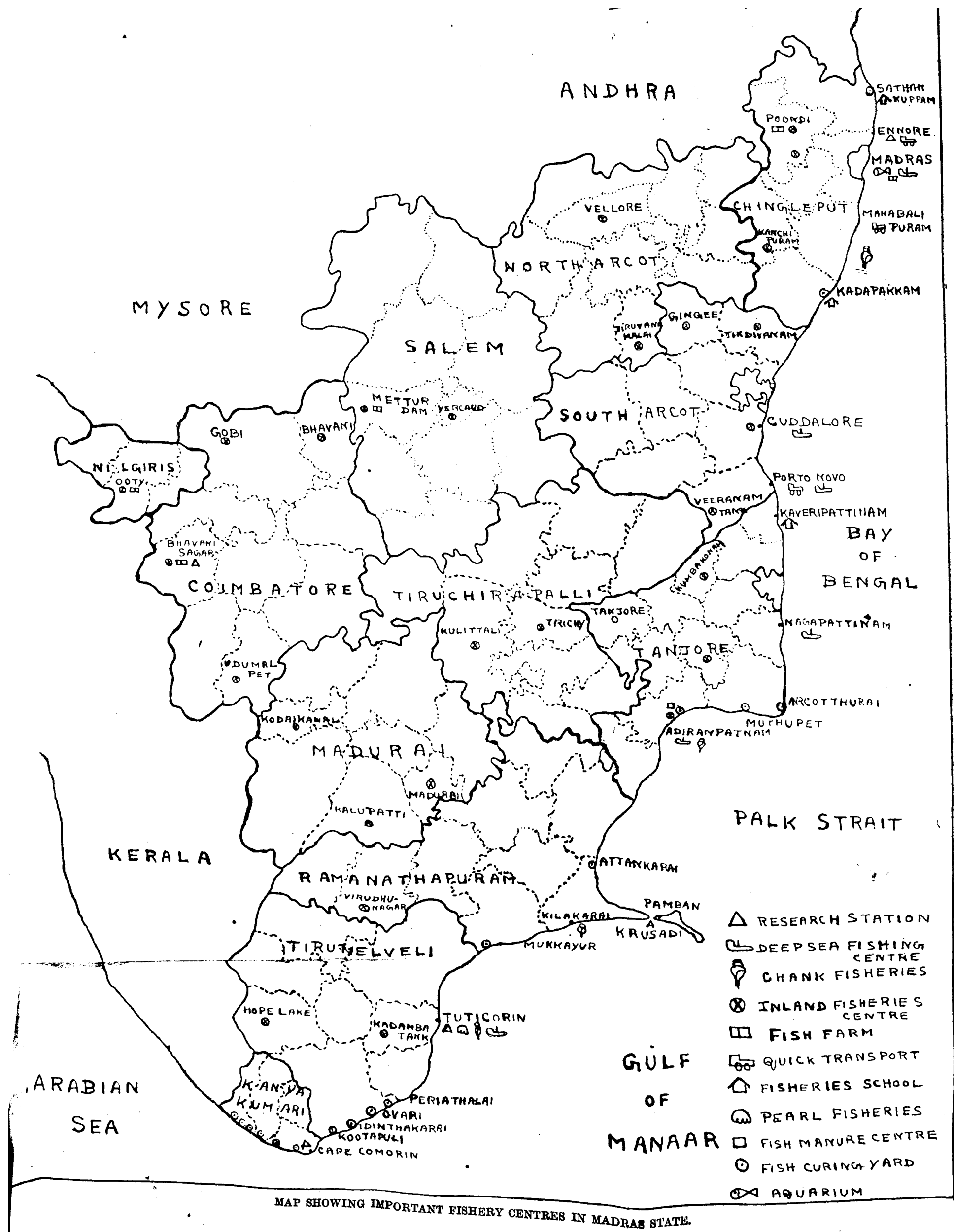
- 1 *Amblypharyngodon*—A minnow—Ollaree and Sorukkai.
- 2 *Arius*—Marine cat fish—Kolutho.
- 3 *Barbus carnaticus*—Carnatic carp.—Pavoori.
- 4 *Barbus chrysopoma*—Olive carp.—Panjalai.
- 5 *Barbus dubius*—Cock fish—Kozhimeen and Kozharinjan kendai.
- 6 *Barbus fluviatilis*—Spotted Barb—Machakendai and Sevali kendai.
- 7 *Barbus hexagonolepis*—Chocolate mahaseer—Karambai.
- 8 *Barbus ticto*—Ticto Barb—Pullikendai.
- 9 *Barbus Sarana*—Sarana—Panjalai and Sanikendai.
- 10 *Barbus vittatus*—Kullakendai.
- 11 *Catla Catla*—Katla—Toppameen and Doraimoen.
- 12 *Caranx*—Horse mackerels—Parai.
- 13 *Charcharias*—Shark—Sura.
- 14 *Chanos Chanos*—Milk fish—Palameen.
- 15 *Chela*—Silver fish—Velichi.
- 16 *Chirocentrus dorab*—Silver bar and Sabro fish—Mulluvai, Karivalai and Tappuvai.
- 17 *Chlorophyceae*—Green algae.
- 18 *Chorinemus*—Lentil or jacket—Katta and Akhamparai.
- 19 *Cirrhitina cirrhosa*—White carp—Vollakendai.
- 20 *Cirrhitina latia*—Kularinjan.
- 21 *Cirrhitina reba*—Reba—Aranjan.
- 22 *Cybtum*—Seer fish—Vanjiram and Seela.
- 23 *Cynoglossus dubius*, *C. punctatus* and *C. Sidensis*—Sole. Nakkumeen.
- 24 *Gyrinus carpio*—Mirror carp—Kannadikendai.
- 25 *Danio*—Danio—Solaiaparavu.
- 26 *Diagramma*—Rock perch—Mathanam.
- 27 *Dussumieria*—Rainbow Sardine—Thondan.
- 28 *Elacate nigra*—Butter fish—Kadeviral.
- 29 *Engraulis*—Anchovy—Poruwa and Kola.
- 30 *Eetroplus suratensis*—Pearl spot—Sethakendai.
- 31 *Eetroplus suratensis*—Pearl spot—Sethakendai.
- 32 *Equula*—Silver bellies—Kanal.
- 33 *Hilsa ilisha*—Indian Shad—Chowauallam.
- 34 *Hilsa toli*—Toli—Karuauallam.
- 35 *Labeo fimbriatus*—Fringe-lipped carp—Solikendai.
- 36 *Labeo kontius*—Cauvery carp—Karumuzhi kendai.
- 37 *Labeo rohita*—Rohu—Rohu.
- 38 *Lactarius*—Big jawed jumper—Kuthippu.
- 39 *Lates calcarifer*—Cook up and Nair fish—Koduwa.
- 40 *Lethrinus*—Sea Bream—Volameen.
- 41 *Lutjanus*—Snapper—Seppili.
- 42 *Macrones aor*—Fresh-water cat fish—Punakoluthi.
- 43 *Macrones vittatus*—Fresh-water fish—Sonankoluthi.

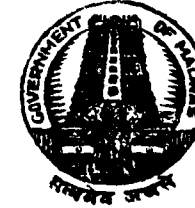
APPENDIX LXVIII—cont.

GLOSSARY OF TECHNICAL POPULAR AND LOCAL NAMES OF FISHES,
PRAWNS, CRABS, OYSTERS AND SEA WEEDS MENTIONED IN
THIS REPORT—cont.

- 44 *Mugil*—Mullet—Madawai.
- 45 *Nuria d mrica*—Flying barb—Meesaparavai.
- 46 *Ophicephalus marulius*—River murrel—Avuri.
- 47 *Penaeus*—Prawns—Erra.
- 48 *Perilampus*—Minnow—Pachameen.
- 49 *Pinctada vulgaris*—Pearl oyster—Muthuchippu.
- 50 *Phaeophyceae*—Brown algae.
- 51 *Prisits*—Saw fish—Vela.
- 52 *Polynemus*—Thread fin—Kala.
- 53 *Pseudorhombus arsius*—Tongue fish—Nakkumeen.
- 54 *Rasbora daniconius*—Rashora—Pattakunju.
- 55 *Rhodophyceae*—Red algae.
- 56 *Rhynchobatus*—Plough fish—Padangan.
- 57 *Rohtee cotio*—Rohtee—Pattakunju.
- 58 *Sardinella*—Sardine—Choodai.
- 59 *Sciaena*—Jew fish—Kathalai.
- 60 *Scomberomorus*—Seer fish—Vanjiram.
- 61 *Scylla serrata*—Green crab.
- 62 *Serranus*—Sea Bass—Kalawa.
- 63 *Sillago sihama*—Whiting—Kelangan.
- 64 *Sphyraena obtusata*—Barracuda—Ooli.
- 65 *Stolephorus*—White bait—Nethale.
- 66 *Stromateus*—Pomfret—Vavul.
- 67 *Synagris*—Pink perch—Lomian and Chengaru.
- 68 *Tenthis*—Oora.
- 69 *Tilapia*—Tilapia—Tilapia.
- 70 *Tinca*—Tench—English kendai.
- 71 *Trichiurus*—Ribbon fish.

CROSS SECTION OF A FISH MARKETING HALL BY P. I. CHACKO





FOOD AND AGRICULTURE DEPARTMENT.

G.O. No. 790, 28th February 1958

Administration Report—Fisheries Department—1956-57—
Reviewed and recorded.

READ—The following paper :—

Letter from the Additional Director of Industries and Commerce,
dated 21st November 1957, No. 1857 Y-2/57.

Order—No. 790, Food and Agriculture, dated 28th February 1958.

4 The report on the working of the Fisheries Department during the year 1956-57 submitted by the Additional Director of Industries and Commerce is recorded with the following remarks.

2. *Administration.*—The year under report was the fourth year after the Fisheries Department was amalgamated with the Department of Industries and Commerce. Sri S. Aruldoss, I.A.S., was in charge of the Fisheries Department as Additional Director of Industries and Commerce throughout the year. The activities of the Department expanded considerably during the year as a result of the working of the Second Five-Year Plan Schemes. The most notable event during the year was the States re-organization as a result of which the West Coast went over to the Kerala State and Kanyakumari came over to Madras State. The re-organization and development of the rich fisheries off Kanyakumari demanded the urgent attention of the Department. An Assistant Director of Fisheries was appointed for that district during the year. A State Fisheries Advisory Board was also set up to advise the Department on fisheries development and welfare measures for fishermen.

3. *Fisheries Research.*—Researches on various problems connected with the conservation, development, exploitation and utilization of the marine and inland fisheries resources were continued during the year. The Government constituted the Fisheries Research Council in January 1956 with a view to assess properly and co-ordinate both the inland and marine fisheries research work.

The half-yearly meetings of the Council have however not been held regularly by the Additional Director of Industries and Commerce. The Government hope that the Council will meet regularly in future and that its decisions will be implemented without delay. The Additional Director of Industries and Commerce will see that more research work is done at the research stations and the research personnel are put to the best use. The work at the biological stations must be diversified and not confined to beaten tracks so that the sea food and bye-product industries may provide food and profit to the community.

(i) *Marine Fisheries Research*.—Consequent on the reorganization of States, which resulted in the Kozhikode Station going to Kerala, a new Technological Station was established at Tuticorin and a sub-station at Cape Comorin during the year. Though programmes were drawn up for these Research stations, detailed investigations were not conducted during the year. The Additional Director of Industries and Commerce will see that adequate research is done at these stations for exploitation of the rich fishing banks around Kanyakumari district particularly the Wadge Bank. Systematic research work should also be conducted at the Biological Station at Ennore near Madras for the development of shrimp and oyster fishing off the Pulicat coast and in the Ennore back waters. The research work done at Krusadai Biological Station does not reveal any new results. The Additional Director of Industries and Commerce is requested to specify in the Report in future in what way the results of research at all these Stations would be useful to the fishing industry.

(ii) *Inland Fishery Research*.—This was concentrated at the Fresh Water Biological Stations at Bhavanisagar and Poondi. Experiments were conducted on the segregation of carp fry, reduction of mortality and spawning of mirror carps, hormonal studies in catla, the limnology of Bhavanisagar, etc. Piscicultural investigations in Vellar river in Tanjore district and Cholavaram lake in Chingleput were also undertaken. The research work at Poondi appears to be insignificant and requires to be heightened. The culture of the exotic fish tilapia was extended to a large number of inland waters with the permission of Government of India. Hilsa fishery in Tanjore district was revived with success. Stocking of quick growing Upper Indian carps, rohu and mrigal was continued. Not much attention has been paid to estuarine fishery research. The development of edible oyster and other varieties of fish in Ennore and Pulicat waters should be taken up.

4. *Development and exploitation of Marine Fisheries*.—(i) *Deep Sea Fishing*.—The Government note that the deep sea fishing activities of the Department were much curtailed during the year due to the fact that all old motor fishing vessels were condemned, although two T.C.M. vessels the "Gudjon" and the "Samudra" were available. A total quantity of 319,082 lb. (140 tons) of fish

was caught during 1956-57 by the departmental boats and vessels as against 109.3 tons caught in 1955-56. The overall expenditure on deep sea fishing operations, including the pay and allowances of the staff, was Rs. 97,735-12-9 and the total receipts Rs. 48,481-2-7 during the year. It is disappointing that the deep sea fishing operations have not been a financial success. The Government feel definitely that the operations could have been made successful in spite of the handicaps if they were more systematic and better controlled. They have reason to think that there was lack of co-ordination and control over the staff at Tuticorin with the result that the deep sea vessels were not put to profitable use. The Additional Director of Industries and Commerce should see that the deep sea fishing operations are conducted in future on a remunerative basis and close control is exercised over the operations. As regards inshore fishing, there was a great demand for power-boats from fishermen and fishermen co-operative societies. The number of boats built under the phased programme in the Second Five-Year Plan has not been adequate to meet the demand and construction of boats through ship-building firms also takes considerable time. The Government have sanctioned a sum of rupees one lakh for establishing a boat building yard in the State wherein the departmental requirements and experimental designs of boats could be undertaken. With the proposed taking over of deep-sea fishing and the pooling of T.C.M. vessels on a zonal basis by the Union Government, the Department will have to concentrate more attention on the development of in-shore fishery by small mechanised boats which are within the means of fishermen. An intensive survey of all fishing grounds both for deep sea and in-shore and off-shore operations should be undertaken immediately, and surveys so far available must be consolidated and made available to fishermen in a suitable form. This is a work which appears to have been neglected for a long number of years. It is basic for all marine fisheries and must be attended to at once.

(ii) *Chank fisheries*.—Chank is one of the main sources of revenue to the Fisheries Department. Chank fisheries off Tirunelveli coast was conducted departmentally while the chank fishery rights off the Ramanathapuram district coast and South Arcot and Chingleput district coasts were leased out to private parties on tender system. The chank fishery off Sivaganga coast was leased out to a private firm for three years from 1st July 1956. During the year under report in Tirunelveli, Sivaganga and Tanjore coasts 795,085 chanks were fished departmentally as against 505,395 chanks fished during the previous year.

(iii) *Pearl fisheries*.—A pearl fishery off Tuticorin coast was conducted again on a large scale during the year. A total number of 11,175,214 oysters were fished during the operations as against 2,129,058 oysters fished during the operations in the previous year. The total revenue realized from this fishery was Rs. 1,68,807-31 nP against an expenditure of Rs. 22,264-24 nP. The net revenue

was about Rs. 1,46,543.07 nP. The Government hope that by intensive investigation and research, the future pearl fisheries will be larger and more successful and remunerative. The Additional Director of Industries and Commerce should take steps to continue research and find out why the volume and periodicity of pearl fishery off Tuticorin is rather sporadic. The Government note that during the year under review experiments with Aqua-lung for diving were conducted successfully. The possibility of using the devices adopted in Western countries by the divers should be further investigated. Investigations on the possibility of starting farms for cultured pearls should also be started with the help of the Deputy Director who was deputed to Japan for a study tour.

5. *Development and exploitation of Inland Fisheries.*—Fishing in the Mettur Reservoir, Adyar River (Madras), Kodakanal Lake, Hope Lake, Poondi Reservoir, etc., was controlled by the Department by the issue of licences. During the year under review there was an appreciable increase in the licence fees collected. The exploration of Mettur Reservoir Fisheries were reorientated last year by discontinuing departmental exploitation and substituting a system of licensing. Although this has obviated mismanagement in disposal of fish, yet the exploitation is poor and the income limited. The Additional Director of Industries and Commerce should pay more attention to the proper utilization and organization of the large fishery and submit proposals to Government. The Government regret that the recoveries from contractors which were pending from 1954 have not yet been fully effected. This must be given energetic attention. The Additional Director of Industries and Commerce should make the Scheme successful by also paying adequate attention to transport and marketing aspects on the lines suggested by Mr. F. H. Barlind, the Food and Agricultural Organization Marketing Expert, who visited this State in the middle of last year. The conservation of fishery in Ootacamund and Kodakanal Lakes and trout fisheries in the Nilgiris should also be given due attention. The rural fishery demonstration units continued to assist owners of ponds, tanks and wells to rear fish by supply of fingerlings. The efforts particularly in the Community Development and National Extension Services areas should be intensified.

Fish marketing and Information.—The total fish landings along the entire coast line of the reorganized Madras State (620 miles) during the year under review was 60,000 tons valued at about Rs. 500 lakhs. Landing of inland fisheries from the various inland waters (about 4 lakhs area in extent) was estimated to be 38,600 tons, valued about Rs. 225 lakhs. The total production of both sea and inland fisheries was thus 98,600 tons. Out of these, 30,000 tons of fish were used for curing, 5,000 tons were retained by the fishermen, 55,000 tons of fish were consumed by the general population, and 1,600 tons were used for miscellaneous purposes like preparation of manure, extraction of oil, etc. The per capita consumption of

fish of the State was estimated at 10.5 pounds which though satisfactory when compared with the All-India average of 3.9 pounds, is far below the nutritional standards and much less than that of many other countries. In regard to market facilities, there should be greater liaison between fishermen and municipal and local board authorities both in regard to provision of markets and roads. The promotion of co-operative societies for marketing particularly for dry fish, which has an export market should be attended to.

Information and propaganda.—During the year under review, the Madras Fishery Museum and the Madras Fresh Water Aquarium continued to be popular. The number of visitors to the Aquarium increased from 79,456 in 1955-56 to 117,332 during the year under review. The Government note with satisfaction that the Aquarium earned a profit. The propaganda unit under the Department visited various fishing hamlets and explained to the fishermen the departmental activities with special reference to the socio-economic rehabilitation of fisher-folk. The Department has recently received an audio-visual van under T.C.M. Aid and it is hoped that more effective propaganda will be carried out by the Department hereafter.

Socio-Economic Work—(i) Fishermen Co-operative Societies.—The fishermen who are the primary producers are closely tied to dealers not only by the normal trading relationship but also by heavy habitual indebtedness. In view of the obvious need to reform such a monopolistic set up, fishermen co-operative societies have been organized in many places in the State. During the year under review the number of fishermen societies in the East Coast increased from 143 to 175. With the successful implementation of the schemes for the grant of long term loans to fishermen co-operative societies, supply of pablo boats, nylon nets and quick transport vehicles, the Government hope that the fishermen will be able to improve their financial position and become self-dependent to undertake marketing of their catches either by themselves or through their co-operatives. The Government are glad to note that the Mettur Dam Fishermen Co-operative Marketing Society has taken advantage of Government assistance in the shape of loan and free services of two officers of the Co-operative Department and that it is doing good work in fishing and selling the catches of its members. It is also observed that the societies like those at Ennore, Vallambadu, Pulicat, Kanathur, Redikuppam, Mahabalipuram, Tanjore, etc., and the District Federations of Madras, Ramanathapuram and Kanyakumari, have also commenced to undertake marketing operations. The Government note with satisfaction, that several relief measures were taken up promptly by the Department to alleviate the distress among the fishermen caused by floods, famine and cyclones by supply of yarn and sail cloth, grant for repairing fishing boats and sale of catamarans at subsidised rates.

The work of settling the fishermen displaced by sea erosion in Rayapuram on sites acquired by Government, was however slow and this must be expedited.

The Government constituted the State Fisheries Advisory Board as a first step to associate non-official representatives of fishermen to secure greater co-operation. This Board at its first meeting held in August 1957 has made several useful recommendations. The Additional Director of Industries and Commerce should see that the recommendations are implemented quickly and satisfactorily.

Scheme included in the Second Five-Year Plan.—Fifteen Fisheries Schemes were approved for inclusion in the Madras State Plan at a total estimated cost of Rs. 84.74 lakhs. Some of the important schemes included in the Second Five-Year Plan relate to construction and distribution of mechanised fishing boats, supply of nylon nets and hooks to fishermen, intensive seed collection and distribution, development of fishing harbours at suitable river mouths, development of major reservoir fisheries, provision of ice plants and cold storage facilities and construction of model fish markets. The provision for 1956-57 was Rs. 11.89 lakhs and the expenditure was Rs. 12.98 lakhs. The Additional Director of Industries and Commerce should see that all the schemes are worked with more vigour as the successful development of marine and inland fisheries depends on the implementation of these schemes.

Food and Agricultural Organization and T.C.M. Aid.—Under the Expanded Technical Assistance Programme of the Food and Agricultural Organization the services of six foreign experts were made available to this State by the Government of India. Mr. G. S. Illugason of Iceland, the Food and Agricultural Organization Fishery Engineer, has trained fishermen in this State in the handling of mechanized boats and the use of nylon gill nets. Mr. Paul Zeiner of Norway and Mr. M. R. Rasmussen of Denmark, Naval Architects, made efforts to improve trawl operations. They also set up the specifications for a boat building yard at Madras. The Harbour specialists, Mr. C. G. Bjuke and Mr. C. R. Bjuke of Sweden carried out detailed investigations for preparation of fishing harbour projects at Cuddalore, Nagapattinam, Tuticorin and Leepuram. Counterpart assistants were provided for the Experts to assist in the investigations and for getting trained to carry on the work after the period of their assignment with the Experts. The Additional Director should make the best use of the investigations conducted by the Experts for improving the boat designs, crafts and tackles and for increasing the efficiency of fishing in the State.

Departmental Conferences.—The All India Fisheries Conference convened by the Government of India was held in Madras in September 1956. The Conference discussed the several aspects of the fishing industry and made useful recommendations. The Department organized an exhibition in that connexion and also arranged a visit of some of the delegates to the Mettur Reservoir

fisheries. The annual Departmental Conference was held at Madras in July 1956 and it reviewed the progress of the Five-Year Plan Schemes.

Finance.—The total revenue of the Department for the year 1956-57 amounted to Rs. 28,05,963-13-6 as against the expenditure of Rs. 33,34,530-7-2 when compared to the revenue of Rupees 23,23,528-11-8 and expenditure of Rs. 25,80,063-3-5 during the year 1955-56. There was increase in expenditure as well as in revenue. After deducting the expenditure of Rs. 9,39,479-1-9 on purely developmental schemes, the department worked at a profit of Rs. 4,10,912-8-1 as against a profit of Rs. 6,64,118-5-9 in 1955-56.

Preparation of the Review.—One noticeable feature in the present report is that it includes detailed information on several activities of the Department in sixty-eight statements and one map appended to the report. A list of the appendices and title to the map have been omitted and these omissions should be supplied before printing the report. The review of the progress of the Second Five-Year Plan Schemes in the Report is not critical and does not indicate the targets and achievements in all cases. This defect must be remedied in future reports.

General.—The working of the Department was satisfactory. Deep sea fishing continued to be small and of not much profit mainly due to the reason that there were not an adequate number of deep sea fishing vessels, but it is unfortunate that even the two good T.C.M. vessels left in, the State were not well utilized due to lack of co-ordination and integration of work and supervision and control over the deep-sea fishing staff at Tuticorin. Small motorised boats have been popularised by the Department successfully and they are very much in demand. For all kinds of marine fishing the basic necessity apart from essential equipment, is the charting of the fishing banks and supply of information regarding the species and seasons at which fish will be met with. This prerequisite should be fulfilled without further delay. It also appears that sometimes the deep-sea vessels were operating in less profitable areas and for very short durations owing to lack of plan between the skipper and the fisheries staff. This state of affairs must be remedied. The survey of fishing grounds must be consolidated and published in a suitable form for the use of fishermen and those who evince interest in commercial fishery. Much success has attended the development of inland fisheries by proper stocking but the position of Mettur fisheries is still not satisfactory and it could be made more remunerative. The Department must draw up an integrated scheme for exploitation, transport and marketing. Estuarine fishing in backwaters and important river mouths should also be developed. The greatest possible attention should be paid to the development of the rich fishing grounds round Kanyakumari.

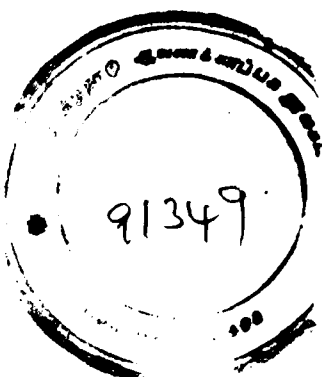
A quick survey should be made for the purpose and necessary facilities should be afforded to fishermen and fishermen co-operative societies in that area. Extension work for the benefit of fishermen should be undertaken at all important centres and audio-visual methods should be employed. Particular attention should be paid to crafts and tackles and nets and net-making. Skill in these should be insisted on in the departmental staff also. Biological and other scientific research should be purposeful and reviewed systematically from time to time so that genuine results may be obtained. The work of the research stations should be published for general information and for the information of other workers in the Department. During the year the Second Five-Year Plan Schemes went into their strides and their progress was satisfactory. The success of the schemes will be judged by the degree by which the efficiency of fishermen and income of fishermen and supply of fish to the public in proper condition and at correct prices have been increased. The Government trust that the department will keep these objectives constantly in view. In the present context of the food resources of the States and its economic situation, the Department should play its due part in increasing the production of fish in improving the condition of the fishermen and adding to the revenues of the State. In a word, for a maritime State like Madras, the Department should help to develop fisheries as an important industry.

(By order of the Governor)

N. MURUGESA MUDALIAR,
Deputy Secretary to Government.

To the Additional Director of Industries and Commerce, Madras 2.

- „ the Director of Industries and Commerce, Madras.
- „ the Board of Revenue, Madras.
- „ the State Port Officer, Madras.
- „ the Controller of Stationery and Printing, Madras (for printing the Review in the Administration Report).
- „ the Director of Information and Publicity, Madras.
- „ the Secretary to the Government of India, Ministry of Food and Agriculture, New Delhi.
- „ the Fisheries Development Adviser to the Government of India, New Delhi.
- „ all Collectors.
- „ the Commissioner, Corporation of Madras, through the Mayor of Madras.



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