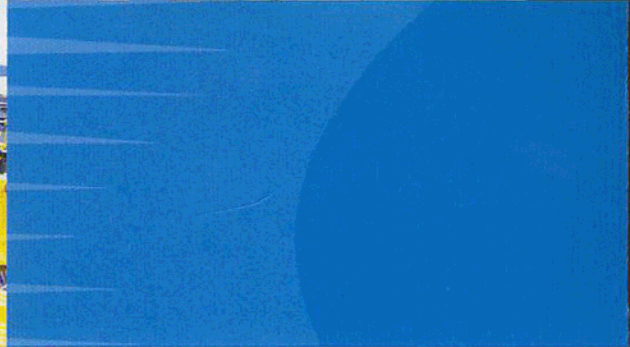




PERANGKAAN TAHUNAN PERIKANAN

ANNUAL FISHERIES STATISTICS

**JILID 1
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JABATAN PERIKANAN MALAYSIA

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KEMENTERIAN PERTANIAN DAN SHARIKAT KERJASAMA

(Ministry of Agriculture and Co-operatives)

BAHAGIAN PERIKANAN

(Fisheries Division)

PERANGKAIAN TAHUNAN
(Annual Statistics)

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KEMENTERIAN PERTANIAN DAN
SHARIKAT KERJASAMA
MALAYSIA
(Bahagian Perikanan)
JALAN SWEETENHAM
KUALA LUMPUR

ANNUAL REPORT 1956

General

No longer may it be said that the fishing industry of the Federation of Malaya is a backward peasant industry. Mechanisation and industrialisation have proceeded apace to an extent where developments may compare in a small way, admittedly, with those of the bigger nations. Traditionally, the inshore waters, especially those in the Straits of Malacca, have been fished intensively with a great variety of gears, both stationary and mobile. In the offshore waters a relatively small number of proven gears are beginning to show their value in the process of mechanisation. There has not been any major type of new gear introduced into Malaya, but there have been modifications of existing fishing gears to adjust them to the use of motor driven craft. The most productive of these are the purse seine, which is now used for the Malayan shad, or ikan terubok, the Malayan chub mackerel, or ikan kembong, and during this year for the first time on the East Coast a purse seine net has been used for catching the Malayan anchovy, the ikan bilis. In addition, mechanised craft have been used with increasing success for the Malay lift net, the pukat tangkol, and the Malay boat seine, the pukat payang. Until recent years the fishing fleets never went more than 35 miles from the coast, except upon the rarest occasions. But today we find craft operating regularly as far as 65 and 75 miles away from their base. Mechanisation at sea is being followed up with developments ashore; the use of mechanical ice-crushers at fish packing plants; the use of hoists and derricks for bringing the fish ashore; the use of refrigeration and chilled ice-water storage for holding fish from periods of glut to periods of shortage; the gradual development of the canning of fish in multi-purpose canneries. All these combine to show the healthy process of evolution. While the use of outboard motors on traditional craft is still widespread, the development of healthy inboard diesel-engined craft is gathering momentum, and at the end of 1956 there were 996 such craft licensed and operating as compared with 603 at the end of 1955.

The weather conditions for the year under review have been rather the reverse of those for 1955. The monsoon on the East Coast is up early, and the fishermen of the North East States were able to operate in January and February, but production fell away in the middle months of the year to recover in September and October. However, the outstanding feature of the North West Coast was the protracted disturbed weather which persisted throughout the year with consequent reduction in fishing operation, and at the same time off the coast of Kedah, a marked absence of the two types of fish which are the backbone of the industry, the Malay shad, or ikan terubok, and the Malay chub mackerel, or ikan kembong. The North East Monsoon set in strongly at the end of October and then there was a lull in the middle of November. This quiet period tempted many fishermen to sea, particularly on the fishing stakes off South Pahang and Johore. This was but a lull before the storm, and a violent storm caught many of the fishermen, particularly off Johore on their fishing stakes, without adequate means of

returning safely, and a total of 53 lives were lost with the complete destruction of over 80 fishing stakes. This was a major disaster. At the same time there were well over 100 boats at sea operating their seine lift nets off the North East States, but due to the skill and seamanship and to the assistance provided by Government craft, no boats were lost, and all the crews returned safe, in some cases after a protracted period of time at sea when undoubtedly they suffered some hardship. The particular events on the Johore coast pointed to the need of a working system and for additional measures to add to the safety of the labourers working on the fishing stakes on that coast.

The average retail prices for all grades of fish remained much the same for the first nine months of the year, but showed a gradual rise in the last three. Ice was available throughout the country at an average price of about \$30/- per ton to the industry, but in some places the price was higher due to transport charges. The opening of the Maran Road connecting the East Coast with Kuala Lumpur by a short route has stimulated the fisheries of North Pahang and South Tringganu, and it is a regular feature to see many lorries operating along this road during the open season.

The total landings for the year were 111,000.83 tons an increase of approximately over 2 per cent over the previous year. This may or may not be significant, but it is a constant battle to keep pace with the rate of population increase which maintains a momentum higher than that at which fish landings increase.

Structure of the Industry

The basic structure of the industry has changed but little, although there is a growing awakening to the value of cooperative effort. On the whole it may be said that fishermen operate with borrowed money, and the man who provides capital has control of the fish. He in turn, distributes these fish to the major consuming centres and rural districts through consignment agents. There are a large number of registered companies owning boats and gears and employing their fishermen on a share basis, there are also considerable numbers of private boat-owners and small gear operators who sell their catch to purchasing agents ashore, often closely linked with an advance payment system. On the North West Coast, a "secret auction" or system of whispering tender prevails. On the East Coast there is a system of open bidding at the landing points on the beaches, but where cash transactions do not follow immediately upon the negotiations, it is a common feature to find argument at the time of reckoning. At the major urban centres of Alor Star, Ipoh, Kuala Lumpur, Malacca and Singapore, there are wholesalers, who, by a system of daily telephonic communications with consignment agents, maintain a balance in the distribution phase of the trade. It is a common fallacy to describe the wholesale agents as a monopolistic fish ring. This could not be further from the truth, for the handling and distribution of fish in Malaya which is so highly perishable, is a most competitive business. However, the physical handling and distribution is far from up to date.

The salt fish industry on the East Coast improved over the previous year, partly due to the improved communications at the centre of the country. Export out of Malaya did not increase to any great extent, but there was some minor improvement with the trade in Indonesia. On the West Coast the production of the Malayan chub mackerel, "ikan kembong", was not so great as to provide a surplus for salting and drying in excess of immediate needs. Boiled kembong in baskets continued to be popular, and the refrigeration of this commodity has expanded in order to adjust supplies to demand.

Federal Fisheries Committee

An event which it is hoped may have far-reaching effects upon the industry, was the acceptance by the Federal Legislative Council in the middle of the year, of the report of the Federal Fisheries Committee. The two major recommendations arising out of that report were firstly that cooperation was to be promoted throughout the country in all phases of the fishing industry and trade, in order to stimulate thrift and capital improvement. Secondly, that a fund should be available to the Minister for Agriculture to provide capital assistance to cooperative societies. A sum of \$3 million has so far been made available to the Minister for this purpose, and a part of it has been used for the training of Assistants to guide in the education of fishermen in cooperative principles and in the organisation of cooperative societies.

There were a considerable number of other recommendations, many of which have concurrently been put in hand, and their influence is already beginning to be felt.

Utilisation

An analysis of the utilisation, import of fish from other territories and the export to other territories shows that we had a net available supply of 944,641 piculs out of a total production in the Federation of Malaya of 1,866,187 piculs. Of the total domestic production 288,011 piculs was processed to make salted and dried fish. Another 213,155 piculs was utilised as agricultural fertiliser or as pig and duck food. 88,661 piculs of small shrimps were processed to make blachan, and 136,718 piculs was utilised for making dried prawns. This gives a total of 731,545 piculs of wet fish taken from the total production for normal processed products. Fresh fish was imported from a number of places. Higher grades were imported from Singapore to the extent of 27,512 piculs. Into Malacca and Port Swettenham and some of the nearby smaller towns a total of 19,019 piculs was imported from Sumatra, the bulk of this fish consists of the Spanish mackerel "ikan tenggiri" and "ikan terubok". From other sources including present shipments brought in by sea and lorry shipments from South Thailand amounted to 58,126 piculs. The total imports of fresh fish were therefore 104,657 piculs. Exports were mainly to Singapore and this amounted to 293,684 piculs, the bulk of this fish is of the middle and lower grades, and is utilised largely by the labouring population of the Colony. Therefore, fish exported to other destinations outside the Federation of Malaya was 974 piculs. The following table illustrates the position:-

Mechanisation

Whilst the structure of the industry has not changed, to any marked extent, as stated above, in so far as the financing of the industry and ownership of craft and gear are concerned, the increase in the number of powered boats has continued as is shown in the following table:-

	<u>Landings</u> <u>Tons</u>	<u>Number of</u> <u>Fishermen</u>	<u>Number of</u> <u>Gears</u>	<u>Powered</u> <u>Boats</u>	<u>Non-Powered</u> <u>Boats</u>
1949	104,880	71,403	21,139	327	21,793 22120
1954	109,934	49,532	18,654	4,052	17,789 21241
1955	109,422	61,212	17,606	4,550	18,879 23122
1956	111,083	50,690	19,427	5,641	17,730 23371

It will be noticed that while there has been a reduction in the number of non-powered boats, a reduction in the number of fishermen, there has been an increase in the number of gears. This is an indication of the efforts of the Department to diversify the fishing effort of the fishermen in the industry. In the past there has been too much reliance upon a single gear to provide fishermen with their livelihood, but during the past year an attempt has been made, with some success, to persuade the fishermen to own a series of gears, so that they may adapt their efforts to the changing seasons. The number of powered boats is about one-third of the number of non-powered boats, but it must be noted that quite a number of registered boats consist of very small craft operating in estuarine waters in very shallow inshore waters, or are engaged only in part-time fishing, and these do not offer a potential for development and mechanisation.

Trials started in 1955 with small inboard diesel engines to replace the outboard engine where it is physically possible were brought to a satisfactory conclusion. For the Chinese drift net sampan and kota, the Japanese single cylinder Yanmar engines of 4/6 and 9 H.P. and the English Petter engine, both single cylinder 5 H.P. and twin cylinder 10 H.P. have proved eminently popular, and have been adopted in many parts of the country. For the smaller boat used by the Malays for hand lining, small long lines or small portable traps, the 3½ H.P. air-cooled Lister engine has become most acceptable. Following on the experiments of 1955, the Department continued into 1956, and eventually produced a most satisfactory small craft modelled on the Trengganu sekochi which was cheap to construct and cost approximately \$1 per day to run. This is a tremendous improvement over the outboard engine, and has been taken up in a number of most unexpected places. The most notable of these is Telok Sari on the East Coast of Johore where the Malay people have found this engine highly satisfactory for their purpose, and there is a small fleet of craft at this village all of which are engined by this type. The manufacturers have performed an invaluable service in taking a number of these fishermen in their workshop in Kuala Lumpur, with assistance from R.I.D.A. and this Department, to give them instruction in the care, maintenance and repair of these engines. This is most important since

fishermen in remote and out of the way places do not find mechanical workshops to hand in order to service and repair their craft and should prove invaluable. It is anticipated that within the next few years the above types of engines will completely replace the outboard engine, except under special conditions where the outboard engine is particularly useful. Among the bigger boats engines of up to 200 H.P., of the fast revolving type have been installed in some of the purse seine boats, and it is a tribute to the industry that these engines which are beautifully cared for and maintained, in consequence give no trouble.

Fishermen's Training

The Fishermen's Training Course in care and maintenance of engines and in helmsmanship, which was started in 1953 with Rural and Industrial Development Authority finance, was continued in 1956 entirely with Departmental funds. 30 Federation fishermen from Trengganu, Kelantan, Pahang, Perak, Johore, Malacca and Penang participated in these courses. Of these 28 obtained the Helmsmanship Certificate of Competency and 62, the Engine Repair and Maintenance Certificate. The small number of passes in the Helmsmanship Certificate Examination was due to the fact that only 47 of the trainees was able to sit for the examination, the rest of them being debarred, either because they had failed the stringent and necessary eye-sight test or were under-aged for the examination. The following table gives the number of trainees from each of the States:-

Trengganu	..	43
Kelantan	..	12
Pahang	..	10
Perak	..	5
Johore	..	5
Malacca	..	3
Penang	..	2

A survey of the efforts made during the past four years to train these fishermen shows that approximately 80 per cent of those who have passed the course are now operating in the industry. In addition, some of those who failed are also operating, and of the remainder it is known that one is running his own small mechanical workshop and taking in business from other fishermen, one or two are employed in Government craft and a few have sought and obtained wage-earning jobs in craft belonging to other people.

In addition to the above trainees from the Federation, four fishermen trainees from Brunei and two members of the staff of the Marine Department were at the request of their respective Governments accepted for the above courses. On the completion of their courses, the Brunei fishermen were attached for a period of six weeks to the Fisheries Officers of the North West and North East zones at Penang and Kuala Trengganu, where they were enabled to see the highly developed purse seine fishery at Kuala Kedah and Pangkor, and the traditional pukot tangkol and pukot payang fisheries of the Malay fishermen on the East Coast. In addition, they also spent some time at Bachok, where they were introduced to the workings of the Kelantan Fish Marketing Scheme.

Kelantan Fish Marketing Scheme

This Scheme which was originally financed with a grant of \$194,200 from the Colonial Development and Welfare Fund was entirely taken over by the Department and run with Federation of Malaya funds from the middle of the year. Its purpose is to improve distribution and assure a fair price to fishermen and consumers while stimulating an increase in output. It is also designed to provide participating fishermen with producer goods at reasonable prices, and to enable them to build up a reserve of capital. Originally the Scheme had been designed to operate on a State-wide basis, but experience showed that the conservative and proud fishermen of Kelantan were not rapidly attracted to the new ideas. In July the re-organised Scheme was concentrated on one small village at Bachok and a Deputy Manager was appointed, who was responsible to the Director of Fisheries for the management. He established his own headquarters in the centre of the village and lived among the fishermen. By personal contact and by explanation at all hours of the day and night, the fishermen gradually came to appreciate the value of assured markets and assured prices. Instead of operating on a basis of fixed prices, the Scheme now bargains in the traditional manner with the fishermen for their day's catch. The fishermen obtains a paper receipt as a result of the transaction, and the cash reckoning is effected every Friday after attendance at the Mosque. The Scheme will take all fish which the fishermen bring, it distributes with its own transport in a variety of directions adding an on-charge to the purchase price from the fishermen sufficient to cover all running expenses and overheads. By these means it is possible to deliver fish at average prices which are considerably lower than those which have prevailed in the past, and at the same time the fishermen are satisfied that they are getting a fair deal, because the cash which they get at the Friday reckoning is precisely the amount bargained for at the time of landing. There are no deductions and no further argument. Any surplus of fish which cannot be disposed of immediately is salted and dried. As this is done under the immediate supervision of the Deputy Manager, a high grade product is prepared. This has been stored for sale during the North East Monsoon, and while it has been possible to sell this dried fish at a much lower rate than the prices prevailing during the monsoon period, it has been equally possible to make an adequate profit to cover all expenses and storage. This is an aspect of the Scheme which must and will be fostered in the future. With the growing confidence of the fishermen and the overcoming of physical difficulties, this Scheme is at last achieving a degree of success. Experience has shown that the major factor in this success is the painstaking approach of the man in charge to satisfy the queries and suspicions of the fishermen themselves as well as giving them a square deal so far as the cash transaction is concerned.

Relationship with R.I.D.A.

In the early part of the year the liaison with the Authority continued as before, but one of the findings of the Federal Fisheries Committee was that R.I.D.A. should gradually cease to provide capital subsidy for the fishing industry, and that this should be taken over by the Ministry of Agriculture. There has therefore been a gradual tailing

off of R.I.D.A. support for the industry, as the cooperative principles mentioned above begin to take place. However, the overall relationship has remained close, and in particular many subsidies have been given for the construction and stocking of fish ponds in inland rural areas. In so far as the Authority is concerned in a general way with rural industrial development, officers of the Department have given lectures to officers of the Authority in the special problems which face the fishing industry and trade.

Fish Processing Experiments

Experiments were continued in the production of fishmeal, and a useful small fishmeal plant has been developed which can cope with a maximum of 8 piculs or half a ton of wet fish per day. A number of samples have been analysed and a statement has been produced of the relative protein contents of fishmeal manufactured from different species of fish. The ultimate adoption by the fishing industry of any fishmeal plant must depend upon the ready availability of the raw material at a cheap price, since the recovery is about 20 per cent. In view of the very high demand for fish of all grades and types in Malaya, it is rarely that glut conditions are such as to permit this to occur.

In addition to ordinary fishmeal an inexpensive method for the production of fish flour was developed. The object of these experiments was to provide a high protein containing flour which would have a long shelf-life when adequately kept, and so be available to peasant people in inland areas where protein is lacking in the diet. From feeding trials on rats carried out at the Institute for Medical Research in Kuala Lumpur, a satisfactory meal was produced. However, it was considered that the microscopic spicules of bone which were contained in the flour, might have an erosive irritant action on the intestines of small children and babies. While it would be possible by refined techniques to eliminate such potential irritants from the flour, it was decided as a matter of policy not to continue with these experiments, but to concentrate on the production and distribution of fresh fish throughout the country. Not only has the approach to be made through the more effective distribution of sea fish, but also through the promotion of freshwater fisheries.

Freshwater Fisheries

It has been increasingly clear over the years that effective work on fish culture among the ra'ayat cannot be sustained without the requisite field staff on the ground to provide advice, administration and encouragement. The approval for the appointment of five Fisheries Assistants and ten Junior Fisheries Assistants for work connected with freshwater fisheries in rivers and natural bodies of water and for fish culture, which was received during the year was therefore most welcome, and reflected an important phase in the development of the Department. Three Fisheries Assistants were appointed in September and two Fisheries Assistants and eight Junior Fisheries Assistants in November and December. Four of these Junior Fisheries Assistants have since been sent overseas to Indonesia to gain experience in freshwater fisheries work. The others were attached to the Headquarters in Penang where they were introduced to the

problems associated with fish culture and with the fresh-water fisheries of the rivers and other bodies of water in general by the Headquarters staff. The Headquarters continued to take an active part in the distribution of fry for the stocking of ponds, irrigation canals and dams. A total of 21,304 Sepat siam (*Trichogaster pectoralis*); 15,720 *Tilapia mossambica*; 90 Kalui (*Osphronemus goramy*) and 28 *Pontius javanicus* were distributed. In addition a supply of 50 Kalui and 100 Sepat siam were despatched by air freight to Brunei at the request of the Brunei Government.

Another important aspect of the Department's work has been the importation of fish fry from overseas. The Federation continued during the year to obtain its supply of Chinese carp fry from Singapore. These carp fry are required to sustain an important pond-fish fishery operated by Chinese market-gardeners round the big towns in the Federation. Whilst figures for 1956 are not as yet available, a recorded 1.7 million fry were imported in 1955 into Singapore from China through Hongkong. Of these, some 70% were estimated to have been re-exported to the Federation. Consequently it is of some concern to this Department to see that a regular supply of fry is available to maintain this industry.

The Department is tackling the problem in two ways namely:-

(a) Finding alternative sources of suitable types of fry from overseas.

(b) Carrying out surveys on fry resources from our own big rivers.

(a) Importation of Catla catla, Labeo rohita and Cirrhina mrigala from India

The first importation of three species of Indian major carp namely Catla catla, Labeo rohita and Cirrhina mrigala into Malaya was made in 1952. The fish were released into fish-ponds at Bayan Lepas, Penang, together with Chinese carp. Catla catla registered exceeding good growth rates of the order of 5 lb. per year, whilst the L. rohita showed an increase in weight of about 4 lb. per year. These increase compared very favourably with that attained by Chinese carp, and the local fry dealers were so impressed, that enquiries had been received from them for the possibility of establishing regular supplies of these fry from India, in case there should be difficulty in the fry trade with China.

A further supply of 6300 Catla catla was received from the Inland Fisheries Research Station, Calcutta, India, during the year. Of these 1300 were for the Fresh-water Fish-Culture Research Project, Malacca, and 5000 retained for further experiments at Bayan Lepas, Penang.

(b) Importation of Tilapia melanopleura from Thailand

Through the kind offices of Nai Boon Indrambarya, Director-General of Fisheries, Thailand, a supply of 49 Tilapia melanopleura of 3½" in length was received from Thailand on 27th October 1956. These were being kept at the Bayan Lepas ponds under observation. T. melanopleura has a good reputation as a weed-remover in Africa

in the same way as the Chinese grass carp here, and it will be interesting to see if this reputation is sustained under our conditions.

During the year a number of courses in pond-culture were held in Malacca, and Negri Sembilan and North Johore for the ra'ayat. These courses were well attended and have been followed up by extension work in the field. The Fisheries Assistant, Special Grade, who was responsible for running these courses also gave a course to other Fisheries Assistants at the end of the year.

Brackish-Water Fisheries: Prawn Ponds and Cockle Culture

The extension of the previous years' work on cockle culture has produced some most interesting results. In the first place, this practice has become more and more widespread as the additions to the population of coastal villages has appreciated. There have undoubtedly been a number of difficulties where proprietorship of foreshore has been in question, and it is clear that cooperative effort as practised at Batu Maung in Penang is the best answer to the social and economic problems which are involved. While the cockle culture industry has spread and prospered, the major interesting feature has been that with the establishment of new rearing and fattening beds at least two new breeding grounds have become established. Both those at present known are on the shores of Penang Island. One off the West Coast and the other off the South Coast of the Island. The rearing and fattening beds were established two years ago at Batu Maung, and quite adventitiously these new beds have developed. A study of the tides has shown that the larvae may well have been carried from the fattening beds and have found a suitable environment in the two places where the new beds have become established. Talking with the elder people of the villages has indicated that many many years ago cockles were known in the places where they have become re-established, and it is probable that they bred there. With the passage of years and particularly the high pressure of the Japanese occupation for readily available supplies of food had wiped out these beds. They have now become re-established.

The development of prawn ponds has received considerable attention, both at a policy level and on the grounds. This is all preparatory to future extension work. Undoubtedly prawn ponds can ultimately prove extremely profitable, but the high initial cost of clearing the "Hutan Darat" on the edge of mangrove swamps, a zone which is particularly adaptable for the construction of prawn ponds, is an important matter. New prawn ponds have been constructed, or have been under construction on the East Coast of Johore and on the Perak Coast, but little actual progress has so far been made. It is hoped that with the availability of finances from the Minister's fund for cooperatives that this particular aspect of production will now be stimulated.

Fishing Experiments.

While the Headquarters vessel MFV. 'Kembong', the MFV. 'Selayang' and the MFV. 'Gelama' have been carrying on with their routine duties, the MFV. 'Tenak' stationed at Kuala Trengganu has been carrying out further demonstration trips with the fishermen of Trengganu in

offshore waters. These trips have been with the use of long lines and have attracted particularly fishermen from Besut. The results have been encouraging and a fine type of inboard diesel-engine is to be found in North Trengganu now, proceeding as far as 70 miles from their base port and stay out at sea for a number of days. In addition the MFV. 'Tenak' has also been promoting the use of a small type of purse seine for the catching of the Malayan anchovy. Traditionally the anchovy, or 'ikan bilis' has either been caught by beach seine nets or else by fishing stakes. The traditional methods rely entirely on the fish coming within the orbit of operation of fishermen and their gears. The adoption and development of the purse seine nets on board a healthy powered motor craft means that fishermen may go out to sea and seek fish during the course of its migration. Five of these new units were in operation by the latter part of the year.

The MFV. 'Tongkol' stationed at Kuantan has been engaged on an echo-sounder survey of a large area of the China Sea with a specific view of finding the best places in which to set portable traps. Very significant results have been obtained from the placing of these traps at the bottom or near to the bottom of steep valleys or banks in the sea bed. An increase of as much as 200 per cent of fish has been observed in catches made on the bottom of such valleys and on the top at the same time, and it is hoped that it would be possible to promote this in the industry. The major problem facing this development at present is the buoying of the traps. Of necessity they are set in deep water and in order to make the operations economical, they must be hauled by winch. This calls for a strong buoy rope. A trap, itself weighing about 70 lb., with 200 lb. of fish in it is quite a considerable load to be lifted through 45 to 60 fathoms. The areas or zones in which these traps can operate so well are also areas in which there are very considerable currents. So that while there is a need to provide a strong buoy rope which can haul the traps quickly, the buoy rope must also be light in order that the marker buoys shall not be drowned by the strong current. This particular problem is at present receiving active consideration.

For the drift net fleet at Malacca, there has been an attempt to introduce powered rollers. A demonstration boat has been fitted with an improvised piece of machinery and it is possible that during the next year or two, it will be an addition to the equipment of this important fleet.

Research

The Government of the Federation of Malaya contributed to the Singapore Regional Fisheries Research Station. The Director of the Station reports briefly as follows:-

The M.F.V. 'Manihine' continued the trawling survey of the offshore waters off the coasts of Malaya and Borneo. Further trials with long lines and drift nets were carried out and further exploratory cruises were made with trolling lines. Some preliminary tests were made with an improvised operational echosounder.

The M.F.V. 'Manihine' began operations on September 12th, 1955 and ceased on August 22nd, 1956. During that time she spent 182 days at sea and covered 15,182 miles on fishing and scientific cruises. The otter trawl was hauled 207 times, 32 times on the western side of the Malay Peninsula and 175 times on the eastern side. From these hauls 28 tons of fish and 7 tons of shark and ray had been landed.

The bottom of the South China Sea is a uniform expanse of soft grey mud over a very large area of which the catches were poor, amounting to less than 100 cwts. per 100 fishing hours when standardised. Grounds exist, however, where better catches than this were obtained. These may be said roughly to occupy 5 regions.

1. Near the south coast of the Great Natuna Island.
2. North of South Natuna Island.
3. East of Singapore Straits to a distance of about 80 miles from the coast.
4. Between P. Tioman and Po. Aur.
5. West of the Anambas Islands.

The catches on these grounds may be analysed as follows:-

<u>Ground</u>	<u>No. of Hauls</u>	<u>Best Catches cwts/100 hrs.</u>	<u>Average Catch cwts/100 hrs.</u>
Great Natuna	12	363	128
South Natuna	4	169	74
East S'pore Straits	13	297	148
Po. Tioman	9	345	140
Anambas Islands	3	132	150

For comparison the rich trawling grounds of Iceland yielded in 1938, 1,000 to 1,100 cwts. per 100 hours, the Irish Sea 134 cwts. and the Great and Little Sole Banks 158 and 199 cwts. respectively. Two distinct types of fish fauna were distinguishable in the South China Sea and in the Straits of Malacca. One, made up largely of Clupeidae (Herringlike fishes) and Sciaenidae (Ikan Gelama), might be called an inshore bottom fauna and was dominant in the catches from shallow water near the Borneo coast where the depth was less than 15 to 20 fathoms. At depths greater than about 20 fathoms this fauna gave way to the more typical fauna of the offshore waters. This consisted of a number of "prime" or "first quality" fish, a number of fishes which might be described as "smalls" and thirdly, a number of fishes of low quality which could be lumped together as "trash". The "prime" fishes are Ikan Merah (Red Snapper), Ikan Kachi (no known English name), Ikan Kerisi (Kaakup), Ikan Kerapu (Rock cod) and Ikan Asbh2 (Scavengers).

The grounds where the percentage of "prime" fishes was high were more commercially valuable than those where it was low.

The highest average proportion of "prime" fishes was taken on the Great and South Natuna grounds (average 41.6% and 42.0% respectively). The highest proportion of "smalls" was taken on the Po. Tioman grounds (56%) with the lowest proportion of "trash".

It is evident from the above that there are a few trawling grounds of moderate commercial potential in the South China Sea which could be exploited by vessels of sufficient range and power.

Trawling off the west coast of Malaya did not yield fruitful results and no success attended further long lining, trolling and drift netting experiments. More trials with long lines using dories are suggested.

Temperature and salinity observations over a wide area of the South China Sea show that a warmer water of lower salinity moves from south-west to north-east across the South China Sea during the South West Monsoon.

Plankton Research.

Fortnightly observations in the Singapore Straits were completed in June 1956 and supplemented by lines of plankton observations in the South China Sea and Straits of Malacca which were to have been repeated at regular intervals by the ship. A paper on this work had been submitted to the Journal of the International Council for the Exploration of the Sea.

Prawns

A systematic account of 2 of the commercially most important genera of prawns in the Singapore ponds has been published in the Bulletin of the Raffles Museum. (No. 27 October 1956). A similar account of 8 genera and 21 species of lesser importance has also been completed and is in course of publication. A general account of the biology of these prawns has also been completed for publication.

Serial observations on temperature and salinity at 5 positions in the Singapore Straits now cover 2 years from August 1954 to August 1956 and will be published in due course.

Work continued at the Fish Culture Research Institute at Malacca. The pond system was completed during the year and the quarters for the senior officers. This Scheme, it is hoped, will be completed in 1957, but during the year Dr. G.R. Fish and Dr. G.A. Frowse were appointed and took up residence to do preliminary work and to be able to check on the delivery of scientific equipment from the United Kingdom. This Station has attracted the greatest interest during the year.

At the end of the year a temporary Research Development Officer was taken into the Department and has commenced on a study of the problems associated with the development of the cockle industry. It is too early as yet to draw any conclusions from the initial work, but it has become apparent that a rapid rise in temperature of the environment in which mature cockles lie can be an immediate stimulus to breeding. This may have important applications.

Visitors during the year

During the course of the year the Department received a number of visitors. Firstly, there was the

visit of Dr. C.F. Hickling, Fisheries Adviser to the Secretary of State, and Professor C.M. Yonge who came specially to report on the progress of the Singapore Regional Marine Fisheries Research Station and the Fish Culture Research Project at Batu Berendam, Malacca. Other visitors who came specifically to acquaint themselves with fish-culture methods in this country were:-

- (a) Messrs. S.S. Felix, H.R. Rabanal, J.R. Lopes and G.L. Ablan of the Bureau of Fisheries of the Philippines.
- (b) Messrs. H.A. Indrasena, Superintendent of freshwater fisheries of Ceylon.
- (c) Mr. B.P. Bhakat, Indian Colombo Plan trainee.
- (d) Dr. Nazir Ahmad, Director of Fisheries, East Pakistan.

Financial Provision

The total cost to the Federation of Malaya for annually recurrent expenditure and personal emoluments of the Pan-Malayan Department of Fisheries was \$565,664. The amount voted for the Regional Marine Research Station as the share of the Federation of Malaya was \$85,400, making a total of Federal Government expenditure of \$651,064. There was no State or Settlement expenditure. The revenue collected in respect of fishing, fishing gears and boats, etc. was \$206,844.

Items of General Interest

The Department took part in the Malayan Agricultural Association's Show in Kuala Lumpur in the middle of the year, and as usual attracted a great deal of interest with live fish in tanks which were to demonstrate the species of economic importance for inland fish culture. In addition a small motor boat was taken and put on display at the exhibition.

During the course of the year demonstrations have been given on the preparation of blachan and the use of mechanical grinders so as to cut down manpower and produce a better product. Throughout the year members of the staff have visited villages throughout the country to give advice and demonstration on all aspects of the Department's work.

An annual departmental conference for Senior Officers was held at the end of the year. This conference was opened by the Hon'ble the Minister for Agriculture, and attended by the Commissioner for Cooperative Development and the Assistant Commissioner for Cooperative Development, Northern Region. The attendance of the Head of another department whose work is so closely linked with that of our own was particularly welcome, and it is hoped that a precedent has been set for all time.

Statistics

The tables on the pages following give a summary of the essential statistics of the industry.

FEDERATION OF MALAYA
CATCHES AND RETAIL VALUES 1956

First Grade	East Coast		West Coast		Total	
	Piculs	£	Piculs	£	Piculs	£
Grade I @ \$139 per picul	88900	16802100	172366	32577174	261266	49,379,274
Grade II @ \$87 per picul	152401	13258887	295484	25707108	447885	38,965,995
Grade III @ \$41 per picul	361951	14839991	701776	28772816	1063727	43,612,807
Buat Baja @ \$10 per picul	31750	317500	61559	615590	93309	933,090
Total	635002	45218478	1231185	87672688	1866187	132,891,166

FEDERATION OF MALAYA
CATCHES AND RETAIL VALUES 1956

First Grade	East Coast		West Coast		Total	
	Piculs	£	Piculs	£	Piculs	£
Grade I @ \$139 per picul	88900 4292	16802100	172366 12255	32577174	261266 15552	49,379,274
Grade II @ \$87 per picul	152401 2500	13258887	295484 1557	25707108	447885 25560	38,965,995
Grade III @ \$41 per picul	361951 21500	14839991	701776 22002	28772816	1063727 63517	43,612,807
Buat Baja @ \$10 per picul	31750 1775	317500	61559 3100	615590	93309 5556	933,090
Total	635002 52707	45218478	1231185 75555	87672688	1866187 11082	132,891,166

FISHERIES REVENUE

State	State or Settlement Revenue					Federal Revenue					Total		
	Boats	Fishing	Turtle Eggs	Miscellaneous	Total	Fisheries Sales	Hire of launches	Sale of No. Boards	Miscellaneous	Total	Total State	Total Federal	G. Total
Perlis	1124.00	376.00	-	23.00	2023.00	-	-	-	-	-	2023.00	-	2023.00
Kedah	4217.46	12685.00	-	-	16902.46	-	-	228.00	-	228.00	16902.46	228.00	17130.46
Penang & P.W.	3770.00	12450.00	-	-	16260.00	281.00	29.65	80.00	18.21	408.86	16260.00	408.86	16668.86
Perak	7276.25	25261.00	-	-	32537.25	124.00	-	316.00	-	440.00	32537.25	440.00	32977.25
Selangor	3581.50	10560.00	-	-	14141.50	20.00	-	159.00	-	179.00	14141.50	179.00	14320.50
N.Sembilan	341.00	581.00	-	-	922.00	-	-	-	-	-	922.00	-	922.00
Malacca	1831.00	3857.50	-	-	5688.50	24.67	173.03	8.00	-	205.70	5688.50	205.70	5894.00
Johore	5108.00	30716.50	-	-	35854.50	-	-	-	-	-	35854.50	-	35854.50
Pahang	1159.00	6087.50	-	-	7239.50	268.64	-	-	-	268.64	7239.50	268.64	7508.14
Tringganu	7701.00	2022.00	59577.58	100.00	68900.58	74.84	24.00	-	-	98.84	68900.58	98.84	68999.42
Kelantan	3113.00	-	1342.50	60.00	4545.50	-	-	-	-	-	4545.50	-	4545.50
Total	38752.11	105159.50	60920.08	183.00	205014.79	793.15	226.68	791.00	18.21	1829.04	205014.79	1829.04	206843.83

FEDERATION OF MALAYA
STATEMENT OF FRESH FISH PRODUCTION - 1956

In Piculs.

States/ Settlements	January	February	March	April	May	June	July	August	September	October	November	December	Total - Piculs
Perlis	3453	2964	2470	2358	2646	1889	1849	1380	1968	2533	3375	3775	30,600
Kedah	14751	12392	10092	7271	4331	3779	6498	3207	2990	4836	5604	5925	82,176
Penang & P.W.	8785	8732	8904	9047	8298	8692	8634	8568	8470	8504	7824	7834	102,351
Perak	53890	50315	46847	51056	49842	65497	60075	49351	53515	47321	52464	47403	627,576
Selangor	22822	21551	23078	20887	20447	21215	27712	20325	24926	18516	16594	17990	256,063
N. Sembilan	391	343	333	203	293	285	295	291	362	295	383	535	4,014
Malacca	3919	4546	5101	3740	3761	4901	4189	3566	3653	4731	4009	3404	49,570
Johore	7065	6848	17163	20305	28583	23387	28531	41915	30495	36617	11629	6168	259,206
Kelantan	1848	5946	5907	10484	8451	9094	14602	15058	19535	6968	665	2184	100,742
Trengganu	3616	14827	12527	17640	16574	19983	26138	30725	30175	12603	6740	3906	200,454
Pahang	3872	4396	11476	21125	17301	17301	21091	16807	16438	15080	7267	1281	153,435
Total - Piculs	129412	132905	143898	164616	161027	176023	199614	191193	192527	158004	116554	100414	1,866,187
East Coast	17186	27539	43739	65819	66210	64778	84810	88427	90558	57051	20523	8363	635,002 = 37,798 Tons
West Coast	112226	105367	100159	98797	94817	111245	114804	102766	101969	100953	96031	92051	1,231,185 = 73,285 Tons
Total - Piculs	129412	132905	143898	164616	161027	176023	199614	191193	192527	158004	116554	100414	1,866,187

+ Johore - East from F.C.S.F. Monthly Reports

= 111,083 Tons

Johore - West from Harbour Master, Johore Bahru

SUMMARY OF FISHING GEARS 1956

Class of Gears	Perlis	Kedah	Penang	Perak	Selangor	N.Sembilan	Malacca	Johore	Pahang	Trengganu	Kelantan	Total
Fishing Stakes	53	388	351	578	423	8	82	1672	78	5	3	3621
Seine Nets	32	255	208	531	26	31	32	146	72	566	158	2057
Gill Nets	7	108	321	383	731	53	385	564	110	559	743	3964
Lift Nets	-	73	31	38	-	2	-	61	101	228	140	674
Lines	4	106	192	267	51	-	192	115	-	1423	624	2974
Fishing Screens	-	3	6	19	36	4	29	43	-	-	4	144
Fish Pots	-	73	71	47	18	9	2	78	29	1570	255	2152
Bagnets	-	1	295	1063	93	-	110	30	1	-	-	1593
Crab nets	-	22	69	144	64	17	-	-	-	-	-	316
Push, Cast & Scoop Nets	-	97	63	36	32	-	8	27	-	141	1022	1426
Manual collection	-	-	1	289	148	-	-	47	21	-	-	506
Total	76	1126	1608	3395	1622	124	840	2783	412	4492	2949	19427

FISHING BOATS 1956

Type of Boats	Perlis	Kedah	Penang	Perak	Selangor	N.Sembilan	Malacca	Johore	Pahang	Trengganu	Kelantan	Total
Inboard Motor	37	52	76	182	66	-	148	-	18	354	63	996
Outboard Motor	9	131	811	1415	718	64	65	701	202	529	-	4645
Non-powered	507	1637	1265	1858	1111	184	664	3706	591	4576	1611	17730
Total	573	1820	2152	3455	1895	248	877	4407	811	5459	1674	23371

FISHERMEN 1956

Nationality	Perlis	Kedah	Penang	Perak	Selangor	N.Sembilan	Malacca	Johore	Pahang	Trengganu	Kelantan	Total
Malays	847	3057	2300	1773	568	272	1322	2343	2946	13665	6561	35664
Chinese	99	636	2461	5222	2360	355	915	1953	316	45	4	14366
Siamese	15	157	27	-	-	-	-	-	-	10	5	214
Indians	-	20	176	185	20	2	7	-	-	-	-	410
Others	-	-	2	-	-	7	-	-	-	-	-	9
Portuguese	-	-	-	-	-	-	27	-	-	-	-	27
Total	961	3880	4966	7180	2948	636	2271	4296	3262	13720	6570	50690

FEDERATION OF MALAYA

IMPORTS

EXPORTS

MONTH	Singapore		Sumatra		Others		Total		Singapore		Others		Total	
	Piculs	Tons	Piculs	Tons	Piculs	Tons	Piculs	Tons	Piculs	Tons	Piculs	Tons	Piculs	Tons
January	1408	83.3	1275	75.9	1833	109.1	4516	268.8	16532	984.1	205	12.1	16737	996.2
February	1446	86.1	1433	85.3	3311	197.1	6190	368.5	13008	774.3	146	8.7	13154	783.0
March	2135	127.1	2208	131.4	5316	316.4	9659	574.9	18252	1086.4	76	4.5	18328	1090.9
April	3012	179.3	1944	115.9	5456	324.8	10413	620.0	24001	1428.6	178	10.6	24179	1439.2
May	2930	174.4	1827	108.7	4931	293.5	9688	576.6	29484	1755.0	97	5.8	29581	1760.8
June	2335	139.0	1905	113.4	6517	387.9	10757	640.3	30618	1822.5	67	4.0	30685	1826.5
July	1940	115.5	1724	102.6	4611	274.5	8275	492.6	29316	1745.0	45	2.7	29361	1747.7
August	2186	130.1	1415	84.2	4229	251.7	7830	466.0	30072	1790.0	15	0.9	30087	1790.9
September	2718	161.8	1316	78.3	5534	329.4	9568	569.5	33597	1999.8	87	5.2	33684	2005.0
October	3385	201.5	997	59.3	7058	420.1	11440	680.9	32285	1921.7	8	0.5	32293	1922.2
November	2101	127.4	1485	88.4	5819	346.4	9495	565.2	19061	1134.6	8	0.5	19069	1135.1
December	1825	106.6	1490	88.7	3511	209.0	6826	406.3	17458	1039.2	42	2.5	17500	1041.7
TOTAL	27512	1637.6	19019	1132.1	58126	3459.9	104657	6229.6	293684	17481.2	974	58.0	294685	17539.2

FEDERATION OF MALAYA
Statement of Fresh Fish Supplies - 1956

	Perlis	Kedah	Penang & P.W.	Perak	Selangor	N.S'lan	Malacca	Johore	Kelantan	T'gganu	Pahang	Total Piculs
Total Production	30600	82176	102351	627576	256063	4014	49570	259206	100742	200454	153435	1,866,187
Less processed into:												
Salted/Dried	-	237	25637	35293	6762	-	-	29475	17210	119570	53827	288,011
Buat Baja	2000	2560	6917	100230	54607	-	-	42818	-	-	-	213,155
Elachan	-	240	2257	3980	80107	-	2077	-	-	-	-	88,661
Dried Prawns	-	573	5966	99713	30466	-	-	-	-	-	-	136,718
Total processed	2000	3610	40777	239216	171942	-	2077	72293	17210	119570	53827	731,545
Balance of Production	28600	78566	61574	388360	84121	4014	47493	186913	83532	80884	99608	1,134,642
Add Imports from:												
Singapore												27,512
Sumatra												19,019
Other sources												58,126
Total Imports												104,657
Gross available supplies												1,239,299
Less Exports:												
Singapore												293,634
Other Destinations												974
Total Exports												294,658
Net available supplies												944,641

Tons 56,229