

# MARINE FISHERIES OF THE PROVINCE OF BOMBAY.

## A REPORT ON THE EXPERIMENTS TO IMPROVE METHODS OF TRANSPORT, WITH RECOMMENDATIONS ON MEASURES FOR GENERAL DEVELOPMENT.

BY

S. B. SETNA, M.SC., F.R.M.S., Ph.D. (*Cantab.*).  
*Fisheries Officer, Department of Industries, Bombay.*

(*With one plate, a map and a graph.*)

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### INTRODUCTION.

1. The introduction of power-propelled vessels by the Government of Bombay to help the fishing industry has served to awaken interest in our fisheries which till comparatively recently had been in a generally neglected condition.

That interest has been aroused by this experiment in Bombay and in other maritime provinces of India and Ceylon is borne out by the numerous inquiries addressed to my department about the commercial possibilities of a more extended use of launches for the transport of fish. There is no doubt that the launches have made available in Bombay an increasing supply of fish, which, far from creating a glut in the market, has scarcely sufficed to meet the demand. In Bombay, at least, there is an insistent and constant demand for fish, and the use of more rapid and effective transport has helped to meet it. The results achieved during the past five years show the great potentialities of power-propelled vessels to extend and develop transport, which like other branches of the industry is still in a primitive and disorganized state.

This résumé surveys the experience of the past five years, records the difficulties that have been encountered and indicates the



appropriate lines on which our fishing industry should be developed if it is to flourish and prosper in the future.

#### GENESIS OF FISHERIES EXPERIMENT.

2. The improvement of the fishing industry has engaged the attention of the Government of Bombay for a considerable period. The first tangible step taken in this direction was in 1923, when the Government of Bombay purchased the Trawler '*William Carrick*' and appointed Mr. A. E. Hefford as marine biologist on board this vessel. Mr. Hefford's work, carried out along the coast of the Bombay Province, was exclusively confined to trawling experiments. The results were published in his *Report on the work of the trawler 'William Carrick'*. The experiment, for reasons subsequently indicated, was unsuccessful. Some information was collected, but there was no direct benefit as such to our fishermen. The main object of the work was to gauge the commercial possibilities of trawling in our waters.

The problem of directly improving the lot of the fishermen was investigated subsequently by Mr. P. B. Advani, the Director of Industries, Bombay, who was asked by the Government of Bombay to submit a report on the marketing of fish in the city of Bombay and to suggest measures for its improvement. The Director of Industries interviewed the Superintendent of the Crawford Market, leading fishermen and fish merchants about the possibilities of increasing the city's supply of fish. The inquiry revealed that there was scope for a considerable increase in the quantity of fish normally received in the Bombay markets, and that an additional 3,000 to 4,000 tons might easily be disposed of annually without elaborate and costly effort. The position in the mofussil, on the other hand, was still more unsatisfactory. In several districts, fish as an article of diet was, more often than not, a luxury which only a few could afford. Mr. Advani's inquiry, indicated that the introduction of power-propelled vessels in the local trade would considerably help to improve the prospects of the fishermen and augment the city's supply of fish. The immediate outcome of the inquiry was the establishment in November, 1933, of a Fisheries section attached to the Department of Industries, Bombay.

The introduction of power-propelled vessels, as a means of rapid transport and of extending the sources of supply, was also advocated by Dr. H. T. Sorley, I.C.S., who conducted a survey of the entire fisheries of the Bombay Province including Sind in 1930-32. The results of his investigations are set forth in a Blue Book entitled *The Marine Fisheries of the Bombay Presidency*.

Sir Frederick Sykes, then Governor of Bombay, manifested a keen interest in the welfare of the fishermen. Shortly before the inauguration of the fisheries experiment, His Excellency visited the Koli community at Colaba in Bombay, to acquaint himself personally with the difficulties under which they laboured. He felt that many of the obstacles confronting the fishermen in the development of their trade might be gradually overcome, and believed that there was considerable scope for the improvement of their



condition, provided that their traditional methods of work were reformed and placed on a more modern and systematic basis.

The first objective of the newly established Fisheries Department was to ascertain the benefits which would accrue to the city's fishing industry from the use of motor launches for the transport of fish from the fishing grounds to the city. The traditional means then, and even now, employed were ordinary sailing craft. In inclement weather such craft are frequently compelled to remain at the fishing grounds and are unable to land the catch at the bunders, or they are confined to port when there is a total lack of wind, or when rough seas prevail, with the result that no fishing is done or the catch meant for transport to the city decays and has to be jettisoned. Fish meant for the markets is thus lost, and the fishermen's labours are wasted. Further, absence of wind frequently prevents a quick return to port, with the result that large quantities of fish are landed in a rotten condition. The initial step was therefore to provide more efficient and rapid means of transport and, as an experiment, Government decided to obtain a launch and use it for the transport of catches between the fishing and landing sites.

#### INAUGURATION OF EXPERIMENT.

3. Sir Frederick Sykes inaugurated the fisheries experiment at Danda on November 10, 1933.

The first power-propelled vessel to be used by Government was one worked by a petrol engine. She was named the '*Lady Sykes*', and was obtained on loan from the Royal Indian Navy (then the Royal Indian Marine). Suitable alterations were carried out to adapt her for use as a fish carrier. Government further sanctioned the construction of two motor boats. In the hope that the fishermen might eventually be able to take charge of and operate their own launches, Government provided five stipends of Rs. 20 each per month for the training of five apprentices of the fishermen's community in the operation and maintenance of motor launches.

Government were not, however, the first in the field in this respect. At least three months prior to the inauguration of the experiment at Danda, private enterprise had been responsible for a venture on similar lines. With a view to finding fresh outlets for its products, the Burma Oil Company had conducted an independent investigation and arrived at the conclusion that the city's supply of fish might be considerably augmented by the use of power-propelled boats.

Realizing, however, that the purchase of power-propelled launches would be beyond the slender resources of a great many of the fishermen, the firm decided to convert an ordinary sailing boat into a power-propelled boat. The guiding factor in view was that if, and when, the fishermen decided to go in for launches, they need not discard their sailing boats numbering thousands, but need merely install a suitable engine in them. The Burma Oil Company accordingly purchased from the fishing village at Worli a newly constructed fishing boat measuring 24 feet in length, and fitted it



with a A 10 B.H.P. Kromhout engine. Considerable structural alterations were necessary, however, before this could be done.

#### BEGINNINGS OF A FISHING FLEET.

##### 4. (a) *Conversion of sailing boats into power-propelled vessels.*

The Department of Industries simultaneously examined the possibility of converting ordinary sailing boats into vessels capable of propulsion by Diesel engines. The opinion of experts consulted by the Department was that fishermen deciding to use mechanically propelled boats to collect and transport fish need not perforce incur expenditure on the acquisition of new boats. The possibility of ordinary sailing craft being converted into power-propelled boats was demonstrated by further experiments by Messrs. Greaves Cotton & Co., who successfully converted a number of country craft into passenger and cargo-carrying launches. The survey on which these experiments were based showed that only one in every 20 of the ordinary sailing craft was capable of conversion into a mechanically propelled unit.

##### (b) *Construction of launches by the Department of Industries and unofficial agencies.*

The outcome of these experiments was most encouraging. The results obtained from the use of the vessels placed at the service of the fishermen by Government exceeded the most sanguine expectations. Equal fruit was borne by the Burmah Oil Company's venture. There, thus, appeared to be a promising future for the regular employment of power-propelled vessels in the fish trade. Accordingly in 1934 Government, impressed with the advantages accruing from the experiment at Danda, placed an order for the construction of two launches with Messrs. Alcock Ashdown & Co. Ltd. Steps were taken to eliminate from these launches the defects revealed in the '*Lady Sykes*', which had been adapted to the purpose of a fish carrier. The two new launches were the '*Sir Frederick Sykes*' and the '*Lady Sykes*', and they continue to be in use today. Appendix I shows the launches constructed by the Department of Industries and also those owned by private individuals. It further shows the progressive increase in the horse-power of the engines installed in the vessels.

*'Lady Sykes' and 'Sir Frederick Sykes' (1934).*—The '*Lady Sykes*' is equipped with a 28.5 B.H.P. Gardner engine, and the '*Sir Frederick Sykes*' with a 38.5 B.H.P. Ruston-Lister engine. The launches, which are capable of average speeds of seven and eight knots, respectively, were equipped with different types of engines in order to test their suitability for the purpose of fisheries work. The total length of each launch is 35 ft., breadth 10 ft. and depth 4 ft. 9 in. Both vessels, which were built in the same year, have life-buoys, life-jackets, fire-extinguishers and the usual navigation lights. They burn crude oil. They were put into commission in September and October, 1934, respectively.

*Launch 'Hydari' (1934).*—The success of the original '*Lady Sykes*' induced Mr. Hasanaly Ebrahim, a fish merchant, to build a launch for his own use. It was constructed at Bassein by local carpenters at the same time as the '*Sir Frederick Sykes*' and '*Lady Sykes*'. Mr. Hasanaly's launch, the '*Hydari*', is fitted with Modaaag Krupp Diesel engine. She is 41 ft. in length, has a 10 ft. beam and a draft when loaded of 3 ft. Her speed is five knots. The engine,



a single cylinder pattern, operating on the two stroke principle, is claimed to develop 25 B.H.P.

'*Lady Brabourne*' (1935).—The following year saw the addition of the '*Lady Brabourne*' to the fleet. She, too, was built by Messrs. Alcock Ashdown & Co. and is a great improvement, both in point of size and engine power, on her predecessors. Her dimensions are:—length 42 ft., breadth 11 ft. 2 in. and depth 5 ft. 3 in. She is fitted with a Ruston-Hornsby '3VQM' marine engine, developing 52 B.H.P. at 1,000 r.p.m.

Fishermen, who till then had felt that the provision of power transport was beyond their means, came to realize from the results achieved that motor launches could play an important part in their trade and that their more extended use would fundamentally improve their prospects.

Trawler '*Cymbria*' (1936).—The launching of the fisheries scheme at Danda had synchronized with the experiment conducted by Mr. P. Schulze, who brought out about the same time a small second-hand trawler from Hamburg for deep sea fishing in the waters around Bombay. A company of four share-holders was floated, but owing to a variety of causes, among them repairs to the trawler's engine, the lack of sufficient capital and the poor catches due to unfavourable weather, the results were very disappointing and the experiment was abandoned. The vessel lay idle for some time and was later reconditioned for use as a fish carrier. It served in this capacity from October 1936 till September 1938, when it ran aground off the rocks near Colaba lighthouse and became a total wreck.

'*Chanatara*' (1937).—The '*Chandtara*' constructed in the same year by local carpenters at Vijaydurg is 46 ft. 9 in.  $\times$  10 ft. 5 in. It is equipped with a 52 B.H.P. Ruston Hornsby engine and is capable of developing a speed of seven knots.

'*Lord Brabourne*' (1938).—The '*Lord Brabourne*', an up-to-date craft, was constructed by the Royal Indian Navy, who, in designing the vessel, ensured that it would be a model craft, the best in the fishing trade on the Bombay coast. It is the largest boat so far built, its dimensions being 45 ft.  $\times$  11 ft.  $\times$  5 ft. 6 in. It has a 57 B.H.P. Gardner engine, which unlike the other launches is installed amidship. Its distinguishing feature is a cork insulated hold provided to minimize the melting of ice and to ensure the fish being kept in sound condition. Another welcome feature, greatly appreciated by the crew, is the provision of large oil and water tanks, which carry the entire quantity of fuel oil (200 gallons) and water (65 gallons) needed for the round voyage, usually lasting about five days. The provision for this storage in the engine room, apart from making for more deck space, also ensures the tidiness and cleanliness of the vessel, both important factors in dealing with so rapidly a perishable commodity as fish. Another aspect in which the new vessel surpasses the older launches is the equipment with electric lighting. She is fitted with a 12 volt battery and a dynamo which is driven from the engine. A photograph of the '*Lord Brabourne*' appears at the end of this account.

'*Nooremohomedi*' (1938).—This vessel was built at Vijaydurg by local carpenters. She is equipped with a 70 B.H.P. Ruston Hornsby engine and provides evidence of the growing tendency to install larger engines and build bigger boats than formerly.

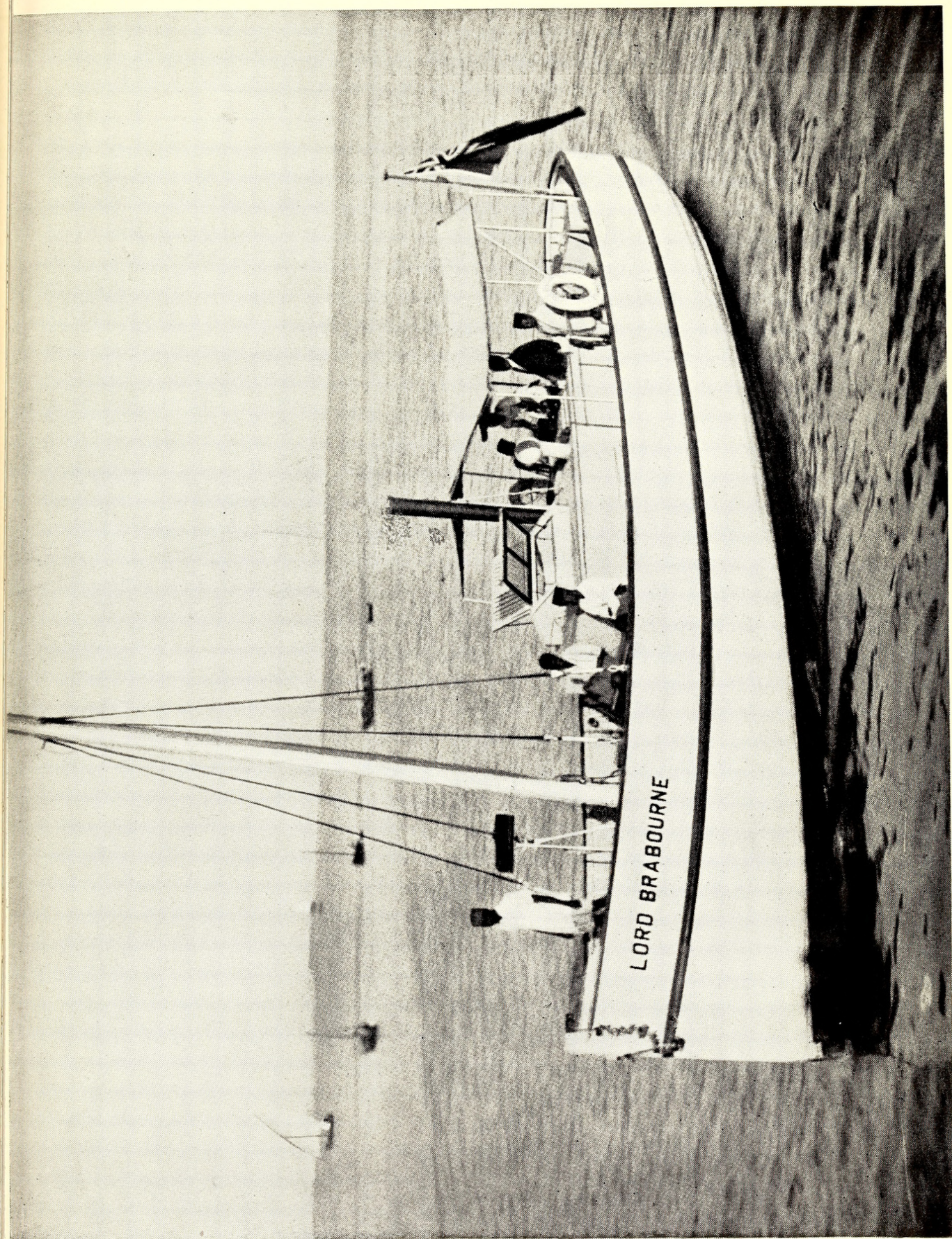
'*Seahawk*' and '*Karimi*' (1938-39).—The vessel '*Seahawk*' was put into service by the Janjira Fishing Co. till the owners Messrs. Damania & Co., boat builders, were in a position to deliver the new vessel the '*Karimi*' which they had been commissioned to build. The '*Karimi*' which is equipped with a 40 B.H.P. Ruston Hornsby engine, worked during 1938-39, between Shrivardhan and Bombay.

'*Khajahind*' (1939).—This is the latest addition to the fishing fleet. She was constructed at Vijaydurg and is equipped with an engine of twice the horse-power of any other engine on existing vessels, namely, 140 B.H.P. Her length is 56 feet.

#### FIELD OF OPERATION OF THE LAUNCHES.

5. In the early stages of the experiment the field of operation of the launches was confined more or less exclusively to the north











of Bombay, extending as far as Bassein. The vessels brought fish from Versova, Maloni, Gorai, Utan, Bassein and Arnala, in the north, and from Revdanda and adjacent sites in the south. The time taken for the voyage to the farthestmost point, north or south, was about three hours. Fish, however, was customarily brought to Bombay by sail boats from these areas. It was therefore realized that the working of the launches within this limited field would not exactly serve the main purpose of the experiment, which was to demonstrate to the fishermen the possibility of increasing the city's supply of fish by exploiting additional and more extended sources of supply.

Arrangements were accordingly made for the launches to journey to more distant fishing sites. The first voyage beyond the usual sphere of operations was undertaken in November 1934, when the '*Sir Frederick Sykes*' went to Jaigad (about 100 miles from Bombay) and returned with an ample catch. Both the '*Sir Frederick Sykes*' and the '*Lady Sykes*' subsequently made alternate voyages to Jaigad and other ports close by, whence they returned with catches of mackerel and other fish. The bulk of the fish transported in 1934-35 was from Jaigad. Catches in 1935-36 were unsatisfactory owing to scarcity of fish both at Jaigad and Ratnagiri, and the launches, therefore, ventured yet further afield. Since September, 1935, all the three Government launches, as well as privately-owned vessels, have operated regularly as far as Karwar, which is nearly 270 miles from Bombay. They also made occasional voyages to Bhatkal, which is the southernmost point of the Province, about 334 miles from Bombay. Transport operations in the north extended as far as Damaun and Kathiawar, which were also tapped as sources of supply to the city. The first voyage was to Diu and was made by the '*Hydari*' in 1935. This vessel went to Madhwar, at the extreme south end of Kathiawar, about 150 miles from Bombay. The prevailing view till then had been that the passage to these fishing sites was unsafe for such small craft, as part of the route lay across the open sea through the Gulf of Cambay. The ease with which the passage was accomplished encouraged other owners to send their launches to Madhwar, which, since the first experimental voyage by the '*Hydari*', is now regularly visited.

The performance of the launches is very creditable in view of their small size, limited horse-power and lack of sufficient facilities for storage. From a limited radius 20 miles North and South of Bombay the fishing grounds now served by the launches have been extended from 270 to 300 nautical miles from Bombay, the duration of one round voyage being generally from 3 to 5 days. The important fishing fields brought within the sphere of operation both north and south of Bombay are indicated in a map appearing as Appendix 2 to this report.

Like the launches, sail boats also operate as fish carriers, but the field is necessarily restricted on account of the longer time taken by them on the voyage, and the consequent deterioration of the catch by the time it reaches Bombay. The only long distance voyage performed by the sail boats is from Madhwar (Diu) to



Bombay, from where fish is brought to the city. Madhwar is about 140 miles to the north of Bombay and the distance is usually covered by a sail boat in about two days. Quick transport from the northern fishing sites by sailing boats is facilitated by the favourable winds which blow from the north during the first half of the year. The season starts early in March and continues up to the latter part of May, when the onset of the monsoon compels suspension of fishing operations; but fishing fields in the south situated at the same distance or nearer than Madhwar are however unable to send their catches to Bombay in sailing boats because the strong head winds encountered on the homeward journey considerably prolong the voyage to the detriment of the catches.

The prospects of a regular launch service for the transport of fish between Bombay and the fishing fields near Diu in the north and off the Konkan coast in the south are most promising. The working of the launches in the Konkan and Kanara areas has shown that the sphere of operations in the south might easily be extended to Bhatkal and even as far south as the west coast of the Madras Presidency where fish is obtained in much greater abundance than off the Bombay coast; while in the north Jamnagar and even Karachi might be brought within the field. This consummation is not impossible of achievement. It will be the next inevitable step, for there is an increasing tendency to construct larger vessels to serve fishing sites where catches are cheaper and more abundant, but which have not so far been touched for want of transport facilities.

It is a noted fact that the further south one goes the richer and more profitable is the yield for readily saleable fishes, such as mackerel and sardines, which move in great shoals and form the bulk of the haul off the Malabar coast. This mainly accounts for the high percentage of the yearly catch *per* fisherman in the Madras Province. Some of the important fishing sites in the South Kanara district (west coast of Madras Province) i.e. Malpe, Bokapatnam, Calicut and Tanur are near Bhatkal, the southernmost point of the Bombay Province. Malpe, Bokapatnam and Tanur are about 43, 78 and 200 miles respectively from Bhatkal. There is no reason why fish from these ports in the Madras Province cannot be brought to Bombay, as the possibility of the transport of fish in a fresh condition from Bhatkal to Bombay has effectively been demonstrated. The *sine qua non*, however, is larger launches, equipped with higher powered engines, a small refrigeration plant and insulated fish holds.

The use of launches has not been an unmixed blessing. Their operation has, to some extent, affected the prosperity of the fish curing yards, of which there are 32 under the control of the Fisheries Section. While the launches have undoubtedly helped to increase the supply of fish in the Bombay markets, they have correspondingly diminished the quantity available for consumption in the areas from which it is brought. The small quantities of fish that find their way to the fish curing yards have still further been reduced by the despatch of fish, in a fresh condition, by bus and rail, to places in the interior where formerly



it was not available and where there is a regular demand for it. The diminution in the supply to the fish curing yards has also affected the fish curing industry. This is amply borne out by the reduced quantities of salt sold at the fish curing yards (*vide* Appendix 3). Whereas the sales of salt in 1935-6 amounted to about 80,000 mds. they declined in 1936-7, 1937-8 and 1938-9 to 56,000, 60,000 and 62,000 mds. respectively. Moreover, people on the Ratnagiri and Kanara coast who used to consume fresh fish are now complaining of diminished supplies and exorbitant prices.

The improvement now effected in methods of transport by the use of launches will not alone enable the fishing trade to take its place as one of the major industries of the country. Increase in the supply to Bombay has been effected by depriving the fish curing yards and the coastal population of their former supplies. If success in the use of launches as carriers is to be unqualified, then fish *must be caught in much more abundant quantities than now*. The launches have at present to make distant voyages to obtain supplies of fish. (Fishing fields situated at Ratnagiri and beyond, up to Bhatkal, are on average visited four times per month). Not infrequently the launches have to remain for days on end at the fishing fields, waiting for a big haul before returning to Bombay. The larger catches on the Konkan coast are due less to the efforts of the fishermen than to the fact that fish move in abundant shoals towards the coast, where they are caught with the *Rapan* nets. If shoals do not come in or are not sighted, the fishermen conclude that no fish is available and they declare the season to be a failure. Actually, so often happens, the shoals may not approach near enough inshore to be caught with *Rapan* nets, which can only be worked from the shore. Launches, however, if operated in conjunction with improved types of nets, will be able to pursue shoals which are at present missed because sailing boats cannot keep pace with them.

#### SEASONS AND STATISTICS.

6. It is a well-known fact that the fishing season starts more or less simultaneously at all fishing centres in the Bombay Province, i.e., immediately after the conclusion of the monsoon. The city of Bombay obtains the bulk of its supply of fish in September and October from the fishing fields situated in the vicinity of Bombay, especially in the north. The fish caught here consists almost exclusively of pomfrets. The presence of pomfrets entirely removes whatever demand there may be for such fish as *wagti*, *mandil*, *dhoma*, *prawns*, *plaice*, etc., which, meeting with scarcely any demand in Bombay, are taken for disposal to villages adjacent to the area where they are caught. They are there dried or converted into fish manure. Pomfrets at the height of the season fetch from Re. 1 to Rs. 3 per score at the landing sites. The demand for such prime fish as *pala*, *bhing*, *surmai*, *kuppa*, *black pomfrets* is also insignificant during the pomfret season. The period when catches of pomfret are greatest in the vicinity of Bombay is from about the second week of September to about



the middle of November. Catches are heaviest usually at and shortly after the spring tides of the first half of the lunar month and diminish during and after the spring tides of the second half.

Shoals of pomfrets gradually diminish after November, after which there is a progressive decline in the quantity of fish caught. The pomfret season by this time is practically at an end and very small quantities are landed, and on account of their obvious scarcity, they realize Rs. 8 to Rs. 10 per score. *Ghols*, *pala*, *rawas*, *surmai*, etc., now appear in small quantities and in the absence of pomfrets are in great demand. This period of reduced catches, when markets are barren of fish, lasts about three months (15th November to 15th February) when any indifferent variety of fish obtains a price that is out of proportion to its normal value. The fall in the supply is not marked by a corresponding slackening in the demand, which is uniformly constant throughout the year. An increase in the supply of about 50 per cent during the period will present no difficulty in disposal.

A revival of fishing activities is again noticeable in March and this continues up to May. *Ghol*, *black pomfret*, *dara*, *surmai*, and *bhing* predominate among the fish caught. *Ghol* are available at Rs. 10 per 20, aggregating 400 lb. *Dara* is exclusively available in the area north of Palghar, whence it is dispatched to Bombay. The month of March really marks the commencement of a second fishing season on our coast, which is not, however, as brisk as the pomfret season. It is estimated that at this period an addition of about 30-40 per cent to the available supply could be absorbed easily by the consuming public in Bombay.

Supply from local sources is, of course, practically non-existent during the monsoon, when the public contents itself with supplies from Karachi and such small quantities as the labours of the local fishermen can produce in spite of the handicaps of the inclement weather.

Conditions in the south of the Province, i.e., on the Konkan and Kanara coast, are not entirely dissimilar. Here, too, as in the north, September marks the start of the fishing season, which in some years reaches its height in October, in others, in November and then at times in these very months precipitously drops almost to the level at the start of the season.

A graph (Appendix 3) which is appended to this note bears out the statement made above. The graph shows the quantities of salt issued to the fish curing yards. On the basis of the sales of salt, it is possible to arrive at some idea of the quantity of fish landed, as on an average, one maund of salt is issued to cure about four maunds of fish (1:4).

A reference to the graph will show that the quantity of salt issued in June, July and August is practically on the border line, and that it gradually takes an upward curve in September and October, reaching its peak in November, after which it falls almost abruptly in December to its initial level. Further, it will be noted that the quantity of salt issued in October and November not



only equals the aggregate amount of salt issued during the year but also at times, as a matter of fact, exceeds it. Similarly, these months see by far the biggest quantity of fish caught. The supplies in other months are limited and scarcely equal the entire total catch in October and November. The fishing season on the Konkan and Kanara coasts is at its ebb in February, from when onwards there is a progressive decline in the quantities landed. This does not mean that fish is not available, but that the fish at this time of the year migrate into deeper waters, where the fishermen do not venture at present on account of their frail, deckless fishing craft and the small sized fishing gear used.

The termination of the fishing season on the Ratnagiri and Kanara coast in March coincides with the beginning of the fishing season off Palghar, Damaun and Diu (Kathiawar coast) in the north and Harnai, Shrivardhan, Murud, Janjira, Mazagaon and Nandgaon in the south. This season lasts up to the end of May, the bulk of the catch off the Kathiawar coastal area being white pomfrets and in the Janjira area black pomfrets. These are noted for their size and ensure for Bombay a supply of such fish as the Bombay public welcomes.

In September the operation of the launches is confined almost exclusively to the north of Bombay. They then take the utmost advantage of the short fishing season there, and the large quantities of white pomfrets available close by. As the end of the season approaches the launches move south to the Konkan and Kanara coasts, after which, in February, their sphere of operation is transferred to Damaun and Diu in the north and the Janjira area in the south. Though the field of operations is wide, the total annual catch transported by the launches is comparatively trivial and is not at all proportionate to the haul that one might have expected from so extensive a coast-line as that of the Bombay Province. Bombay's supply of fish is thus precarious for the major portion of the year and whatever semblance of steadiness it possesses is due mainly to the launches, which to a considerable extent make up the deficiency of supply that existed formerly. They can shift their sphere of operations to the particular area, anywhere on the coast, where supplies of fish may be large for the time being.

The type of work done by the launches is best illustrated by a representative example. For this purpose the *Lord Brabourne* has been selected and the relevant information is furnished in Appendix 4.

The total quantity of fish landed by the launches since the inception of the experiment and the types of fish brought to Bombay are enumerated in Appendices 5 and 6. Appendix 6 shows that mackerel (*Scomber macrolepidotus*) ranks first in point of quantity. The fish is popularly known throughout the Bombay coast by its vernacular name 'bangda'. It has a high food value, and is noted for its nutritiveness and easy digestibility. Special reference is made to the mackerel as it is usually scarce in Bombay waters. The small supply of the fish which previously found its way into the



Bombay markets was due not so much to the enterprise of the fishermen, as to the fact that the shoals had somehow strayed from their usual migratory course. In early winter, i.e. from the end of September up to the middle of December, immense shoals of mackerel seek our coasts, where they assemble from their mysterious wanderings at sea. Thousands of fishermen all along the west coasts of both the Bombay and the Madras Presidencies depend for their livelihood on catches of this fish.

Prior to the introduction of the launches, owing to the meagreness of the demand at the fishing sites, a minute fraction of the large quantities caught was consumed fresh *on the spot*. The bulk of the catch, which was sold at a very trivial price, used to find its way to the fish curing yards, where it was cured and salted to be exported long afterwards for sale in Bombay and other places, while a considerable quantity was converted into fish manure. As a result, a first-class product was reduced to a third-class commodity. Owing to the introduction of rapid long-range power transport, mackerel and other fish are now brought in a fresh condition to Bombay, where they find a ready sale and meet a real demand. Large and rich fishing fields have thus been brought within comparatively easy reach of the city.

Other edible varieties of fish than those specified in the appendix are also available, but are not brought to Bombay. People in Bombay do not usually buy any fish beyond the regular types to which they are accustomed. Such fish as *dhoma*, *wagti*, *pedwa*, *shingala*, *gegar*, *mandil* and *musi*, for which there is very little demand in Bombay, are taken by sail boats to the fishing villages for local consumption or for drying. Nevertheless, these despised species are nutritious, and if consumed more largely by the public would greatly benefit our fishermen, who are often at their wit's end to supply the limited types of fish usually demanded by the consuming public. No attempt has, hitherto, been made to make known or popularize the numerous forms of fish available in Bombay markets. This object will have to be kept in the forefront of any programme to promote the fish trade in Bombay.

The report of transport operations would be incomplete without reference to the process of dispatch from the fishing fields to the landing site. No sooner is the fish taken aboard than gutting operations begin. The abdomens of the larger fish such as *dara*, *gnol*, *iswan*, etc., are slit open and the viscera from the body cavity are removed and thrown away. The swim-bladders are removed and laid aside for later attention. These are sold in Bombay separately to special traders who deal in them at a rate varying from one to two annas each. They are exported to England and China, where the product is utilized for the manufacture of isinglass. The gutted fish are washed with sea water and stored with their ventral surface downwards, to facilitate the escape of water from the melting crushed ice stuffed into the body cavity. Pomfrets, mackerel and other small sized fish are not gutted; they are simply stored in ice in the holds. In storage, great care is taken, however, to ensure that fish do not come into direct contact with the sides of the vessel as



the heat transmitted from the sea outside causes softening of the outer layers of fish. Liberal quantities of crushed ice are sprinkled on the bottom and along the sides of the holds. The bottom of the hold is spread over with ice to a thickness of about 6 to 8 inches. A layer of fish is spread out on the ice. Fish and ice are then arranged in alternate layers. Usually one pound of ice is allowed for each pound of fish for a five-day voyage. The ice cools the fish to 32° F and this temperature is maintained throughout the voyage. The larger launches carry, per voyage, on an average, about seven tons of ice. This ensures the perfect freshness of the fish for about five days. Fish cargoes are landed at Sassoon Dock, which is also extensively used by a large number of sailing craft to land their catches.

#### ADVANTAGES OF POWER-PROPELLED BOATS.

##### 7. (a) *Cost of upkeep of launches.*

The initial expenditure in respect of a launch is heavy owing chiefly to the cost of construction of the vessel and the purchase and installation of the engine. Recurring expenditure is, however, not excessive, representing mainly the purchase of oil, stores and overhauling (*vide* Appendix 7). The expenditure under the different heads is not as excessive as it seems, and is more than made good by the increased number of voyages, and the greater certainty of bringing large catches of fish to the city, and by the greater loads they carry. Apart from the saving in time comparatively much less labour is also employed in bringing fish from the fishing sites. A carrier sail boat has to employ about eight men, and is further assisted by two to four men in small tonies stationed on the fishing grounds. These tonies take over the catches from the fishing boats and transfer them to the carrier sail boats.

A launch, on the other hand, is able to get alongside a fishing boat with greater facility and rapidity than a sailing boat doing it. Fishing boats which have contracted to supply their catch to a particular launch, fly flags to differentiate them, at sight, from other fishing boats fishing in the same locality.

##### (b) *Greater cruising radius.*

The greater cruising radius of the launches is their most important advantage. Fishermen do not at present fish beyond a radius of about 15 miles. Owing to the distance to be traversed there is the fear that the fish may deteriorate by the time it is brought ashore. Apart from their rapidity of transport, the wider operations of the launches will encourage the fishermen to venture beyond their present limited region of activity, as they have the certain prospect of their fish being landed with scarcely any risk of deterioration. Moreover, fish brought by launches is more readily saleable, as there is a better demand for it. The prices realized from the sale of fish transported by the launches are higher than those obtained for fish brought by carrier sail boats.



Experience has shown that fish brought from distant landing sites, even from a distance of 300 miles, by the launches is superior in quality to the fish caught in close proximity to Bombay and even to fish brought by train from Bhyandar, Virar, and other stations on the B.B. & C.I. Railway, or by steamer and rail from Veraval and Jamnagar, or by steamer from Karachi and by sail boats from Diu. The reason is that fish transported by rail and sail boats is usually caught about 10 to 15 miles off shore and conveyed in open sail boats which lack storage and other facilities, with the result that it deteriorates considerably in quality on its way to the landing site. The fish is now auctioned and several hours must elapse before the consignment is iced, packed and taken to the railway station for dispatch to Bombay. A few hours more are taken up by the journey, and further time elapses before it is unpacked and auctioned to retail vendors and eventually put up for sale in the Bombay market. It is estimated that on an average at least 20 to 25 hours, if not more, elapse between the time fish is caught at the fishing site and the time it is put up for sale in Bombay. Fish brought from Karachi and Diu takes much longer before it is put on the market counters. There is no such inordinate delay with fish brought by the launches. The catch is placed in ice as soon as it is caught and is transported under specially conditioned means, i.e. properly protected fish holds and insulated boxes. The cargo is never exposed to the sun and is not handled so frequently as fish brought by steamer, rail and sail boat.

Fishermen who formerly patiently waited the return of sailing craft, now eagerly look forward to the more punctual arrival of the launches which bring fish in a more fresh and wholesome condition, yielding them greater profits.

(c) *Benefit to Trade and Other Interests.*

Apart from augmenting the city's supply of fish, the improvement in methods of transport has also led to an improvement in the economic condition of the fishermen working in areas formerly outside the reach of the city's markets. No longer dependent on a fitful and scanty demand, they now not only secure a profitable outlet for the catches but also obtain a better price for their fish. Prior to the visits of the launches to their grounds 1,000 mackerel (approximately 200 lb.) would fetch about Rs. 2, but the identical quantity now yields on an average about Rs. 7, and sometimes as much as Rs. 13 when catches are small and the general demand for fish in Bombay is great. Compared with their conditions prior to the visits of the launches to their ports, this is an immense gain to the fishermen, the capital value of whose catches has been advanced beyond all proportions.

Effective transport has also tended to increase activity at the fishing sites particularly in the southern parts of the coast of our province. The system of payments in ready cash introduced by the launch owners has even tempted fishermen of the Madras Presidency to invade our fishing fields. Fishermen from Malpe operated



*rapan* nets at Gangavali, Chendia, Kodar and Bingi. Their invasion has led not only to a healthy element of competition but to improvement in fishing methods since it has induced our fishermen at Baitkhol (Karwar) to use the more effective *rapan* nets which were formerly unknown there. There were 15 such nets in use at the close of the fishing season which ended on March 31, 1939. Greater certainty of lucrative sales is also inducing fishermen to strive for big catches, despite the obvious limitations of the primitive fishing gear.

Users of *rapan* nets resorted to an original device to obtain the fullest benefit from the launches. In the *rapan* net (shore seine), which are worked from the shore a shoal of fish is surrounded and dragged shorewards, but not landed. Advantage is now taken of estuaries and creeks, wherever they exist, to keep the fish alive in their natural habitat till the arrival of the launches. Fishermen are thus enabled to demand and obtain their own price for the catch, for if the bid of the first launch owner is below expectation, the catch is not removed from the water but kept there till a remunerative rate is obtained.

Evidence of the benefit conferred on fishermen in Karwar is further furnished by the honorary organizer of Co-operative Societies at Majali. He states in a letter addressed to this office that the visits of the launches to places in Karwar are eagerly looked forward to by the local fishermen, who were grateful to Government for the introduction of the launches. They now take a keener interest than previously in the pursuit of their trade, and feel that a period of prosperity has set in for them. As evidence of this, the honorary organizer reports that the fishermen have now paid in full to their co-operative society dues which had been outstanding for the past four years.

Improved transport has not only benefited inshore fisheries but also fishing in deeper waters such as at Harnai, Shrivardhan, Murud, Janjira, Mazagaon and Nandgaon. On account of the difficulty experienced in landing their catches fresh in Bombay, fishermen from these parts were formerly compelled to leave their own rich fishing grounds and work in closer proximity to the city. They usually migrated towards Bombay in April and May when black pomfrets were in season. This tendency was arrested when the launches started to serve these distant fishing sites. Fishermen (about 40 boats) who had established their temporary base at Sassoon Dock (Bombay) promptly left and returned to their native fishing grounds, having arranged with the launches to take over their catches. This move was beneficial. The assurance that their fish would be expeditiously transported to Bombay has led them to fish for longer hours at night. They now often remain longer at the fishing fields.

Similarly, the extension of the sphere of operations of the launches to Damaun benefited the fishermen there. Prior to the appearance of the launches in those waters the fishermen went out about 20 miles to sea in quest of *dara* and remained at the fishing site for about 10 days at a stretch. To prevent decomposition fish caught were salted at sea. Since the arrival of the launches their catch is



taken over immediately and brought to Bombay in a fresh condition. This is an undoubted piece of good fortune to the local fishermen who are now free from the harassing anxiety of curing their fish at sea. The launches now provide both ready custom and also ready cash.

The surplus yields have given more employment to fishermen and fisherwomen and to those who furnish the crew of the launches, not to mention the large number of coolies and motor lorries which are engaged in the transport of a perishable commodity.

Indirect interests, like the Bombay Port Trust, Municipal markets, fuel suppliers and insurance companies have also profited from the large quantities of fish now brought to Bombay.

The example of the benefits accruing to the fishing trade through improved methods of transport has also influenced parallel development in trade other than fisheries. The conversion of sailing craft into power-propelled vessels by the installation of diesel engines has begun to find vogue in other commercial ventures. The Bombay Steam Navigation Company built the *Noor-Jahan* and equipped her with a 50 B.H.P. Diesel engine. She is being used along the coastal ports for the transport of merchandise other than fish. Another private owner built a vessel named *Hilda* equipped with a 25 B.H.P. Diesel engine for the same purpose. Two vessels, the *Takadevi* and the *Mandwa Queen*, equipped with 18 and 36 B.H.P. engines respectively were built by another company for the carriage of passengers between Bombay and Mandwa and intermediary ports. Besides these, there are now other smaller vessels, similarly equipped and used for the transport of passengers. All the above-mentioned vessels were designed and constructed wholly by Indian boat-wrights. A considerable fillip has thus been given to the boat-building industry.

(d) *Growth of refrigerating facilities.*

Larger supplies of fish made available by the launches have induced the flow of private capital into channels intimately bound up with the fishing trade. Several ice factories and cold storage plants have sprung up. Two ice factories and cold storage plants have since been set up at Malwan, on the Ratnagiri coast, and Chendia on the Karwar coast. In Bombay quick freezing plant employing the Z-process has been installed by a Russian technician at the Kermani market at De Lisle road (Bombay) and an ice factory and a cold storage plant have been constructed on the east side of the Crawford market (Bombay). A feature of the last plant is that it has a number of small chambers which are hired out at small fees either to one individual or to several collectively. This plant also provides for the quick freezing of fish.

During the current year an ice factory and a quick freezing and storage plant were set up at Sassoon Dock (Bombay) where all the launches, both Government and private, land their catches. This factory and cold storage plant have met a long-felt want and proved an undoubted boon both to fishermen and owners of launches and sailing craft. It has obviated the need of obtaining ice from remote



centres in the city, thus saving a good deal of time and expenditure. The existence of the cold storage plant at the Dock is a welcome facility to the fishermen, who are now able to store catches at any hour of the day or night when retail vendors are not on the spot.

The resources and facilities for cold storage are thus brought within the reach of even the most petty trader. The establishment of ice factories and quick freezing plants provides striking evidence of the increasing realization by the public of the importance of the fish trade as an avenue for the investment of capital. Another advantage is that fish caught when supplies are plentiful can be stored fresh for ready sale to the public in the monsoon when supplies are low and the demand has to be met to a large extent by imports of indifferent quality from Karachi.

All the capital for the ice factory and cold storage plant, amounting to over Rs. 5,00,000, has been furnished by private enterprise.

#### APPRENTICE SCHEME.

8. One of the most conspicuous features of the scheme is the opening out of a new avenue of employment to youths of the fishing community. An important consideration was to train youths as mechanics to operate the launches. With this end in view an apprenticeship scheme was started. Lads from the fishing community are now being trained in the operation and maintenance of motor launches to enable them to take charge of their own launches. The number of apprentices so far trained is 17 of whom six have passed the examination and obtained the necessary certificate from the mercantile marine department. These boys have been in regular employment on Government launches ever since they successfully qualified at their examination. The work of the apprentices has been quite satisfactory. They have shown constant zeal and devotion to duty. Besides improving their material prospects, the scheme has thus also served to open a new sphere of employment to the fishing community. Experience has shown that the work of a mechanic aboard a fishing vessel is extremely arduous and fatiguing, and calls for great powers of endurance. Mechanics recruited from classes other than the fishing community are not able to stand up to the strain of continuous service at sea.

#### CONCLUSION.

9. The foregoing makes it clear that the objects underlying Government's experiments, namely, the popularization, by actual demonstration, of launches for the transport of fish and an increase in the city's supply of fish, have been amply fulfilled (*vide* Appendix 5). The increase in supplies is undoubted and is forcefully borne out by a comparison with the figures quoted by Dr. H. T. Sorley, in his report on the *Marine Fisheries of the Bombay Presidency*. His survey disclosed that the city's supply of fish annually amounted to 10,000 tons. The latest statistics show that the fish brought by the launches to Bombay during a short fishing season in



1938-39 totals about 700 tons over and above Dr. Sorley's figures. The city's supply of fish has thus been increased by about seven per cent in five years which, in view of the inveterate prejudices and ingrained conservatism of the fishermen to any reforms, is no small achievement.

As far as direct increase in supply is concerned the experiment with launches for the transport of fish in our waters has been more successful than the experiment with the trawler *William Carrick*, which the Government of Bombay brought out in 1923. In 36 voyages, over a period of nine months, this vessel caught 188,138 lb. of fish, of which 152,875 lb. were landed for sale in Bombay, the remainder being disposed of at Karachi. The entire sale proceeds amounted to Rs. 19,350. One of the launches during seven months of the fishing season of 1938-39 brought to Bombay 453,943 lbs. of fish, which realized an aggregate of Rs. 34,683.

The work of the launch differs in one respect from that of the trawler, for while the former merely transports, the latter also catches fish. The comparison, however, has its point in one important respect. Fish landed either by launch or trawler would, in the normal course of events, never have found its way to the Bombay markets. These results indicate that launches are, at present, more remunerative than trawlers and that under existing conditions even their bare use as carriers, is productive of better results. It is not suggested that there is no scope for trawling in our waters. Prevailing conditions indicate that the introduction of trawlers would at the moment be premature. Trawling must follow an intensive study and exploration of the field. We must know a great deal more about the movements and periodicity of fish in our local waters before we launch on such a costly enterprise. Trawling is bound to be hampered by certain inherent defects peculiar to our type of fisheries. I do not intend to suggest that I am opposed to trawling, which is indeed an invaluable and effective method of ensuring big catches, but there seems to be an erroneous belief that trawling is an 'open sesame' that will at once unlock to our fishermen the treasures of the deep.

The view that increased supplies are synonymous with 'trawling' is borne out by the examples of the Bengal, Madras and Bombay administrations, all of which have at some time or the other, invested in trawlers as a means of augmenting supplies. This view is founded on the mistaken belief that a trawler rakes in every form of life below or on the surface of the water in which it is operated. This is not so. A trawler operates on the floor of the sea bed, and the upper levels of the sea abounding with valuable surface forms entirely escape the trawl. That valuable fisheries can be established and maintained without trawlers has not at all been realized in this country.

Trawling is but an advanced, though expensive, stage of fisheries and should be resorted to only after exhaustive exploitation of other cheaper and less elaborate methods, none of which have ever been considered worthy of trial in our waters. A method extensively employed both on the Asiatic and American sea-boards of the



Pacific Ocean is the 'Purse seine'. Fishing by the purse-seine is not only economic but also yields large catches. Pelagic fish, according to present conditions, are ultimately the most remunerative products of the sea. We must turn our attention to our most remunerative harvests, the shoals of pelagic species such as *mackerel*, *sardine*, *pedwa*, *pomfrets*, *pala*, *bhing* which command an instant market. The purse-seine is one of the most effective types of net for the capture of these pelagic forms and can be adapted most conveniently to our requirements. The 'purse-seine' is not unlike our native '*rapan*', on which it may be considered an improvement. The working principle of the '*rapan*' and the 'purse-seine' is identical, with this difference that the former is operated from the shore, and dependent therefore on the appearance of shoals of fish in the relatively shallow waters of our harbours and estuaries while the latter is employed at sea, being designed for the capture of shoals moving in deeper waters. The 'purse-seine', whose measurements range from 200 to 400 fathoms in length and 30 to 50 fathoms in depth would be ideal for use off the North and South Kanara coast, where immense shoals of sardines and mackerel appear annually. Its use would bring about a decided change for the better in the development of our fisheries.

The Gill net (drift net), with different sized meshes for the capture of different varieties of fishes, equally offers promise of good results. Gill nets are not unknown in our waters. They are, however, comparatively small, measuring, as a rule, half-a-mile in length and usually about 12 feet in width, whereas gill nets in use in Europe and America are over three miles long and 40 feet wide. The dimensions of the Indian net must of needs be smaller as they are worked by man-power, whereas in Europe and America vessels are equipped with special power-driven machinery to lift the extensive stretches of net. A gill net is really a wall of netting hanging vertically in the water, set either to capture fish moving about in the regions nearer the surface or sunk low enough to capture those which swim at deeper levels.

Another useful net which may be used with success in our waters is the 'Danish seine', which is a simpler and cheaper form of the trawl. A recommendation for the introduction of this net in our waters was put forward by Mr. A. E. Hefford, in his report on the work of the Steam Trawler '*William Carrick*'. He gives a detailed description of the 'Danish seine' and its potentialities. The 'Danish seine' is capable of catching as much fish, and not infrequently more than a trawl net. The initial cost of equipping a vessel with a 'Danish seine' is only one-fourth of the cost of fitting out a steam trawler, and a vessel capable of working this gear can be built and completely equipped at about one-tenth of the cost of a steam trawler, while the crew is about half that required for a trawler.

Bombay is in a singularly fortunate position for the introduction of improved types of nets. The operation of the launches has conclusively shown that fish may be transported in excellent condition from anywhere on our extensive coast line to Bombay. The



adaptation of launches for actual fishing, besides their present use as carriers, would imply a further and considerable advance in the economic status of the fishermen, for the use of power-propelled vessels, together with new contrivances for fishing, cannot but render the calling of fishermen more fruitful. It will free them from their utter dependence on the elements, will extend their limited sphere of their operations and provide results which cannot be expected from the primitive type of craft and tackle now in use.

The Province of Bombay is constantly faced with the problem of supplying fish to that large section of its population with whom it forms a regular item of diet. That section would considerably increase if fish were made available in quantities which would ensure cheapness of price. If the city of Bombay, with its transport and marketing facilities, is deficient of supplies the mofussil towns are even more so. There is no reason for the continuance of these conditions, particularly in a maritime Province whose extensive sea-board is abundantly stocked with fish, equal in many instances in food and sale values to the best obtainable in any part of the world. The present supplies are not only far below the potential but even below the actual demand. Adjustment of supplies to demand is our problem.

Apart from meeting the market demand, increased supplies of fish will also lead to the establishment of several profitable ancillary industries, such as manure, fish meal, fish guano, fish maws and the manufacture of fish oil, and fish glue. The Bombay Province, despite its extensive sea-board, cannot boast of a single factory for the manufacture of these useful, saleable products. The demand is great, but the scarcity of raw material renders their manufacture impossible. In this respect Bombay lags far behind the Madras Presidency, which during 1936-37 had 103 factories for the manufacture of manure by-products, and during 1927-28 produced 100,000 tons of fish guano, valued at about Rs. 70,00,000. As against this the fish annually caught in the Bombay Province including Sind averages 50,000 tons and realizes only Rs. 80,00,000 as a primary product.

Other activities which will be stimulated by an increased yield of fish will be the rope-making industry, the manufacture of nets, and boat-building. There will also be the demand for an increased output of ice. Larger numbers of women and men will be needed to handle increased catches. More work will be provided for coopers, hawkers, ice vendors, packers and so on, the bulk of whom will be recruited from the fishing community.

What efficient methods can do for the welfare of the fishing communities is well illustrated by the example of Japan. This country in 1919 had a fishing fleet of 3,933 power-propelled vessels, which by 1936 rose to 62,169. Japan's progress has been phenomenal. As in Bombay, the industry in Japan was first dependent entirely on sailing craft. It was only after the replacement of sailing craft by power-propelled vessels that the fishing industry was entirely transformed and came to occupy a leading place in the nation's



economy. With a coast line less than that of India and many European countries, Japan now occupies a rank in the forefront of the world's fisheries. Sailing vessels there are being gradually replaced by power-propelled vessels equipped with every modern facility for catching fish and preparing it for the market by freezing, treating and canning it aboard. The number of sailing boats declined from 380,577 in 1919 to 308,541 in 1935.

The explorations of our coastal waters by the 'Investigator' and the work of the various trawlers that have from time to time been employed by the Provincial Governments, and the investigations of the recent John Murray Expedition to the Indian Ocean, conclusively show that the Arabian Sea is as prolific of life as the North Atlantic Ocean or the English Channel. There is no reason, therefore, why analogous results, proportionate to the resources available, should not be achieved in Bombay.

No review of the progress of the work carried out by the fisheries section will be complete without a reference to yet another serious handicap from which the fishing industry in Bombay now suffers, i.e. the lack of a regular fishing dock equipped with contrivances used in leading fishing ports elsewhere in the world, for the expeditious landing and conveyance of catches to the various consuming centres, both retail and wholesale.

Efforts to develop and modernize our fishing industry are now hampered by difficulties arising from the want of adequate port facilities. The absence of a suitable landing site or sites for fish in Bombay adversely affects the quick landing and dispatch of fish to the markets in the city. Their provision is fundamental to any attempt to improve and develop the fishing trade. Our fishing craft should be able to leave or enter port at any stage of the tide. Under the conditions prevailing fishing vessels, both launches and sailing craft, are unable to leave and enter port when the tide is out. The result is that the owners of these vessels not infrequently miss the busiest and most lucrative hour in the market. Both the quality of the catch and prices are thus adversely affected. Further, the serious extent to which the lack of efficient docking facilities interferes with the movements of the fishing vessels, especially the launches, is not generally realized. They cannot be loaded with ice, Diesel oil, or other necessary material so long as they rest on the floor of the basin. This reduces the effectiveness of power vessels, and involves loss of time and the consequent curtailment of voyages performed during the season.

Even places where fish have been traditionally landed have no special facilities for unloading catches at low tide when fishermen have to run up and down between the boats and the shore, carrying their loads on their heads. These drawbacks can only be overcome by the provision of better docking facilities. The increased use of launches on our coast has brought this problem to the forefront. If power transport is to prove the success it is designed to be, it is imperative that the provision of adequate docking facilities be not delayed any longer.



## APPENDIX I

No.	Name of the launch	Year of construction	Tonnage and cost of complete vessel	Engine B. H. P. and speed	Name of owner	Remarks
1	Shelmari	1933 24 ft. in length	Not known Rs. 3,500 Engine 2,200 } Hull 1,300 }	10 B.H.P. Diesel Engine (Kromhout). 6 knots	Messrs. Patil & Bhika	Originally belonged to the Burnah Shell Oil Co. Ltd., who converted a fishing craft into a power propelled boat.
2	Original 'Lady Sykes'	Not known	Not known Rs. 1,900	14 B.H.P. Petrol Engine. 6.6 knots	R.I.N.	Borrowed from the R.I.N. for demonstration purposes. Returned in 1934.
3	'Lady Sykes'	1934 35' x 10' x 4' - 9"	4.17 Rs. 13,000 Engine 5,450 Hull and other equipment 7,550	28.5 B.H.P. Diesel Engine (Gardner) 7.24 knots	Department of Industries.	Sold on hire purchase system to Messrs. Patil & Bhika. Built at Messrs. Alcock Ashdown & Co.
4	'Sir Frederick Sykes'	1934 35' x 10' x 4' - 9"	4.93 Rs. 12,600 Engine 5,640 Hull and other equipment 6,690	38 B.H.P. Diesel Engine (Lister) 8.34 knots.	Do.	Do. do.
5	'Hydari'	1934	6.06 Rs. 8,000	25 B.H.P. Diesel Krupp Engine	Messrs. Hamid & Co.	...



6	'Lady Brabourne'	1936 42' x 11' x 5' - 3"	8'99 Rs. 19,800  Engine 9,950 Hull and other equipment 9,850	52 B.H.P. Diesel Engine (Ruston Lister) 8'32 knots.	Department of Industries	Sold on hire purchase system to Messrs. Jagannath S. Parker & Co. Built at Messrs. Alcock Ashdown & Co.
7	'Cymbria'	Not known	Not known Rs. 40,000	90 B.H.P. Diesel Not known	Messrs. Hamid & Co., Bombay	Old trawler brought cut by Mr. P. Schulze. It was converted into a fish carrier in 1936-37. She grounded off the rocks at Colaba and became a total wreck in 1938.
8	'Lord Brabourne'	1937 45' x 11' x 5' - 6"	7'83 Rs. 23,000  Engine 9,815 Hull and other equipment 13,185	57 B.H.P. Diesel Engine Gardner (with insulated hold) 8'23	Department of Industries	Sold on hire purchase system to Messrs. Jagannath S. Parker & Co. Built at R. I. N. Dockyard.
9	'Chandtara'	1937 46' - 9" x 10½' x 8'	14 Rs. 18,000  Engine 12,000 Hull and other equipment 6,000	52 B.H.P. (Ruston Hornsby) Not known	Mr. Abubakar Hussein Saheb Thakur	Built at Vijaydurg.
10	'Nooremohomedi'	1938	Not known Rs. 22,000  Engine 14,000 Hull etc. 8,000	70 B.H.P. Engine (Ruston Hornsby) Not known	Do.	Built at Bassein.







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2	Original 'Lady Sykes'	Not known	Engine 2,200 Hull 1,300 Not known Rs. 1,900	14 B.H.P. Petrol Engine. 6.6 knots	R.I.N.	Borrowed from the R.I.N. for demonstration purposes. Returned in 1934.
3	'Lady Sykes'	1934 35' x 10' x 4' - 9"	4.17 Rs. 13,000 Engine 5,450 Hull and other equipment 7,550	28.5 B.H.P. Diesel Engine (Gardner) 7.24 knots	Department of Industries.	Sold on hire purchase system to Messrs. Patil & Bhika. Built at Messrs. Alcock Ashdown & Co.
4	'Sir Frederick Sykes'	1934 35' x 10' x 4' - 9"	4.93 Rs. 12,600 Engine 5,640 Hull and other equipment 6,690	38 B.H.P. Diesel Engine (Lister) 8.34 knots.	Do.	Do. do.
5	'Hydari'	1934	6.06 Rs. 8,000	25 B.H.P. Diesel Krupp Engine	Messrs. Hamid & Co.	...
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9	'Chandtara'	1937 46' - 9" x 10 1/2' x 8'	14 Rs. 18,000 Engine 12,000 Hull and other equipment 6,000	52 B.H.P. (Ruston Hornsby) Not known	Mr. Abubakar Hussein Saheb Thakur	Built at Vijaydurg.
10	'Nooremohomedi'	1938	Not known Rs. 22,000 Engine 14,000 Hull etc. 8,000	70 B.H.P. Engine (Ruston Hornsby) Not known	Do.	Built at Bassein.

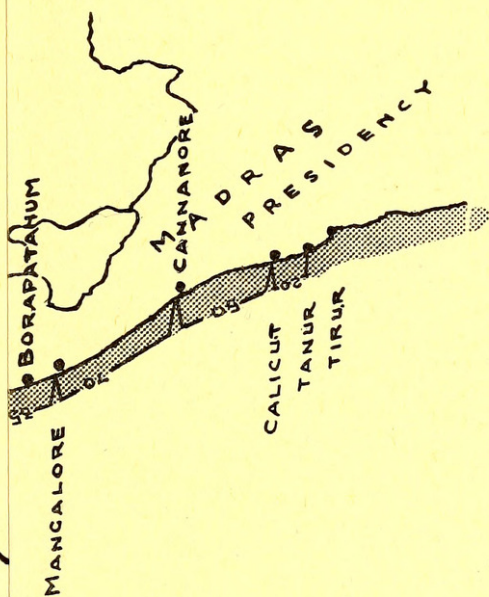


## APPENDIX I—(contd.)

No.	Name of the launch	Year of construction	Tonnage and cost of complete vessel	Engine B. H. P and speed	Name of owner	Remarks
11	'Karimi'	1939 45' × 12' × 6'	Not known Rs. 13,000 <hr/> Engine 7,000 Hull and other equipment 6,000	40 B.H.P. (R. Hornsby) Not known	Janjira Fishing Co.	Built at Billimora.
12	'Sea Hawk'	...	...	...	...	Built at Billimora. She was temporarily put into service at the time 'Karimi' was under construction.
13	'Khajahind'	1939 56' × 13' × 6'	Not known Rs. 30,000 <hr/> Engine 20,000 Hull and other equipment 10,000	M.W.M. 140 B.H.P.	Abubakar Hussein Thakur	Built at Vijaydurg.



# Appendix 7



DEPARTMENT OF INDUSTRIES  
BOMBAY.  
23-6-39









Setna, S B. 1939. "Marine Fisheries of the Province of Bombay." *The journal of the Bombay Natural History Society* 41, 340–368.

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