

A PRELIMINARY ACCOUNT OF THE FISHERIES OF VIZHINGAM

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INTRODUCTION

As a part of the research programme of the Central Marine Fisheries Research Station, it was decided in 1948 to conduct a survey of the Indian coastline to estimate the marine fish landings, and to find out the types of fish stocks available. As very little work (Bal and Banerji, 1951) has been done in the past regarding the fishery resources of our country, a preliminary survey was found essential before embarking on the final programme. With this in view, the author conducted a preliminary survey in 1949 to ascertain the number of fishing villages, boats, nets and fishermen along the coastal strip extending from Cape Comorin in the south to Ponnani River in Malabar District in the north. Based on the data thus collected, the final design to estimate the landings was made. Initially five observation centres, Blangad in South Malabar, Narakkal and Malippuram in Trichur District, Wadi in Quilon District, and Vizhingam in Trivandrum District, of the erstwhile Travancore-Cochin State, were selected. Regular observations were taken at these centres in 1950. From 1951 onwards observations were restricted to two centres, Narakkal and Vizhingam, and from January 1953 to August 1954 observations were confined to Vizhingam alone. From September 1954 onwards two more centres, Cape Comorin and Wadi, were also included for the estimation of fish landings. As Vizhingam is a very important fishing centre, and as data for five consecutive years were available it was decided to embody the observations in the present paper as suggested by Dr. N. K. Panikkar, the then Chief Research Officer, Central Marine Fisheries Research Station, Mandapam Camp.

TOPOGRAPHY AND CLIMATIC CONDITIONS

Vizhingam is situated in the Neyyattinkara Taluk, in the Trivandrum District about eight miles south of Trivandrum City. (Long.: E. 76° 59' 15", Lat.: N. 8° 22' 30"). The nearness of this village to the needy markets in the city makes it a fishing village always humming with activity. The fishing operation in this village is restricted to a coastline of about four furlongs. The beach is a very narrow one. The fishing area is enclosed by two rocky promontories jutting into the sea, known as Mathilppuram on the western side and Kottappuram on

the eastern side. Due to this characteristic physical feature the fishing area is more or less a protected bay thereby affording excellent opportunities for fishing operations. By the side of the Kottappuram area a rivulet known as the Venganoor Thodu joins the sea. The mouth of this rivulet is always in communication with the sea (Fig. 1).

Vizhingam enjoys an equable and damp climate and the temperature ranges from 70° to 90° F. There are two monsoon seasons prevailing in this area, the south-west and the north-east. The south-west monsoon begins in May or June and lasts till about the beginning of August. The north-east monsoon is of short duration and begins in October-November. The greater part of the rainfall is derived from the south-west monsoon.

FISHING CRAFT AND TACKLE

It is a well-known fact that the typical craft of the west coast of India is the dugout canoe (Hornell, 1938, Bal and Banerji, 1951). However, along the southernmost part of the south-west coast of India catamarans are also used in addition to the dugout canoes. This is mainly due to the fact that the nature of the sea changes gradually and at Cape Comorin it is almost identical to that of the east coast. At Vizhingam both the dugouts and the catamarans, locally known as the 'Vallom' and 'Marom' respectively, are used.

Dugouts operating nets.—These are big dugouts measuring 28 to 30 feet in length, 2½ feet in height, and 3½ feet in breadth. These are used for operating Boat-seines, Shore-seines, Gill-nets and Drift-nets. They are usually made from large trunks of *Aini* (*Artocarpus hirsuta* Lank.), *Elavu* (*Bombax malabaricus* D.C.) and *Mavu* (*Mangifera indica* Linn). The cost ranges from Rs. 1,200 to 3,000.

Dugouts operating hooks and lines.—These are smaller ones measuring 18 to 22 feet in length, 2 feet in height, and 3 feet in breadth. The timber used is the same as for the big dugouts.

Catamarans.—The catamarans of the Indian coasts can be classified under five types (Bal and Banerji, 1951). They are the Orissa and Ganjam type, Vishakapattanam type, Coromondel type, the Boat-catamaran, and the Raft. Of these the catamaran of this locality belongs to the last category. This is a small catamaran consisting of four logs tied together. The catamarans operating nets measure 17 to 20 feet in length and those operating hooks and lines measure 12 to 15 feet in length. The timber used for catamarans operating nets is from *Perumaram* (*Ailanthus malabarica* D.C.), *Mulluelavu*, (*Zanthoxylum rhetsa* D.C.) or *Murrukku* (*Erythrina stricta*

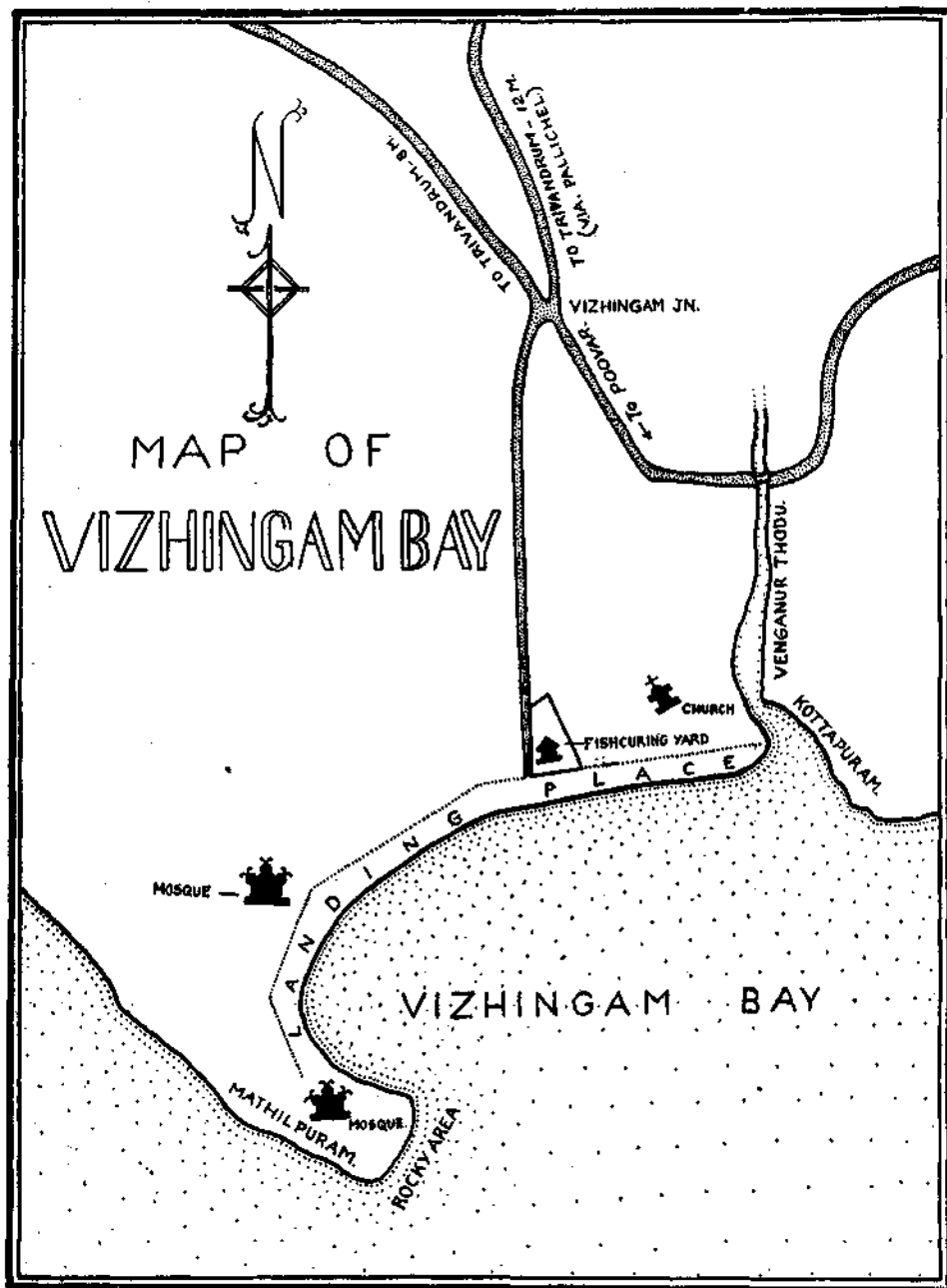


FIG. 1. Map of Vizhingam Bay.

Roxb). The cost varies from Rs. 150 to 450. The wood used in the construction of catamarans operating hooks and lines is either *Panjielavu* (*Eriodendron anfractuosum* D.C.) or *Murrukku*.

Though many kinds of nets are operated from this locality the most important ones in use are the Boat- and Shore-seines, locally known as the *Thattu madi* and *Kara madi* respectively. In addition Gill-nets and Drift-nets are also operated.

Boat-seine or Thattu madi.—The net is composed of three parts, (1) a rather short wide mouthed conical portion called the *Madi* or net proper made of cotton, (2) a coir platform known as *Thattu* attached to the lower lip of the net and (3) two long coir wings attached to the margin of the *Thattu* on either side known as the *Era Vala*.

The madi or the net proper.—This is a conical bag-shaped net with a constriction in the middle. The net is made up of four pieces. These pieces are known as *Ara vala*, *Kuralu madi*, *Thelinga madi*, and *Ka vala*.

Ara vala.—This is the bottommost portion of the net constituting the net proper. This measures $2\frac{1}{4}$ yards in length and the mesh is $\frac{1}{4}$ inch knot to knot inside.

Kuralu madi.—This portion is attached just in front of the *Ara vala* and measures $1\frac{1}{2}$ yards in length. The mesh is the same as that of the *Ara vala*.

Thelinga madi.—This portion is attached to the front margin of the *Kuralu madi* and measures 7 yards in length. There is no difference in the size of the mesh.

Ka vala.—This is a small piece of netting measuring six inches in length attached to the front margin of the *Thelinga madi*. The mesh measures $\frac{3}{4}$ inches knot to knot inside.

All the various parts of the net are made of cotton.

Thattu or platform.—To the floor of the lower lip of the net is attached a coir platform known as the *Thattu* which is composed of three rectangular pieces, one in the middle and two at the sides. The middle portion is known as the *Thattu* and the side pieces are known as the *Me valai*. The *Thattu* measures 63 feet in length and breadthwise it has got 38 meshes each measuring 18 inches knot to knot inside. The side pieces measure 67 feet in length and have 35 meshes each measuring 18 inches knot to knot inside.

Era vala or the wings.—The wings are made of coir. Each wing measures 91 feet in length with 35 meshes breadthwise each measuring 108 inches

knot to knot inside.¹ These wings are attached to the side portions of the *Thattu*. To the distal extremity of the wings on either side are attached two coir ropes or *Kamba* 240 feet long.

Mode of operation.—Two catamarans or boats are employed for operating this net. The net and other parts are attached and loaded in one catamaran or boat and the two catamarans or boats paddle along. As soon as a shoal is sighted the net is shot and one of the warps is handed over to the crew in the other catamaran or boat. Then they take a course away from one another and encircle the shoal. After encircling the shoal the two come closer and meet, and the two begin to haul up the net simultaneously. When the bag portion of the net is hauled up the contents are emptied into one, and the operation is repeated if the catches are satisfactory. The net is always shot in the direction opposite to the movement of the shoal.

This net is operated from April to October and it mainly brings in miscellaneous sorts of fish, such as *Trichiurus*, *Caranx*, *Arius*, Clupeids, Sciænids, Pomfrets, etc. The cost of the net is about Rs. 350.

Shore-seine or Kara madi.—The Shore-seines are locally known as *Kara madi* signifying thereby that they are operated from the shore. A typical Shore-seine consists of three parts,

- (i) The Warps or *Kamba*,
- (ii) The Wings or *Kayaru*,
- (iii) The Net or *Madi*.

The shape of the net varies considerably. In general it may be described as a funnel-shaped net with two wings and warps.

The net or the Madi.—The net is made of two pieces called the *Mel madi* or *Neriya vala*, and the *Ara vala*.

Ara vala.—This is the bottommost portion of the net, constituting the bag. It measures 25 feet in length and the mesh is 0·3 inches knot to knot inside. The cod end of the net measures 9 feet in breadth.

Mel madi or Neriya vala.—This piece of netting is attached to the anterior margin of the *Ara vala*. It measures 27 feet 4 inches in length and the mesh is 0·7 inches knot to knot inside, towards the *Ara vala* side, and 1·2 inches towards the mouth side.

The wings or Kayaru.—The wings, made of coir, range from 1000 to 2000 feet and are attached along the lateral margins of the *Mel madi*. The mesh size increases from the proximal to the distal extremity. Towards

the end attached to the net the mesh is 6 to 9 inches knot to knot inside and towards the distal extremity it is 24 to 36 inches.

The warp or Kamba.—The warps or *Kamba* are also made of coir, and each measures 700 feet in length minimum. These are attached to the wings.

Mode of operation.—This is operated by one dugout. The net is loaded into the dugout and before leaving the shore one of the warps is handed over to a party on shore. The dugout makes a semi-circular course all the while paying out the net and as soon as the dugout reaches the shore, after paying out the net, the other warp is also handed over to another party. The two parties on the shore begin to haul up the net simultaneously. Meanwhile three or four persons jump into the area enclosed by the warps and begin to beat the water so as to scare the fish in that area into the net. As the hauling progresses the parties on the shore come closer and closer and when the two parties meet the net is dragged ashore. The net is operated from October to May and brings in many sorts of inshore pelagic fishes.

This net with a slight modification is used for capturing Tuna, and is known as *Churukku madi*. In addition to the various parts found in the *Kara madi* this net has got a funnel-shaped portion attached to the inner edge towards the mouth side of the *Mel madi*. Along the narrow edge of this funnel-shaped netting runs a cord by pulling which the net can be closed. This mechanism renders it possible to close the net after the fishes have been caught thus preventing their escape.

Gill-nets.—Three types of gill-nets, viz., the *Chala vala* (for sardines) *Netholi vala* (for *Anchoviella*) and *Vāla vala* (for *Chirocentrus*) are operated locally.

Chala vala.—These nets are formed by lacing together small pieces of netting called *Mal*. Each *Mal* measures 6 feet by 18 feet. Four such pieces are laced together end to end to form a larger piece called the *Thattu* and twelve such pieces form one complete net. The mesh is $\frac{3}{4}$ inches knot to knot inside.

Netholi vala.—This net differs from the previous one in the size of mesh only. The mesh is $\frac{1}{2}$ inch knot to knot inside.

Vāla vala.—This net also differs from the previous one in the size of the mesh only. The mesh is $1\frac{1}{4}$ inches knot to knot inside.

Operation.—Two men and a catamaran are needed for operating these nets. When a shoal is sighted the net is shot perpendicular to the direction of movement of the fish and after some time the head and foot ropes which are tied on to the catamaran are dragged in and the net is slowly hauled into the catamaran, and the fishes that are gilled in the net are taken.

Noo vala or Drift-net.—The measurements and the construction of this net are similar to those of the gill-nets. The mesh is 3 inches knot to knot inside. The mode of operation is also similar to that of the gill-net.

Hooks and lines.—There are two types of hooks and lines, in this locality. They are the *Valiya choonda* and the *choonda kayaru*.

Valiya choonda.—This type of long line ranges from 900 to 1000 feet in length. Hooks of many sizes (Nos. 4 to 7) are attached at six feet intervals by 10 inch snoods. Usually 150 hooks are attached. One end of the line is tied to the catamaran or boat and to the other extremity a wooden float and a sinker are attached. Sharks, Rays, Skates and other big sized fishes are caught in this.

Choonda kayaru.—This is another type of line about 600 feet in length. A small rope 3 feet in length is tied at the middle to the extremity of the long rope. This is usually employed for catching fishes like *Arius*, *Chorinemus*, etc.

FISHING COMMUNITY

The fishing community is highly conservative, superstitious, and dogmatic like the fishing communities that dot our far flung coastline. The life of these people, who reap the harvest of the seas, is fraught with danger, whether they are engaged in gill-netting for whitebait or line fishing for sharks. As a result of their very nature of work Vizhingam fishermen have developed into a sturdy race of people inured to heavy rains, bitter winds and rough seas and capable of working under arduous conditions. They live in constant danger, and their returns are most unsteady. The sea may abound with good fish, but it may be difficult to take them out and it may not be always very profitable to sell them when taken out. Their life is always dependent on the whims and fancies of nature. A poor season may be followed by a good season and the fisherman must be ready to gamble on this uncertainty and make the most out of his opportunities. The fishermen of this locality embrace the Christian and Muslim religions.

TABLE I

Showing the number of fishermen, boats, nets, etc., at Vizhingam

Total Fishing Population	Men	Women	Children	No. actually engaged in fishing	No. engaged in other industries			
					<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>
5334	1544	1676	2114	1185	1554	140	90	10

No. of Boats	No. of catamarans	Number of Nets						
		<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>
144	619	92	439	215	85	88	17	200

i, Net making; *ii*, Fish marketing; *iii*, Fish curing; *iv*, Employed otherwise. *a*, Shore-seine; *b*, Boat-seine; *c*, Gill-net (Sardines); *d*, Gill-net (*Anchoviella*); *e*, Gill-net (*Chirocentrus*); *f*, Drift-net; *g*, Hooks and lines.

OWNERSHIP OF EQUIPMENT

In the area under report the ownership of equipment can be classified under three major heads, viz., (1) Individual ownership, (2) Collective ownership, and (3) Ownership under Co-operative Societies.

Of these, among the Christian fishermen of Vizhingam, the ownership of fishing equipments is maintained by individuals. A few individuals own equipments and for conducting fishing operations labour is hired from fishermen. The labour charges vary for different nets. In the case of the boat-seine 5/7 of the total proceeds is distributed among the fishermen who operate the net in proportion to the efficiency of the fishermen as determined by the owner and the rest is taken by the owner. Among the Muslim fishermen ownership of equipment is maintained jointly as well as individually. Here also the payment of labour charges is made on the same principles as outlined above.

COLLECTION OF DATA AND ESTIMATION OF LANDINGS

During 1950 observations for a period of 3 to 4 days every fortnight were made at Vizhingam. During 1951 to 1952 the frequency of observation was increased to 6 to 7 days every fortnight and from January 1953 to August 1954 observations were made throughout the month. From September 1954

onwards observations were taken for 4 to 5 days every fortnight. The unit of sampling was a boat-net combination. During every day of observation 5% of each of the boat-net combinations working on that day was examined and the catches recorded. When different species were landed by the same boat-net combination the weights of each species were determined separately. But when catches were not sorted out an eye estimation of the composition of the catches was made. The total number of each unit, operating on every day, was also recorded. The method of estimation consisted of finding out the average catch per fishing unit and the average number of fishing unit of each type working per day. The product of these two when multiplied by the number of days in a month would give the total production for the month.

FISHERIES

GENERAL

That the seas off the Vizhingam coast abound in marine life is amply borne out by the fact that the average annual production for the years 1950 to 1954 has been estimated at 3880.14 tons. This may be partly due to the peculiar physical feature of the place as well as its nearness to the needy markets. The estimated landings for the years 1950 to 1956 are shown in Fig. 2 (for 9 months only in 1950) and the percentage composition of landings is given in Table II.*

From the computed landings it is seen that 1952 has been the most productive year during these five years. This is mainly due to the fact that the sharks, rays, skates, sardine and perch groups and the cuttle fish fishery showed considerable increase during that year. The estimated monthly landings for the years 1950 to 1954 are given in Fig. 3.

SOME IMPORTANT COMMERCIAL FISHERIES

Whitebait fishery.—This is an important commercial fishery of this locality. *Anchoviella heterolobus*, *A. commersonii*, *A. indica* and *A. tri* locally known as *Netholi* constitute this fishery. Of these the first two form the major part of the commercial catches. The fishery starts usually in March and lasts till January, the peak season occurring between April and June (Table III). The catch analysis made during 1950 to 1954 shows that the maximum yield from this fishery has been obtained in 1951 followed by 1952, 1954 and 1953 and the minimum in 1950 (Table II). These are usually caught in boat-seines, shore-seines and gill-nets. The shore-seines are operated in the

* The paper was completed early in 1955 and the percentage composition of fish landings is given up to 1954 only. However, the figures of total landings up to 1956 have been included.

bay proper and the gill-nets and boat-seines within a radius of 3 to 4 miles from the shore. In the fresh condition this fish is in high demand among the poorer class of people. The fish is cured by sun-drying and the cured product fetches Rs. 80 to 110 per cwt. The main market is Colombo.

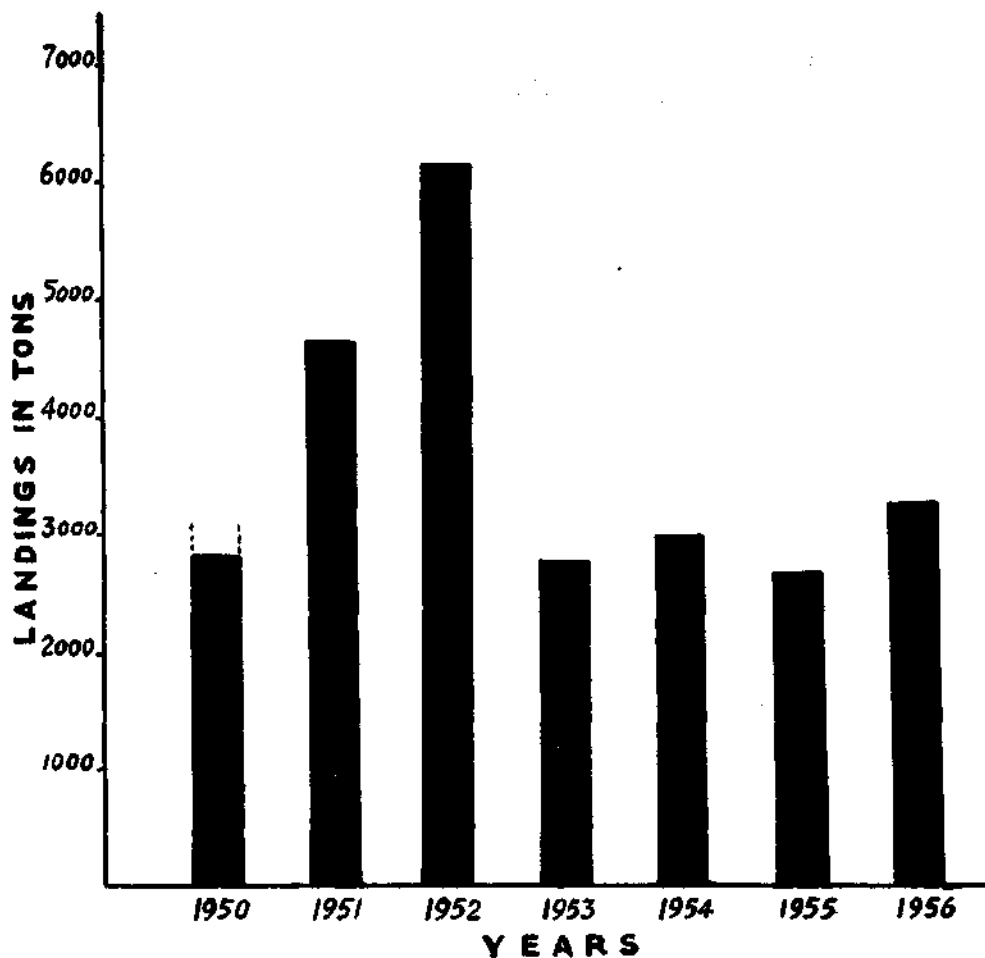


FIG. 2. Estimated total fish landings at Vizhingam during 1950-56.

Ribbon-fish fishery.—The shoaling fish popularly known as Ribbon-fish or Hair Tails, and locally known as *chavala*, belong to the Family Trichiuridæ; they contribute 19.41% of the total catches. The species that form the catches in this area are *Trichiurus savala* and *T. haumela*. These begin to appear in May and exist as a major fishery till about September. The fishery was at its lowest ebb in 1950 and the maximum catch during the 5-year period, 1950 to 1954, was in 1952. The maximum catch during 1951 and 1953 was in

TABLE II

Percentage composition of fish landings at Vizhingam

Fish Groups	1950	1951	1952	1953	1954	Average
Mackerel ..	..	0.26	0.23	0.11	0.45	0.22
Seer-fish ..	0.50	0.12	0.10	0.33	0.29	0.22
Oil-sardine ..	0.62	..	..	..	..	0.08
Other sardines ..	29.97	12.93	15.60	9.99	3.57	14.08
Other clupeoids ..	..	0.22	..	..	..	0.05
Anchovies and whitebait ..	15.96	39.17	22.15	23.57	22.97	25.30
Prawns ..	0.12	2.08	0.28	1.05	3.27	1.25
Shrimps ..	..	0.09	..	0.02	0.75	0.15
Ribbon-fishes ..	0.15	12.22	18.47	34.65	31.65	19.41
Dorab ..	13.59	..	..	..	..	1.78
Catfishes ..	0.68	1.25	5.03	7.24	11.91	5.14
Sciaenids ..	4.98	7.83	0.88	1.52	3.76	3.46
Pomfrets ..	..	0.83	0.27	3.18	0.71	0.87
Carangids ..	5.94	2.29	3.97	4.51	1.90	3.61
Perches ..	3.09	..	3.86	0.46	0.44	1.86
Silver-bellies ..	1.03	1.44	2.63	2.79	1.58	2.02
<i>Lactarius</i> ..	9.15	0.46	2.06	2.04	1.08	2.48
Tuna ..	9.11	0.75	0.68	0.78	4.22	2.40
Red mullets ..	..	0.07	..	..	0.51	0.09
Sharks, rays and skates ..	0.66	14.45	19.89	6.95	3.73	11.58
Indian barracuda ..	0.10	..	1.03	0.04	3.95	1.02
<i>Balistes</i> ..	4.02	2.69	..	0.11	0.99	1.27
<i>Hemirhamphus</i> ..	0.01	0.01	..	..	..	..
<i>Sepia</i> ..	0.32	0.62	2.73	0.05	0.17	1.14
Post-larval fishes ..	..	0.03	0.01	0.07	0.14	0.04
<i>Histiophorus</i> ..	..	0.17	..	0.53	0.92	0.27
Mulletts ..	..	..	0.13	..	..	0.04

June, and in 1952 the month of July registered the maximum catch. In 1954 the peak landing was made in September. Thus it is seen that the peak period is not constant for this fishery every year (Table IV). The method adopted for catching this fish is by boat-seines. The nets are used within a radius of three to four miles from the shore. Even though in the fresh condition they do not stand in high estimation, the cured product is in high demand in the interior markets of Kerala and Madras States. Two processes are in vogue in curing this fish; one is by salting and sun-drying and the other by salting without drying. The product obtained by the former method is sent to Virudhunagar, Koilpatti and Tinnevely in

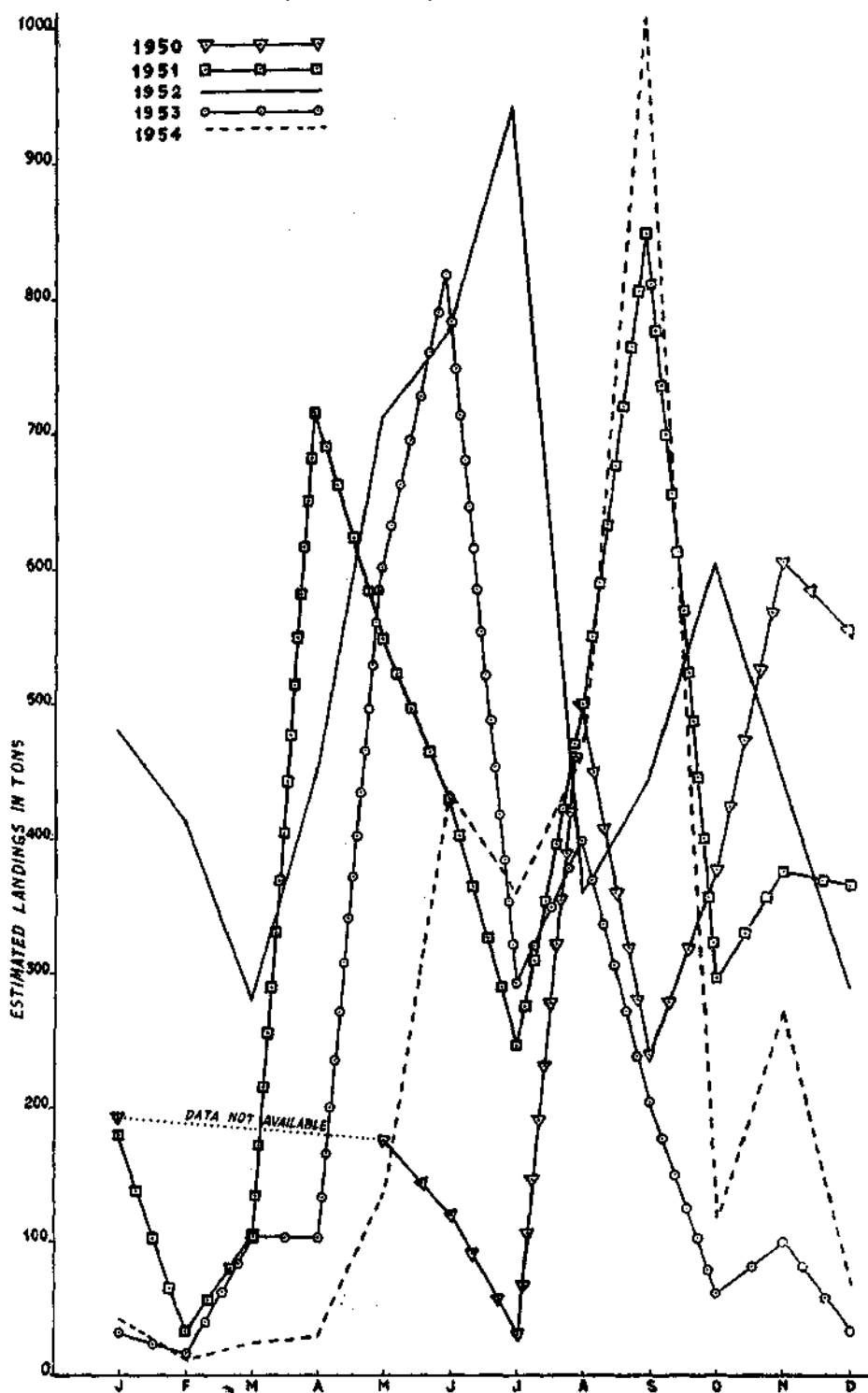


FIG. 3. Estimated monthly fish landings at Vizhingam during 1950-54.

TABLE III
Monthly landings of Anchoviella spp. (in lb.)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1950	157475	*	*	*	1186	688	..	32188	3436	67266	585609	..	847848
1951	..	..	137465	1313021	832564	..	..	261399	..	433854	334457	17991	3330751
1952	490665	..	75835	5260	693147	910742	114155	..	..	737035	22816	4856	3054511
1953	8862	..	135529	159828	776419	105562	63478	71131	72076	29811	10991	29516	1463203
1954	250	..	..	18810	181372	539119	196600	242754	69075	51324	188926	55677	1543907

* Data not collected.

Madras State and to Changanacherry, Adirampuzha and Kottayam in Kerala State. The latter product is mainly intended for Ceylon. The price of the cured product varies from Rs. 40 to 42½ per cwt.

TABLE IV

Monthly landings of *Trichiurus* spp. (in lb.)

Year	April	May	June	July	August	September	October	Total
1950 ..	*	..	8215	..	..	..	..	8215
1951 ..	..	823	649097	305836	78156	..	17395	1051307
1952 ..	..	42210	489774	1484745	429211	..	102949	2548889
1953 ..	..	..	1483233	364126	303590	236	..	2151185
1954 ..	290	..	180297	312236	26732	1621367	..	2146922

* Data not collected.

Sardine fishery.—The sardine fishery of this area is constituted by *Sardinella fimbriata*, *S. melanura* and *Dussumieria* spp. On an average they constitute 14.05% of the total catches. These begin to appear by May and exist as a major fishery up to January. The maximum landing of this group of fishes was reached in 1950. This was mainly due to the enormous landing of *S. melanura* during that year. In 1951 the fishery registered a downward trend. A revival was however indicated in 1952. In 1953 and 1954 the fishery has again shown a downward trend (Table V). The fishery has been showing violent fluctuations during the 5 year period. In 1950 and 1951 the peak period was observed in December. In 1952, however, the maximum yield was obtained in February. In 1953 the peak period was reached in May but in 1954 it shifted to June (Table IV). These fishes are caught in gill-nets, and to a small extent in shore-seines also. They are not cured in large quantities for commercial purposes. Most of the commercial catch is consumed in fresh condition.

Shark, ray and skate fishery.—The elasmobranchs are very well represented in these waters. They constitute 11.58% of the total catches. Many species of sharks and dog fishes belonging to the genera *Carcharias*, *Galeocerdo*, *Sphyrna*, *Scoliodon* and *Chiloscyllium*, are landed in considerable quantities in this locality. Species of rays and skates belonging to the genera *Myliobatis*, *Pristis*, *Rhynchobatus*, *Rhinobatus* and *Pteroplatea* are also not uncommon in these waters. From the estimated landings for the

TABLE V
Monthly landings of Sardines (in lb.)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1950	..	*	*	*	11375	..	12688	780831	271903	219950	193033	965042	2454822
1951	95732	..	4763	214663	223216	..	..	24551	18788	..	833	529077	1111623
1952	280866	563838	168230	531521	125715	5783	58178	..	40040	2402	318462	..	2095035
1953	..	..	..	..	356152	18403	..	79755	67800	21356	57955	18888	620300
1954	2569	6461	689	4893	15760	86196	45585	43472	33496	..	629	271	240021

* Data not collected.

TABLE VI
Monthly landings of sharks, rays and skates (in lb.)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1950	..	*	*	*	..	20169	..	..	..	..	14742	..	34911
1951	..	..	..	..	81379	270710	..	19088	13580	157635	465090	236376	1243658
1952	175162	275482	152954	269631	334488	254480	..	..	168740	276572	520700	316417	2744626
1953	23395	4047	14177	..	5123	11426	94122	147502	74755	33314	22332	917	431110
1954	..	..	193	7131	11591	26102	50255	29618	71290	28927	11866	15602	250575

* Data not collected.

years 1950 to 1954 it is seen that there has been an erratic upward trend in the availability of these fishes. They are landed almost throughout the year. In 1950 the peak landing was made in June, whereas in 1951 and 1952 the maximum catch was observed in November. In 1953, August registered the maximum landing. In 1954, September recorded the maximum catch (Table VI). These are mainly caught by hooks and lines and in minor quantities by drift-nets. These tackle are used about 6 to 7 miles from the shore. Though not consumed in the fresh condition in large quantities, the cured product is extensively exported to Ceylon. Curing is done by filleting, salting and sun-drying. The price per cwt. of cured product varies from Rs. 30 to 55. Apart from this, a flourishing trade exists on shark fins and shark liver.

Catfish fishery.—*Arius* spp., locally known as *Thedu* constitute 5.14% of the total catches. *Arius thalassinus*, and *A. dussumieri*, are the common species that form the bulk of the catches. The landings were lowest in 1950 and the maximum catch was recorded in 1954. The season starts by May and closes by October to November. But during 1950 the fishery appeared only in August. The maximum catch was landed in the month of August in 1950, 1951 and 1953. But during 1952 and 1954 the peak season shifted to September (Table VII). These are caught in boat-seines and hooks and lines within a radius of 3 to 5 miles from the shore. Though not in high demand in the fresh condition, a flourishing trade exists for the cured product. These are cured by filleting, salting and sun-drying. The price per cwt. for the cured product varies from Rs. 40 to 50. The main market for the cured product is Colombo.

Tuna fishery (local name *Choorā*).—Even though the tuna contribute only 2.40% of the total catches in this locality, they need special mention since “the discovery and utilisation of high sea fishery, like the tuna and the sword fish, will contribute substantially to increased production as shown by the history of these fisheries in the Pacific” (Panikkar, 1951). The important species that are landed in this locality are *Euthynnus alletteratus affinis* and *Auxis* sp. Of these *Euthynnus* forms the major portion of the commercial catches. During 1950 to 1954 the maximum catch was landed in 1950. In 1951 a steep fall was observed. In 1952 the fishery improved but recorded a fall in 1953. However in 1954 it has again revived (Table VII). The season starts by October to November and lasts till about May. During 1950, 1952 and 1953 the maximum catch was obtained in November. In 1951 the maximum catch was recorded in April and in 1954 in January (Table VIII). These fishes are mostly caught by shore-seines operating

TABLE VII
Monthly landings of *Arius spp.* (in lb.)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total	
1950	..	*	*	*	35937	..	..	..	..	35937	
1951	2860	11838	45401	12004	35123	..	..	107226	
1952	59914	2134	125970	7974	268079	229350	..	..	693421	
1953	..	301	192	870	6424	24338	50876	43522	136732	91721	49433	44839	..	449248
1954	698	3531	4767	..	397071	142917	250014	1580	800578

* Data not collected.

TABLE VIII
Monthly landings of *Tuna* (in lb.)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total	
1950	..	110672	*	*	*	45718	..	..	2962	309625	2962	309625	15136	484113
1951	13213	..	25390	12283	..	..	13410	..	13410	..	..	64296
1952	13139	5407	15300	..	..	..	60341	..	60341	..	94187
1953	..	85	3928	..	2960	..	..	..	98	40549	98	40549	923	48543
1954	..	121240	2967	10095	4719	38712	2095	614	..	91573	..	91573	11406	283321

* Data not collected.

in the bay area of Vizhingam. The tuna are in great demand in the fresh as well as in the cured condition. The process adopted in curing is by salting and sun-drying. The main market for the cured product is Ceylon and the price varies from Rs. 100 to Rs. 120 per cwt.

Silver-belly fishery.—*Leiognathus* spp. constitute 2.02% of the total catches in this locality. Even though a minor fishery it needs special mention as it forms the main fish for the poorer class of people. The season for this fishery is from March to June and September to January. In 1950 the fishery did not appear during this season. The landings were very meagre in 1950 compared to the other years (Table VIII). The maximum yield from this fishery was obtained in 1952. The peak seasons were in January 1951, December 1952, May 1953, and July 1954 (Table IX). These fish are usually caught in boat-seines and shore-seines. In the fresh as well as in the cured condition they are in great demand among the poorer class of people. Curing is by salting and sun-drying. The price per cwt. of cured product varies from Rs. 40 to 50. The main markets for this are Kottayam, Adirampuzha and Changanacherry in Kerala State.

Big-jawed jumper fishery.—*Lactarius lactarius*, locally called *parava* constitutes 2.04% of the catches in this area. The fishery has been showing very erratic fluctuations during the five-year period, 1950 to 1954. The maximum landing was recorded in 1950 but in 1951 it has shown a sudden decrease. Compared to 1951, 1952 showed an increase. In 1953 and 1954 also the fishery had deteriorated (Table X). The season starts by May and closes by September. In 1950 and 1952 the maximum landings were made in May and in 1951 and 1953 in August. In 1954 the maximum yield was reached in June (Table X). These are caught in boat-seines and shore-seines. The fish is in good demand in the fresh as well as in the cured condition in the local markets. In addition, it has a good market in Ceylon and it is also largely sent to Virudhunagar, Koilpatti, Tinnevely and Sankaranayanarkoil in Madas State. The price varies from Rs. 40 to 60 per cwt.

Seer-fish fishery.—The mid-pelagic or demersal fish, *Cybium*, locally called *Nemmeen*, deserves special mention. Though it contributes only 0.22% of the total catches, from the economic point of view its availability is of significant importance to the fishermen as it fetches a lucrative price in the fresh as well as in the dried condition. The common species that constitute the commercial catch are *Cybium guttatum*, and *C. commersonii*. The maximum catch during the five-year period 1950 to 1954 was in 1950, and the minimum in 1951 (Table XI). The season starts by September to October and closes by March to April usually. In 1950 and 1952 the maximum catch

TABLE IX
Monthly landings of Leiognathus spp. (in lb.)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1950	..	*	*	*	..	..	29442	..	..	..	..	..	29442
1951	49862	..	797	5902	..	..	..	..	4295	..	32166	3108	96130
1952	..	..	34302	28017	21488	5783	..	..	58658	9050	21611	184851	363760
1953	9493	..	5305	25242	45906	1233	..	45526	10921	2124	15536	11896	173234
1954	4156	1300	..	948	24262	6666	37535	13468	600	12504	3772	1198	106409

* Data not collected.

was recorded in September, whereas in 1951 and 1954 the maximum yield was reached in October. During 1953 the maximum catch was recorded

TABLE X
Monthly landings of *Lactarius lactarius* (in lb.)

Year	May	June	July	August	September	October	Total
1950	.. 236246	220153	28434	..	1232	..	480065
1951	.. 869	..	..	37940	..	489	39298
1952	.. 253685	8088	..	..	23000	..	284753
1953	.. 46793	24670	..	54215	1018	..	126696
1954	.. 13913	49028	4849	..	4674	..	72464

in March (Table XI). The tackle employed for catching this fish is shore-seines and drift-nets. The process adopted for curing this fish is salting and sun-drying. The cured product fetches Rs. 140 to 150 per cwt. The main market is Ceylon.

Chank fisheries.—The Chank beds of the west coast of India are restricted to the Travancore and Kathiawar Coasts. Chanks are extensively fished in the Cape Trivandrum coastal belt and they form a flourishing trade in the fishing villages of Muttom, Thengapattanam, Colachel and to a small extent, in Vizhingam and Trivandrum. At Vizhingam the points from where the chanks are fished lie near the Mathilppuram and Kottappuram areas. The season is from November to January. It has been estimated that annually about 1,500 chanks are fished out. There are nineteen divers in this locality at present. The chanks are sent to Thengapattanam about 30 miles south, from where they are sent to Dacca where there is great demand for chanks for the manufacture of bangles.

REMARKS

It is evident from the foregoing pages that the major fisheries start just before the south-west monsoon. The reasons for this may be varied and numerous. It is highly probable that the sea off Vizhingam becomes rich in plankton due to the influx of water from the various rivers and lakes that open into the sea along the Travancore Coast. According to the catch analysis made during the years 1950 to 1954 it is seen that 1952 was the most productive year. It will not be possible to find out the reasons for the annual fluctuations in landings without making a detailed study on currents, on temperature and salinity of the sea-water and on

TABLE XI
Monthly landings of Cybium spp. (in lb.)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1950	18448	*	*	*	..	..	..	..	23807	1142	792	886	44875
1951	..	..	..	..	..	..	..	..	..	10269	..	..	10269
1952	..	1296	205	..	..	..	..	..	2572	2987	6445	..	13505
1953	1414	1753	3572	11961	334	..	..	..	22	..	970	654	20680
1954	584	1360	..	728	215	416	111	86	3060	6357	4051	2756	19724

* Data not collected.

plankton as these are vital factors that influence not only the movements and occurrence of fish, but their hatching, survival and growth.

DISPOSAL OF CATCHES

Fish being an easily perishable article of food the aim of the fishermen is to dispose of the catches as quickly as possible. As soon as the catches are landed the usual method in disposing of the catches is by auctioning. The auctioning is done by a middleman. The merchants then dispose of the catches to the retailers who sell it to the consumers.

Utilisation.—Only 15 to 20% of the total catches is cured. Fresh fish is in great demand in the interior markets of the State and it is only when the landings are very heavy, and the facilities for transport to interior markets inadequate that the fish is cured. Moreover, cured fish is not in high demand in local markets. As there is always a ready market for fresh fish there is no fish-manure industry in this locality.

Methods of curing.—The main methods in curing fish in this locality are sun-drying and curing with salt.

Sun-drying.—The fish is spread over the beach and dried for two days. Occasionally they are turned over to facilitate equal drying of both sides. Usually, lean fish like whitebait and clupeids are dried like this.

Salting and drying.—Fishes like *Leiognathus* and *Trichiurus* are salted without gutting and after two days they are dried on the beach and packed. *Lactarius* is usually given an incision on the dorsal side and salt is packed into this incision and left over for two days. Afterwards they are dried for two days. Pomfrets and seer-fish are gutted, incisions made on their flesh and salt applied. They are allowed to remain in this condition for two days and then taken out and dried on palmyra mats spread on the beach for two days. The same method is adopted for sharks, rays and skates. In the cases of fishes like tuna and perches another method is adopted. The fishes are gutted, slit open, incisions made on their flesh and salt is applied. They are placed in wooden or cement tubs in layers, with a sprinkling of salt in between the layers. After two days they are taken out, dried and packed. Sometimes they are also packed without drying.

METHODS OF TRANSPORT

A variety of methods exists in transporting fish from the point of capture to the consumer. The catches of the catamarans are usually emptied into a basket made of palmyra leaf locally known as *Omel* having a capacity of nearly 2 cwt. and tied on to the catamaran and landed on the shore.

The catches of the dugouts are collected from the nets and emptied into the dugout itself and landed on the shore. The methods employed in transporting fish on land are by headloads, bullock-carts, bicycles, and motor lorries, the most common means in this locality being by bicycles. Fish is transported in this manner to markets which are even 20 to 30 miles away from this place. Fish is carried by headloads to markets which are 10 to 12 miles away from this place. Motor lorries are extensively used in the transport of fishes to distances beyond 100 miles when the catches are very heavy. Bullock-carts are usually employed for the transport of cured fish. However, during times of heavy landings owing to inadequacy of other means of transport, fresh fish is transported by bullock-carts also.

MARKETS

The main markets to which fresh fish is sent from this locality are the Connemara, Chalai, Manakad, Perur Kada and Pangode markets in Travandrum. Fish is also sent to interior markets like Balaramapuram, Kattakada, Neyattinkara, Nedumangad and Kalikavila, 5 to 30 miles away from this place. With the help of motor lorries fish is transported to places like Kottarakara, Kilimanoor, Vembayam, Attingal and Vithura. The main market for cured fish is Ceylon. In addition, cured fish is sent to Adirampuzha, Changanacherry, Kottayam, Devikulam, Peermade and Punaloor in Kerala State and to Virudhunagar, Tinnevely, Koilpatti and Rajapalayam in Madras State.

SUMMARY

A brief account of the fishing craft and tackle of Vizhingam is given.

The fish landings of Vizhingam for the years 1950 to 1954 have been studied. The maximum production during this period was in 1952. The percentage composition of the catches has been elucidated.

An account of some fisheries of commercial importance is given.

The methods of curing, disposal of the catches, modes of transport, utilization, and the markets are also outlined.

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