



MARINE FISHERIES INFORMATION SERVICE



दर्यावर्दी मच्छीमार जनगणना

किनार पट्टीवर वसलेल्या मच्छीमार खेड्यांच्या लोककल्याण योजने करितां केंद्रीय समुद्रीय मत्सकीय अनुसंधान संस्था, कोचीन येत्या मे-जून १९८० मध्ये जनगणना करणार आहे. या कार्यात आम्ही आपल्या बहुमूल्य सहकार्यांची अपेक्षा करीत आहोत.



സമുദ്ര മത്സ്യ ബന്ധനത്തിൽ ഏർപ്പെട്ടിരിക്കുന്നവരുടെ

സെൻസസ്

കടലോര പ്രദേശങ്ങളുടെ ക്ഷേമ പ്രവർത്തനങ്ങൾ ആസൂത്രണം ചെയ്യാൻ വേണ്ടി സെൻട്രൽ മറൈൻ ഫിഷറീസ് റിസർച്ച് ഇൻസ്റ്റിറ്റ്യൂട്ട്, (കൊച്ചി), ഒരു സെൻസസ് 1980 മെയ്-ജൂൺ മാസങ്ങളിൽ നടത്തുന്നു. ഈ സംരംഭത്തിൽ നിങ്ങളുടെ സഹകരണം പ്രതീക്ഷിക്കുന്നു.

Technical and Extension Series

No. 30

AUGUST 1980

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

COCHIN, INDIA

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

THE MARINE FISHERIES INFORMATION SERVICE: Technical and Extension Series envisages the rapid dissemination of information on marine and brackish water fishery resources and allied data available with the Fishery Data Centre and the Research Divisions of the Institute, results of proven researches for transfer of technology to the fish farmers and industry and of other relevant information needed for Research and Development efforts in the marine fisheries sector.

Abbreviation - *Mar. Fish. Infor. Serv. T & E Ser., No. 30: 1981*

CONTENTS

1. Preface
2. All India Census of Marine Fishermen,
Craft and Gear : 1980
3. Books

Cover photo: Publicity posters

PREFACE

The Central Marine Fisheries Research Institute (CMFRI), Cochin is conducting quinquennial census on marine fishermen population and infrastructure facilities since 1948 as part of the Fishery Resources Assessment Division programme. This census serves the purpose of periodical updating of the frame on marine fish landing centres which is required for the estimation of marine fish catch in India. The information on infrastructure facilities available in the marine fishing villages forms a good base for planning and development of this economically backward sector. The National Commission on Agriculture has also recommended that such census should be undertaken by CMFRI, with the help of State Fisheries Departments periodically, preferably once in five years.

During 1980 CMFRI has undertaken this census, covering 7 maritime States viz. West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka and Gujarat and two Union Territories namely Pondicherry, Karaikkal, Mahe and Yanam and Goa, Daman and Diu. This is the first time that the Institute has carried out the census operations on an intensive and massive scale within a short period of less than a month availing the services of about 1500 persons engaged locally besides 165 of this Institute staff. The task involved strenuous field work covering difficult terrain and visits to almost inaccessible marine fishing villages. Altogether 2,132 marine fishing villages with 1,442 landing centres have been visited covering a total of 3,33,038 households.

The Fishery Resources and Assessment Division of the Institute organised and carried out this census with the active co-operation of large number of scientists and technical personnel of all the Divisions of this Institute. The help rendered by the respective State Governments went a long way in the successful conduct of this census.

Based on the analysis of census data, the Institute proposes to bring out a few publications. In the present publication, district-wise details on the distribution of marine fishermen population, their educational status, number of fishermen engaged in actual fishing and number of crafts and gears owned by fishermen are given. It is hoped that the information furnished in this report would be useful to the State Governments, Central and other agencies involved in the development of marine fisheries sector. The list of scientific and technical personnel of the Institute who actively participated in the census programme is appended.

I wish to place on record my sincere appreciation to the hard work put in by my colleagues of this Institute who were associated in this venture and of the whole hearted co-operation extended by the officials of the State Fisheries Departments. S/Shri T. Jacob, G. Venkataraman, K. Alagaraja and S. K. Dharmaraja had also seen to the effective co-ordination of the programme.

E. G. SILAS
Director

ALL INDIA CENSUS OF MARINE FISHERMEN, CRAFT AND GEAR: 1980*

Introduction

For planning developmental programmes in marine fisheries sector, the information such as the number of fishing villages, landing centres, fishermen population, active fishermen, fishing crafts and gears in the maritime states of India is a prerequisite. Such information also provides the frame needed for conducting sample survey for estimation of marine fish production and fishing effort in India. Further, periodic frame surveys are necessary to understand the status of the traditional small scale fisheries sector in the changing pattern of fishing industry. Keeping these in view, the Central Marine Fisheries Research Institute has been conducting frame surveys at periodic intervals ever since 1948-49. The National Commission on Agriculture has emphasised in its recommendation that CMFRI should conduct quinquennial census in order to update the inventory of fishing resources available in the coastal villages with the help of State Governments. This gave a fillip to the Institute to organise the census on a massive and intensive scale. The field work was carried out during May-July 1980 in all the maritime states in the mainland except in Maharashtra. The census work in Maharashtra was not taken up as the same was carried out by the Maharashtra Government in the previous year.

The planning for the conduct of the census at all India level was done much in advance. A team of scientists of the Fishery Resources Assessment Division visited various states and sought the co-operation of the state officials. The different schedules to be used for the collection of census data were prepared and finalised in consultation with State Governments. The major items on which information was collected in the house-hold schedule were family size, educational status, number of active fishermen, number of mechanised and non-mechanised fishing crafts and number of fishing gears. Since the schedules were to be filled in with the help of local persons, they were printed bilingual—English and the regional language. Suitable publicity materials in the form of attractive folders and wall posters in respective local languages were also prepared.

The programme of work was executed by the Fishery Resources Assessment Division with the participation of a large number of scientific and technical personnel of the various divisions of the Institute in the field opera-

tions. All the State Departments extended their full co-operation in the conduct of the census and particularly the Fisheries Departments of Orissa, Pondicherry and Gujarat lent the services of some of their staff for the field work. Orientation training for the staff was conducted at Contai, Cuttack, Waltair, Madras, Mandapam Camp, Cochin, Karwar, Veraval and Bhuj. Wide publicity was given through the press, Akhasvani and Doordarshan sufficiently in advance highlighting the census work.

The enumeration work was conducted during May-July 1980 in the maritime states of West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Gujarat and the two Union Territories of Pondicherry and Goa. Over 2,000 marine fishing villages were visited and census data collected as per the village and household schedules through house-to-house canvassing.

In the collection of census data the terms used are defined as follows:

1. Marine fisherman is one who is engaged in marine fishing/associated activities.
2. Marine fishing village is an assemblage of houses where marine fishermen live.
3. Fish landing centre is a place where fishermen land their catch.
4. Fishermen family is one in which atleast one member is engaged in marine fishing/related activities.
5. Fishermen engaged in actual fishing:
 - i) Full time category includes those fishermen who spend atleast 90% of their time in fishing.
 - ii) Part time includes those who spend at least 30% but less than 90% of their time in fishing.
 - iii) Occasional includes those who spend less than 30% of their time in fishing.

*Prepared by the Fishery Resources Assessment Division.

6. Educational status:

- i) Primary standard refers to those who have completed V std.
- ii) Secondary standard refers to those who have completed X std.
- iii) Above secondary refers to those who continued their studies after X standard.

7. Children are those who have not completed their 12th year of age irrespective of their sex. All others come under adult.

Census figures for the whole country, states and districts excluding Maharashtra, Andaman and Lakshadweep are discussed in the ensuing account.

Summary census details of all maritime states of India (Figs. 1—8)

The statewise details of census figures in India are given in Tables 1 & 2. The number of marine fishing villages in India (excluding Maharashtra, Andamans and Lakshadweep) is 2,132, the number of landing centres being 1,438. There are 3.33 lakh fishermen households with the total marine fishermen population of 18.93 lakhs. Adult males and females comprise about 31% each and children 38%. The average family size works out to 5.7. Of the total population, 15% are educated upto primary standard, 3% secondary and 1% continued studies above secondary standard. The fishermen engaged in actual fishing form 23% of the total fishermen population. Among these engaged in actual fishing 82% come under full time, 11% part time and 7% occasional categories.

The number of mechanised boats in the country excluding Maharashtra, Andamans and Lakshadweep is observed to be about 14,000 (Table 21). About 9,300 mechanised boats are owned by the fishermen families, majority of them on a share basis. Of these about 6,300 are engaged in trawling (trawlers), 2,400 gillnetting (gill netters), 240 dol net fishing (dol netters) and 220 purse seining (Purse-seiners).

The ownership of mechanised boats is not confined to fishermen alone. There are mechanised boats owned by industrialists who do not reside in the marine fishing villages. Since this census covers only marine fishing villages, it was not possible to collect details

of number of mechanised boats owned by this sector in each state during the limited time of the census. The frequent interstate movement of these boats in the waters of the different states also rendered it more difficult to collect this data. Hence in the sections dealing with the statewise analysis, mechanised boats owned by fishermen alone are considered. However, the details of the total number are given in table 21.

As regards non-mechanised fishing crafts, there are 1.35 lakh units of which about 73,400 are catamarans, 37,900 plank-built boats and 21,700 dug-out canoes.

There are about 14,000 trawlnets and 240 purse-seines. Among other gears, drift/gill nets are of the order of about 2.16 lakhs, hooks & lines being the next major gear with 57,000 numbers. The other gears are fixed bag nets (49,000), boat seines (30,000), shore seines (19,000), scoop nets (6,000) and Rampans (190).

District-wise details of different states

West Bengal

Census of marine fishermen population was conducted in the six districts of West Bengal viz. Murshidabad, Nadia, Hooghly, Howrah, 24 Parganas and Midnapore (Table 3 & 4). Though the former four districts are situated in the interior, there are some fishermen settled in these districts engaged in seasonal marine fishing.

Fishing Villages and landing centres

There are 303 fishing villages wherein marine fishermen reside. The maximum number is in Midnapore district (148) followed by Howrah (79) and 24 Parganas (58). The number of fishing villages in the remaining districts is very low ranging from 2 to 9. The total number of landing centres is 47, all the landing centres being situated in the districts of 24 Parganas and Midnapore.

Population

There are about 14,000 fishermen households in the state, the maximum number being in Midnapore district (35%), the next highest in 24 Parganas (31%) followed by Howrah (28%). Four per cent of the fishermen families are found in Murshidabad and one per cent each in Hooghly and Nadia districts. On an average the number of families per village is 47, the

Table 1. Statewise figures of marine fishing villages and fishermen population in India—1980

Sl. No.	Items	S T A T E S									Total
		West Bengal	Orissa	Andhra Pradesh	Tamil Nadu	Pondichery, Karaikal, Mahe and Yanam	Kerala	Karnataka	Goa Daman Diu	Gujarat	
1.	No. of fishing villages	303	236	453	422	27	304	147	61	179	2,132
2.	No. of landing centres	47	56	379	375	27	222	105	54	173	1,438
3.	No. of fishermen households	14,169	20,329	72,862	75,721	4,625	99,894	15,638	6,725	23,075	3,33,038
4.	Fishermen population										
a)	Adults:										
	Male	27,547	37,536	97,364	1,26,967	7,362	2,10,609	32,715	12,459	42,835	5,95,394
	Female	23,624	33,837	96,459	1,26,691	7,544	2,09,853	34,888	12,398	42,249	5,87,543
b)	Children	32,390	45,771	1,32,481	1,42,245	10,406	2,19,410	45,290	15,055	66,931	7,09,979
	Total	83,561	1,17,144	3,26,304	3,95,903	25,312	6,39,872	1,12,893	39,912	1,52,015	18,92,916
5.	Educational status										
a)	Primary	15,606	7,618	20,386	60,075	4,922	1,19,823	21,596	7,060	23,901	2,80,987
b)	Secondary	2,752	2,045	3,562	11,897	1,370	23,514	5,174	2,617	4,067	56,998
c)	Above Secondary	452	359	429	3,860	270	5,317	1,553	338	911	13,489
	Total	18,810	10,022	24,377	75,832	6,562	1,48,654	28,323	10,015	28,879	3,51,474
6.	No. of fishermen engaged in actual fishing										
a)	Full time	9,026	20,617	73,506	87,442	5,021	1,11,970	17,664	6,841	25,616	3,57,703
b)	Part time	9,497	6,262	4,910	4,020	187	11,017	5,558	1,362	6,841	49,654
c)	Occasional	1,233	3,845	5,487	5,038	304	8,114	1,783	668	4,070	30,542
	TOTAL	19,756	30,724	83,903	96,500	5,512	1,31,101	25,005	8,871	36,527	4,37,899

Table 2. Statewise figures of marine fishing crafts and gears in India—1980

Sl. No.	Items	STATES									Total
		West Bengal	Orissa	Andhra Pradesh	Tamil Nadu	Pondicherry Karaikal, Mahe and Yanam	Kerala	Karnataka	Goa, Daman, Diu	Gujarat	
1.	<i>No. of fishing crafts</i>										
a)	<i>Mechanised</i>										
	Trawlers	—	—	447	2,295	176	745	808	407	1,410	6,288
	Gill netters	247	106	9	324	—	215	23	213	1,225	2,362
	Dol netters	—	—	—	—	—	—	—	—	241	241
	Purse-seiners	—	—	—	—	—	9	173	39	—	221
	Others	63	—	—	8	—	14	74	—	18	177
	Total	310	106	456	2,627	176	983	1,078	659	2,894	9,289
b)	<i>Non-mechanised</i>										
	Plank built boats	3,972	3,262	11,359	8,957	83	4,376	1,747	1,108	3,040	37,904
	Dug out canoes	89	186	1,781	2,210	72	10,415	4,454	1,397	1,080	21,684
	Catamarans	—	6,276	22,198	31,851	1,595	11,480	23	8	—	73,431
	Others	—	4	675	325	—	—	718	—	—	1,722
	Total	4,061	9,728	36,013	43,343	1,750	26,271	6,942	2,513	4,120	1,34,741
2.	<i>No. of fishing gears</i>										
	Trawl nets	—	—	823	6,219	437	1,454	1,788	772	2,672	14,165
	Purse-seines	—	—	—	—	—	9	188	41	—	238
	Drift/gill nets	2,467	10,427	42,385	1,18,300	1,851	23,307	6,571	3,346	7,383	2,16,037
	Boat seines	—	2,676	9,738	7,220	375	9,779	23	165	—	29,976
	Fixed bag nets	6,200	2,778	14,617	1,842	152	—	941	430	21,857	48,817
	Hooks & lines	869	15,265	10,752	22,111	720	2,949	1,507	127	2,376	56,676
	Rampans	—	—	—	—	—	—	86	101	—	187
	Shore seines	436	2,893	3,042	4,549	84	2,926	3,924	987	—	18,841
	Traps	61	515	130	8,919	9	2,239	—	—	86,952	98,825
	Scoop nets	345	37	2,925	1,040	362	1,371	—	—	—	6,080
	Others	2,433	5,201	37,199	6,339	120	2,761	10,925	2,813	28,013	95,804

Table 3. Districtwise figures of marine fishing villages and fishermen population—West Bengal 1980

Sl. No.	Item	DISTRICTS						Total
		Murshidabad	Nadia	Hooghly	Howrah	24 Parganas	Midnapore	
1.	Number of villages	9	7	2	79	58	148	303
2.	No. of landing centres	—	—	—	—	28	19	47
3.	No. of fishermen households	564	138	136	3,962	4,341	5,028	14,169
4.	Fishermen population							
a)	Male	966	273	200	6,130	8,536	11,442	27,547
b)	Female	989	212	179	5,385	7,344	9,515	23,624
c)	Children	686	279	269	8,937	9,249	12,970	32,390
	TOTAL	2,641	764	648	20,452	25,129	33,927	83,561
5.	Educational status							
a)	Primary	224	22	121	3,056	5,071	7,112	15,606
b)	Secondary	74	11	1	395	920	1,351	2,752
c)	Above secondary	11	3	1	57	264	116	452
	TOTAL	309	36	123	3,508	6,255	8,579	18,810
6.	No. of fishermen engaged in actual fishing							
a)	Full time	—	—	—	1,289	1,703	6,034	9,026
b)	Part time	589	190	171	3,143	3,290	2,114	9,497
c)	Occasional	11	—	1	493	463	265	1,233
	TOTAL	600	190	172	4,925	5,456	8,413	19,756

Table 4. Districtwise figures of marine fishing crafts and gears—West Bengal 1980

Sl. No.	Item	DISTRICTS						Total
		Murshidabad	Nadia	Hooghly	Howrah	24 Parganas	Midnapore	
1.	No. of fishing Crafts							
a)	Mechanised							
	Gillnetters	4	—	2	—	184	57	247
	Others	—	—	—	1	47	15	63
	TOTAL	4	—	2	1	231	72	310
b)	Non-mechanised							
	Plankbuilt boats	25	7	10	1,160	1,640	1,130	3,972
	Dug out canoes	—	—	—	1	86	2	89
	TOTAL	25	7	10	1,161	1,726	1,132	4,061
2.	No. of fishing gears							
	Drift/gill nets	20	15	10	1,075	910	437	2,467
	Fixed bagnets	—	—	18	1,134	2,296	2,752	6,200
	Hooks & lines	—	—	—	244	565	60	869
	Shore seines	—	—	—	25	314	97	436
	Traps	—	—	—	1	60	—	61
	Scoop nets	—	—	—	—	263	82	345
	Others	—	18	—	268	283	1,864	2,433

number of persons being 276 per village. The average family size in this state works out to 5.9.

The total fishermen population in West Bengal is about 84,000 of which adult males constitute 33%, adult females 28% and children 39%. Break-up

figures for different districts show that Midnapore district alone accounts for 41% of the total marine fishermen population while 24 Parganas and Howrah districts account for 30% and 24% respectively. The rest of the population (5%) is distributed in the remaining three districts.

Education

Nineteen per cent of the fishermen population have completed primary standard, 3% secondary standard and 1% continued studies above secondary standard.

Fishermen engaged in actual fishing

The number of fishermen engaged in actual fishing forms 24% of the total fishermen population. Among these the number of fishermen engaged in full time and part time fishing constitutes about 47% each and those engaged in occasional fishing 6%. In Midnapore district as much as 72% of the fishermen engaged in actual fishing belong to the full time category and only 25% come under the part time category. In the districts of 24 Parganas & Howrah the reverse is the case i.e., fishermen engaged in part time fishing are more in number than those engaged in full time fishing (60% and 64% respectively). Almost all the fishermen of Hooghly, Murshidabad and Nadia districts belong to part time category. The higher percentage of fishermen engaged in full time fishing in Midnapore district can be attributed to the greater opportunities for fishing in the district which has got a long coast line.

Fishing crafts

The total number of mechanised crafts owned by fishermen is 310. Out of this, gillnetters constitute 80%. The maximum number of mechanised boats is in the district of 24 Parganas (231), the next highest being in Midnapore district (72). Out of the 231 mechanised boats in 24 Parganas as many as 184 are gillnetters and the rest carrier boats. In Midnapore district also gillnetters form the maximum number (57), there being only 15 carrier boats. The number of mechanised boats in the possession of fishermen in the other districts is negligible. The reason for the large number of mechanised boats observed in 24 Parganas may be due to the availability of better infrastructure facilities at places like Diamond Harbour, Namkhana and Kakdwip.

Altogether about 4,100 non-mechanised boats are recorded in this state. 24 Parganas leads all other districts in the number of non-mechanised boats (43%) followed by Howrah district (29%). Midnapore district occupies the third place (28%). The number of boats possessed by the fishermen of Murshidabad, Hooghly and Nadia districts is very low. Among the two categories of non-mechanised boats viz. plank-

built boat and dug out canoe the former dominates, constituting about 98%. However, relatively higher numbers of dug out canoes are noticed in the district of 24 Parganas as compared to other districts.

Fishing gears

Out of the gears observed, fixed bag net constitutes the maximum (6,200), the next highest being drift/gill net (2,500). The largest number of fixed bag nets is found in Midnapore (44%) followed by 24 Parganas (37%) and Howrah (18%). Maximum number of drift/gill net is observed in Howrah district (44%), the next highest being in 24 Parganas (37%) followed by Midnapore (18%).

Orissa

In Orissa, the census was carried out in the maritime districts of Balasore, Cuttack, Puri and Ganjam (Tables 5 & 6).

Fishing villages and landing centres

The number of marine fishing villages in Orissa State is 236, the maximum being in Balasore district (169), the next highest being in Ganjam and Puri (28 and 27 respectively). The lowest is in Cuttack (12). The number of landing centres in the state is 56, the largest number being in Balasore and Ganjam districts (20 each) followed by Puri and Cuttack.

Population

The total number of marine fishermen households in Orissa state is 20,300. Districtwise analysis of the fishermen families shows that the maximum is in Balasore district (61%), the next highest being in Ganjam (20%) followed by Puri (17%). Minimum number of fishermen families is observed in Cuttack district (2%). The average family size in the state works out to 5.8.

The total fishermen population in the state is 1.17 lakhs. Out of this, adult males constitute 32%, adult females 29% and children 39%. On an average, the number of persons per village comes to 496.

Districtwise analysis of the fishermen population shows that the maximum number is in Balasore district (64%), followed by Puri (18%), Ganjam (16%) and Cuttack (2%).

Table 5. Districtwise figures of marine fishing villages and fishermen population—Orissa 1980

Sl. No.	Item	DISTRICTS				Total
		Balasore	Cuttack	Puri	Ganjam	
1.	No. of villages	169	12	27	28	236
2.	No. of landing centres	20	5	11	20	56
3.	No. of fishermen households	12,316	393	3,472	4,148	20,329
4.	Fishermen population					
a)	Male	24,145	886	6,733	5,772	37,536
b)	Female	20,963	728	6,119	6,027	33,837
c)	Children	29,410	1,047	7,888	7,426	45,771
	TOTAL	74,518	2,661	20,740	19,225	1,17,144
5.	Educational status					
a)	Primary	6,119	25	1,180	294	7,618
b)	Secondary	1,362	2	545	136	2,045
c)	Above Secondary	215	—	118	26	359
	TOTAL	7,696	27	1,843	456	10,022
6.	No. of fishermen engaged in actual fishing					
a)	Full time	11,539	442	4,938	3,698	20,617
b)	Part time	4,204	349	643	1,066	6,262
c)	Occasional	2,766	4	417	658	3,845
	TOTAL	18,509	795	5,998	5,422	30,724

Table 6. Districtwise figures of marine fishing crafts and gears—Orissa 1980

Sl. No.	Item	DISTRICTS				Total
		Balasore	Cuttack	Puri	Ganjam	
1.	No. of fishing crafts					
a)	Mechanised					
	Gill netters	106	—	—	—	106
	TOTAL	106	—	—	—	106
b)	Non-mechanised					
	Plank built boats	2,324	218	475	245	3,262
	Dug out canoes	103	—	76	7	186
	Catamarans	1	228	2,831	3,216	6,276
	Others	4	—	—	—	4
	TOTAL	2,432	446	3,382	3,468	9,728
2.	No. of fishing gears					
	Drift/gill nets	1,702	425	2,782	5,518	10,427
	Boat seines	141	19	1,467	1,049	2,676
	Fixed bag nets	2,507	198	1	72	2,778
	Hooks and lines	212	242	10,688	4,123	15,265
	Shore seines	2,475	—	58	360	2,893
	Traps	492	23	—	—	515
	Scoop nets	14	—	—	23	37
	Others	4,575	4	13	609	5,201

Education

Among the fishermen population, those who have completed primary standard forms 7%, secondary 2% and beyond secondary standard less than 1%.

Fishermen engaged in actual fishing

The number of fishermen engaged in actual fishing in

this state is found to be about 30,700 forming 26% of the total fishermen population. Of this, the number of fishermen who are engaged in full time fishing constitutes 67%, part time 20% and occasional 13%. Among actual fishermen in Puri district as much as 82% belong to full time category, 11% to part time and 7% to the occasional. In Ganjam district 68% belong to the full time category and 20% and 12% to the remaining two categories respectively. In Balasore

district, the percentage of fishermen engaged in full time fishing is 62, the part time and occasional being 23 and 15 respectively. The percentage of fishermen belonging to full time category in Cuttack district is 55, part time being 44 and occasional 1.

Fishing crafts

The total number of mechanised boats owned by fishermen is 106, all these being gill netters from Balasore district. The total number of non-mechanised crafts is about 10,000. Ganjam and Puri districts lead the other districts with 36% and 35% respectively. In Balasore district, the number of non-mechanised crafts is less (25%), the lowest being in Cuttack district (4%). Among the different types of non-mechanised crafts in the state, catamarans constitute the largest number (64%) followed by plank-built boats (34%) and dug-out canoes only 2%. In Balasore district, plank-built boats constitute as much as 96%, whereas in Ganjam and Puri districts catamarans constitute the largest components of non-mechanised crafts viz. 93% and 84% respectively.

Fishing gears

Altogether seven types of gears are found in this state. Of these, hooks and lines constitute the maximum number (15,300) followed by drift/gill nets (10,400), shore seines (2,900), fixed bag nets (2,800) and boat seines (2,700). In Balasore district *Junjal*, a small purse seine constitutes the largest number in the category "others." Among the different types of gears, maximum number of drift/gill nets is observed in Ganjam district whereas maximum numbers of hooks and lines and boat seines are observed in Puri district. Fixed bag nets and shore seines form the largest number in Balasore district.

Andhra Pradesh

The Census on marine fishermen population was conducted in Andhra Pradesh in the nine coastal districts, namely, Srikakulam, Vijayanagaram, Vishakapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasam and Nellore (Tables 7 & 8).

Fishing villages and landing centres

There are 453 marine fishing villages in the entire coast of Andhra Pradesh with 379 fish landing centres. Regarding the number of marine fishing villages, Srika-

kulam leads having 24% followed by East Godavari (19%), Vishakapatnam (14%), Nellore (14%), Prakasam (13%), Krishna (6%), Guntur 5%, Vijayanagaram and West Godavari (3% each). The maximum number of landing centres is noticed in Srikakulam (86), followed by East Godavari (75), Nellore (56), Prakasam (52) and Vishakapatnam (50). The rest of the districts have only less than 30 landing centres each.

Population

There are about 73,000 fishermen families in this state. East Godavari district has the maximum (28%) followed by Srikakulam (22%), Vishakapatnam (16%), Prakasam (10%), Nellore (7%), Krishna (6%), Guntur (5%), West Godavari and Vijayanagaram (3% each). On an average, there are about 160 families per village. However, in East Godavari and Guntur average number of fishermen families per village exceeds 200, each having about 238 and 233 families respectively, lowest (83) being in Nellore district. The average family size is 4.5.

The total fishermen population is 3.26 lakhs. Among them, adult males and females form 30% each and children 40%. In the total population, East Godavari accounts for 26% followed by Srikakulam (23%), Vishakapatnam (18%), Prakasam (9%), Nellore (7%), Krishna (6%), Guntur (5%), Vijayanagaram and West Godavari (3% each). The average number of persons per village is 720.

Education

In the state, 6% of the fishermen population have completed primary standard, 1% secondary and less than 1% beyond secondary standard.

Fishermen engaged in actual fishing

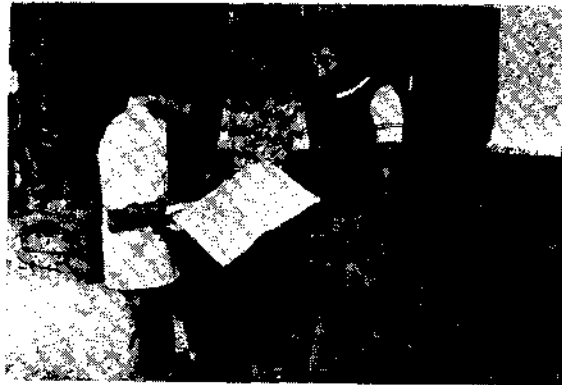
There are about 84,000 fishermen engaged in actual fishing in all the nine coastal districts of Andhra Pradesh forming 26% of the total marine fishermen population. Of these, 88% fall under full time category followed by part time and occasional, 6% each. The percentage of fishermen engaged in full time fishing varies from 71 to 99 in the various districts of the State.

Fishing crafts

There are 447 trawlers and 9 gill netters owned by the fishermen of the state. The maximum number of

Table 7. Districtwise figures of marine fishing villages and fishermen population—Andhra Pradesh 1980

Sl. No.	Item	DISTRICTS									Total
		Srika-kulam	Vijaya-nagaram	Visakha-patnam	East Godavari	West Godavari	Krishna	Guntur	Prakasam	Nellore	
1.	No. of fishing villages	105	16	62	84	14	28	22	60	62	453
2.	No. of landing centres	86	15	50	75	10	26	9	52	56	379
3.	No. of fishermen households	16,026	2,195	11,472	20,045	2,328	4,658	3,960	6,939	5,239	72,862
4.	<i>Fishermen population</i>										
a)	Male	21,362	3,694	17,661	25,812	2,822	5,921	4,892	8,777	6,423	97,364
b)	Female	23,291	2,953	17,515	24,957	2,919	5,588	4,624	8,325	6,287	96,459
c)	Children	31,577	4,456	24,969	34,442	3,399	6,945	6,337	11,373	8,983	132,481
	Total	76,230	11,103	60,145	85,211	9,140	18,454	15,853	28,475	21,693	326,304
5.	<i>Educational status</i>										
a)	Primary	5,974	97	2,004	5,432	1,253	1,285	1,167	1,721	1,453	20,386
b)	Secondary	1,779	4	239	683	165	220	176	226	70	3,562
c)	Above secondary	201	—	20	75	34	25	21	50	3	429
	Total	7,954	101	2,263	6,190	1,452	1,530	1,364	1,997	1,526	24,377
6.	<i>No. of fishermen engaged in actual fishing</i>										
a)	Full time	12,279	3,164	14,716	20,368	1,798	4,125	3,570	7,273	6,213	73,506
b)	Part time	427	294	500	1,643	316	569	994	146	21	4,910
c)	Occasional	1,400	143	834	997	416	796	473	384	44	5,487
	TOTAL	14,106	3,601	16,050	23,008	2,530	5,490	5,037	7,803	6,278	83,903



Enumeration work in progress

Table 8. Districtwise figures of marine fishing crafts and gears — Andhra Pradesh 1980

Sl. No.	Item	DISTRICTS								Total	
		Srika-kulam	Vijaya-nagaram	Visakha-patnam	East Godavari	West Godavari	Krishna	Guntur	Prakasam		Nellore
1.	<i>No. of fishing crafts</i>										
a)	<i>Mechanised</i>										
	Trawlers	—	—	1	113	—	60	273	—	—	447
	Gill netters	—	—	—	1	—	—	8	—	—	9
	Total	—	—	1	114	—	60	281	—	—	456
b)	<i>Non-mechanised</i>										
	Plank built boats	898	634	2,180	5,387	144	1,226	828	14	48	11,359
	Dug out canoes	285	6	123	599	99	5	159	291	214	1,781
	Catamarans	7,555	370	5,163	2,340	—	1	323	3,694	2,752	22,198
	Others	2	1	108	218	17	2	11	192	124	675
	Total	8,740	1,011	7,574	8,544	260	1,234	1,321	4,191	3,138	36,013
2.	<i>No. of fishing gears</i>										
	Trawl net	—	128	—	367	1	130	197	—	—	823
	Drift/gill net	13,060	1,570	10,818	5,753	164	1,344	1,510	3,448	4,718	42,385
	Boat seine	2,821	592	2,648	1,953	58	—	46	949	671	9,738
	Fixed bag net	830	—	288	4,412	98	4,181	2,862	413	1,533	14,617
	Hooks & lines	4,769	974	2,871	341	—	302	50	1,164	281	10,752
	Shore seine	926	245	907	284	21	24	201	281	153	3,042
	Traps	—	—	125	—	—	5	—	—	—	130
	Scoop net	55	43	276	1,380	2	921	3	19	226	2,925
	Others	3,828	537	2,450	9,128	5,490	5,485	3,233	4,628	2,420	37,199



Discussion with village leaders

mechanised crafts is observed in Guntur, (62%), the next highest being in East Godavari (25%) followed by Krishna (13%), trawlers constituting the major fishing craft.

There are about 36,000 non-mechanised boats in the different districts of the State. Catamarans (62%) dominated the crafts followed by plank-built boats (32%) and dug-out canoes (5%). Among the districts, Srikakulam and East Godavari have the largest number of non-mechanised crafts (24% each) followed by Vishakapatnam (21%), Prakasam (12%), Nellore (9%), Guntur (4%), Krishna (3%), Vijayanagaram (3%) and West Godavari 1%.

In the districts of Srikakulam and Vishakapatnam, catamarans form the major craft (86% and 68% respectively) followed by plank-built boats (10% and 29% respectively). In the districts of Vijayanagaram, East Godavari, West Godavari, Krishna and Guntur, plank built boats form the dominant craft. Dug-out canoe is found to be the major craft in the districts of Prakasam and Nellore.

Fishing gears

There are about 800 trawl nets in the state, the maximum number being in East Godavari district (45%) followed by Guntur (24%), Krishna and Vijayanagaram (16% each). Of the remaining gears, drift/gill nets are maximum followed by fixed bag nets, hooks & lines, boat seines, shore seines and scoop nets.

Drift/gill nets form the major gear in all the districts of Andhra Pradesh except in Krishna and Guntur where the major gear is fixed bag net. Hooks & lines form the second major gear in the districts of Srikakulam, Vijayanagaram and Vishakapatnam. Boat seines form the third important gear in the districts of Srikakulam, Vijayanagaram, Vishakapatnam, East Godavari, West Godavari and Nellore.

Compared to the previous census conducted in the state during 1975-76, the fishermen population has increased by 37%. Similarly number of fishermen engaged in actual fishing also increased by 30%. There is an overall increase of 40% in the number of fishing crafts.

Tamil Nadu

The census was conducted in the 8 maritime districts of Chengalpattu, Madras, South Arcot, Thanjavoor

Pudukottai, Ramanathapuram, Thirunelveli and Kanyakumari (Tables 9 and 10).

Fishing villages and landing centres

The total number of marine fishing villages in Tamil Nadu is 422 and landing centres 375. The maximum number of fishing villages and landing centres are seen in Thanjavoor district, being 87 and 84 respectively. Ramanathapuram district comes next in the order with 80 fishing villages and 64 landing centres followed by Chengalpattu with 65 each. In all other districts, the number of villages and landing centres are less than 60 each.

Population

There are about 76,000 fishermen families in Tamil Nadu, the maximum number being in Kanyakumari district (25%) followed by Thanjavoor (20%), Ramanathapuram (17%) and Thirunelveli (10%). In the remaining four districts the percentage was less than 10 in each. The average number of fishermen families in a village in this state works out to 179, varying from 77 in Pudukottai to 387 in Kanyakumari. The average family size is 5.2 in the state. Adult males and females form 32% each, the rest being children.

The total fishermen population in Tamil Nadu is about 3.96 lakhs, Kanyakumari recording the maximum number of fishermen forming 25% of the state total. The next highest percentage was seen in Ramanathapuram and Thanjavoor (18 each) followed by Thirunelveli district (11). In the remaining districts the percentages are less than 10 each.

Education

Out of the total fishermen population, 15% have completed primary standard, 3% secondary standard and 1% beyond secondary standard.

Fishermen engaged in actual fishing

The total number of fishermen who are engaged in actual fishing in the state is 96,500 forming about 24% of the total fishermen population. Of these, the number of fishermen who are engaged in full time fishing forms 91%, part time and occasional being 4% and 5% respectively. The districtwise analysis shows that the percentages of fishermen engaged in full time fishing range from 84 to 95, the maximum and minimum being

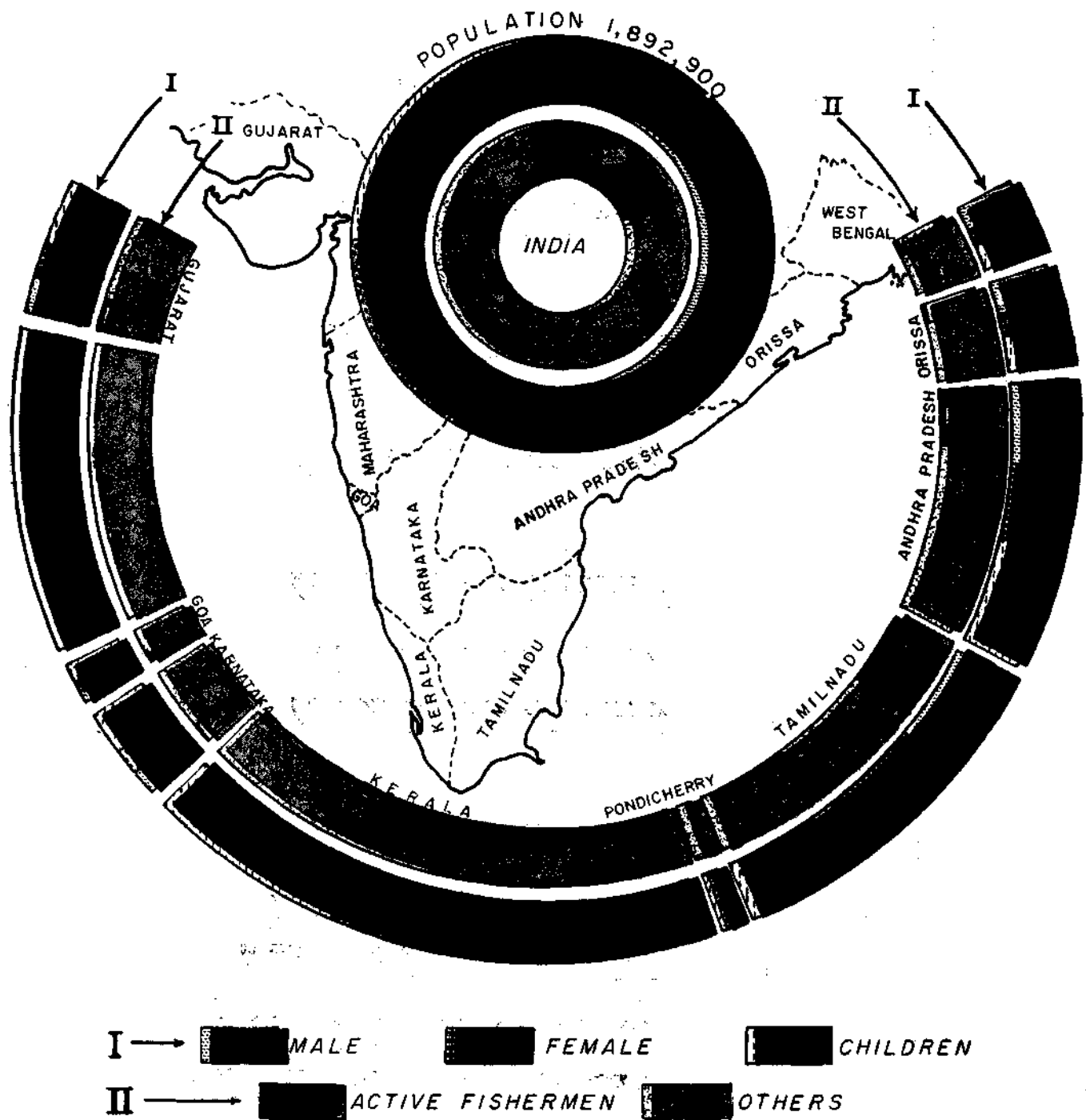


Fig. 1. Statewise distribution of marine fishermen population in India.

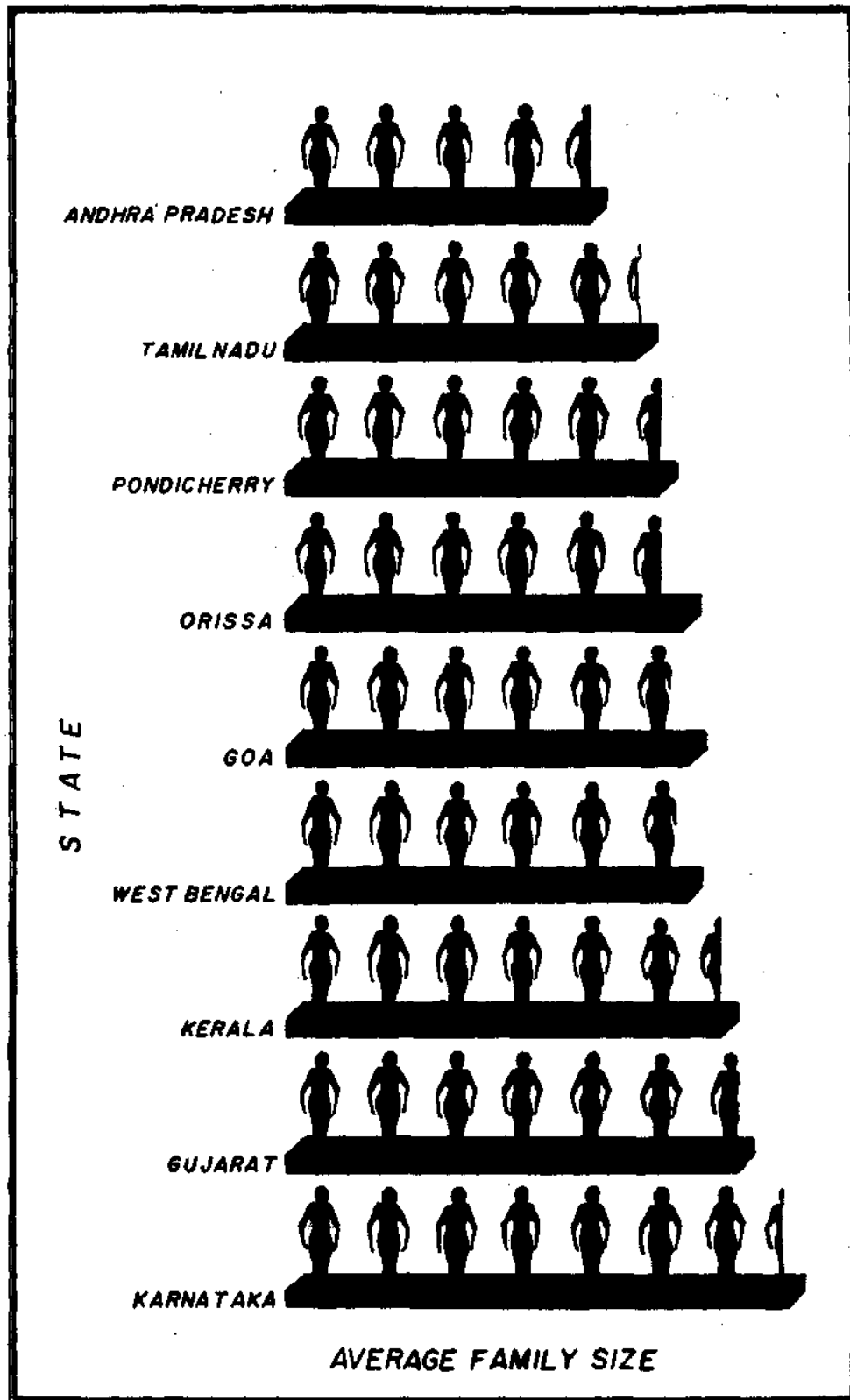


Fig. 2. Statewise average family size of fishermen.

Table 9. Districtwise figures of marine fishing villages and fishermen population—Tamil Nadu 1980

Sl. No.	Items	DISTRICTS								Total
		Chengel- pattu	Madras	South Arcot	Thanjavoor	Pudukottai	Ramana- thapuram	Thirunel- veli	Kanyaku- mari	
1.	<i>No. of fishing villages</i>	65	37	55	87	20	80	32	46	422
2.	<i>No. of landing centres</i>	65	16	53	84	20	64	28	45	375
3.	<i>No. of fishermen households</i>	7,263	5,662	7,021	15,348	1,539	12,473	7,858	18,557	75,721
4.	<i>Fishermen population</i>									
a)	Male	10,426	10,667	11,538	21,782	2,473	21,582	14,559	33,940	1,26,967
b)	Female	10,753	10,337	11,433	22,209	2,285	24,598	13,320	31,756	1,26,691
c)	Children	13,227	12,041	13,506	26,223	3,016	24,963	15,914	33,355	1,42,245
	Total	34,406	33,045	36,477	70,214	7,774	71,143	43,793	99,051	3,95,903
5.	<i>Educational status</i>									
a)	Primary	8,394	5,639	7,383	4,496	622	9,676	10,515	13,350	60,075
b)	Secondary	1,761	3,403	2,038	567	72	1,092	773	2,191	11,897
c)	Above secondary	375	300	306	265	17	260	550	1,787	3,860
	Total	10,530	9,342	9,727	5,328	711	11,028	11,838	17,328	75,832
6.	<i>No. of fishermen engaged in actual fishing</i>									
a)	Full time	7,722	6,586	8,581	16,884	1,779	14,785	10,363	20,742	87,442
b)	Part time	314	90	133	716	80	430	218	2,039	4,020
c)	Occasional	951	368	413	546	52	345	334	2,029	5,038
	Total	8,987	7,044	9,127	18,146	1,911	15,560	10,915	24,810	96,500



Enumeration work in progress

Table 10. Districtwise figures of marine fishing crafts and gears—Tamil Nadu 1980

Sl. No.	Items	DISTRICTS								Total
		Chengal-pattu	Madras	South Arcot	Thanjavoor	Pudukkottai	Ramanathapuram	Thirunelveli	Kanyakumari	
1.	<i>No. of fishing crafts</i>									
a)	<i>Mechanised</i>									
	Trawlers	2	96	299	552	36	981	103	226	2,295
	Gillnetters	—	8	—	5	—	27	5	279	324
	Others	—	—	—	2	—	1	—	5	8
	Total	2	104	299	559	36	1,009	108	510	2,627
b)	<i>Non-mechanised</i>									
	Dug out canoes	206	18	527	284	9	626	3	537	2,210
	Plank built boats	902	50	197	1,176	908	4,074	958	692	8,957
	Catamarans	7,371	2,287	2,541	5,043	128	370	2,584	11,527	31,851
	Others	83	—	1	195	—	44	1	1	325
	Total	8,562	2,355	3,266	6,698	1,045	5,114	3,546	12,757	43,343
2.	<i>No. of fishing gears</i>									
	Trawl nets	10	287	574	1,496	82	3,029	217	524	6,219
	Drift/gill net	8,362	2,107	4,797	22,337	14,479	35,048	14,338	16,832	118,300
	Boat seine	1,273	327	539	2,262	519	24	206	2,070	7,220
	Fixed bag net	525	101	158	168	32	737	12	109	1,842
	Hooks & lines	3,068	519	3,263	4,140	2,756	5,362	487	2,516	22,111
	Shore seine	306	46	211	1,637	57	1,523	66	703	4,549
	Traps	2	7	—	166	4,062	3,312	—	1,370	8,919
	Scoop nets	68	—	252	698	—	22	—	—	1,040
	Others	485	6	3,078	1,571	31	1,168	—	—	6,339

in the districts of Ramanathapuram and Kanyakumari respectively. The percentage of fishermen engaged in part time fishing range from 1% to 8%, the highest and lowest being in Kanyakumari and Madras districts respectively. As regards fishermen engaged in occasional fishing, the maximum is found in Chengalpattu (11%) and the minimum in Ramanathapuram (2%).

Fishing crafts

The total number of mechanised boats owned by the fishermen of Tamil Nadu is about 2,600 consisting of 2,300 trawlers and 300 gill netters. Ramanathapuram district possesses the maximum number (38%). Thanjavoor district comes next (21%) followed by Kanyakumari (19%) and South Arcot (11%). The percentage in other districts is less than 5 each.

In Ramanathapuram district trawlers form 97% and gillnetters 3% and in Thanjavoor the trawlers constitute 99% and gillnetters 1%. However in Kanyakumari district trawlers and gillnetters form 44% and 55% respectively.

A total number of about 43,000 non-mechanised boats is found in Tamil Nadu. Of these, catamarans constitute 73%, plank-built boats and dug-out canoes forming 21% and 5% respectively. Kanyakumari district possesses the maximum number of non-mechanised boats (29%), the corresponding percentages for the districts of Chengalpattu, Thanjavoor and Madras being 20, 15 and 5 respectively. In all other districts the percentage is less than 5 each.

Catamaran forms the major fishing craft in all the districts except in Pudukottai and Ramanathapuram where plankbuilt boats are predominant. In the districts of South Arcot and Ramanathapuram relatively higher proportions of dug out canoes are noticed.

Fishing gears

There are about 6,200 trawl nets in the state, Ramanathapuram accounting for the maximum (49%) followed by Thanjavoor (24%), South Arcot (9%) and Kanyakumari (8%). Of the different types of non-mechanised gears in the state, drift/gillnet forms the major gear followed by hooks & lines, traps and boat seines. The remaining gears are comparatively less in number.

Drift/gill net forms the dominant gear in all the districts, hooks & lines forming the next important gear except in Pudukottai. Relatively higher proportions of shore seine are seen in the districts of Thanjavoor and Ramanathapuram. Traps constitute an important gear in Pudukottai, Ramanathapuram and Kanyakumari districts.

A comparison of the census data collected in 1980 with those of 1975-76 shows that the number of fishermen population and those engaged in actual fishing increased by 27% and 11% respectively. Kanyakumari district continues to lead both in the total fishermen population and the number of fishermen engaged in actual fishing. The number of indigenous fishing crafts increased by 42%. The number of catamarans increased by 30% and the dug out canoes 28%.

Pondicherry, Karaikal, Mahe and Yenam

The census figures for the Union Territory are given in Tables 11 & 12.

Fishing villages and landing centres

There are 27 fishing villages in the Union Territory the maximum number being in Pondicherry (15) followed by Karaikal (10). In Mahe and Yenam there is only one fishing village each. The number of landing centres is the same as the number of fishing villages.

Population

There are about 4,600 families, Pondicherry accounting for the maximum (62%) followed by Karaikal region (27%). Mahe and Yenam have only 8% and 3% respectively.

The total fishermen population is about 25,300 comprising 29% adult males, 30% adult females and 41% children. Pondicherry and Karaikal regions are the major areas where the fishermen population forms 58% and 27% respectively of their total in the Union Territory. The average family size in the territory works out to 5.5.

Education

Out of the total fishermen population, 19% have completed primary standard, 5% secondary and 1% above secondary standard.

Table 11. Regionwise figures of marine fishing villages and fishermen population — Union Territory of Pondicherry, Karaikal, Mahe and Yenam 1980

Sl. No.	Items	REGIONS				Total
		Pondicherry	Karaikal	Mahe	Yenam	
1.	No. of fishing villages	15	10	1	1	27
2.	No. of landing centres	15	10	1	1	27
3.	No. of fishermen households	2,864	1,252	392	117	4,625
4.	<i>Fishermen population</i>					
a)	Male	4,142	2,044	1,054	122	7,362
b)	Female	4,124	2,156	1,139	125	7,544
c)	Children	6,506	2,585	1,108	207	10,406
	TOTAL	14,772	6,785	3,301	454	25,312
5.	<i>Educational status</i>					
a)	Primary	3,038	1,375	483	26	4,922
b)	Secondary	783	493	94	—	1,370
c)	Above secondary	181	74	15	—	270
	TOTAL	4,002	1,942	592	26	6,562
6.	<i>No. of fishermen engaged in actual fishing</i>					
a)	Full time	2,777	1,491	648	105	5,021
b)	Part time	137	49	1	—	187
c)	Occasional	118	143	43	—	304
	TOTAL	3,032	1,683	692	105	5,512

Table 12. Regionwise figures of marine fishing crafts and gears—Union Territory of Pondicherry, Karaikal, Mahe and Yenam 1980

Sl. No.	Items	REGIONS				Total
		Pondicherry	Karaikal	Mahe	Yenam	
1.	<i>No. of fishing crafts</i>					
a)	<i>Mechanised</i>					
	Trawlers	101	72	3	—	176
	Gillnetters	—	—	—	—	—
	TOTAL	101	72	3	—	176
b)	<i>Non-mechanised</i>					
	Dug out canoes	—	—	72	—	72
	Plank built boats	56	2	—	25	83
	Catamarans	1,049	546	—	—	1,595
	TOTAL	1,105	548	72	25	1,750
2.	<i>No. of fishing gears</i>					
	Trawl nets	273	159	5	—	437
	Drift/gill nets	1,203	588	56	4	1,851
	Boat seine	145	158	70	2	375
	Fixed bag net	63	—	—	89	152
	Hooks & lines	438	282	—	—	720
	Shore seine	45	39	—	—	84
	Traps	—	9	—	—	9
	Scoop nets	297	65	—	—	362
	Others	45	75	—	—	120

Fishermen engaged in actual fishing

The number of fishermen engaged in actual fishing forms 22%. Among them, those engaged in full time fishing, part time and occasional form 91%, 3% and 6% respectively. Pondicherry and Karaikal rank

first and second in the total number of fishermen who are actually engaged in fishing.

Fishing crafts

In the Union Territory there are 176 trawlers owned

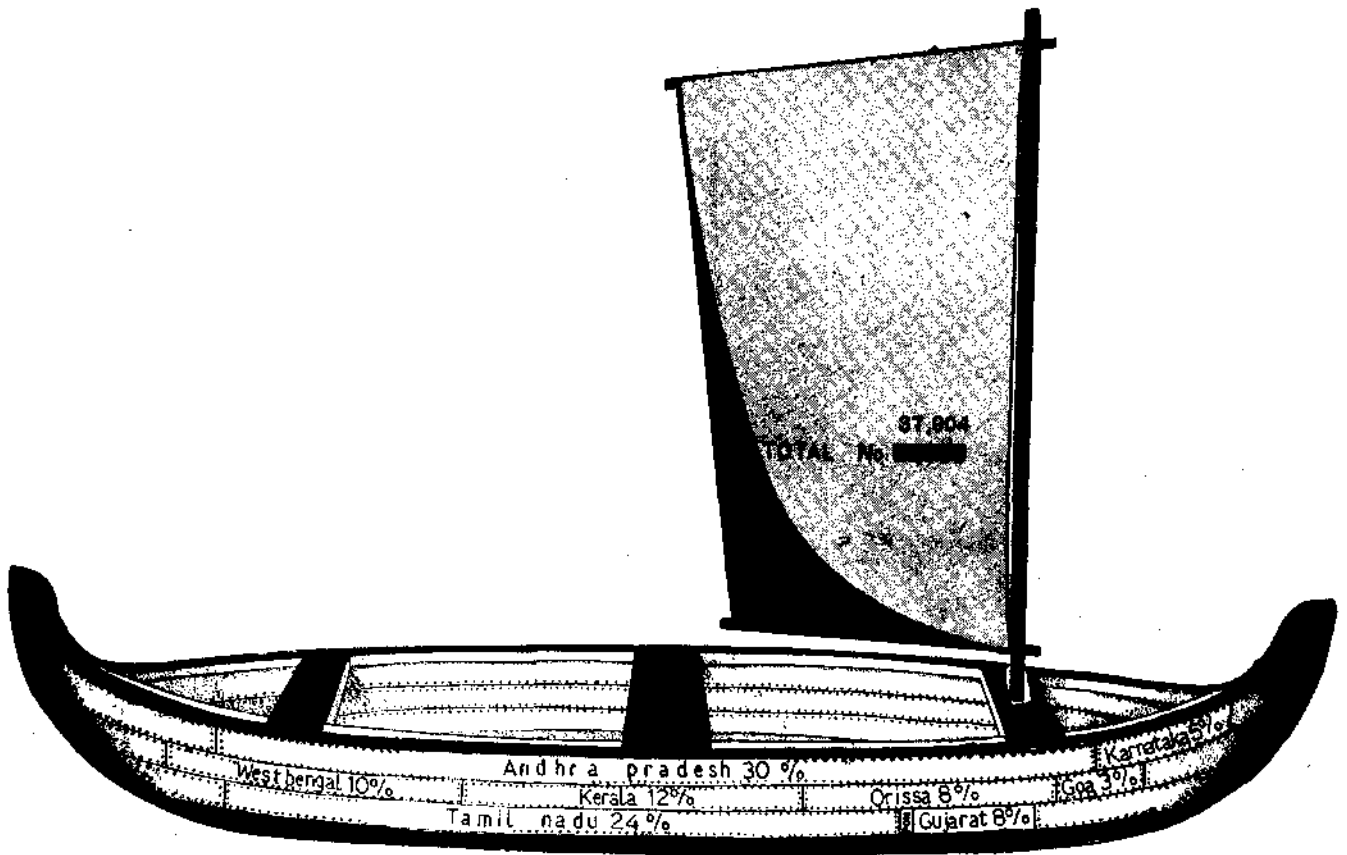


Fig. 3. Distribution of plank-built boats in maritime states

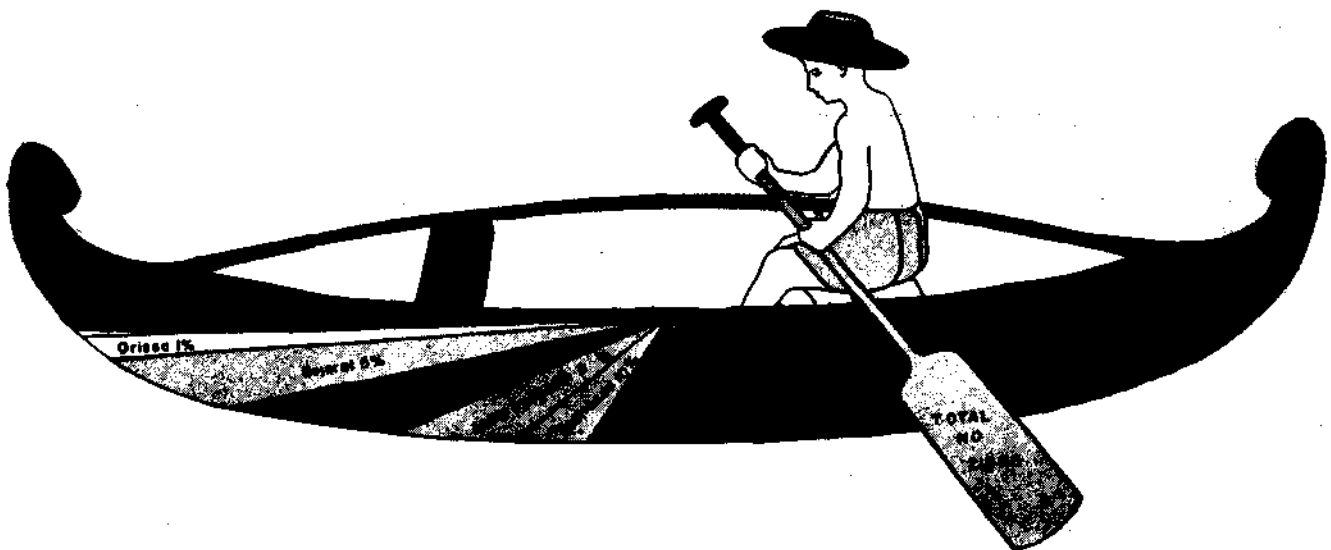


Fig. 4. Statewise distribution of dug out canoes

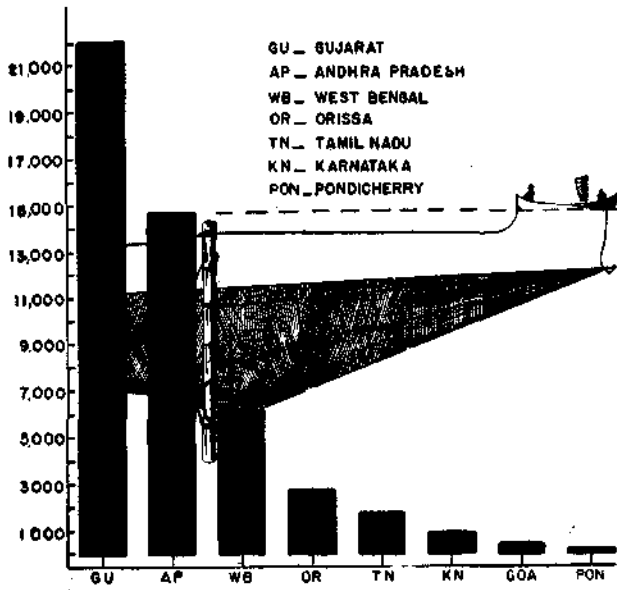


Fig. 5. Distribution of fixed bag nets in maritime states.

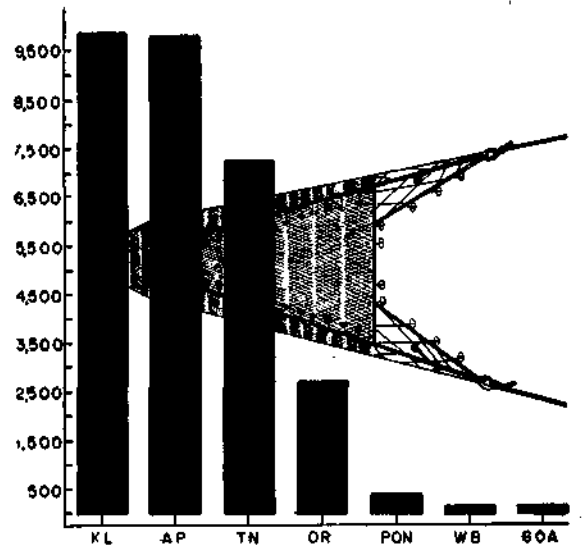


Fig. 7. Distribution of boat seines in maritime states.

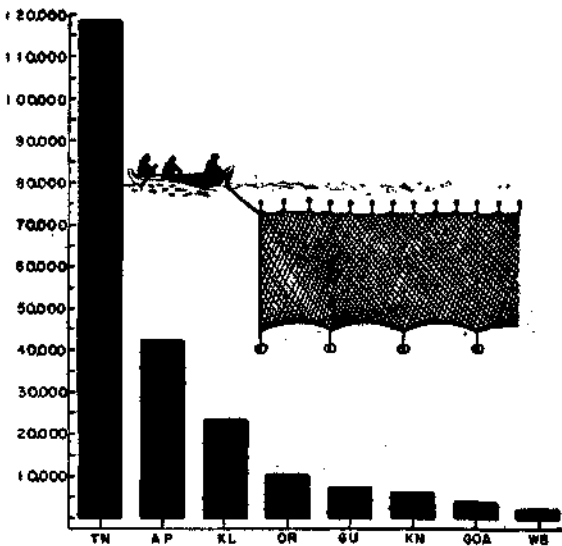


Fig. 6. Statewise distribution of drift/gill nets.

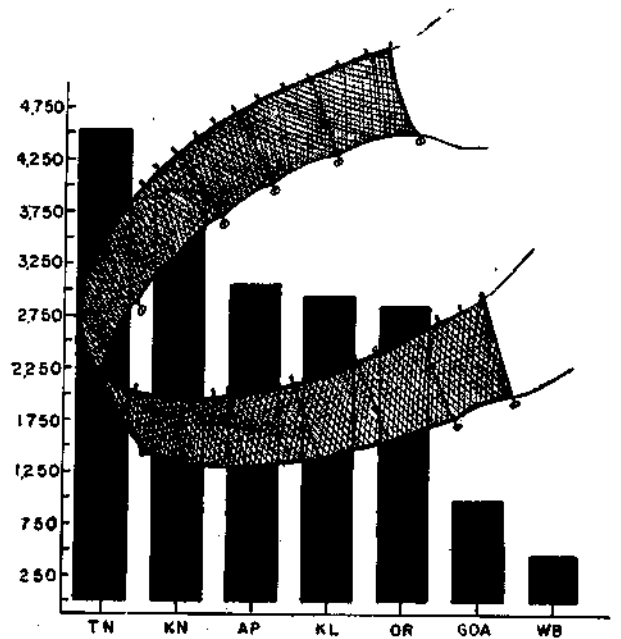


Fig. 8. Statewise distribution of shore seines.

by fishermen of which Pondicherry accounts for 57% and Karaikal 41%. Among 1,750 non-mechanised boats, catamarans contribute 91%, plank-built boats 5% and dug-out canoes 4%.

Fishing gears

There are about 440 trawl nets, Pondicherry and Karaikal having 63% and 36% respectively. Among the non-mechanised gears, drift/gillnet forms the major gear. Hooks and lines, boat seines and scoop nets are the other important gears. In Pondicherry and Karaikal region the drift/gill nets and hooks & lines form the important gears. While boat seine forms the third important gear in Pondicherry and Karaikal, it is the dominant gear in Mahe. In Yenam, however, fixed bagnets are predominant.

Kerala

The census was conducted in 8 coastal districts of Kerala viz. Trivandrum, Quilon, Alleppey, Ernakulam, Trichur, Malapuram, Kozhikode and Cannanore (Tables 13 & 14).

Fishing villages and landing centres

Of the 304 fishing villages in Kerala, the maximum number is found in Cannanore district (65) while Malapuram district has the lowest number (18). This showed an increase of 36 villages from 268 recorded in 1975 census, mostly by increase in Kozhikode and Cannanore districts. There are 222 landing centres in the state. Trivandrum district accounts for the maximum number (24%) while Malappuram district contributes to the minimum (5%).

Population

The total fishermen population in the state is about 6.4 lakhs. This is 63% more than those recorded in the previous census. Adult males and females form 33% each of the total population, children constituting 34%. The districtwise percentage distribution of the total population ranges from 8 in Ernakulam to 21 in Trivandrum. There are about 1 lakh fishermen families in the state. As in the case of population distribution, the number of fishermen households is highest in Trivandrum district (27%) and lowest in Ernakulam district (8%). In the state as a whole, average size of a fishermen family is 6.4 ranging from 5.0 in Trivandrum to 8.5 in Malappuram.

Education

Those who are literate constitute 23 per cent of the total fishermen population in the state. Out of them 81% completed primary standard, 16% secondary standard and 3% beyond secondary standard.

Fishermen engaged in actual fishing

Twenty per cent of the total fishermen population are engaged in actual fishing. 85% among them are engaged in full time fishing, 8% part time and 7% occasional.

Fishing crafts

There are about 980 mechanised fishing crafts owned by the fishermen families. 76% of these crafts come under the category of trawlers. Gill netters which constitute 22% is the next major category. The maximum number of mechanised crafts is recorded in Quilon district (37%) followed by Ernakulam (16%), Cannanore (15%) and Kozhikode (13%). In all other districts it is less than 7%. 14 crafts recorded under 'others' include liners and carrier boats.

Of the 26,000 non-mechanised crafts, catamarans form 44%, dug-out canoes 40% and plank-built boats the rest. Catamarans are found only in Trivandrum, (90%) and Quilon districts (10%). Plank-built boats are concentrated more in southern districts of Trivandrum, Quilon and Alleppey whereas dug-out canoes are comparatively more in northern districts of Trichur, Malapuram, Kozhikode and Cannanore.

Fishing gears

There are about 1,500 trawl nets owned by fishermen in the state, bulk of which is found in the districts of Quilon (41%), Cannanore (18%), Ernakulam (16%) and Kozhikode (14%). The most commonly used gear in all the districts of Kerala State is drift/gill net. Boat seine is the next important gear found in all the districts. Hooks & lines, traps and scoop nets are mainly concentrated in Trivandrum district. In all the coastal districts of Kerala except in Trivandrum, indigenous fishing operations are mainly carried out either by drift/gill net or by boat seine. But in Trivandrum district, fishing activity is more diversified with the use of various types of gears such as drift/gill nets, shore seines, boat seines, scoop nets and traps. Among the gears given under 'others', cast nets constitute a major portion.

Table 13. Districtwise figures of marine fishing villages and fishermen population—Kerala 1980

Sl. No.	Items	DISTRICTS								Total
		Trivandrum	Quilon	Alleppey	Ernakulam	Trichur	Malappuram	Kozhikode	Cannanore	
1.	No. of fishing villages	54	29	39	20	22	18	57	65	304
2.	No. of landing centres	54	33	34	13	19	12	24	33	222
3.	No. of fishermen households	26,519	12,381	15,648	7,648	8,295	8,321	11,884	9,148	99,894
4.	Fishermen population									
	Male	43,848	27,615	33,026	16,931	19,655	19,888	26,320	23,326	2,10,609
	Female	41,737	25,662	33,105	17,098	20,421	22,366	26,157	23,307	2,09,853
	Children	46,502	25,836	31,257	15,030	20,356	28,650	26,957	24,822	2,19,410
	Total	1,32,087	79,113	97,388	49,059	60,432	70,904	79,434	71,455	6,39,872
5.	Educational status									
	Primary	23,566	19,056	19,170	14,633	13,845	5,435	13,154	10,964	1,19,823
	Secondary	2,009	3,611	9,410	3,174	1,099	345	1,133	2,733	23,514
	Above secondary	900	1,258	1,181	415	397	44	364	758	5,317
	Total	26,475	23,925	29,761	18,222	15,341	5,824	14,651	14,455	1,48,654
6.	No. of fishermen engaged in actual fishing									
	Full time	20,882	12,115	19,365	7,768	10,186	12,944	16,005	12,705	1,11,970
	Part time	5,115	875	904	1,862	720	425	435	681	11,017
	Occasional	3,116	982	872	586	700	577	609	672	8,114
	TOTAL	29,113	13,972	21,141	10,216	11,606	13,946	17,049	14,058	1,31,101

Table 14. Districtwise figures of marine fishing crafts and gears—Kerala 1980

Sl. No.	Items	DISTRICTS								Total
		Trivandrum	Quilon	Alleppey	Ernakulam	Trichur	Malappuram	Kozhikode	Cannanore	
	No. of Fishing crafts									
a)	Mechanised									
	Trawlers	13	319	32	133	27	12	90	119	745
	Gill netters	18	45	8	22	34	43	34	11	215
	Purse seiners	—	—	—	—	—	—	—	9	9
	Others	—	—	1	4	—	2	—	7	14
	Total	31	364	41	159	61	57	124	146	983
b)	Non-Mechanised									
	Plank built boats	911	760	1,442	265	112	597	287	2	4,376
	Dug out canoes	1,282	680	735	1,198	1,411	1,416	1,907	1,786	10,415
	Catamarans	10,302	1,178	—	—	—	—	—	—	11,480
	Total	12,495	2,618	2,177	1,463	1,523	2,013	2,194	1,788	26,271
	No. of fishing Gears									
	Trawl nets	22	593	59	229	45	30	209	267	1,454
	Purse seines	—	—	—	—	—	—	—	9	9
	Drift/gill nets	10,236	3,764	1,635	1,620	1,787	545	1,770	1,950	23,307
	Boat seines	2,648	774	1,385	435	683	1,038	1,587	1,229	9,779
	Hooks & lines	2,133	157	130	37	60	101	163	168	2,949
	Shore seines	1,150	657	431	197	85	125	137	144	2,926
	Traps	2,195	44	—	—	—	—	—	—	2,239
	Scoop nets	1,209	33	—	74	—	43	5	7	1,371
	Others	500	69	425	740	307	—	602	118	2,761

Karnataka

Fishing villages and fish landing centres

The census was carried out in South Kanara and North Kanara, the coastal districts of Karnataka. Tables 15 & 16 give the districtwise distribution of marine fishermen population and crafts and gears.

There are 147 fishing villages spread along Karnataka coast, 77 villages in South Kanara and 70 in North Kanara. Fish landings take place in 55 landing centres in South Kanara while there are 50 centres in North Kanara district.

Table 15. Districtwise figures of marine fishing villages and fishermen population—Karnataka 1980

Sl. No.	Item	DISTRICTS		Total
		South Kanara	North Kanara	
1.	No. of fishing villages	77	70	147
2.	No. of landing centres	55	50	105
3.	No. of fishermen households	8,992	6,646	15,638
4.	<i>Fishermen population</i>			
a)	Male	20,544	12,171	32,715
b)	Female	23,070	11,818	34,888
c)	Children	27,214	18,076	45,290
	TOTAL	70,828	42,065	1,12,893
5.	<i>Educational status</i>			
a)	Primary	13,752	7,844	21,596
b)	Secondary	4,077	1,097	5,174
c)	Above secondary	1,237	316	1,553
	TOTAL	19,066	9,257	28,323
6.	<i>Fishermen engaged in actual fishing</i>			
a)	Full time	9,502	8,162	17,664
b)	Part time	4,014	1,544	5,558
c)	Occasional	975	808	1,783
	TOTAL	14,491	10,514	25,005

Table 16. District-wise figures of marine fishing crafts and gears—Karnataka 1980

Sl. No.	Item	DISTRICTS		Total
		South Kanara	North Kanara	
1.	<i>Fishing crafts</i>			
a)	<i>Mechanised</i>			
	Trawlers	454	354	808
	Purse seiners	110	63	173
	Gill netters	16	7	23
	Carrier boats	65	2	67
	Others	2	5	7
	TOTAL	647	431	1,078
b)	<i>Non mechanised</i>			
	Dug out canoes	2,225	2,229	4,454
	Plank built boats	11	1,736	1,747
	Catamarans	4	19	23
	Others	29	689	718
	TOTAL	2,269	4,673	6,942
2.	<i>Fishing Gears</i>			
	Trawl nets	945	843	1,788
	Purse seines	121	67	188
	Fixed bag net	84	857	941
	Boat seines	1	22	23
	Drift/gill net	1,130	5,441	6,571
	Hooks and lines	300	1,207	1,507
	Rampans	24	62	86
	Shore seines	2,990	934	3,924
	Others	4,470	6,455	10,925

Population

There are about 15,600 fishermen households in the state, 58% of them being in South Kanara district. There are 1.13 lakh marine fishermen population in the state, of which 63% are in South Kanara district. In the state, 60% of the population are adults, 29% males, and 31% females. In South Kanara district 29% are adult males, 33% adult females and 38% children and in North Kanara district males form 29%, females 28% and children 43%. Average size of the family in the state is 7.2.

Education

Nineteen per cent of the marine fishermen population have received education at primary level, 5% at secondary level and only 1% above secondary level.

Fishermen engaged in actual fishing

Twenty two per cent of the fishermen in the state are engaged in actual fishing activities, 16% full time, 5% part time and 1% occasional. In South Kanara district 20% are engaged in actual fishing; 13% full time, 6% part time and 1% occasional. In North Kanara 19% are engaged in full time fishing, 4% part time and 2% occasional.

Fishing crafts

There are about 800 trawlers owned by the fishermen of the State of which 56% are in South Kanara district. In South Kanara there are 110 purse-seiners owned by fishermen while in North Kanara there are 63. Apart from these, there are 67 carrier boats and 23 gill netters.

There are about 4,500 dug-out canoes in the state evenly distributed in the two districts. Out of about 1,750 plank-built boats the majority are in North Kanara district.

Fishing gears

Out of about 1,800 trawl nets in the state owned by the fishermen, 53% are possessed by fishermen of South Kanara. There are about 6,600 drift/gill nets in the state, 83% of them being in North Kanara district. Out of 86 Rampans recorded, 62 are in North Kanara and 24 in South Kanara. Among 4,000 shore seines other than Rampans, 76% are in South Kanara district.

Goa, Daman and Diu

Census was carried out in the Union Territory of Goa, Daman and Diu (Tables 17 & 18).

Table 17. Districtwise figures of marine fishing villages and fishermen population—Goa—1980

Sl. No.	Item	DISTRICT			Total
		Goa	Daman	Diu	
1.	No. of fishing villages	47	5	9	61
2.	No. of landing centres	46	5	3	54
3.	No. of fishermen households	3,380	1,057	2,288	6,725
4.	<i>Fishermen population</i>				
a)	Male	6,429	1,898	4,132	12,459
b)	Female	5,991	1,932	4,475	12,398
c)	Children	6,812	2,594	5,649	15,055
	TOTAL	19,232	6,424	14,256	39,912
5.	<i>Educational status</i>				
a)	Primary	4,302	565	2,193	7,060
b)	Secondary	1,793	65	759	2,617
c)	Above secondary	210	29	99	338
	TOTAL	6,305	659	3,051	10,015
6.	<i>Fishermen engaged in actual fishing</i>				
a)	Full time	3,678	1,041	2,122	6,841
b)	Part time	651	106	605	1,362
c)	Occasional	336	51	281	668
	TOTAL	4,665	1,198	3,008	8,871

Table 18. Districtwise figures of marine fishing crafts and gears—Goa 1980

Sl. No.	Item	DISTRICT			Total
		Goa	Daman	Diu	
1.	<i>Fishing crafts</i>				
a)	<i>Mechanised</i>				
	Trawlers	231	29	147	407
	Purse seiners	39	—	—	39
	Gill netters	46	124	43	213
	Others	—	—	—	—
	TOTAL	316	153	190	659
b)	<i>No-mechanised</i>				
	Dug out canoes	1,054	59	284	1,397
	Plank built boats	1,006	67	35	1,108
	Others	6	—	2	8
	TOTAL	2,066	126	321	2,513
2.	<i>Fishing Gears</i>				
	Trawl nets	306	44	422	772
	Purse seines	41	—	—	41
	Fixed bag nets	73	140	217	430
	Boat seines	109	—	56	165
	Drift/gill nets	2,293	641	412	3,346
	Hooks and lines	127	—	—	127
	Rampans	101	—	—	101
	Shore seines	259	—	728	987
	Others	1,597	780	436	2,813

Fishing villages and landing centres

There are 61 fishing villages in the territory, 47 in Goa, 5 in Daman and 9 in Diu. Out of 54 landing centres in the territory, 46 are in Goa, 5 in Daman and 3 in Diu.

Population

Out of 6,700 fishermen households in the territory, 50% are in Goa, 16% in Daman and 34% in Diu. The marine fishermen population in the Territory is about 40,000, 48% in Goa, 16% in Daman and 36% in Diu. Average size of the family in the territory is 5.9. Among the fishermen population in the territory 31% each are adult males and females and 38% children. The same pattern is observed in the districts also.

Education

In the territory 18% of the population have received education at primary level, 7% at secondary level and 1% above secondary level.

Fishermen engaged in actual fishing

Twentytwo per cent of the population are engaged in actual fishing; 17% full time, 3% part time and 2%

occasional. In Goa district, 24% are engaged in actual fishing; 19% full time, 3% part time and 2% occasional. 19% of the population in Daman are engaged in actual fishing; 16% full time, 2% part time and 1% occasional. In Diu district, 21% are engaged in actual fishing; 15% full time, 4% part time and 2% occasional.

Fishing crafts

Fishermen of the territory possess 407 trawlers of which 57% are in Goa district, 7% in Daman and 36% in Diu. 39 purse-seiners recorded in the territory belong to fishermen of Goa district. Out of 213 gill netters owned by the fishermen in the territory, 22% are in Goa district, 58% in Daman and 20% in Diu.

There are 2,500 non-mechanised crafts in the territory of which 55% are dug-out canoes and 44% plank built boats. 75% of the dug out canoes and 91% of the plank-built boats are in Goa district. 20% of the dug out canoes are in Diu and only 4% in Daman. 6% of the plank-built boats are in Daman and only 3% in Diu district.

Fishing gears

There are 772 trawl nets and 41 purse seines owned by the fishermen. 55% of the trawl nets are in Diu

district, 40% in Goa and 5% in Daman. All the 101 Rampans are confined to Goa. Out of 3,350 drift/gill nets, 69% are in Goa district, 19% in Daman and 12% in Diu. Shore seines other than Rampans are mostly found in Diu (74%).

Gujarat

The enumeration work in this state was carried out in two stages. In the districts except Kutch area it was conducted in June-July 1980. Since the Kutch-Bhuj district remained cut off for a long period due to heavy rains and floods, the census work in this area was put off and was taken up only in May-June 1981. The census was carried out in the districts of Valsad, Surat, Baruch, Kheda, Bhavanagar, Amreli, Junagadh, Jamnagar, Rajkot and Kutch. The details of census figures are shown in Tables 19 and 20.

Fishing villages and landing centres

There are 179 fishing villages with almost same number of landing centres. Out of the fishing villages, 29% are in Kutch, 23% in Valsad, 12% in Junagadh, 11% in Jamnagar and 8% in Surat. The rest of the districts accounts for less than 7% each. The number of landing centres also followed more or less the same pattern.

Population

The total fishermen population is about 1.5 lakh, Valsad accounting for 39%, Junagadh 28% and the remaining 8 districts less than 10% each. Of the total population, adult males and females constitute 28% each and the rest are children. There are about 23,000 fishermen households in the state. Valsad district is having the maximum number of families (39%) followed by Junagadh (26%) and Amreli (10%). Average size of a fishermen family is 6.6.

Education

Sixteen per cent of the population completed primary standard, 3% secondary standard and less than 1% continued above secondary.

Fishermen engaged in actual fishing

About 24% of the fishermen population are engaged in actual fishing. Out of these, 70% belong to full time category, 19% part time and the remaining 11% do fishing only occasionally.

Fishing crafts

There are about 2,900 mechanised boats owned by the fishermen families, nearly half of them trawlers. Gill netters constitute 42%. Mechanised boats are concentrated more in Junagadh, Valsad and Amreli coasts. These 3 districts together contribute 96% of the total mechanised boats.

There are about 4,100 non-mechanised crafts of which 74% are plank-built boats and the rest dug-out canoes. Plank built boats are recorded more in Kutch, Valsad, Jamnagar, Rajkot and Junagadh. Comparatively more number of dug out canoes are seen in Valsad, Junagadh and Amreli districts.

Fishing gears

There are about 2,700 trawl nets owned by the fishermen. Regarding non-mechanised gears, fixed bag net is the most popular one which is used in all the districts. Dol nets form the major constituent of the fixed bag nets. Valsad is having the maximum number closely followed by Surat. Junagadh and Valsad districts together contribute about 63% of the drift/gill nets. Hooks and lines are mostly operated in Surat and Valsad districts. A large number of traps (*fanse*) are found in Baruch district. These traps are small contraptions meant for capturing gobids found in the marshy exposed coast of the district.

General remarks

Among the maritime states, the maximum fishermen population is found in Kerala. The number of fishermen per km coast line is the highest in Kerala (1,143) followed by Karnataka (418), Tamil Nadu (396), Andhra Pradesh (336), Goa (261), Orissa (244), West Bengal (139) and Gujarat (125). In general among the adult population, proportion of males to females is found to be 1:1 in all the states except in West Bengal (1.2:1), Orissa (1.1:1) and Karnataka (1:1.1). The number of persons per family for the whole of India works out to 5.7. Among the states, Karnataka records the maximum (7.2), other states where the family size exceeds the all India average being Gujarat (6.6), Kerala (6.4), West Bengal and Goa (5.9 each). However, in the states of Andhra Pradesh (4.5), Tamil Nadu (5.2) and Pondicherry (5.5) the family size is less than the all India figure.

In educational status, the percentage of persons completed at least primary standard is above the all India level (19) in the states of Goa (26), Karnataka (25), Pondicherry (25), Kerala (24), West Bengal (23),

Table 19. Districtwise figures of marine fishing villages and fishermen population—Gujarat 1980

Sl. No.	Item	DISTRICTS										Total
		Valsad	Surat	Baruch	Kheda	Bhavna- gar	Amreli	Junagadh	Jamnagar	Rajkot	Kutch	
1.	No. of fishing villages	41	15	12	1	4	8	22	20	5	51	179
2.	No. of landing centres	39	15	11	1	4	7	16	21	8	51	173
3.	No. of fishermen households	9,055	1,361	926	82	197	2,233	6,105	1,157	841	1,118	23,075
4.	Fishermen population											
a)	Male	18,487	2,719	1,561	119	315	3,649	10,545	2,211	1,173	2,056	42,835
b)	Female	17,478	2,737	1,478	109	289	3,925	10,774	2,196	1,176	2,087	42,249
c)	Children	22,989	2,984	2,369	208	575	6,985	21,524	3,691	2,309	3,297	66,931
	TOTAL	58,954	8,440	5,408	436	1,179	14,559	42,843	8,098	4,658	7,440	1,52,015
5.	Educational status											
a)	Primary	13,170	2,815	285	6	79	896	6,502	67	6	75	23,901
b)	Secondary	2,158	1,052	32	—	7	147	663	1	—	7	4,067
c)	Above secondary	705	112	4	—	—	27	63	—	—	—	911
	Total	16,033	3,979	321	6	86	1,070	7,228	68	6	82	28,879
6.	No. of fishermen engaged in actual fishing											
a)	Full time	8,345	994	997	73	119	2,619	8,101	1,582	1,146	1,640	25,616
b)	Part time	1,760	445	94	9	216	130	2,731	174	1,087	195	6,841
c)	Occasional	3,332	515	51	—	1	10	94	8	—	59	4,070
	TOTAL	13,437	1,954	1,142	82	336	2,759	10,926	1,764	2,233	1,894	36,527

Table 20. Districtwise figures of marine fishing craft and gears—Gujarat, 1980

Sl. No.	Items	DISTRICTS										Total
		Valsad	Surat	Baruch	Kheda	Bhav-nagar	Amreli	Junagadh	Jamnagar	Rajkot	Kutch	
1.	No. of fishing crafts											
a)	Mechanised											
	Trawler	348	—	—	—	—	117	900	28	—	17	1,410
	Gill netter	285	3	—	—	1	93	790	51	—	2	1,225
	Dol netter	99	—	—	—	—	51	91	—	—	—	241
	Others	18	—	—	—	—	—	—	—	—	—	18
	Total	750	3	—	—	1	261	1,781	79	—	19	2,894
b)	Non-mechanised											
	Plank built boats	658	136	160	—	—	90	233	586	504	673	3,040
	Dug out canoe	442	—	56	—	7	172	304	40	—	59	1,080
	TOTAL	1,100	136	216	—	7	262	537	626	504	732	4,120
2.	No. of fishing gears											
	Trawl net	614	—	—	—	—	222	1,760	51	—	25	2,672
	Drift/gill nets	2,253	464	313	3	25	448	2,427	562	575	313	7,383
	Fixed bagnets	5,177	4,964	2,375	—	120	688	1,066	13	4,121	3,333	21,857
	Hooks & lines	662	1,131	260	40	38	—	226	13	—	6	2,376
	Traps	729	673	85,550	—	—	—	—	—	—	—	86,952
	Others	12,157	1,882	804	35	742	597	2,045	3,716	2,973	3,062	28,013

Gujarat (20) and Tamil Nadu (19). But in Orissa (10) and Andhra Pradesh (8) the percentage was far below the all India level.

The percentage of fishermen (around 23) engaged in actual fishing is more or less the same in all the states. Among them, the percentage of fishermen engaged in full time fishing ranges from about 70 to 90 in all the states except in West Bengal (47). This can be attributed to a sizeable number of them having fishing as seasonal occupation.

The maximum number of landing centres per 100 km of coast line is noticed in Kerala (40) followed by Karnataka (39), Andhra Pradesh (39) and Tamil Nadu (38). But in the states of Gujarat (14), Orissa (12) and West Bengal (9) the number is considerably low.

The total number of mechanised boats in the country is about 19,000 (Table 21). Excluding Maharashtra, Andamans and Lakshadweep the total number of mechanised boats is about 14,000 of which 68% are trawlers and 23% gill netters. The maximum number of mechanised boats is found in Gujarat (24%) followed by Kerala (22%), Tamil Nadu (20%), Karnataka (14%) and the remaining 5 states having less than 6% each. The total number of trawlers in Kerala and Tamil Nadu accounts for 27% each followed by Karnataka (16%), Gujarat (13%) and the remaining 5 states having less than 5% each. Most of the purse-seiners are found

in Karnataka. Of the 14,000 mechanised boats, 66% are owned by the fishermen mostly on share basis.

Out of about 38,000 plank built boats, 30% are found in Andhra Pradesh, 24% in Tamil Nadu, 12% in Kerala and 10% in West Bengal. In the remaining five states they constitute less than 10% each. In the case of catamarans Tamil Nadu (43%) leads followed by Andhra Pradesh (30%) and Kerala (16%). Kerala ranks first with 48% of total dug-out canoes, Karnataka coming second (21%) followed by Tamil Nadu (10%) and Andhra Pradesh (8%).

Out of 2.16 lakh drift/gill nets, Tamil Nadu accounts for 55%, Andhra Pradesh 20%, Kerala 11% and the other six states less than 5% each. As regards 49,000 fixed bag nets, Gujarat has 45%, Andhra Pradesh 30% and West Bengal 13%. Almost 90% of total number of boat seines are found in the states of Kerala (33%), Andhra Pradesh (33%) and Tamil Nadu (24%).

The enormous number of fishermen engaged in actual fishing and the extent of crafts and gears employed by them as indicated by the present census would indicate the magnitude of the fishing activities in the marine sector in the country. It is hoped that this enumeration will be helpful in viewing the activities of this sector in the proper perspective for future planning and development.

Table 21. *Statewise number of mechanised boats which are in operation in India*

Sl. No.	State	Trawlers	Gill netters	Purse seiners	Dol netters	Others	Total
1.	West Bengal	—	740	—	—	—	740
2.	Orissa	350	119	—	—	—	469
3.	Andhra Pradesh	580	—	—	—	—	580
4.	Tamil Nadu	2,614	143	—	—	—	2,757
5.	Pondicherry	160	3	—	—	—	163
6.	Kerala	2,630	362	37	—	9	3,038
7.	Karnataka	1,553	28	325	—	98	2,004
8.	Goa	494	274	66	—	74	908
9.	Gujarat	1,209	1,547	—	650	7	3,413
Total (Excluding Maharashtra, Andamans & Lakshadweep)		9,590	3,216	428	650	188	14,072
Andamans*							10
Lakshadweep*							213
Maharashtra*							4,718
ALL INDIA							19,013

* Source: Indian Fisheries—1947-77.

APPENDIX

List of scientific and technical staff of C.M.R.F.I. who participated in the census programme.

1. Fishery Resources Assessment Division

Shri T. Jacob, Scientist S.3	Shri T. Girijavallabhan, Technical Assistant T.II.3
„ G. Venkataraman „	„ K. Soman „
Dr. K. Alagaraja, Scientist S.2	„ S. B. Chandrangathan „
Shri S. K. Dharma Raja „	„ P. K. Mahadevan Pillai „
„ K. Narayana Kurup, Scientist S.1	„ P. Karunakaran Nair „
„ K. Balan „	„ K. C. Yohannan „
„ K.K.P. Panikkar „	„ A. Ganapathy, Technical Assistant T.I.3
„ R. Sathiadas „	„ K. Thulasidas „
„ M. Srinath „	„ Sapan Kumar Ghosh, Jr. Technical Assistant T.2
Mrs. K. Vijayalakshmi, Scientist S	„ K. Dhanaraju „
Shri C. R. Shanmughavelu, Field Officer T.7	„ K. Ramasomayajulu „
„ Syed Basheeruddin „	„ T. Chandrasekhara Rao „
„ S. S. Dan, Field Officer T.6	„ H. Kather Batcha „
„ G. Balakrishnan „	„ L. Chidambaram „
„ U. K. Satyavan, Senior Technical Assistant T.4	„ A. Srinivasan „
„ Varghese Philipose „	„ C. Kasinathan „
„ Varghese Jacob, Computer T.II.3	„ S. Russel Conrad Samuel „
„ G. Krishnankutty Nair „	„ Joseph Andrews „
„ P. Sivaraman „	„ V. Sivaswamy „
„ V. Rajendran „	„ T. S. Balasubramanian „
Smt. V. P. Annam „	„ J. L. Oza „
Shri. A. Kanakkan, Computer T.I.3	„ Y. D. Savaria „
„ S. Haja Najumudeen, Computer T.2	„ K. B. Waggmare „
„ C. J. Prasad „	„ V. Thanapathi „
Smt. P. L. Ammini „	„ S. Subramani „
„ K. Santhakumari „	„ O. M. J. Habeeb Mohamed „
Shri C. V. Seshagiri Rao, Technical Assistant T.II.3	„ N. Palanisamy „
„ K. V. S. Seshagiri Rao „	„ Hameed Batcha „
„ P. Ananda Rao „	„ V. Achutha Rao, Field Assistant T.1
„ G. C. Lakshmaiah „	„ M. Radhakrishnan „
„ A. Hanumantha Rao „	„ S. Satya Rao „
„ M. Mohamed Sultan „	„ M. Bose „
„ S. Manivasagam „	„ S. Sankaralingam „
„ K. S. Krishnan „	„ P. Palani „
„ R. Gurusamy „	„ V. S. Gopal „
„ N. Retnasamy „	„ Ahamed Kamal Basha „
„ I. P. Ebenezer „	„ S. Mahadevasamy „
„ K. Ramakrishnan Nair „	„ N. Chennappa Gowda „
„ Jacob Jerold Joel „	„ T. Krishnan Kutty „
„ R. Bhaskaran Achari „	„ K. Chandran „
„ T. G. Vijaya Warriar „	„ N. Narayana „
„ M. Babu Philip „	„ P. M. Dalwadi „
„ C. K. Krishnan „	„ M. Chellappa „
„ A. A. Thankappan „	„ J. Krishna Babu „
	„ M. Chandrasekhar „
	„ N. Varatharajan „

Shri R. Somu Field Assistant T.1
 „ B. Sreedhara „
 „ Y. V. Venkatachalamurthy „
 „ S. S. Sugwekkar „
 „ M. Padmasekhara „

2. Fishery Biology Division

Dr. P. S. B. R. James, Joint Director
 „ B. Krishnamoorthi, Scientist S.3
 Shri M. H. Dhulkhed, Scientist S.2
 Dr. G. Luther „
 „ M. Vasudev Pai „
 Shri A. Noble „
 „ V. N. Bande „
 Dr. T. Appa Rao Scientist S.1
 Shri S. Reuban „
 Dr. E. Vivekanandan „
 „ H. Mohamed Kasim „
 Shri K. M. S. Ameer Hamsa „
 „ V. Gandhi „
 „ A. Raju „
 „ S. K. Chakraborty „
 Dr. N. Gopinatha Menon „
 Shri Mohamed Zafarkhan, Scientist S
 „ J. P. Karbhari, Field Officer T.6
 „ M. V. Somaraju, Technical Assistant T.II.3
 „ K. Nandakumaran „
 „ P. Ramadoss „
 „ S. G. Vincent „
 „ P. Ramalingam „
 „ S. Chandrasekhar, Field Assistant T.1
 „ K. Narayana Rao „
 „ H. K. Dhokia „
 „ S. Kemparaju „
 „ T. Mohamed Iqbal „
 „ G. Krishnaiah „

3. Crustacean Fishery Division

Dr. S. Ramamoorthy, Scientist S.3
 Shri M. Mydeen Kunju, Scientist S.2
 „ V. D. Deshmukh, Scientist S.1
 „ G. Sudhakara Rao „

Shri K. Devarajan Scientist S.1
 „ E. V. Radhakrishnan „
 „ K. N. Rajan „
 „ W. Venugopalam, Senior Technical Assistant T.4
 „ V. Suresh, Technical Assistant T.II.3
 „ J. Bhuvaneshwara Varma, Field Assistant T.1
 „ Arun Jeshwant Maistry „
 „ B. P. Thumber „
 „ C. K. Dinesh „

4. Molluscan Fishery Division

Shri K. Nagappan Nair, Scientist S.3
 „ K. A. Narasimham, Scientist S.2
 Dr. K. Satyanarayana Rao „
 Shri P. V. Srinivasan, Scientist S.1
 Dr. N. Ramachandran „
 Shri K. Ramadoss „
 „ Kuber Vidyasagar „
 „ G. Syda Rao „
 „ G. Radhakrishnan, Scientist S
 „ B. Narayana Rao, Junior Technical Assistant T.2
 „ K. T. Thomas, Field Assistant T.1
 „ M. P. Sivadasan „

5. Fishery Environment Division

Shri T. Tholasilingam, Scientist S.3
 „ G. Subbaraju, Scientist S.2
 Dr. K. Radhakrishna, Scientist S.2
 Shri S. Muthusamy Scientist S.1
 „ S. Krishna Pillai „
 „ M. Rajagopalan „
 „ C. V. Mathew, Scientist S
 „ P. Mojumdar, Field Officer T.7
 „ G. M. Kulkarni, Senior Technical Assistant T.4
 „ K. Ramachandran Nair, Technical Assistant T.II.3
 „ K. P. Viswanathan, Junior Technical Assistant T.2
 „ J. R. Ramalingam „
 „ M. Najumuddin „
 „ P. M. Aboobacker „
 „ C. H. Ellithathayya, Field Assistant T.1
 „ P. D. Solanki „



BOOKS

The Chemical biology of fishes: Volume 2. By R. Malcolm Love, Academic Press, London, pp 944, 1980.

This book is a continuation of the survey begun in Volume 1 on the Chemical biology of fishes published in 1970. Factors which influence the chemical composition of fish are reviewed and a lengthy key to the chemical literature is included so that papers giving the concentration of specific substances in different organs of many species of fish can be identified at a glance.

The two volumes are designed to be used together. As biologists are tending to use a more biochemical approach and biochemists are becoming more interested in fish, the overall approach is now more biochemical. Distinctions are drawn between the biochemistry of fish and that of warm-blooded animals. The final chapter considers how the biologist can use chemistry as a tool to assess the biological condition of fish and their potential as food for man, making it quite novel. While some suggested methods are speculative, a number of new approaches emerge and these should stimulate advances in the field of fish biology. The book will be of considerable interest to fisheries research laboratories, biology and biochemistry departments, fish culture establishments and commercial fish farms.

Tuna fishing with pole and line: Edited by M. Ben-Yami Fishing News Books Ltd., England, pp. 150, 1980.

This manual attempts to provide information and advice to those fishermen, fishing technologists, fishing instructors and extension workers for whom such pole and line fishing is new, as well as for those who wish to improve their present techniques. It is well illustrated covering the chapters viz vessels, live-bait fishing techniques, handling and transport of live-bait, tuna fishing gear and auxiliary equipment, fishing operation and handling fish on board.

Fish population dynamics: By George V. Nikolskii. Translated by Dr. J.E.S. Bradley, Ed. by R. Jones. Bishen Singh Mahendra Pal Singh, Dehra Dun and Otto Koeltz Science Publishers, Koenigstein (W. Germany), pp. 323, 1980.

This is the English translation of the Russian book. The book starts with a brief introduction followed by a discussion of the main process that influence fish population dynamics: Food supply, breeding, development and growth, natural and fishing mortality. It has a chapter on biological principles of the mathematics of fish population dynamics. The last two chapters deals with some of the practical conclusions that emerge from the study of population dynamics as regards forecasting catches and raising the productivity of commercial fish populations. Finally the author presents some views on future problems as regarding the theory of fish population dynamics.

Diseases of Marine Animals: Vol. I: General aspects—Protozoa to Gastropoda: Edited by Otto Kinne. John Wiley & Sons, New York. pp. 466, 1980.

This is the first volume of the series. The book reviews comprehensively and critically all essential information available to date on the biotic diseases, proliferative disorders and structural abnormalities of marine animals. This book corrects numerous misquotations which have found their way into the scientific literature over the years. Topical emphasis is placed on a detailed documentation of the types and causes of the diseases of marine animals (from the protozoa via the Invertebrate to the Aves and Mammalia), the significance of diseases as an ecological and evolutionary phenomenon and the importance of disease for organismic performance, with a special view on experimental ecology and aquaculture.

