CHANGING PATTERN OF PRAWN PRODUCTION IN SMALL-SCALE FISHERIES OF INDIA

by

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Abstract

Almost the entire production of prawns in the country from the different regions may be included in the small-scale fisheries sector, only a small percentage being contributed by the large trawlers. The trends in overall production of prawns in this sector over the past two decades would indicate that there has been an increase in production of nearly 125 percent. It is quite evident that this has been brought about as a result of the change in pattern of the fishery by the introduction of trawl nets operated by small mechanized vessels; the present indications are that further increase in effort by small mechanized vessels in the existing fishing grounds in the inshore regions may not bring any substantial increase in production of prawns.

Gear and region analysis of the 1978 catch is presented along with suitable illustrations. Major gears operated for exploiting prawns are fixed bagnets, boat seines, shore seines and gillnets operated by both mechanized and non-mechanized country crafts, and trawl nets operated by small vessels up to 13 m. While fixed bagnets are in operation mostly in the northern region of both west and east coasts, the seine nets are widely used in the southern part of the west coast and all along the east coast. Gillnets made of synthetic twine are increasingly introduced in all areas in the prawn fishery of the inshore regions for catching large sized prawns. Trawls are in operation in all areas with maximum production from the south-west coast. On the whole, the trawl nets and fixed bagnets contribute to the maximum landings of prawns, the former catching mostly penaeid prawns and the latter non-penaeids.

CONTENTS

1. INTRODUCTION

World fisheries statistics show that India has reached the top rank in prawn production in 1973 and ever since this is being maintained. During the past 25 years, the country's export earnings through marine products, mostly contributed by prawn products has increased considerably. While there are many reasons that could be attributed to the magnificent improvement in all India prawn catches, the change in pattern of the prawn fishery in the small-scale fisheries sector from the indigenous to the mechanized is undoubtedly significant. Thus, the small-scale fisheries, most of which is rural based, play a very important role in the overall prawn production. Almost the entire production of prawns from the different regions may be included in the small-scale sector, only a small percentage being contributed by the large trawlers. In a total marine fish production of 1.4 million tons 0.18 million tons of prawns have been landed by this sector in 1978. Synoptic pictures covering both regional production as well as biological aspects of the fishery for the first three quarters of 1978 have been published in CMFRI (1978a, 1978b, 1979). An attempt is made in this contribution to examine the overall production of prawns in the small-scale sector during 1978 with reference to the indigenous and mechanized gears employed and the problems encountered in the changing fishing patterns.

2. TREND IN PRODUCTION

The marine prawn production during 1978 was estimated at 179 856 tons. Out of this, about 1 119 tons were landed by the larger trawlers. So the total production in the small-scale sector was 178 737 tons. An examination of the trend in production of prawns over the past ten years (Fig. 1) shows a steady increase from 1969 to 1973, reaching above 200 000 tons. After 1973, there was a slight reduction (in 1974) and reached the maximum of 220 000 tons in 1975. Thereafter, there was again a reduction in the subsequent years, although the year 1978 showed an increase over the production of the preceding year. The trend in overall production over the past two decades indicates an increase of nearly 125 percent (George, 1978). The annual average prawn landings for the past ten years works out to 167 663 tons (Table 1). The general increase in the production is mostly brought about by increased effort resulting from the change-over to shrimp trawling in several areas along the coastline. In some areas of prawn exploitation, the increasing use of gillnets is bringing in more catches of the bigger sized exportable varieties.

Over 85 percent of the entire prawn production is from the west coast, mostly landed in Maharashtra and Kerala coasts. The prawn catches consist of both penaeid and non-penaeid prawns. A study of the data for the past decade shows that on an average 62.4 percent (104 594 tons) of the entire production was contributed by penaeid prawns and the rest 37.6 percent (63 069 tons by non-penaeid prawns (Tables 2 and 3). The major portion of the total production being penaeid prawns, more or less the same trend in production over the years as that of the total production was noticed in the case of these prawns,

the increasing trend leading to the maximum production in 1975 and thereafter slight reduction. In the case of non-penaeid prawns the maximum was in 1972 (Fig. 1). Comparison of statewise production of the two different varieties of prawns over the past ten years is possible from Tables 1 to 3.

A regional study of the data on production along with the data on the effort expended in the different areas shows that there is steady increase of total effort put into the exploited fishery (Silas et al., 1976) over the years, coupled with an increase in production in most of the areas. However, in areas like the Kerala coast, while the effort is increasing, there is decline in the catch from the highest figure reached in 1975. To a certain extent, a similar trend of catch and effort relationship is seen on the Karnataka coast. So in these areas, it seems that it may not be possible to increase the catch with an increase in effort. In other words, the additional yield from further increases in fishing in the existing fishing grounds will only be marginal, with decrease of return per unit effort.

3. PATTERN OF PRAWN FISHERY IN 1978

Composition

The prawn fishery during 1978, although not reaching the maximum level recorded in the years 1973 and 1975, was better than that of 1977. The catch as usual is composed of penaeid and non-penaeid prawns. Along the Maharashtra coast, landing the maximum catch among the maritime states, the major portion is contributed by non-penaeid prawns, the most important species of which are Palaemon tenuipes, Acetes indicus and Hippolysmata ensirostris. However, in 1978 a noticeable change in the pattern of species composition in the fishery is that the contribution of penaeid prawns in the fishery has increased considerably, reaching 48 percent. In Andhra Pradesh and Gujarat, these non-penaeid prawns also form part of the fishery. In Kerala and other states, the penaeid prawns, which are in greater demand from the industry, predominate in the landings, the dominant species being Metapenaeus dobsoni, M. affinis, M. monoceros, M. brevicornis, Parapenaeopsis stylifera, Penaeus indicus, P. merguiensis, P. semisulcatus and P. monodon.

Statewise production

The statewise penaeid and non-penaeid prawn landings (Tables 4-6 and Fig. 1) show that in the overall catch, penaeid prawns accounted for 72 percent and non-penaeids 28 percent, the increased contribution of penaeid prawns coming from Maharashtra state. The maximum production period of penaeid prawns for the year was during July-September and December and this was mainly due to their peak landings in Kerala, Tamil Nadu and Andhra Pradesh during the former season and in Gujarat and Maharashtra during the latter. In Karnataka the highest catch was registered during January. The non-penaeid prawns dominated in the fishery in Maharashtra (51.9%) and West Bengal (52.3%) with peak catches during May and December in the two states, respectively.

Monthwise production

The total monthly landings of prawns (Table 4) showed a steady increasing trend from January to May. In June, there was a sudden decline and the catch figure went up to the maximum of 22 912 tons in July. In all the maritime states on the northwest and northeast coasts, the prawn production was relatively poor throughout the southwest monsoon period, the catch improving considerably in later months. In Maharashtra state, there were two peaks in the fishery, one in May and the other in October to December. January was the most productive month in Karnataka. In Kerala, the fishery showed improvement during the second and third quarters of the year, but remaining at a low level during the post monsoon period when normally the catches are good. A unique feature noticed in this part of the coast was that when the fishing activities remained very weak in most of the areas of the west coast, due to the monsoon, the prawn production from here was the highest during July to August. This was mostly due to the intensive exploitation by trawl nets off Quilon area. Along the east coast the prawn landings, on the whole, were better. Except for the low catch in April to May and November to December, comparatively higher landings were maintained in most of the months in Tamil Nadu and Andhra Pradesh with peak in September.

Gearwise production

Major gears in operation for exploiting prawns are fixed bagnets, boat seines, shore seines and gillnets operated by both mechanized and non-mechanized country crafts and trawl nets operated by small mechanized vessels up to 13 m length. While fixed bagnets are mostly operated in the northern region of the west and east coasts, the seine nets are widely used in the southern regions of the west coast and all along the east coast. Gillnets made of synthetic twine are increasingly introduced in all areas in the prawn fishery of the inshore regions for catching large sized prawns. Trawl nets are in operation in all areas. The important gears operated in the small-scale prawn fishery in different areas along with their local vernacular names are given in Table 7. In addition to the main gears cast nets, drag nets and dip nets are also used in certain areas in the inshore prawn fishery to a limited extent. The gear analysis of the prawn landings during 1978 (Table 8) indicates that on the whole, the trawl nets and fixed bagnets contribute to the maximum landings of prawns, the former catching mostly penaeid prawns and the latter non-penaeids (Table 9).

Seine nets

Both the shore seines and the boat seines together landed 12 294 tons (6.9%) of the total prawn production of 178 737 tons (Table 9). The density of prawn landings along the different areas of the coastline of India is depicted in Fig. 2. The maximum production by seine nets is found along Kerala coast and Andhra Pradesh. In the northern maritime states like Gujarat, Maharashtra, West Bengal and Orissa, there is very little production of prawns by seines, especially in the northwestern states.

Fixed bagnets

The fixed bagnets are the stake nets and dhol nets of different types which contribute to 66 242 tons (37.1%) of the total prawn landings (Table 9). The major portion of the production by fixed bagnets is from the Maharashtra coast (Fig. 3) and the catches mainly consist of non-penaeid prawns. These nets are in operation only along the northeast and northwest coasts. In Andhra Pradesh, fixed nets are also operated to a limited extent.

Gillnets

The gillnets are being increasingly used in several areas for catching the larger sized prawns which are in great demand from the industry. Gillnets of different synthetic twines and silk nets are in use in different areas. The production of prawns by gillnets amount to 3.9 percent (Table 9). The Tamil Nadu and Maharashtra coasts produce the maximum quantity of prawns by gillnets (Fig. 4). In the changing pattern of prawn fishery in the country, the gillnets are becoming important.

Trawl nets

In the small-scale prawn fishery of India, the introduction of shrimp trawls over the past two decades has brought phenomenal increase in production. The trawl nets operated by the smaller type of mechanized vessels up to 13 m length may be included in the small-scale sector. In the total production of 178 737 tons 51.2 percent (91 419 tons) is produced by the trawl nets. The density of trawl net landings of prawns in the different areas of the coast (Fig. 5) shows that the central zones of the Kerala coast produce the most. The area next in abundance is the Maharashtra coast. Most of the other areas also produce average quantities by the operation of trawls. Monthwise production of prawns by the different gears are also shown in Fig. 2 to 5.

PROBLEMS IN THE SMALL-SCALE PRAWN FISHERIES

The yield of prawns in the exploited fishery of all regions shows wide fluctuation. Multispecies co-exist in the fishing grounds in all regions, but the combinations of the species differ in different areas, as do the variations in abundance. These features, together with their exploitation in the estuaries and backwaters in the juvenile stages, make the dynamics of the fishery, particularly of penaeid prawns, more complex. In the case of the penaeid prawns, as a result of their peculiar life history characterized by a period of more or less predictable length which is passed in an estuarine or brackishwater environment, the impact of the extensive backwater fishery of the juveniles by stake nets and other gears on the inshore fishery should be of great concern. The prawn landings from the inshore waters as well as from the adjoining estuarine region at a few selected centres shown in Table 10 would indicate the extent of exploitation of the juvenile population of the prawns which form the fishery in the inside waters. In view of the inseparable link between these prawns and brackishwater environments, regulating the inside fishery for the small juveniles is one of the steps which should be considered for improvement of marine fishery.

With the introduction of more and more mechanized fishing vessels into the capture fishery for prawns, certain clashes of interest between fishermen operating mechanized boats and those operating indigenous craft and gear are taking place. In some areas, this has even resulted in violence leading to the closure of fishing operations. In order to solve this problem, it may become necessary to delineate areas of operation for the different types of craft and gear. A proper delineation of this nature would be possible only when detailed data of the seasonal, geographic and bathymetric distribution of the component species of the fishery are available. To a large extent, such data are being collected and processed for dissemination to the industry in the resources assessment projects of work undertaken by the Institute.

5. CONCLUSION

During the past decade and a half, there has been concern about depletionary tendencies of prawn resources in specific areas along the coast voiced by some quarters in the fishing industry as well as other agencies. Although this is mostly concerned with the increasing number of smaller sized prawns in the commercial catches as a result of the continued fishing in proven grounds as against earlier fishing in virgin grounds, in most of the areas wide annual fluctuations are noticed along with consequent decrease in catch per unit effort. As the fishery is largely dependent on the population which is replenished every season by the surviving spawners and the subsequent recruitment of fresh broods into the fishable stock, it is quite apparent that the fluctuations in the fishery are greatly caused by these biological features. However, in areas like the inshore regions of the southwest coast, increasing intensive input of effort in limited fishing grounds is indicating that it may not be possible to increase the catch substantially by the increase of effort, but it may lead to decrease of return per unit effort. The changing patterns in the fishery have also been associated with smaller sized species like Metapenaeus dobsoni and Parapenaeopsis stylifera occurring as major components in the fishery of different areas while the larger sized species such as Penaeus monodon and Penaeus indicus showing fluctuations.

With all these considerations in mind, it may be necessary to create regulatory measures which would safeguard judicious exploitation of these resources. The estuarine and brackishwater environments which form nursery grounds for the young prawns could be protected. Fishing operations could be limited to certain seasons. Mesh sizes of the gears in operation could be regulated. Since the composition of the catch is so varied, and the breeding season so long, some regulatory measures, such as closed seasons in some areas, catch quotas, etc. may not be possible. However, protection and conservation of the breeding areas would go a long way in improving the catches from the marine sector.

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Table 1. Total prawn landings over 10 year period (1969-1978)

Maritime States	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Annual Average	State-wise %
West Bengal & Orissa	5 638	3 016	1 500	1 471	3 051	3 487	5 707	5 635	1 690	3 879	3 507.4	2.1
Andhra	6 064	6 890	9 205	5 582	8 839	12 699	10 675	11 108	11 375	9 563	9 200.0	5.5
Tamil Nadu	5 814	5 264	3 699	5 033	5 789	8 106	12 033	9 033	8 356	13 912	7 703.9	4.6
Pondicherry	614	447	290	182	41	29	64	93	105	316	218.1	0.1
Kerala	34 368	36 954	32 813	36 577	85 751	60 829	77 962	34 533	40 324	45 428	48 553.9	29.0
Karnataka	3 980	7 539	4 420	8 075	8 236	12 696	3 074	2 594	3 335	8 440	6 238.9	3.7
Goa	559	627	279	561	785	1 448	1 762	4 643	1 460	1 673	1 379.7	0.8
Maharashtra	45 780	57 345	93 611	104 125	80 349	64 737	93 665	104 474	93 653	85 346	82 308.5	49.1
Gujarat	3 273	3 599	3 014	2 231	10 620	6 119	15 781	19 275	10 121	11 034	8 506.7	5.1
Andamans	8	10	12	12	8	28	28	39	45	265	45.5	0.0
All India Total	106 098	121 691	148 843	163 849	203 469	170 178	220 751	191 427	170 464	179 856	167 662.6	

Table 2. Penaeid prawn landings over 10 year period (1969-1978)

Maritime States	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Annual Average	State-wise %
West Bengal & Orissa	5 638	2 994	1 414	1 471	2 565	2 322	2 920	2 827	1 404	3 204	2 675.9	2.6
Andhra	4 307	5 004	8 917	5 145	8 170	9 857	7 152	8 833	6 266	8 031	7 168.2	6.9
Tamil Nadu	5 526	4 724	3 637	4 885	4 504	8 060	11 460	8 864	8 197	13 327	7 318.4	7.0
Pondicherry	614	447	289	177	33	27	62	93	103	245	209.0	0.2
Kerala	34 334	36 940	31 294	35 866	84 770	59 815	77 207	34 478	40 150	45 034	47 988.8	45.9
Karnataka	3 980	7 538	4 420	8 058	8 235	12 695	3 074	2 594	3 335	8 422	6 235.1	6.0
Goa	559	627	279	561	785	1 448	1 762	4 643	1 436	1 647	1 374.7	1.3
Maharashtra	14 545	28 920	18 974	20 173	16 894	14 712	24 653	40 772	26 675	41 091	24 740.9	23.6
Gujarat	2 622	2 653	2 873	2 013	10 550	5 970	13 395	11 497	8 861	7 938	6 837.2	6.5
Andamans	8	10	12	12	8	28	28	39	45	265	45.5	0.0
All India Total	72 133	89 857	72 109	78 361	136 514	114 934	141 713	114 640	96 472	129 204	104 593.7	

Table 3. Non-penaeid prawn landings over 10 year period (1969-1978)

Maritime States	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Annual Average	State-wise %
West Bengal & Orissa	-	22	86	-	486	1 165	2 787	2 808	286	675	831.5	1.3
Andhra	1 757	1 886	288	437	669	2 842	3 523	2 275	5 109	1 532	2 031.8	3.3
Tamil Nadu	288	540	62	148	1 285	46	573	169	159	585	385.5	0.6
Pondicherry	-	-	1	5	8	2	2	-	2	71	9.1	0.0
Kerala	34	14	1 519	711	981	1 014	755	55	174	394	565.1	0.9
Karnataka	-	1	-	17	1	1	-	-	-	18	3.8	0.0
Goa	-	-	-	-	-	-	-	-	24	26	5.0	0.0
Maharashtra	31 235	28 425	74 637	83 952	63 455	50 025	69 012	63 702	66 978	44 255	57 567.6	91.3
Gujarat	651	946	141	218	70	149	2 386	7 778	1 260	3 096	1 669.5	2.6
Andamans	-	-	-	-	-	-	-	-	-	-	-	-
All India Total	33 965	31 834	76 734	85 488	66 955	55 244	79 038	76 787	73 992	50 652	63 068.9	

Table 4. Monthly prawn landings in different maritime states during 1978

Maritime States	Prawn catch in tons													
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total for 1978	Total for 1977
Gujarat (excluding Kutch)	817	285	293	458	492	37	40	56	493	2 034	1 051	4 091	10 147	10 121
Kutch	-	-	-	-	-	-	-	-	-	-	-	-	887	
Maharashtra	4 824	7 929	4 764	6 931	15 624	684	3 207	2 755	5 022	11 997	8 203	13 406	85 346	93 653
Goa	121	90	292	208	166	13	2	36	109	24	220	392	1 673	1 460
Karnataka	2 223	797	497	1 812	235	99	42	1 884	254	4	148	444	8 440*	3 335
Kerala	895	814	3 484	1 624	4 468	5 653	17 213	7 146	3 130	107	287	604	45 428*	40 324
Tamil Nadu	1 465	1 235	1 028	882	481	1 110	1 287	1 530	2 580	1 166	463	685	13 912	8 356
Pondicherry	1	62	15	47	36	97	13	15	5	6	2	17	316	105
Andhra Pradesh	455	483	536	216	219	382	1 014	1 473	2 984	1 121	526	154	9 563	11 375
Orissa	375	293	248	349	34	31	91	68	339	325	348	110	2 611	819
West Bengal	34	167	28	8	24	44	-	-	18	4	128	812	1 268*	871
Andamans	5	4	3	3	4	3	3	2	3	2	3	3	365**	45
All India Total	11 215	12 159	11 186	12 538	21 783	8 153	22 912	14 965	14 937	16 790	11 379	20 718	179 856	170 464
Month-wise percentage	6.2	6.8	6.2	7.0	12.1	4.5	12.7	8.3	8.3	9.3	6.3	11.5		

* Include catches of exploratory fishing vessels of Government of India
** Include 227 tons landed by larger trawlers of private firms

Table 5. Monthly non-penaeid prawn landings in different maritime states during 1978

Maritime States	Jan	Feb	Mar	Apr	May	June	Prawn catch in tons July	Aug	Sept	Oct	Nov	Dec	Total for 1978	Total for 1977
Gujarat (excluding Kutch)	157	98	139	254	94	29	21	29	88	337	221	1 615	3 082	1 260
Kutch	-	-	-	-	-	-	-	-	-	-	-	-	14	
Maharashtra	2 992	6 123	2 485	4 109	11 829	380	714	402	419	6 246	3 748	4 808	44 255	66 978
Goa	-	-	-	-	-	-	-	-	-	-	-	26	26	24
Karnataka	-	6	-	-	-	-	-	12	-	-	-	-	18	-
Kerala	23	9	91	49	19	17	134	52	-	-	-	-	394	174
Tamil Nadu	-	9	24	4	25	50	263	32	1	1	163	13	585	159
Pondicherry	-	-	-	5	-	64	-	-	-	-	-	2	71	2
Andhra Pradesh	9	29	18	58	2	118	264	417	236	202	152	27	1 532	5 109
Orissa	-	-	-	-	-	-	6	-	6	-	-	-	12	17
West Bengal	10	107	4	-	2	4	-	-	-	-	102	434	663	269
Andamans	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All India Total	3 191	6 381	2 761	4 479	11 971	662	1 402	944	750	6 786	4 386	6 925	50 652	73 992
Month-wise percentage	6.3	12.6	5.5	8.8	23.6	1.3	2.8	1.9	1.5	13.4	8.7	13.6		

Table 6. Monthly penaeid prawn landings in different maritime states during 1978

Maritime States	Prawn catch in tons												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total for 1978	Total for 1977
Gujarat (excluding Kutch)	660	187	154	204	398	8	19	27	405	1 697	830	2 476	7 065	8 861
Kutch	-	-	-	-	-	-	-	-	-	-	-	-	873	
Maharashtra	1 832	1 806	2 279	2 822	3 795	304	2 493	2 353	4 603	5 751	4 455	8 598	41 091	26 675
Goa	121	90	292	208	166	13	2	36	109	24	220	366	1 647	1 436
Karnataka	2 223	791	497	1 812	235	99	42	1 872	254	4	148	444	8 422*	3 335
Kerala	872	805	3 393	1 575	4 449	5 636	17 079	7 094	3 130	107	287	604	45 034*	40 150
Tamil Nadu	1 465	1 226	1 004	878	456	1 060	1 024	1 478	2 579	1 165	300	672	13 327	8 197
Pondicherry	1	62	15	42	36	33	13	15	5	6	2	15	245	103
Andhra Pradesh	446	454	518	158	217	264	750	1 056	2 748	919	374	127	8 031	6 266
Orissa	375	293	248	349	34	31	85	68	333	325	348	110	2 599	802
West Bengal	24	60	24	8	22	40	-	-	18	4	26	378	605*	602
Andamans	5	4	3	3	4	3	3	2	3	2	3	3	265**	45
All India Total	8 024	5 778	8 427	8 059	9 812	7 491	21 510	14 001	14 187	10 004	6 993	13 793	129 204	96 472
Month-wise percentage	6.2	4.5	6.5	6.2	7.6	5.8	16.6	10.9	11.0	7.7	5.4	10.7		

* Include catches of exploratory fishing vessels of Government of India

** Include 227 tons landed by larger trawlers of private firms

Table 7. Common types of gear used for catching prawns along Indian coasts

Maritime States	Name of gear	Local names	Mode of operation of crafts
Gujarat	Fixed bagnets	Dol, Gholwa Gunja	Non-mechanized and mechanized
	Gill nets	-	-do-
	Trawl nets	Hull	Mechanized
Maharashtra	Fixed bagnets	Dol, Bokshi	Non-mechanized and mechanized
	Gill nets	-	-do-
	Shore seines	Rampan	Non-mechanized
	Trawl nets	-	Mechanized
Goa	Gill nets	Kattali	Non-mechanized and mechanized
	Shore seines	Rampan	Non-mechanized
	Trawl nets	-	Mechanized
Karnataka	Gill nets	Shettibala Pattubala Kanthabala	Non-mechanized
	Shore seines	Yendi Kairampani	-do-
	Trawl nets	-	Mechanized
Kerala	Gill nets	Silk vala Chemmeen vala	Non-mechanized
	Shore seines	Kamba vala Karamadi	Non-mechanized
	Boat seines	Thangu vala Kolli vala Chala vala Vettukili vala Thattumadi	Non-mechanized
	Trawl nets	-	Mechanized

Table 7. Common types of gear used for catching prawns along Indian coasts

Maritime States	Name of gear	Local names	Mode of operation of crafts
Tamil Nadu	Gill nets	Erral valai Podivalai Ara valai Raal valai Madakkural valai	Non-mechanized
	Shore seines	Karamadi	-do-
	Boat seines	Thattumadi Thuri valai Thallu valai Madi, Eru valai	
	Trawl nets	-	Mechanized
Pondicherry	Gill nets	Chinnakkanni vala Ara valai Vaala valai	Non-mechanized
	Shore seines	Periya valai	-do-
	Boat seines	Thuri valai Eru valai	-do-
	Trawl nets	-	Mechanized
Andhra Pradesh	Fixed bagnets	Gidasa vala	Non-mechanized
	Gill nets	Silk vala	-do-
	Shore seines	Pedda vala	-do-
	Boat seines	Iraga vala	-do-
	Trawl nets	-	Mechanized
Orissa	Fixed bag	Mallo jal	Non-mechanized
	Gill nets	Bhasani jal Chilika valai	Non-mechanized and mechanized

Table 7. Common types of gear used for catching prawns along Indian coasts

Maritime States	Name of gear	Local names	Mode of operation of crafts
Orissa	Shore seines	Sarini jal	Non-mechanized
	Boat seines	Iraga vala	-do-
	Trawl nets	-	Mechanized
West Bengal	Fixed bagnets	Behundi jal	Non-mechanized
	Gill nets	Bhasani jal	-do-
	Shore seines	Sarini jal	-do-
Andamans	Gill nets	-	Non-mechanized

Table 8. 1978 Prawn landings by types of gear

Maritime States	Landings in tons						
	Fixed bagnets	Boat seines	Shore seines	Gill nets	Trawl nets (up to 13 m)	Other types	Total
Gujarat (excluding Kutch)	5 884	-	-	854	3 301	108	10 147
Maharashtra	58 412	-	17	1 265	24 707	945	85 346
Goa	-	-	108	26	1 539	-	1 673
Karnataka	-	-	1 524	488	6 360	67	8 439
Kerala	-	4 303	79	723	40 114	206	45 425
Tamil Nadu	-	1 338	213	2 471	9 797	93	13 912
Pondicherry	-	77	12	79	148	-	316
Andhra Pradesh	725	3 322	1 204	768	3 242	302	9 563
Orissa	30	33	12	324	2 211	1	2 611
West Bengal	1 191	-	52	24	-	-	1 267
Andamans	-	-	-	38	-	-	38
Total	66 242	9 073	3 221	7 060	91 419	1 722	178 737

Table 9. Composition of penaeid and non-penaeid prawn landings by different types of gear during 1978

Gears	Landings in tons		
	Penaeids	Non-penaeids	Total (%)
Fixed bag	21 285	44 957	66 242 (37.1)
Gill nets	6 694	366	7 060 (3.9)
Shores seines	2 961	260	3 221 (1.8)
Boat seines	7 905	1 168	9 073 (5.1)
Trawl nets	88 519	2 900	91 419 (51.2)
Other types	1 300	422	1 722 (0.9)
Total	128 664	50 073	178 737

Table 10. Prawn landings at different centres from the sea and adjoining estuarine region during 1975 to 1978 (in tons)

Centre	Marine				Estuarine			
	1975	1976	1977	1978	1975	1976	1977	1978
Panaji, Goa	324.8	212.2	257.7	186.3	1.9	3.1	1.9	1.9
Calicut	734.0	298.4	447.2	236.8	57.0	62.5	73.2	76.8
Cochin	10 874.3	2 566.0	5 340.7	2 309.7	-	1 454.2	1 426.9	1 039.6
Madras	169.4	718.9	412.8	216.0	-	8.3	-	17.2
Kakinada	1 625.2	2 428.3	5 278.0	1 091.7	338.0	240.0	-	523.2
Puri	-	182.2	110.5	107.9	14.6	20.1	10.8	19.5

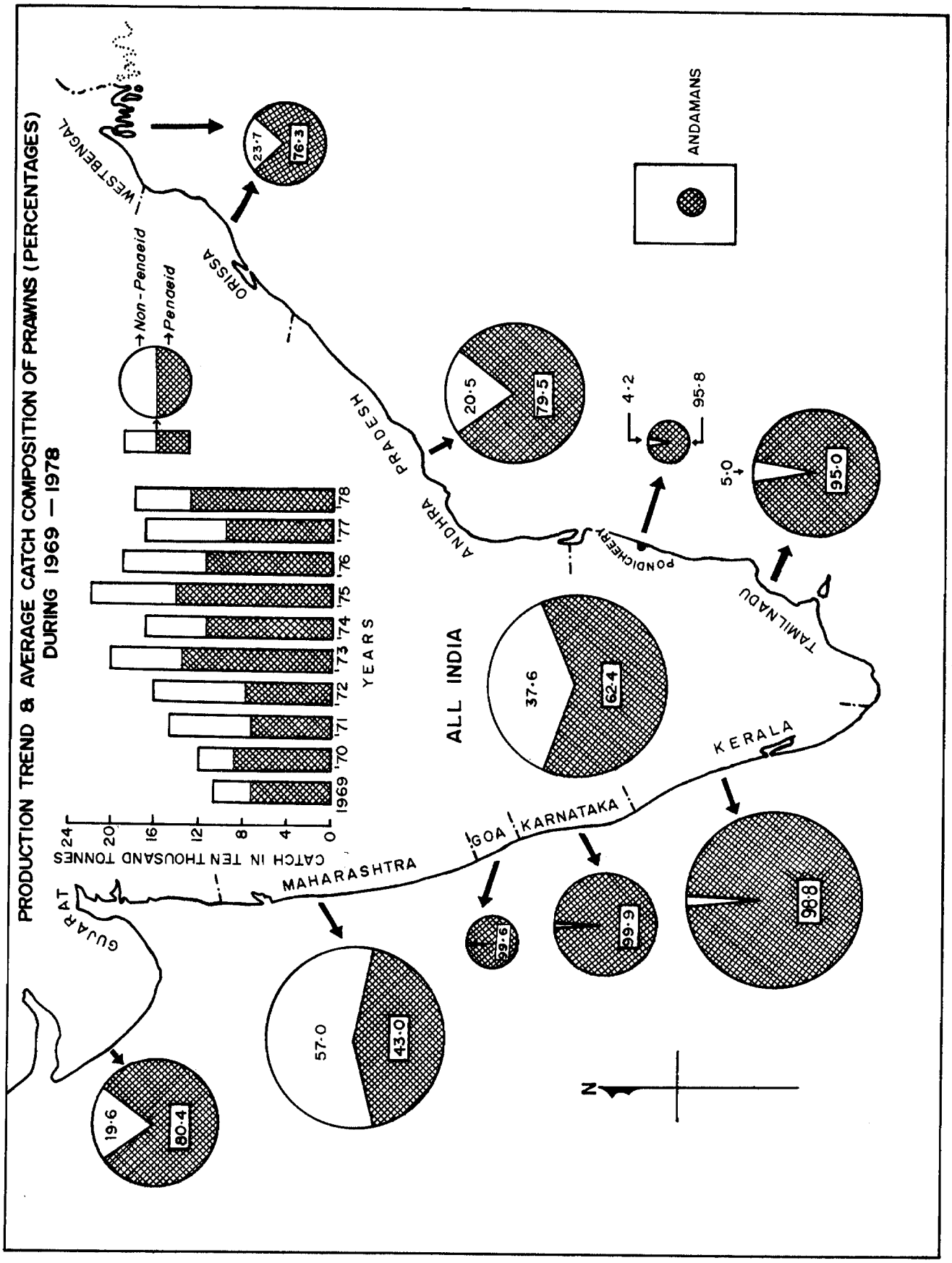
PRODUCTION TREND & AVERAGE CATCH COMPOSITION OF PRAWNS (PERCENTAGES) DURING 1969 — 1978
CATCH IN TEN THOUSAND TONNES
YEARS
1969 '70 '71 '72 '73 '74 '75 '76 '77 '78
0 4 8 12 16 20 24
→Non-Penaeid
→Penaeid
WEST BENGAL
ORISSA
ANDHRA PRADESH
TAMILNADU
PONDICHERRY
ANDAMANS
GOA
KARNATAKA
KERALA
MAHARASHTRA
GUJARAT
ALL INDIA
23·7
76·3
20·5
79·5
4·2
95·8
5·0
95·0
37·6
62·4
19·6
80·4
57·0
43·0
0·4
99·6
1·2
98·8
N

Figure 1

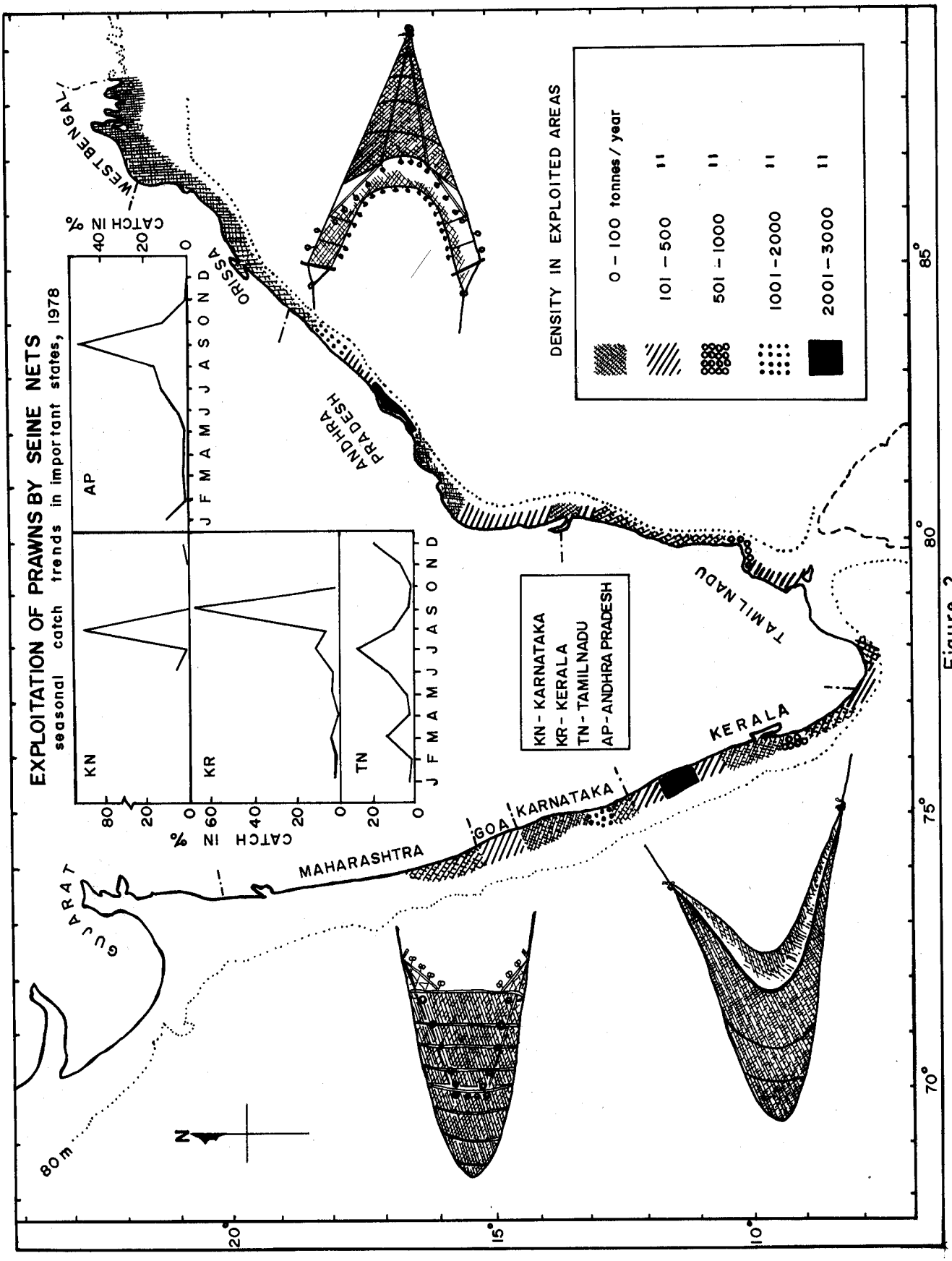
EXPLOITATION OF PRAWNS BY SEINE NETS
seasonal catch trends in important states, 1978
DENSITY IN EXPLOITED AREAS
0 - 100 tonnes / year
101 - 500
501 - 1000
1001 - 2000
2001 - 3000
KN - KARNATAKA
KR - KERALA
TN - TAMILNADU
AP - ANDHRA PRADESH
CATCH IN %
J F M A M J J A S O N D
AP
KN
KR
TN
WEST BENGAL
ORISSA
ANDHRA PRADESH
TAMILNADU
KERALA
KARNATAKA
GOA
MAHARASHTRA
GUJARAT
80 m
N
85°
80°
75°
70°
20°
15°
10°

Figure 2

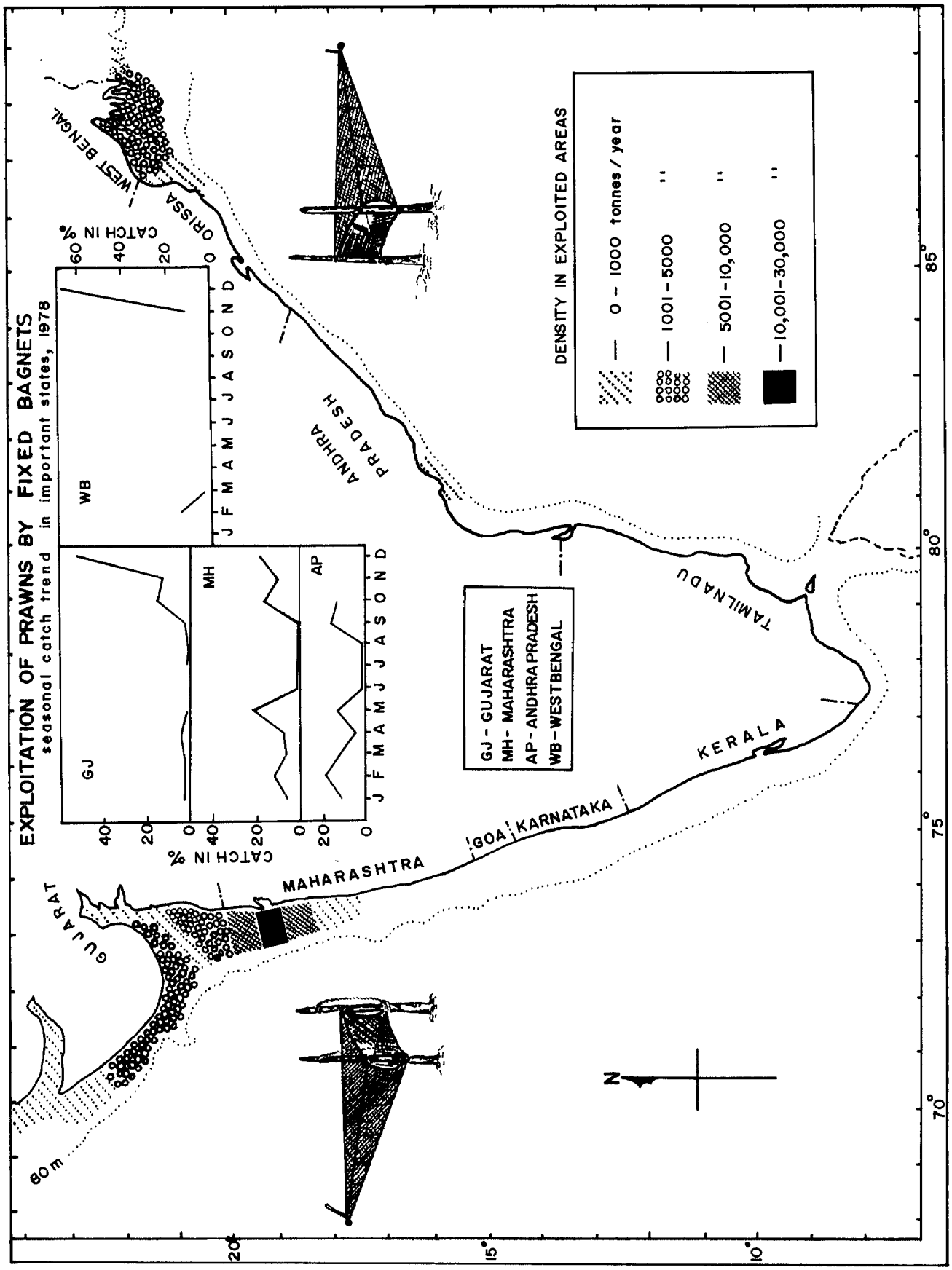
EXPLOITATION OF PRAWNS BY FIXED BAGNETS
seasonal catch trend in important states, 1978
DENSITY IN EXPLOITED AREAS
0 - 1000 tonnes / year
1001 - 5000 "
5001 - 10,000 "
10,001 - 30,000 "
GJ - GUJARAT
MH - MAHARASHTRA
AP - ANDHRA PRADESH
WB - WESTBENGAL
CATCH IN %
J F M A M J J A S O N D
WB
GJ
MH
AP
WEST BENGAL
ORISSA
ANDHRA PRADESH
TAMILNADU
KERALA
KARNATAKA
GOA
MAHARASHTRA
GUJARAT
80m
N
85°
80°
75°
70°
20°
15°
10°

Figure 3

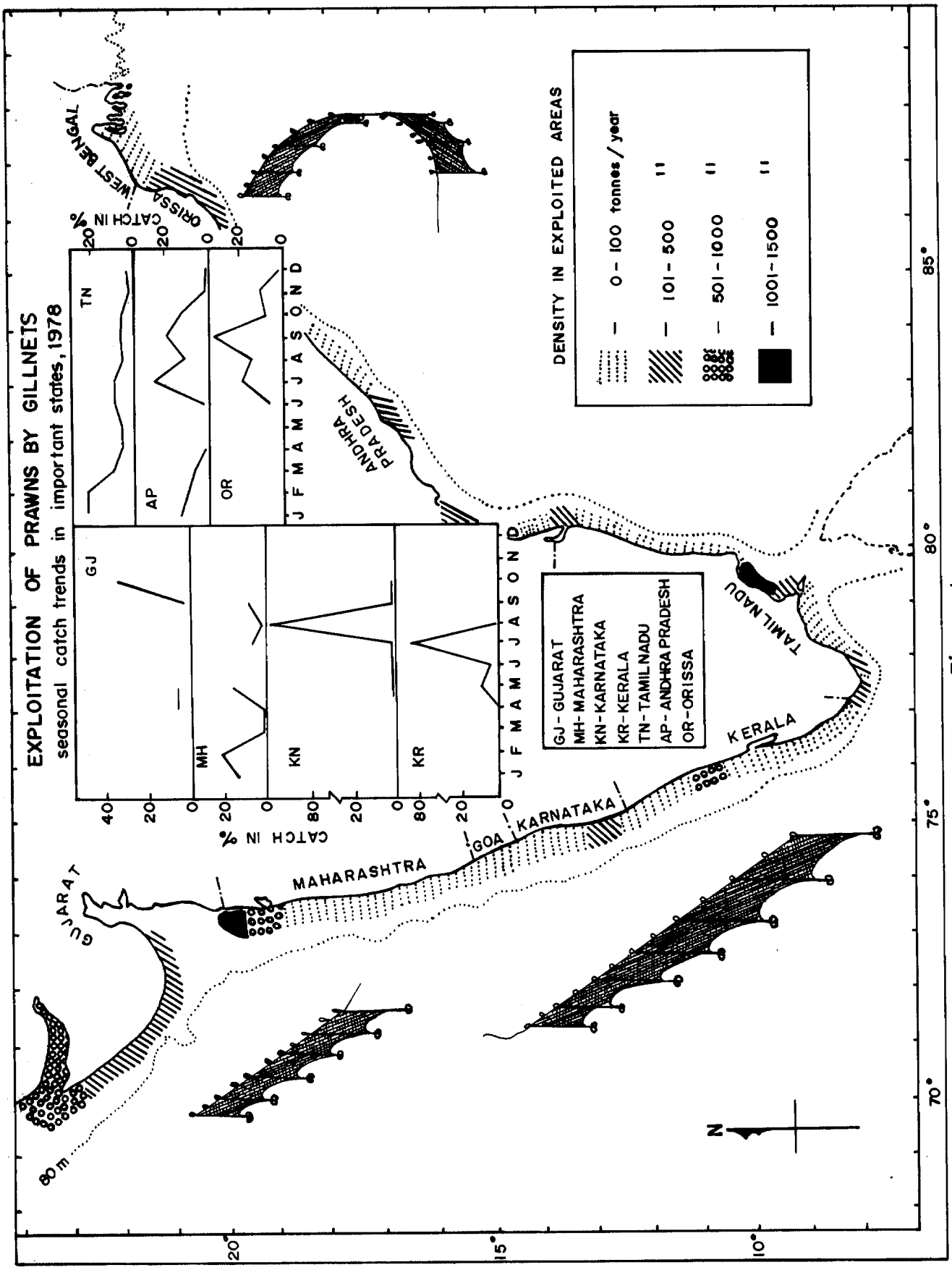
EXPLOITATION OF PRAWNS BY GILLNETS
seasonal catch trends in important states, 1978
DENSITY IN EXPLOITED AREAS
0 - 100 tonnes / year
101 - 500
501 - 1000
1001 - 1500
GJ - GUJARAT
MH - MAHARASHTRA
KN - KARNATAKA
KR - KERALA
TN - TAMILNADU
AP - ANDHRA PRADESH
OR - ORISSA
GUJARAT
MAHARASHTRA
GOA
KARNATAKA
KERALA
TAMIL NADU
ANDHRA PRADESH
ORISSA
WEST BENGAL
80 m
CATCH IN %
J F M A M J J A S O N D
N
70°
75°
80°
85°
20°
15°
10°

Figure 4

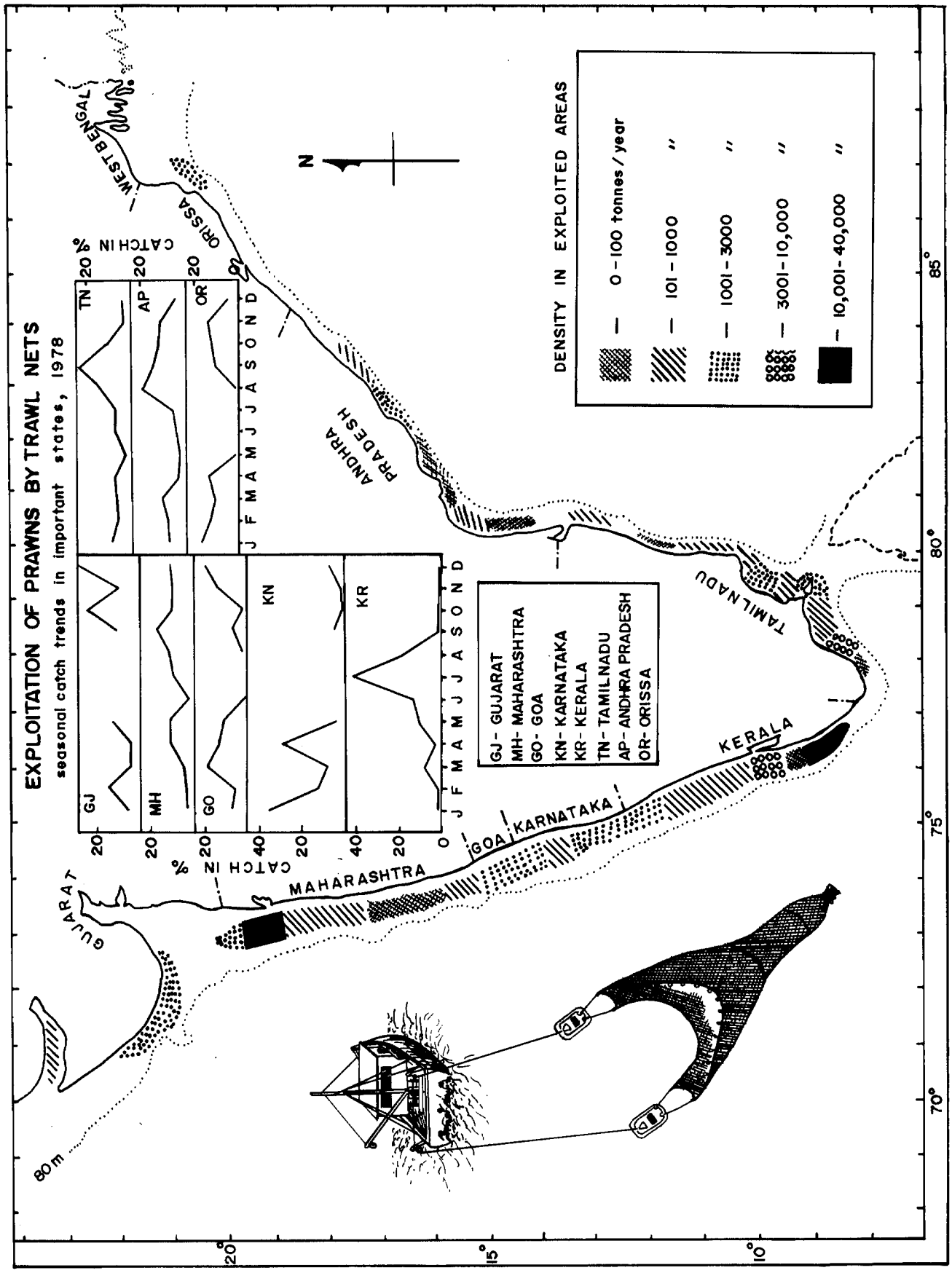
EXPLOITATION OF PRAWNS BY TRAWL NETS
seasonal catch trends in important states, 1978
DENSITY IN EXPLOITED AREAS
0-100 tonnes / year
101-1000 "
1001-3000 "
3001-10,000 "
10,001-40,000 "
GJ- GUJARAT
MH- MAHARASHTRA
GO- GOA
KN- KARNATAKA
KR- KERALA
TN- TAMILNADU
AP- ANDHRA PRADESH
OR- ORISSA
CATCH IN %
J F M A M J J A S O N D
GJ
MH
GO
KN
KR
TN
AP
OR
WEST BENGAL
ORISSA
ANDHRA PRADESH
TAMILNADU
KERALA
KARNATAKA
GOA
MAHARASHTRA
GUJARAT
80m
N
20°
15°
10°
70°
75°
80°
85°

Figure 5