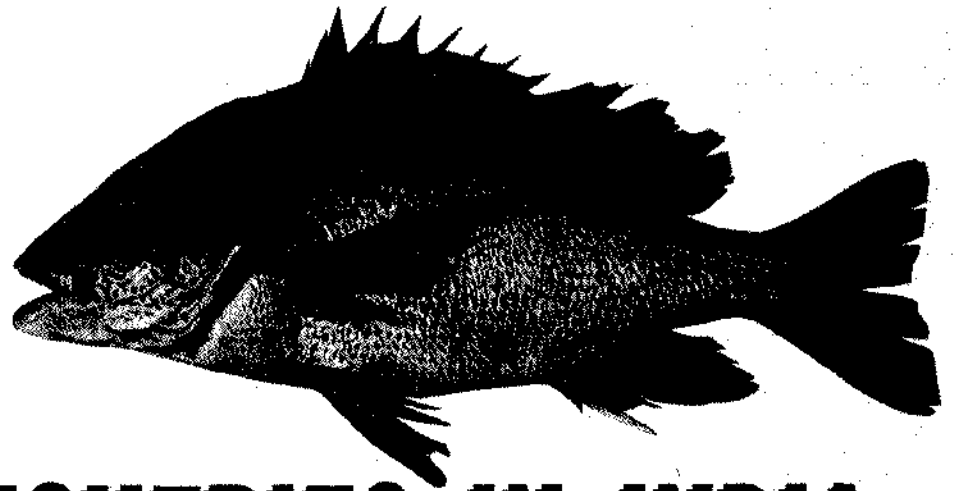
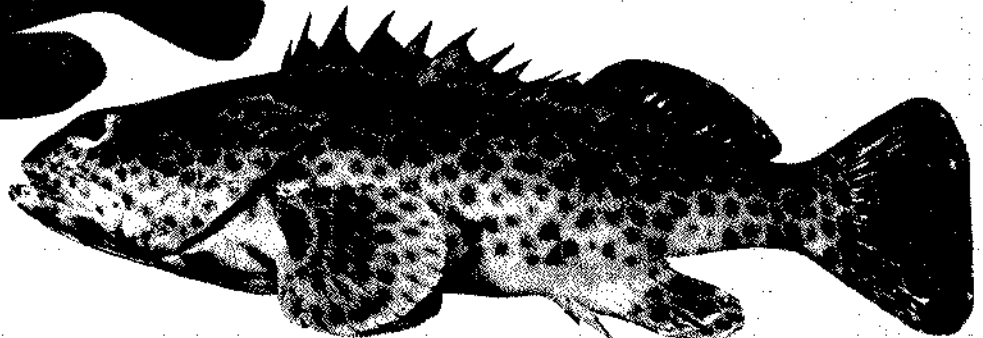


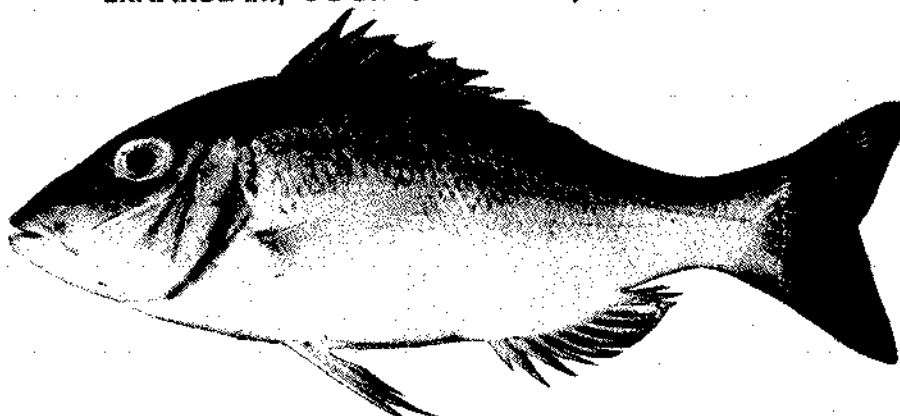
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PERCH FISHERIES IN INDIA



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PERCH FISHERIES IN INDIA - A CRITICAL ANALYSIS

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ABSTRACT

Perches as a single group contribute substantially to the annual all India marine fish production. Due to various reasons there was a spurt in the production of perches from 1981 onwards. In this context an attempt is made to study the production of different groups of perches by the multi-gear system under operation in the Indian inshore coastal waters. Regionwise, Statewise, Gearwise, Groupwise, Quarterwise data were used for the present study. Maximum catchable potential of perches is arrived at 1.16 lakh tonnes by adopting Relative Response Model against the present all India annual average of 90,000 t.

INTRODUCTION

During the last fifteen years (1975 - '89), total perch landings in India have shown variations ranging from 18,000 tonnes in 1976 to 103,000 t in 1989. However, from 1981 onwards the total perch landings showed an increasing trend except for a small decline during 1987. Upto 1983 the estimates centred around an average of 38,000 t and around 87,000 t during the rest of the period. Landings from the maritime States during this period also experienced similar trend as in the case of all India perch landings. In this chapter an analysis of the total perch landings is made and the maximum catchable potential of the perch resources from the presently exploited regions is obtained using Relative Response Model.

To get the correct picture of the perch fishery a detailed study is made in this paper on the data available during 1985 - '89 on important perch groups *viz.* Rock cods, Snappers, Pig-face breams, Threadfin breams and other perches. These data on Statewise, gearwise, groupwise and quarterwise catch and effort indicated the groups that contributed more to the total perch landings and the gear responsible for such contributions (Tables 4 - 13).

TOTAL PERCH LANDINGS

All India : As indicated earlier, since 1981 there was an increasing trend in the over all perch

landings in India (Fig. 1). Taking this portion for analysis, three point moving averages of landings were taken as follows and maximum catchable potential obtained (Table 1).

Using Relative Response Model (Alagaraja, 1984) the maximum catchable potential of perches from the presently exploited regions is estimated at 116,000 t against the last five year's average landings of 90,000 t.

TABLE 1. Estimation of maximum catchable potential (000' t) using Relative Response Model

Year	Landings	3 point moving averages	C_t	C_{t+1}
1982	45	44	44	57
1983	56	57	57	66
1984	71	66	66	79
1985	72	79	79	85
1986	93	85	85	92
1987	90	92	92	95
1988	93	95		$r^2 = 0.98$
1989	103			$a = 21.64$
				$b = 0.8136$
				$c = 116$

REGIONWISE LANDINGS

Northeast region : West Bengal and Orissa have contributed relatively less when compared to other maritime States of India. In West Bengal,

the total perch landings varied from nil (1977 and 1978) to 225 t (1979) and almost nil landings in the previous years. The landings once again plunged down to 13 t in 1980 and were around 60 t during 1981-87. However, in 1988 and 89 the landings reached 125 t and 170 t respectively. Average annual landings during 1985-89 were 100 t only.

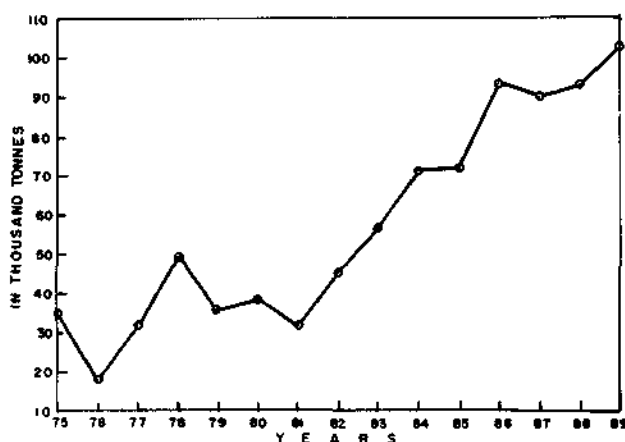


Fig. 1. Total annual perch landings in India from 1975 to 1989.

In Orissa also there was no definite trend in landings of perches, the landings ranged from about 30 t in 1976 to 2,700 t in 1987. Barring 1982 when the landings were 1800 t, the highest till 1986, the landings fluctuated with no trend at all. In 1987 the landings were maximum and then started decreasing to 1,476 t in 1989 (Table 2). The landings during the last five years centred around 1,800 t.

Southeast region : In Andhra Pradesh, Tamil Nadu and Pondicherry the landings were more when compared to Northeast region. In Andhra Pradesh there was no trend in the annual perch landings. The landings varied from 1,800 t in 1976 to 11,100 t in 1984. From 1984 onwards there was a declining trend in the landings except in 1987, when the landings were 9,400 t reaching 4,400 t in 1989 the average for the last five years being 6,900 t.

In Tamil Nadu the estimated perch landings varied from about 5,300 t in 1976 to 18,500 t in 1987. Here also there was no definite trend noticed during 1975-'89. Fluctuating around 7,000 t during 1975-81, the landings

jumped to 12,400 t in 1982 and 14,300 t in 1983 then declined to 12,000 t in 1984. After 1984 the trend was almost increasing till 1989 with a jump to 18,500 in 1987 and with 17,000 t and 17,800 t respectively in 1988 and 1989. The average during 1985-89 was at 15,600 t. In Pondicherry including Karaikkal, the total annual perch landings did not exceed 1,500 t during 1975-'89. The total perch landings varied from 390 t in 1975 and 1977 to about 1,500 t in 1983. In this Union Territory also no trend was noticed in the perch landings during 1987-'89 (Table 2) and the average for the last five years was 850 t.

Southwest region : In Kerala, Karnataka and Goa perch landings were high when compared to all other regions in India. Among the maritime States, Kerala ranked first in the contribution to perch landings. In Kerala also there was no trend noticed in the perch landings during 1975-'89, the landings varied from 3,000 t in 1976 to 49,000 t in 1989. However, after 1983 almost an increasing trend was noticed barring a big jump to 46,000 t in 1986. The average landings during 1985-'89 were 38,000 t. In Karnataka, having no definite trend, the landings ranged from 170 t in 1978 to 10,000 t in 1988 with an average of 6,200 t during 1985-'89. The perch landings in Goa also did not show any trend during 1975-89 with range from 45 t in 1975 to 2,500 t in 1987 and with an average of 1,340 t during 1985-'89.

Northwest region : In Maharashtra and Gujarat also there was no definite trend in the perch landings during 1975-'89. In Maharashtra the landings were minimum during 1976 with 1,460 t and maximum during 1988 with 17,400 t with an average of 11,000 t during the last five years (Table 2). In Gujarat a minimum of about 1,000 t during 1979 and a maximum of 10,400 t during 1985 was recorded with an average of 7,600 t during 1985-89.

Island territories : The contribution to perch landings was varying from 140 t in 1976 to 1,200 t in 1988 in Andaman and Nicobar Islands and from 90 t in 1989 to 380 t in 1980 in Lakshadweep Islands. In these regions also no definite trend could be seen in the perch landings during 1975-'89. During the last five

years the average landings in Andaman and Nicobar Islands were 700 t and in Lakshadweep 120 t (Table 2).

Northeast region with 2,000 t of perches (Table 3).

TABLE 2. Statewise total annual perch landings (t) during 1975-89

Year	West Bengal	Orissa	Andhra	Tamil Nadu	Pondicherry	Kerala	Karnataka	Goa	Maharashtra	Gujarat	Andaman	Lakshadweep	India
75	15	186	4888	8153	389	14741	727	45	2484	3261	157	186	35232
76	1	31	1751	5341	769	3069	454	310	1460	4641	142	193	18162
77	0	55	2727	7918	391	14121	1489	505	2973	1213	196	211	31799
78	0	173	1945	9241	487	24989	174	781	6951	4174	234	163	49312
79	225	151	3095	5919	1004	20239	181	203	3225	973	239	203	35657
80	13	341	4639	6886	666	17814	1069	269	3712	2454	302	376	38541
81	37	122	5694	6453	932	8549	399	1183	2617	4832	192	315	31325
82	52	1790	7138	12397	1302	11179	518	908	5716	3437	361	230	45028
83	20	899	8828	14267	1372	9916	4428	1495	8244	5026	604	252	56053*
84	88	681	11125	11804	832	26882	2241	1640	5849	8688	864	205	71289**
85	67	932	8070	12120	1427	30710	1865	1350	3870	10422	864	115	71812
86	78	1650	6974	13031	895	46004	4728	1531	7888	9572	884	86	93321
87	60	2722	9362	18463	774	30135	9645	2493	9805	5638	718	157	89972
88	125	2445	5547	16804	740	32304	9956	583	17423	5359	1153	139	92578
89	171	1476	4369	17827	423	48986	4693	750	15986	6911	884	86	102562

* Includes 720 tonnes landed by large trawler

** Includes 390 tonnes landed by large trawler

Among the regions, Southwest region dominates other regions contributing 54,000 t of perches including 46,000 t of Threadfin breams followed by Northwest region with 23,000 t of perches and 12,000 t of Threadfin

STATEWISE, GEARWISE, QUARTERWISE AND IMPORTANT GROUPWISE LANDINGS OF PERCHES DURING 1985-'89

West Bengal : During the five years, contribu-

TABLE 3. Regionwise Threadfin breams and total perch landings during 1981-89 (in tonnes)

Regions	1981	1982	1983	1984	1985	1986	1987	1988	1989
<i>Northeast region</i>									
Threadfin breams	7	831	523	460	338	489	343	546	282
Total perches	159	1831	911	765	999	1728	2782	2570	1647
<i>Southeast region</i>									
Threadfin breams	4140	6722	7280	5344	5032	6636	9225	6591	9128
Total perches	13079	20837	24459	23761	21617	20900	28599	23091	22619
<i>Southwest region</i>									
Threadfin breams	7260	9885	12359	23026	26224	42627	30060	30985	45776
Total perches	10131	12605	15839	30763	33925	52263	42273	42843	54429
<i>Northwest region</i>									
Threadfin breams	4211	6164	7012	8940	7146	10426	7378	15103	12490
Total perches	7449	9153	13270	14537	14292	17460	15443	22782	22897

breams, Southeast region with 23,000 t of perches and 9,000 t of Threadfin breams and

tion from smaller trawlers to perch landings was nil. Other mechanised units such as gill nets

TABLE 4. Estimated quarterwise and gearwise landings of perches (tonnes) during 1985 - '89 in West Bengal

Groups	I Qr				II Qr				III Qr				IV Qr				Annual Total			
	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL
1985																				
Rock cods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snappers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other perches	0	28	3	31	0	0	0	0	0	0	2	2	0	30	4	34	0	58	9	67
Total perches	0	28	3	31	0	0	0	0	0	0	2	2	0	30	4	34	0	58	9	67
Total landings	0	5413	551	5964	0	75	172	247	0	2252	889	3141	47	12969	1173	14189	47	20789	2785	23541
Effort (in units)	0	6027	12781	18808	0	1061	8945	10006	0	25684	10768	36452	124	32341	15408	47873	124	65113	47902	113139
1986																				
Rock cods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snappers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other perches	0	14	4	18	0	0	7	7	0	1	10	11	0	29	13	42	0	44	34	78
Total perches	0	14	4	18	0	0	7	7	0	1	10	11	0	29	13	42	0	44	34	78
Total landings	65	1549	5299	6913	0	26	450	476	0	1659	1279	2938	43	4967	777	5787	108	8201	7805	16114
Effort (in units)	93	8747	15837	24677	0	1873	12824	14697	0	20277	13046	33323	124	13554	16292	29970	217	44451	57999	102667
1987																				
Rock cods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snappers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other perches	0	24	17	41	0	0	2	2	0	1	6	7	0	9	1	10	0	34	26	60
Total perches	0	24	17	41	0	0	2	2	0	1	6	7	0	9	1	10	0	34	26	60
Total landings	0	11512	2225	13737	0	68	165	233	0	1247	357	1604	295	6086	786	7167	295	18913	3533	22741
Effort (in units)	0	13810	19707	33517	0	1197	8276	9473	0	11760	14875	26635	419	29331	13030	42780	419	56098	55888	112405
1988																				
Rock cods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snappers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other perches	0	56	14	70	0	0	6	6	0	2	3	5	0	9	35	44	0	67	58	125
Total perches	0	56	14	70	0	0	6	6	0	2	3	5	0	9	35	44	0	67	58	125
Total landings	0	2283	773	3056	0	6	118	124	0	1242	367	1609	308	3034	3886	7228	308	6565	5144	12017
Effort (in units)	0	7232	12601	19633	0	340	6798	7138	0	12347	11514	23861	540	23174	34832	58546	540	43093	65745	109378
1989																				
Rock cods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snappers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other perches	0	0	1	1	0	0	0	0	0	0	4	4	0	165	1	166	0	165	6	171
Total perches	0	0	1	1	0	0	0	0	0	0	4	4	0	165	1	166	0	165	6	171
Total landings	256	1242	741	2239	0	175	10	185	0	11065	1001	12066	0	20550	1738	22288	256	33032	3490	36778
Effort (in units)	798	12117	15816	28731	0	1298	1484	2782	0	22579	10547	33126	0	35676	12490	48166	798	71670	40337	112805

TN = Trawl net; OM = Other mechanised gear; NM = Non-mechanised gear; Qr = Quarter

TABLE 5. Estimated quarterwise and gearwise landings of perches (tonnes) during 1985 - '89 in Orissa

Groups	I Qr			II Qr			III Qr			IV Qr			Annual Total							
	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL				
1985																				
Rock cods	0	0	1	1	0	0	0	0	0	0	10	10	5	0	1	6	5	0	12	17
Snappers	0	0	7	7	0	0	14	14	0	0	0	0	0	0	1	1	0	0	22	22
Pig-face breams	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4	0	0	4
Threadfin breams	76	0	0	76	0	0	0	0	0	1	0	1	262	0	1	263	338	1	0	340
Other perches	124	0	138	262	0	0	21	21	17	0	62	79	133	0	55	188	274	0	276	550
Total perches	200	0	146	346	0	0	35	35	17	5	72	94	400	0	58	458	617	5	311	933
Total landings	11312	44	5558	16914	100	98	2441	2639	1274	448	5249	6971	14308	1649	4438	20395	26994	2239	17686	46919
Effort (in units)	28965	1224	211408	241597	588	1587	101996	104171	3922	5711	140507	150140	34608	19553	117238	171398	68083	28075	571149	667306
1986																				
Rock cods	0	0	1	1	0	0	2	2	0	0	0	0	0	0	0	0	0	0	3	3
Snappers	0	0	9	9	0	0	74	74	0	0	0	0	8	15	106	129	8	15	189	212
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	139	0	24	163	0	0	4	4	0	0	0	0	322	0	0	322	461	0	28	489
Other perches	53	118	134	305	0	0	69	69	5	78	151	234	270	0	68	338	328	196	422	946
Total perches	192	118	168	478	0	0	149	149	5	78	151	234	600	15	174	789	797	211	642	1650
Total landings	19016	1391	5725	26132	54	56	3442	3552	933	1497	6305	8735	9879	1407	7214	18500	29882	4351	22686	56919
Effort (in units)	27055	7098	159488	193461	655	731	104606	105992	3763	10850	146302	160915	25201	9794	197135	232130	56674	28473	607531	692678
1987																				
Rock cods	0	0	22	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	22
Snappers	0	0	33	33	0	0	8	8	0	0	0	0	0	0	2	2	0	0	43	43
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	151	0	3	154	0	0	0	0	23	0	1	24	164	0	1	165	338	0	5	343
Other perches	941	41	199	1181	6	9	160	175	14	7	54	75	706	43	134	883	1667	100	547	2314
Total perches	1092	41	257	1390	6	9	168	183	37	7	55	99	870	43	137	1050	2005	100	617	2722
Total landings	9191	2722	9068	20981	46	164	5496	5696	3321	626	3021	6968	13826	1433	9590	24849	26384	4945	27165	58494
Effort (in units)	28358	27658	201973	257989	608	1559	142061	144228	11227	12768	117033	141028	42823	13290	289926	346039	83016	55275	750993	889284
1988																				
Rock cods	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
Snappers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	359	0	1	360	0	0	1	1	0	0	0	0	159	0	26	185	518	0	28	546
Other perches	217	26	212	455	2	4	12	18	66	29	57	152	1141	10	119	1270	1426	69	400	1895
Total perches	576	26	217	819	2	4	13	19	66	29	57	152	1300	10	145	1455	1944	69	432	2445
Total landings	5813	652	6273	12738	191	55	2023	2269	4408	2159	2310	8874	15259	1390	5780	22429	25668	4256	16386	46310
Effort (in units)	22992	5686	184256	212934	1160	658	100856	102674	17296	11420	90361	119077	40240	11324	172365	223929	81688	29088	547838	658614
1989																				
Rock cods	0	0	1	1	0	0	4	4	0	0	0	0	0	0	0	0	0	0	5	5
Snappers	0	0	0	0	0	0	1	1	0	0	0	0	7	0	0	7	7	0	1	8
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	190	0	17	207	1	0	9	10	0	0	3	3	57	0	5	62	248	0	34	282
Other perches	163	55	384	602	6	8	108	122	16	5	12	33	204	183	37	424	389	251	541	1181
Total perches	353	55	402	810	7	8	122	137	16	5	15	36	268	183	42	493	644	251	581	1476
Total landings	4745	1110	6485	12340	457	579	2373	3409	1801	3100	4219	9120	11379	5061	5725	22165	18382	9850	18802	47034
Effort (in units)	21807	10247	206433	238487	1853	4509	63687	70049	13783	20709	135542	170034	46253	41364	182852	270469	83696	76829	588514	749039

TN = Trawl net; OM = Other mechanised gear; NM = Non-mechanised gear; Qr = Quarter

TABLE 6. Estimated quarterwise and gearwise landings of perches (in tonnes) during 1985 - '89 in Andhra Pradesh

Groups	I Qr				II Qr				III Qr				IV Qr				Annual Total			
	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL
1985																				
Rock cods	0	0	3	3	2	0	4	6	6	0	2	8	1	0	3	4	9	0	12	21
Snappers	84	0	858	942	14	0	413	427	32	0	228	260	41	0	45	86	171	0	1544	1715
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	553	0	4	557	312	0	6	318	181	0	0	181	366	0	4	370	1412	0	14	1426
Other perches	762	2	1547	2311	553	2	489	1044	645	2	246	893	412	1	247	660	2372	7	2529	4908
Total perches	1399	2	2412	3813	881	2	912	1795	864	2	476	1342	820	1	299	1120	3964	7	4099	8070
Total landings	8568	14	36012	44594	6794	15	18097	24906	10689	22	14293	25004	7399	3	16861	24263	33450	54	85263	118767
Effort (in units)	22285	124	605010	627419	25241	181	495385	520807	38439	267	639806	678512	19665	54	451069	470788	105630	626	2191270	2297526
1986																				
Rock cods	3	0	4	7	1	0	0	1	5	0	0	5	3	0	23	26	12	0	27	39
Snappers	21	0	82	103	13	0	98	111	42	0	68	110	15	7	233	255	91	7	481	579
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	799	0	13	812	387	0	99	486	260	0	1	261	503	0	10	513	1949	0	123	2072
Other perches	1172	0	798	1970	406	7	173	586	699	0	215	914	607	0	207	814	2884	7	1393	4284
Total perches	1995	0	897	2892	807	7	370	1184	1006	0	284	1290	1128	7	473	1608	4936	14	2024	6974
Total landings	11693	32	29598	41323	8833	23	18080	26936	14312	75	26420	40807	13776	34	29349	43159	48614	164	103447	152225
Effort (in units)	23594	187	580061	603842	26280	190	453219	479689	40778	553	509638	550969	25796	212	558831	584839	116448	1142	2101749	2219339
1987																				
Rock cods	0	0	0	0	4	0	7	11	3	0	38	41	0	0	0	0	7	0	45	52
Snappers	40	0	102	142	21	0	264	285	13	0	67	80	3	1	133	137	77	1	566	644
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	688	0	5	693	792	0	110	902	545	0	0	545	209	0	40	249	2234	0	155	2389
Other perches	1280	1	395	1676	507	1	2831	3339	620	0	248	868	256	0	138	394	2663	2	3612	6277
Total perches	2008	1	502	2511	1324	1	3212	4537	1181	0	353	1534	468	1	311	780	4981	3	4378	9362
Total landings	14813	153	33236	48202	8632	165	24930	33727	11361	171	15635	27187	7711	406	21927	30044	42537	895	95728	139160
Effort (in units)	23509	659	572202	596370	20626	583	427684	448893	32157	726	525821	558704	21922	2542	536450	560914	98214	4510	2062157	2164881
1988																				
Rock cods	3	0	0	3	4	0	4	8	7	0	7	14	1	0	1	2	15	0	12	27
Snappers	43	0	238	281	24	3	122	149	17	0	375	392	13	0	35	48	97	3	770	870
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	458	0	11	469	213	0	23	236	251	0	0	251	171	1	6	178	1093	1	40	1134
Other perches	798	7	820	1625	331	1	326	658	463	167	121	751	334	2	146	482	1926	177	1413	3516
Total perches	1302	7	1069	2378	572	4	475	1051	738	167	508	1408	519	3	188	710	3131	181	2235	5547
Total landings	11683	545	23023	35251	4570	209	15734	20513	8545	1542	14554	24641	9735	722	32698	43155	34533	3018	86009	123560
Effort (in units)	27397	4295	722958	754650	21069	1524	508052	530645	29207	8742	532138	570087	25613	6617	647571	679801	103286	21178	2410719	2535183
1989																				
Rock cods	7	0	11	18	15	0	3	18	0	0	3	3	4	0	19	23	26	0	36	62
Snappers	19	75	115	209	8	4	76	88	6	6	77	89	11	2	414	427	44	87	682	813
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	294	0	21	315	474	0	4	478	151	0	2	153	150	0	0	150	1069	0	27	1096
Other perches	354	5	266	625	309	0	240	549	252	3	151	406	343	18	457	818	1258	26	1114	2398
Total perches	674	80	413	1167	806	4	323	1133	409	9	233	651	508	20	890	1418	2397	113	1859	4369
Total landings	7935	1062	27235	36132	4662	814	16709	22185	8589	308	23358	32250	12446	1605	18510	32561	33532	3784	85812	123128
Effort (in units)	18406	11647	621550	651603	18210	2672	360469	381351	26854	2600	482573	512027	25106	15788	498756	539650	88576	32707	1963348	2084631

TN = Trawl net; OM = Other mechanised gear; NM = Non-mechanised gear; Qr = Quarter

TABLE 8. Estimated quarterwise and gearwise landings of perches (in tonnes) during 1985 - '89 in Pondicherry

Groups	I Qr				II Qr				III Qr				IV Qr				Annual Total			
	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL
1985																				
Rock cods	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2	
Snappers	0	0	0	0	0	0	0	0	0	13	13	0	0	1	1	0	0	14	14	
Pig-face breams	0	0	0	0	0	20	20	0	0	15	15	0	0	0	0	0	0	35	35	
Threadfin breams	34	0	0	34	177	0	12	189	227	0	19	246	277	0	60	337	715	0	91	806
Other perches	52	0	46	98	234	0	25	259	116	0	49	165	25	0	23	48	427	0	143	570
Total perches	86	0	46	132	411	0	57	468	343	0	98	441	302	0	84	386	1142	0	285	1427
Total landings	453	42	3066	3561	1087	128	2588	3803	1826	164	3412	5402	1615	18	2081	3714	4981	352	11147	16480
Effort (in units)	4648	923	114889	120460	7009	1678	98234	106921	7365	722	70913	79000	8268	651	93391	102310	27290	3974	377427	408691
1986																				
Rock cods	0	0	0	0	0	3	3	0	0	3	3	0	0	0	0	0	0	0	6	6
Snappers	0	0	17	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	17
Pig-face breams	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11
Threadfin breams	112	0	25	137	129	0	3	132	255	0	9	264	20	0	8	28	516	0	45	561
Other perches	41	0	42	83	69	0	18	87	71	1	24	96	9	0	25	34	190	1	109	300
Total perches	153	0	95	248	198	0	24	222	326	1	36	363	29	0	33	62	706	1	188	895
Total landings	989	0	1821	2810	1373	3	1642	3018	2424	277	2835	5536	363	18	2516	2897	5149	298	8814	14261
Effort (in units)	5360	0	65420	70790	9918	47	74954	84919	9986	2607	46862	59405	2820	543	93550	96913	28034	3197	280786	312017
1987																				
Rock cods	0	0	5	5	0	3	3	0	0	2	2	0	0	0	0	0	0	0	10	10
Snappers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig-face breams	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3
Threadfin breams	0	0	0	0	0	0	0	18	0	34	52	3	0	6	9	21	0	0	40	61
Other perches	113	2	24	139	219	0	5	224	253	0	29	282	25	0	30	55	610	2	88	700
Total perches	113	4	30	147	219	0	8	227	271	0	65	336	28	0	36	64	631	4	139	774
Total landings	631	57	2589	3277	1119	107	2622	3848	1860	96	2609	4565	369	0	1397	1766	3979	260	8237	13456
Effort (in units)	3526	695	78549	82770	8276	1298	100466	110040	7323	2117	53832	63272	1580	0	67025	68605	20705	4110	299872	324687
1988																				
Rock cods	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	1	1	2
Snappers	0	24	33	57	0	2	2	0	3	2	5	0	0	0	0	0	0	27	37	64
Pig-face breams	0	15	8	23	0	2	2	0	2	6	8	0	8	0	8	0	25	16	41	
Threadfin breams	185	0	11	196	71	0	6	77	99	0	0	99	4	0	25	29	359	0	42	401
Other perches	31	34	44	109	17	0	0	17	16	0	5	21	0	8	77	85	64	42	126	232
Total perches	216	73	96	385	88	0	10	98	115	6	14	135	4	16	102	122	423	95	222	740
Total landings	1082	265	1499	2846	791	164	2339	3294	1462	62	3170	4694	155	27	1988	2170	3490	518	8996	13004
Effort (in units)	4904	1612	61142	67658	2675	1408	61754	65837	8428	1253	58329	68010	806	217	64370	65393	16813	4490	245595	266898
1989																				
Rock cods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snappers	0	0	5	5	0	0	0	0	0	23	23	0	0	0	0	0	0	0	28	28
Pig-face breams	0	7	3	10	0	0	0	0	0	0	0	0	0	4	4	0	7	7	14	
Threadfin breams	86	0	12	98	32	0	7	39	50	0	26	76	12	0	12	180	0	45	225	
Other perches	6	1	13	20	18	0	13	31	21	0	41	62	18	0	25	43	63	1	92	156
Total perches	92	8	33	133	50	0	20	70	71	0	90	161	30	0	29	59	243	8	172	423
Total landings	866	194	1576	2656	369	558	3649	4576	1435	26	2552	4013	717	44	354	1115	3407	822	8131	12360
Effort (in units)	5566	3451	50113	59130	2963	3052	58900	64915	8801	297	61387	70485	4792	1372	25030	31194	22122	8172	195430	225724

TN = Trawl net; OM = Other mechanised gear; NM = Non-mechanised gear; Qr = Quarter

TABLE 9. Estimated quarterwise and gearwise landings of perches (in tonnes) during 1985 - '89 in Kerala

Groups	I Qr				II Qr				III Qr				IV Qr				Annual Total			
	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL
1985																				
Rock cods	4	111	169	284	0	2	2	4	1	0	0	1	1	181	10	192	6	294	181	481
Snappers	0	30	80	110	0	0	0	0	0	0	0	0	0	19	8	27	0	49	88	137
Pig-face breams	0	27	35	62	0	0	1	1	0	0	0	0	0	110	29	139	0	137	65	202
Threadfin breams	2588	33	100	2721	2450	9	102	2561	17746	45	92	17883	694	38	299	1031	23478	125	593	24196
Other perches	1501	92	320	1913	257	71	77	405	169	966	519	1654	363	398	961	1722	2290	1527	1877	5694
Total perches	4093	293	704	5090	2707	82	182	2971	17916	1011	611	19538	1058	746	1307	3111	25774	2132	2804	30710
Total landings	22362	38380	16064	76806	23944	15729	14148	53821	31799	45165	26717	103681	19019	52472	20198	91689	97124	151746	77127	325997
Effort (in units)	111766	199223	473610	784599	95341	119504	291001	505845	51963	177489	203860	433312	108779	306314	521158	936251	367849	802530	1489629	2660008
1986																				
Rock cods	0	156	107	263	3	0	2	5	3	1	11	15	2	46	4	52	8	203	124	335
Snappers	0	31	42	73	0	8	6	14	0	0	20	20	0	21	0	21	0	60	68	128
Pig-face breams	0	12	185	197	0	1	4	5	0	19	0	19	0	0	67	67	0	32	256	288
Threadfin breams	2139	11	67	2217	2127	3	16	2146	30098	188	572	30858	3073	3	42	3118	37437	205	697	38339
Other perches	1000	85	303	1388	482	5	16	503	67	599	100	766	930	2974	353	4257	2479	3663	772	6914
Total perches	3139	295	704	4138	2612	17	44	2673	30168	807	703	31678	4005	3044	466	7515	39924	4163	1917	460044
Total landings	22673	25815	23121	71809	25956	15776	10517	52249	42186	66681	19304	128171	24807	92288	13782	130877	115622	200560	66724	382906
Effort (in units)	145734	224129	420133	789996	108632	226605	384445	719682	46833	231805	213372	492010	101364	328058	267820	626242	402563	1010597	1305770	2718930
1987																				
Rock cods	5	529	64	598	2	6	4	12	2	0	9	11	136	185	4	325	145	720	81	946
Snappers	0	235	40	275	0	0	0	0	0	1	2	3	0	121	1	122	0	357	43	400
Pig-face breams	0	14	7	21	0	1	0	1	0	0	19	19	0	1	32	33	0	16	58	74
Threadfin breams	4226	8	47	4281	1616	42	47	1705	15470	174	211	15855	1319	33	114	1466	22631	257	419	23307
Other perches	1704	978	151	2833	634	40	19	693	68	532	83	683	654	266	279	1199	3060	1816	532	5408
Total perches	5935	1764	309	8008	2252	89	70	2411	15540	707	324	16571	2109	606	430	3145	25836	3166	1133	30135
Total landings	31658	13476	5908	51042	42195	10134	7823	61052	37201	72095	15065	124361	32857	23759	11118	67734	143911	119464	39914	303289
Effort (in units)	163160	161875	33919	664254	170893	114498	299306	584697	62379	269991	276581	606951	189973	221581	337272	748826	586405	767945	1252378	2606728
1988																				
Rock cods	141	528	50	719	27	17	0	44	15	3	17	35	12	87	1	100	195	635	68	898
Snappers	6	745	11	762	1	0	0	1	0	0	0	0	20	98	0	118	27	843	11	881
Pig-face breams	52	95	128	275	0	2	5	7	0	99	0	99	0	2	27	29	52	198	160	410
Threadfin breams	4279	110	122	4511	2660	33	13	2706	15156	6	55	15217	2480	4	93	2577	24575	153	283	25011
Other perches	2219	416	34	2669	817	0	76	893	104	526	6	636	257	615	34	906	3397	1557	150	5104
Total perches	6697	1894	345	8936	3505	52	94	3651	15275	634	78	15987	2769	806	155	3730	28246	3396	672	32304
Total landings	42990	9296	5978	58264	50901	19489	6929	77319	52362	92434	6739	151535	49716	119275	12899	181690	195969	240494	32345	468808
Effort (in units)	221851	175853	363234	760938	211369	152674	300816	664879	87007	290831	198758	576596	342827	509765	333096	1185688	863074	1129123	1195904	3188101
1989																				
Rock cods	0	1076	44	1120	22	22	2	46	13	1	4	18	21	52	1	74	56	1151	51	1258
Snappers	5	940	32	977	40	3	1	44	0	1	0	1	1	16	0	17	46	960	33	1039
Pig-face breams	0	129	17	146	0	0	0	0	0	0	0	0	0	47	0	47	0	176	17	193
Threadfin breams	7365	23	276	7664	5120	106	54	5280	22414	838	138	23390	5608	754	31	6393	40507	1721	499	42727
Other perches	475	31	5	511	1319	281	50	1650	102	529	16	647	663	259	39	961	2559	1100	110	3769
Total perches	7845	2199	474	10418	6501	412	107	7020	22529	1369	158	24056	6293	1128	71	7492	43168	5108	710	48986
Total landings	46347	50731	6146	103224	48345	69160	6225	123730	46298	144601	9122	200021	58227	150251	12073	220551	199217	414743	33566	647526
Effort (in units)	210266	290739	426459	927464	172675	274652	336624	783951	71336	375027	199699	646062	141024	380339	290460	811823	595301	1320757	1253242	3169300

TN = Trawl net; OM = Other mechanised gear; NM = Non-mechanised gear; Qr = Quarter

TABLE 10. *Estimated quarterwise and gearwise landings of perches (in tonnes) during 1985 - '89 in Karnataka*

Groups	I Qr				II Qr				III Qr				IV Qr				Annual Total			
	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL
1985																				
Rock cods	1	0	36	37	0	0	5	5	6	0	8	14	5	8	0	13	12	8	49	69
Snappers	0	0	0	0	0	0	0	0	0	0	0	0	0	33	1	34	0	33	1	34
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	487	79	11	577	455	1	0	456	4	0	0	4	176	64	0	240	1122	144	11	1277
Other perches	167	0	13	180	151	0	3	154	0	0	12	12	104	1	34	139	422	1	62	485
Total perches	655	79	60	794	606	1	8	615	10	0	20	30	285	106	35	426	1556	186	123	1865
Total landings	8948	9081	1457	19486	8147	4932	948	14027	946	15264	5646	21856	8160	50166	5149	63475	26201	79443	13200	118844
Effort (in units)	53482	12905	60627	127014	43017	10386	48779	102182	9599	9464	78857	97920	32777	28115	112151	173043	138875	60870	300414	500159
1986																				
Rock cods	0	0	3	3	0	0	15	15	0	0	0	0	0	0	3	3	0	0	21	21
Snappers	0	0	1	1	0	0	0	0	0	0	0	0	0	19	1	20	0	19	2	21
Pig-face breams	0	0	0	0	0	0	1	1	0	0	0	0	0	0	4	4	0	0	5	5
Threadfin breams	1504	79	0	1583	1264	1	0	1265	0	0	0	0	144	0	1	145	2912	80	1	2993
Other perches	666	24	5	695	498	7	30	535	1	289	31	321	59	55	23	137	1224	375	89	1688
Total perches	2170	103	9	2282	1762	8	46	1816	1	289	31	321	203	74	32	309	4136	474	118	4728
Total landings	2135	31740	1913	54978	16239	5436	1143	22818	3788	26066	4381	34235	14034	57964	5247	77245	55386	121206	12684	189276
Effort (in units)	77142	22766	72215	172122	5399	6533	53152	113584	8297	8733	86745	103775	34261	34118	78755	147134	173599	72149	290867	536615
1987																				
Rock cods	0	0	4	4	0	0	3	3	0	0	0	0	467	1	0	468	467	1	7	475
Snappers	0	0	0	2	0	0	0	0	0	0	0	0	17	0	0	0	17	2	0	19
Pig-face breams	0	0	3	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	4	4
Threadfin breams	1761	0	1	1762	1775	0	1	1776	0	0	0	0	1316	0	0	1316	4852	0	2	4854
Other perches	1902	4	22	1828	908	0	24	932	10	12	128	150	1371	0	12	1383	4091	16	186	4293
Total perches	3563	6	30	3599	2683	0	29	2712	10	12	128	150	3171	1	12	3184	9427	19	199	9645
Total landings	43526	10616	959	55101	22790	7513	965	31268	1124	24150	3478	38752	34857	55702	4895	95454	102297	107981	10297	220575
Effort (in units)	102686	13809	39207	154982	55193	7986	45672	108851	15226	15963	63337	94526	127044	53182	38102	218328	300149	90940	186318	576687
1988																				
Rock cods	697	1	0	698	95	0	5	100	0	0	1	1	34	6	0	40	826	7	6	839
Snappers	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	3498	0	0	3498	1771	0	0	1771	0	0	0	0	666	0	0	666	5935	0	0	5935
Other perches	2145	0	25	2170	390	3	15	408	13	47	92	152	438	12	1	451	2986	62	133	3181
Total perches	6340	1	25	6366	2256	3	21	2280	13	47	93	153	1138	18	1	1157	9747	69	140	9956
Total landings	44193	34143	2909	81245	15500	9472	1089	26061	2300	19497	2104	23901	21630	58056	1515	81201	83623	121168	7617	212408
Effort (in units)	88917	34841	26730	150488	41703	9170	49283	100156	13786	11103	50927	75816	63206	69381	47082	179669	207612	124495	174022	506129
1989																				
Rock cods	51	6	5	62	10	0	2	12	0	11	17	28	52	0	0	52	113	17	24	154
Snappers	0	2	0	2	0	0	0	0	0	1	0	1	0	1	0	1	0	4	0	4
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	2081	0	0	2081	893	0	0	893	0	0	0	0	56	0	0	56	3030	0	0	3030
Other perches	1033	7	8	1048	320	0	15	335	12	8	12	32	88	0	2	90	1453	15	37	1505
Total perches	3165	15	13	3193	1223	0	17	1240	12	20	29	61	196	1	2	199	4596	36	61	4693
Total landings	33270	25259	582	59111	15040	7699	1259	23998	4355	39294	2056	45705	7799	112392	2007	122198	60464	184644	5904	251012
Effort (in units)	113862	81286	19529	214677	57464	20799	36580	114843	21704	28540	40625	90869	20991	48753	36666	106410	214021	179878	133400	526799

TN = Trawl net; OM = Other mechanised gear; NM = Non-mechanised gear; Qr = Quarter

TABLE 11. Estimated quarterwise and gearwise landings of perches (in tonnes) during 1985 - '89 in Goa

Groups	I Qr			II Qr			III Qr			IV Qr			Annual Total			TOTAL				
	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM		TOTAL			
1985																				
Rock cods	205	0	0	205	0	0	0	0	0	0	0	0	0	0	0	0	205	0	0	205
Snappers	0	0	0	0	0	0	32	32	0	0	0	0	0	46	0	46	0	46	32	78
Pig-face breams	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Threadfin breams	412	0	0	412	337	2	0	339	0	0	0	0	0	0	0	0	749	2	0	751
Other perches	6	2	101	109	20	13	113	146	0	0	40	40	0	6	14	20	26	21	268	315
Total perches	623	2	102	727	357	15	145	517	0	0	40	40	0	52	14	66	980	69	301	1350
Total landings	13299	1962	652	15913	9508	661	2093	12262	1367	1228	1656	4251	3443	11506	1551	16500	27617	15357	5952	48926
Effort (in units)	37054	9091	11114	57259	33441	3271	8412	45124	2635	6750	13425	22810	9917	24074	6521	40512	83047	43186	39472	165705
1986																				
Rock cods	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2
Snappers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	762	0	0	762	532	1	0	533	0	0	0	0	0	0	0	0	1294	1	0	1295
Other perches	17	1	5	23	0	2	10	12	0	0	1	1	68	0	130	198	85	3	146	234
Total perches	779	1	6	786	532	3	10	545	0	0	1	1	68	0	131	199	1379	4	148	1531
Total landings	14284	3832	1940	20056	7171	879	229	8279	358	1487	5265	7110	14054	3035	1871	18960	35867	9233	9305	54405
Effort (in units)	26156	26992	10364	63512	19932	10013	7968	37913	2160	9373	7095	18628	56221	19459	5113	80793	104469	65837	30540	200846
1987																				
Rock cods	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1
Snappers	0	0	0	0	0	1	0	1	0	0	4	4	0	0	0	0	0	1	4	5
Pig-face breams	0	0	0	0	0	0	0	0	0	63	0	63	0	0	0	0	63	0	0	63
Threadfin breams	1620	23	0	1643	235	0	0	235	0	0	0	0	6	14	1	21	1861	37	1	1899
Other perches	270	18	28	316	2	12	76	90	1	10	11	97	1	10	108	370	31	124	525	
Total perches	1890	41	28	1959	237	14	76	327	1	63	14	78	103	15	11	129	2231	133	129	2493
Total landings	23703	3454	309	27466	6591	856	705	8152	214	6490	146	6850	6228	16107	874	23209	36736	26907	2034	65677
Effort (in units)	39895	27046	3943	70884	33704	5457	3346	42507	2664	5697	1920	10281	20743	21014	5872	47629	97006	59214	15081	171301
1988																				
Rock cods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snappers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	13	0	0	13	26	0	0	26	0	0	0	0	0	0	0	0	39	0	0	39
Other perches	313	0	5	318	39	3	6	48	7	48	17	72	83	8	15	106	442	59	43	544
Total perches	326	0	5	331	65	3	6	74	7	48	17	72	83	8	15	106	481	59	43	583
Total landings	22835	9384	220	32439	4239	3309	164	7712	359	2255	52	2666	3387	43553	1411	48351	30820	58501	1847	91168
Effort (in units)	38031	14535	2180	54746	19671	8900	4810	33381	2271	4011	1628	7910	8889	23807	11535	44231	68862	51253	20153	140268
1989																				
Rock cods	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
Snappers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	4	0	0	4	0	0	0	0	0	1	14	15	0	0	0	0	4	1	14	19
Other perches	551	0	3	554	135	2	10	147	1	1	17	19	0	2	6	8	687	5	36	728
Total perches	555	3	3	561	135	2	10	147	1	2	31	34	0	2	6	8	691	9	50	750
Total landings	10677	11699	285	22661	4039	5235	96	9370	3397	22626	702	26725	18	60915	177	61110	18131	100475	1260	119866
Effort (in units)	22221	15173	4756	42150	21633	13288	5893	40814	19493	12916	7298	39707	195	25791	3039	29025	63542	67168	20986	151696

TN = Trawl net; OM = Other mechanised gear; NM = Non-mechanised gear; Qr = Quarter

TABLE 12. Estimated quarterwise and gearwise landings of perches (in tonnes) during 1985 - '89 in Maharashtra

Groups	I Qr				II Qr				III Qr				IV Qr				Annual Total			
	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL
1985																				
Rock cods	73	5	0	78	77	0	0	77	0	0	0	0	94	25	1	120	244	30	1	275
Snappers	51	39	0	90	23	2	0	25	0	0	1	1	94	6	13	113	168	47	14	229
Pig-face breams	0	0	1	1	0	0	0	0	0	0	13	13	0	0	0	0	0	0	14	14
Threadfin breams	699	40	0	739	781	0	0	781	331	1	0	332	666	146	0	812	2467	187	0	2654
Other perches	123	43	21	187	65	15	72	152	64	11	12	87	226	26	20	272	478	95	125	698
Total perches	936	127	22	1085	946	17	72	1035	395	12	26	433	1080	203	34	1317	3357	359	154	3870
Total landings	26524	51408	2666	90328	15746	45220	1260	62226	15587	12760	2407	30754	60365	97736	4624	162725	117952	207124	10957	336033
Effort (in units)	40170	103686	34249	178055	30737	98483	42174	171394	16656	57797	109411	183864	89076	271387	26527	396990	176639	531303	222361	930303
1986																				
Rock cods	28	14	2	44	28	15	0	43	0	2	2	4	475	73	0	548	531	104	4	639
Snappers	29	56	1	86	3	39	2	44	3	29	10	42	583	149	0	732	618	273	13	904
Pig-face breams	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Threadfin breams	1219	109	0	1328	1836	9	0	1845	277	0	0	277	1064	0	5	1069	4396	118	5	4519
Other perches	169	30	2	201	91	25	49	165	47	24	51	122	1209	111	17	1337	1516	190	119	1825
Total perches	1445	209	6	1660	1958	88	51	2097	327	55	63	445	3331	333	22	3686	7061	685	142	7888
Total landings	40426	42203	1380	84009	33368	42271	979	76618	23221	17512	2074	42807	51601	58485	1840	111926	148616	160471	6273	315360
Effort (in units)	95516	131923	27860	255299	62981	86857	45249	195087	16599	79624	73521	169744	35417	159808	88437	283662	210513	458212	235067	903792
1987																				
Rock cods	179	3	2	184	15	4	0	19	60	0	0	60	607	0	0	607	861	7	2	870
Snappers	43	174	1	218	0	122	0	122	150	16	6	172	382	55	0	437	575	367	7	949
Pig-face breams	0	1	2	3	0	0	2	2	0	0	2	2	0	0	0	0	0	1	6	7
Threadfin breams	1578	108	0	1686	2564	0	0	2564	417	10	5	432	667	0	0	667	5226	118	5	5349
Other perches	774	125	10	909	509	16	17	542	451	17	29	497	612	65	5	682	2346	223	61	2630
Total perches	2574	411	15	3000	3088	142	19	3249	1078	43	42	1163	2268	120	5	2393	9008	716	81	9805
Total landings	46283	80925	1462	78670	27631	30227	2039	59897	21533	15513	3353	40399	51085	50840	4337	106242	146512	127505	11191	285208
Effort (in units)	93439	126773	41665	262787	51353	90165	76831	218349	26706	67079	83905	177690	72186	168450	58410	299046	244594	452467	260811	957872
1988																				
Rock cods	500	31	13	544	309	12	0	321	299	6	3	308	443	18	7	468	1551	67	23	1641
Snappers	151	1	0	152	63	18	0	81	239	0	4	243	562	39	0	601	1015	58	4	1077
Pig-face breams	0	1	0	1	0	0	0	0	0	0	0	0	0	1	2	3	0	2	2	4
Threadfin breams	4723	0	0	4723	3538	0	2	3540	547	0	0	547	3536	0	0	3536	12346	0	2	12346
Other perches	481	257	1	739	249	8	16	273	298	2	17	317	959	62	5	1026	1987	329	39	2355
Total perches	5855	290	14	6159	4159	38	18	4215	1383	8	24	1415	5500	120	14	5634	16897	456	70	17423
Total landings	40286	30273	646	71205	41296	44179	1890	87365	21659	8477	1077	31213	55769	64644	5048	125461	159010	147573	8661	315244
Effort (in units)	80263	173526	28425	282214	71186	181390	51190	303766	20132	60967	77189	158288	58330	192615	36514	287459	229911	608498	193318	1031727
1989																				
Rock cods	405	25	0	430	439	10	0	449	57	2	0	59	1489	19	3	1511	2390	56	3	2449
Snappers	141	13	0	154	2	17	0	19	185	0	0	185	342	19	0	361	670	49	0	719
Pig-face breams	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threadfin breams	2893	0	0	2893	2862	2	0	2864	595	56	0	561	3631	0	0	3631	9981	58	0	10039
Other perches	876	68	0	944	803	9	0	812	290	2	4	296	702	25	0	727	2671	104	4	2779
Total perches	4315	108	0	4421	4106	38	0	4144	1127	60	4	1191	6164	63	6	6230	15712	267	7	15986
Total landings	46665	35832	646	83143	43852	33990	1409	79251	18425	12098	956	31479	61793	61666	44998	168457	170735	143586	48009	362330
Effort (in units)	62273	136890	20759	218922	46484	120750	33745	200979	11937	63339	39177	114453	50996	185269	42212	278477	171690	505248	136893	812831

TN = Trawl net; OM = Other mechanised gear; NM = Non-mechanised gear; Qr = Quarter

TABLE 13. Estimated quarterwise and gearwise landings of perches (in tonnes) during 1985 - '89 in Gujarat

Groups	I Qr				II Qr				III Qr				IV Qr				Annual Total			
	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL	TN	OM	NM	TOTAL
1985																				
Rock cods	165	21	16	202	26	9	20	55	0	0	0	0	143	6	0	149	334	36	36	406
Snappers	211	29	0	240	18	56	0	74	0	0	0	0	531	41	0	572	760	126	0	886
Pig-face breams	35	2	0	37	0	0	0	0	0	0	0	0	6	3	0	9	41	5	0	46
Threadfin breams	2866	0	0	2866	465	0	0	465	0	0	0	0	1161	0	0	1161	4492	0	0	4492
Other perches	1012	150	342	1504	419	111	259	789	6	30	313	349	1148	272	530	1950	2585	563	1444	4592
Total perches	4289	202	358	4849	928	176	279	1363	6	30	313	349	2989	322	530	3841	8212	730	1480	10422
Total landings	57275	32192	20266	109733	15206	14468	11794	41468	255	11671	4333	16259	60152	36291	23812	120255	132888	94622	60205	287715
Effort (in units)	36490	132186	141135	309811	12911	56917	133833	203661	682	70710	101467	172859	40045	144502	111115	295662	90128	404315	487550	981993
1986																				
Rock cods	66	16	16	98	1	0	0	1	26	4	3	33	89	4	6	99	182	24	25	231
Snappers	92	68	0	160	21	2	0	23	0	0	0	0	96	0	0	96	209	70	0	279
Pig-face breams	18	0	0	18	0	0	0	0	0	0	0	0	22	3	3	28	40	3	3	46
Threadfin breams	2186	0	0	2186	255	0	0	255	2101	0	0	2101	1365	0	0	1365	5907	0	0	5907
Other perches	1521	51	335	1907	53	16	109	178	17	0	199	216	428	234	146	808	2019	301	789	3109
Total perches	3883	135	351	4369	330	18	109	457	2144	4	202	2350	2000	241	155	2396	8357	398	817	9572
Total landings	57294	24501	15498	97293	17784	35126	5719	58629	3964	7565	3926	14825	25263	41540	18695	85498	104305	108732	43208	256245
Effort (in units)	42874	101514	153946	298334	20312	91725	103404	215441	2887	48863	85663	137413	21582	113346	113786	248714	87655	355448	456799	899902
1987																				
Rock cods	194	86	2	282	6	9	1	16	0	0	0	0	581	29	4	614	781	124	7	912
Snappers	180	23	0	203	1	3	0	4	0	0	0	0	76	29	0	105	257	55	0	312
Pig-face breams	25	5	0	30	0	0	0	0	0	0	0	0	10	0	0	10	35	5	0	40
Threadfin breams	902	1	0	903	241	0	0	241	23	0	0	23	862	0	0	862	2028	1	0	2029
Other perches	1118	144	105	1367	76	46	109	231	16	5	279	300	232	34	181	447	1442	229	674	2345
Total perches	2419	259	107	2785	324	58	110	492	39	5	279	323	1761	92	185	2038	4543	414	681	5638
Total landings	51177	25825	13071	90073	21811	10220	5697	37728	5505	5718	3267	14490	36401	35074	23134	94609	114894	76837	45169	236900
Effort (in units)	36619	119123	105042	260784	25228	93409	134233	252870	6696	41626	122288	170610	28352	136806	83724	248882	96895	390964	445287	933146
1988																				
Rock cods	65	14	0	79	24	2	0	26	0	0	0	0	38	14	2	54	127	30	2	159
Snappers	61	3	0	64	11	13	13	37	0	0	0	0	173	21	0	194	245	37	13	295
Pig-face breams	0	2	0	2	0	0	0	0	0	0	0	0	57	0	0	57	57	2	0	59
Threadfin breams	1226	0	0	1226	364	0	0	364	14	0	0	14	1153	0	0	1153	2757	0	0	2757
Other perches	267	4	252	523	81	5	202	288	6	0	164	170	479	26	603	1108	833	35	1221	2089
Total perches	1619	23	252	1894	480	20	215	715	20	0	164	184	1900	61	605	2566	4019	104	1236	5359
Total landings	31996	12988	10853	55837	16466	15640	5316	37422	3345	6735	7538	17618	35612	25632	35242	96486	87419	60995	58949	207363
Effort (in units)	26929	106809	208620	342358	17897	93126	102736	213759	4422	48934	188554	241910	32656	114008	186725	333389	81904	362877	686635	1131416
1989																				
Rock cods	143	28	7	178	67	5	0	72	8	2	0	10	346	40	5	391	564	75	12	651
Snappers	224	7	0	231	0	69	0	69	12	0	0	12	189	24	0	213	425	100	0	525
Pig-face breams	13	0	0	13	0	0	0	0	0	0	0	0	35	0	0	35	48	0	0	48
Threadfin breams	942	5	0	947	734	5	0	739	27	0	0	27	738	0	0	738	2441	10	0	2451
Other perches	545	14	225	784	262	55	148	465	213	345	263	821	824	37	305	1166	1844	451	941	3236
Total perches	1867	54	232	2153	1063	134	148	1345	260	347	263	870	2132	101	310	2543	5322	636	953	6911
Total landings	35150	17398	17306	69854	23547	18409	5247	47203	6358	32106	24273	62737	52642	56871	37957	147470	117697	124784	84783	327264
Effort (in units)	28698	126225	173118	328041	22421	84523	95412	202356	6377	118128	216559	341064	36343	206318	107761	350422	93839	535194	592850	1221883

TN = Trawl net; OM = Other mechanised gear; NM = Non-mechanised gear; Qr = Quarter

contributed more ranging from about 30 t in 1987 to 170 t in 1989 maximum being in first and fourth quarters. Only other perches were recorded in the landings (Table 4).

Orissa : In Orissa maximum contribution came from smaller trawlers followed by nonmechanised units and other mechanised units. Fourth and first quarters contributed the maximum according to the order of magnitude throughout the five year period. The contribution from trawlers ranged from about 620 t in 1985 to about 2,000 t in 1987. In the case of nonmechanised units the contribution ranged from 310 t in 1985 to 620 t in 1986 and in other mechanised units from 5 t in 1985 to about 250 t in 1989. Other perches contributed maximum followed by Threadfin breams (Table 5).

Andhra Pradesh : First quarter landings were more in 1985, '86 and '88 when compared to other quarters in these years. In 1987 second quarter and in 1989 fourth quarter contributed maximum to the perch landings. The contribution of perch landings in the third quarter during the five year period were also, however, good, unlike in West Bengal and Orissa. Smaller trawlers contributed more to the perch landings in this State during 1986 to 1989. In 1985 nonmechanised units landed 4,100 t which was slightly more than that of trawlers (4,000 t). Except Pig-face breams all other groups landed during the five years. Maximum contribution, however, came from other perches followed by Threadfin breams. No definite trend could be traced in the perch landings during the five year period (Table 6).

Tamil Nadu : Interestingly during the second and third quarter, perch landings were more than those of other two quarters in this State throughout the five year period. Throughout the period other perches dominated the total perch landings except in 1989, followed by Threadfin breams, Pig-face breams, Rock-cods and Snappers. This trend was more or less maintained in all the quarters too. Except in 1985 in all the years trawler landings were more ranging from 5,100 t in 1985 to 12,600 t in 1989 registering almost an increasing trend in the five year period. Threadfin breams dominated the trawl landings ranging from 2,600 t in 1985 to 7,600 t

in 1989, followed by other perches ranging from 2,100 t in 1985 to 4,400 t in 1989. The others in the order of abundance in the landings were Pig-face breams, Rock-cods and Snappers. Nonmechanised units landed other perches more ranging from 2,200 t in 1989 to 3,700 t in 1988, followed by Pig-face breams, Rock-cods and Snappers. The contribution from other mechanised units was relatively very much less, the maximum being 1,400 t only in 1988 (Table 7).

Pondicherry : The total perch landings varied from 420 t in 1989 to 1,430 t in 1985. A clear cut declining trend in perch landings was noticed in this Union Territory. Threadfin breams dominated the perch landings throughout the five year period except in 1987 when other perches dominated the perch landings. Contribution from other groups was relatively less. Landings in the second and third quarters were more than in other two quarters in 1985, '86 and '87 whereas in 1988 and '89 the contribution in the first quarter and third quarter respectively was maximum. There was otherwise no quarterwise trend in this Union Territory. Trawlers contributed maximum in all the five years followed by nonmechanised gears. Contribution from other mechanised units was very much less (Table 8).

Kerala : During the five year period the total perch landings in Kerala varied from 31,000 t in 1985 to 49,000 t in 1989. Throughout the period Threadfin breams dominated the perch landings contributing more than 75% of the perch landings. This is particularly due to the maximum contribution of smaller trawlers to the perch landings in the State. Small trawlers contributed more than 80% of the perch landings. The contribution from other mechanised and nonmechanised units was less than 20%. Landings in the third quarter accounted for more than 50% of the annual perch landings in all the five years. The contribution in the first quarter ranked second in 1985, '87, '88 and '89. In 1986 fourth quarter ranked second. The contribution from other quarters in the rest of the years was relatively less. Among the groups as mentioned earlier, Threadfin breams dominated the perch landings followed by other perches maintaining the quarterwise trend of the total perch landings (Table 9).

Karnataka : The total perch landings in Karnataka fluctuated from about 1,900 t in 1985 to 10,000 t in 1988. There was an increasing trend in the perch landings till 1988 then the landings dropped to 4,600 t in 1989. Threadfin breams dominated the perch landings in all the five years followed by other perches and Rock-cods. Contribution from Threadfin breams ranged from 1,300 t in 1985 to 6,000 t in 1988, from other perches from 490 t in 1985 to 4,300 t in 1987 and from Rock-cods from 20 t in 1986 to 840 t in 1988. Landings in the first quarter were always higher than those in other quarters followed by the second quarter except in 1987 when fourth quarter landings ranked second. Major contribution came from the small trawlers, the contribution varying from 1,600 t in 1985 to 9,700 t in 1988 forming more than 98% of the total perch landings in 1987 and '88. Trawlers landed more of Threadfin breams resulting in high percentage of this group in the total perch landings as indicated above. Contribution from other mechanised and nonmechanised units was relatively very much less (Table 10).

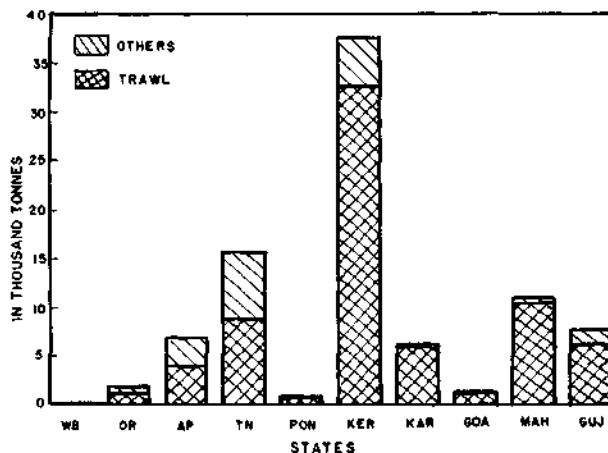


Fig. 2. Average (1985-'89) annual gearwise contribution of perches.

Goa : The total perch landings started increasing from 1,350 t in 1985 to 2,500 t in 1987 then decreasing to 580 t in 1988 and then going up to 750 t in 1989. In the first three years maximum contribution to the perch landings came from Threadfin breams followed by other perches. In the last two years the trend was reversed in that other perches contributed more to perch landings followed by Threadfin breams. The contribution from Threadfin breams showed

an increasing trend in the first three years from 750 t in 1985 to 1,900 t in 1987 and suddenly dropping to 40 t in 1988 and to 20 t in 1989. First quarter landings were always maximum followed by second quarter except in 1988 when fourth quarter ranked second. The landings in other quarters were relatively less during 1985-'89. Among gears, trawls dominated in their contribution to the perch landings followed by nonmechanised units. The contribution of trawls followed the over all trend so far as their quarterwise contribution was concerned (Table 11).

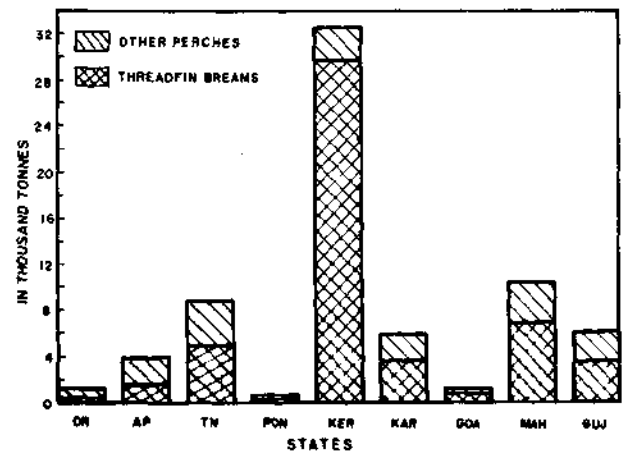


Fig. 3. Average (1985-'89) annual trawl contribution of perches.

Maharashtra : An increasing trend in the total perch landings was noticed during 1985-'88 the landings ranging from 3,900 t in 1985 to 17,400 t in 1988 and dropping to 16,000 t in 1989. Among the groups Threadfin breams dominated the perch landings following the same trend as the total perch landings starting with 2,700 t in 1985 reaching the maximum at 12,300 t in 1988 and dropping to 10,000 t in 1989. Other perches, Rock-cods, Snappers and Pig-face breams were landed in the order of abundance. Landings in the fourth quarter were high in 1985 (1,320 t), '86 (3,700 t) and 1989 (6,230 t). However, in 1987 the landings in the second quarter was maximum (3,249 t) and in 1988 the landings in the first quarter was maximum (6,200 t). In general landings in the third quarter was high throughout the period 1985-'89. Major contribution to the perch landings came from trawls forming more than 90% of the total perch landings followed by the contribution of other mechanised units and nonmechanised units.

Their contribution in the quarters followed the same trend as that of total perch landings as mentioned above (Table 12).

Gujarat : There was a decreasing trend in total perch landings during 1985-'88. The landings started declining from 10,400 t in 1985 to 5,400 t in 1988 and increased to 6,900 t in 1989. In the first three years the landings in the first quarter were maximum followed by those in the fourth quarter and in the last two years, landings in the fourth quarter were maximum followed by those in first quarter. Other perches, followed by Threadfin breams dominated the perch landings in 1985, '87 and '89. During 1986 and '88 Threadfin breams dominated the total perch landings followed by other perches. Rock-cods, Snappers and Pig-face breams were also landed in this State. About 80% of perch landings were accounted for by the trawls followed by nonmechanised units and other mechanised units. The trend in the landings of these units followed that of total perch landings as indicated above (Table 13).

CONCLUSIONS

Over the last five years 1985-'89, the average all India perch landings were about 90,000 t against the catchable potential of 1,16,000 t in the presently exploited area extending upto 50 m depth. Kerala ranked first with an average of 38,000 t out of which 33,000 t was contributed by trawls, 4,000 t by other mechanised units and 1,000 by the nonmechanised units. Tamil Nadu ranked second with an annual average of 16,000 t, trawlers contributing 9,000 t mechanised units 1,000 t and non-mechanised units 6,000 t. Maharashtra landed 11,000 t of perches on an

average during 1985-'89, trawlers contributing 10,000 t and others 1,000 t. Gujarat landed annually an average of 8000 t out of which trawlers contributed 6000 t. Andhra Pradesh contributed 7000 t annually in the last five years with trawler contribution of 4,000 t and nonmechanised units 3,000 t. The annual average perch landings during 1985-'89 from Karnataka were 6,200 t out of which 6,000 t were landed by trawl units. The contribution from the rest of the States was less than 2,000 t per year (Fig. 2). Major contribution to perch landings came from trawls among gears and Threadfin breams among groups. Among the States that contributed to heavy landings of Threadfin breams by trawls Kerala ranked first with 30,000 t followed by Maharashtra (7,000 t), Tamil Nadu (4,900 t), Karnataka and Gujarat (4,000 t each) (Fig. 3). Domination of other perches in the total perch landings during 1985-'89 in the entire Northeast region comprising West Bengal and Orissa and also Andhra Pradesh and Tamil Nadu in the east coast and Gujarat in the west coast was noticed. In the rest of the States, Threadfin breams contributed the maximum. Landings in the first and the fourth quarters were maximum in West Bengal, Orissa and Andhra Pradesh in the east coast and in Maharashtra and Gujarat in the west coast during the five year period whereas those were maximum in the second and third quarters in Tamil Nadu in the first and third quarters in Pondicherry, in the third quarter in Kerala and in the first quarter in Karnataka and Goa.

The present level of exploitation of perches is below the level of maximum catchable potential as indicated above and atleast 1,00,000 t can be exploited without affecting the perch resources from the presently exploited regions.