
Introduction to Crustacean Fisheries of India

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India is blessed with long coastline of about 8118 km along the West Bengal, Orissa, Andhra Pradesh, Tamil Nadu and Pondicherry along the east coast; along Gujarat, Maharashtra, Goa, Karnataka, Kerala along the west coast. India has 2.02 million sq.km exclusive economic zone area and 0.53 million sq.km continental shelf area, a potential source for marine fisheries. The rich continental shelf area, is a good habitat for demersal fishes as well as crustaceans such as penaeid prawns, non-penaeid prawns, crabs, lobsters and stomatopods. Mechanised trawler is the main gear operated in the continental shelf area targeting crustacean resources. Though trawl net is operated for penaeid prawn, non penaeid prawns, crabs and stomatopods form by catch as all these resources habituate in the same fishing ground.

Crustacean resources

Crustacean resources comprise penaeid prawns, non-penaeid prawns, crabs, lobsters and stomatopods. Total landings of crustacean resources, group wise and contribution of crustacean resources to total marine fish landings during 1996-2011 are shown in table, 1.

Total annual marine fish landings of India ranged from 2.29 to 3.82 million t with mean at 2.76 million t. Annual total crustacean resources ranged from 3.62 lakh t to 5.32 lakh t with mean at 4.36 lakh t, and its contribution to total marine fish landings ranged from 13.9 % to 18.9 % with mean at 15.9 %. The landings of penaeid prawns ranged from 1.71 lakh t to 2.67 lakh t with mean at 2.06 lakh t. Landings of non-penaeids ranged from 1.04 lakh t to 1.70 lakh t with mean at 1.48 lakh t. The catch for lobsters ranged from 1,201 t to 2,787 t with mean at 1921 t. Crab landings ranged from 27,538 t to 55,695 t with mean at 41,731 t. Stomatopod catches varied from 21,187 t to 72,342 t with mean at 42,294 t. On an average penaeid prawns contributed 7.4%, non-penaeid prawns 5.4 %, crabs 1.5%, stomatopods 1.5 % and lobsters 0.1 % (Fig.1).

Trends in crustacean landings, group wise, are shown in fig. 2. Increasing trend was observed in total crustacean resources during the 16 years period. Both penaeids and non – penaeids have shown increasing trend, the trend of penaeids being higher than non penaeids, comparatively. A marginal increasing trend was observed in crab landings. Though lobster catches have shown decreasing trend, its contribution to total crustacean resources was very less (0.1%). Despite increasing trends exhibited by penaeids, non penaeids, crabs, stomatopods have shown decreasing trend because of competing in the same fishing ground with penaeids.

East Coast

State wise crustacean resources (t) and crustacean resources contribution from east coast to total crustacean landings of India are shown in table, 2. The contribution of crustacean resources from the east coast is 26.4 % to total crustacean landings. Tamil Nadu contributed highest (8.2 %) followed by Andhra Pradesh (6.5 %), West Bengal (6.4%), Orissa (5.1%) and Pondicherry (0.2 %). Tamil Nadu contributed 31.1 % to the total crustacean resources of the east coast, followed by Andhra Pradesh (24.7%), West Bengal (24.1%), Orissa (19.4%) and Pondicherry (0.7%). (Fig. 3).

West Coast

State wise crustacean resources (t) and crustacean resources contribution from west coast to total crustacean landings of India are shown in table, 3. West coast contributed 73.1 % of total crustacean resources of India. Gujarat contributed highest (27.6 %) followed by Maharashtra (24.1 %), Kerala (13.8 %), Karnataka (6.4 %) and Goa (1.2 %). Along the west coast Gujarat dominated (37.%%), followed by Maharashtra (33.2%), Kerala (18.8%), Karnataka (8.7%) and Goa (1.8%) (fig. 4).

Commercially important species

State wise commercially important penaeids, non penaeids, crabs, lobsters are shown in table 4.

Table 1. Group wise crustacean landings (t) along the Indian Coast during 1996-2011.

Year	Penaeids	Non penaeids	Lobsters	Crabs	Stomatopods	Total crustaceans	Total fish landings	%
1996	187792	104462	2631	28908	72342	396135	2380842	16.6
1997	208542	153636	2787	44820	92611	502396	2692409	18.7
1998	214678	173950	2619	34152	72603	498002	2635670	18.9
1999	174384	147961	2094	27538	49918	401895	2401706	16.7
2000	204277	151515	2431	48253	46141	452617	2652928	17.1
2001	176448	145232	1389	29739	34944	387752	2292703	16.9
2002	203801	137714	2573	36049	48553	428690	2589645	16.6
2003	214780	137229	1233	41988	37341	432571	2587095	16.7
2004	171641	116231	1371	40900	32071	362214	2538105	14.3
2005	172099	121107	1201	37182	21187	352776	2295490	15.4
2006	172460	170787	1551	51067	30551	426416	2710988	15.7
2007	195599	138983	1523	40420	25163	401688	2888461	13.9
2008	213327	187173	1974	55695	30500	488669	3207205	15.2
2009	245159	168415	1872	47897	27379	490722	3205453	15.3
2010	260181	126997	1720	52243	30150	471291	3346687	14.1
2011	267932	187061	1761	50847	25250	532851	3820207	13.9
Mean	205194	148028	1921	41731	42294	439168	2765350	
%	7.4	5.4	0.1	1.5	1.5	15.9		

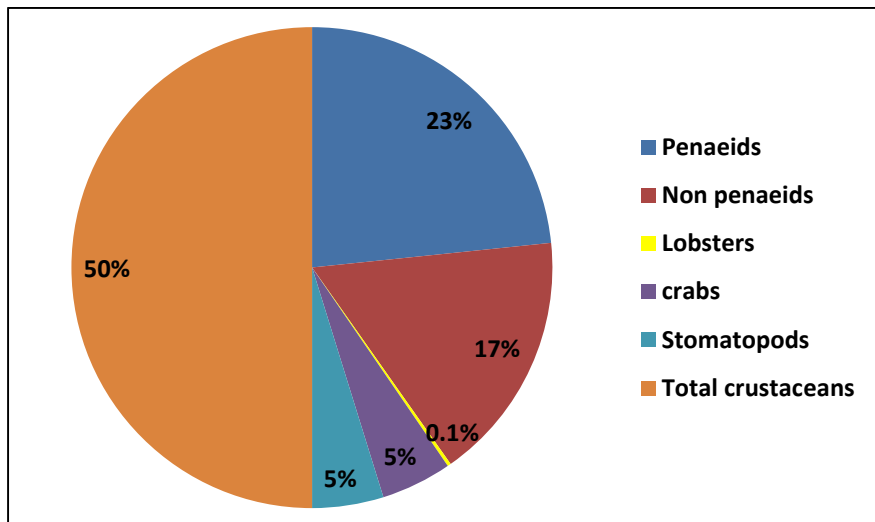


Fig.1. Mean contribution of crustacean resources to total marine fish landings during 1996-2011.

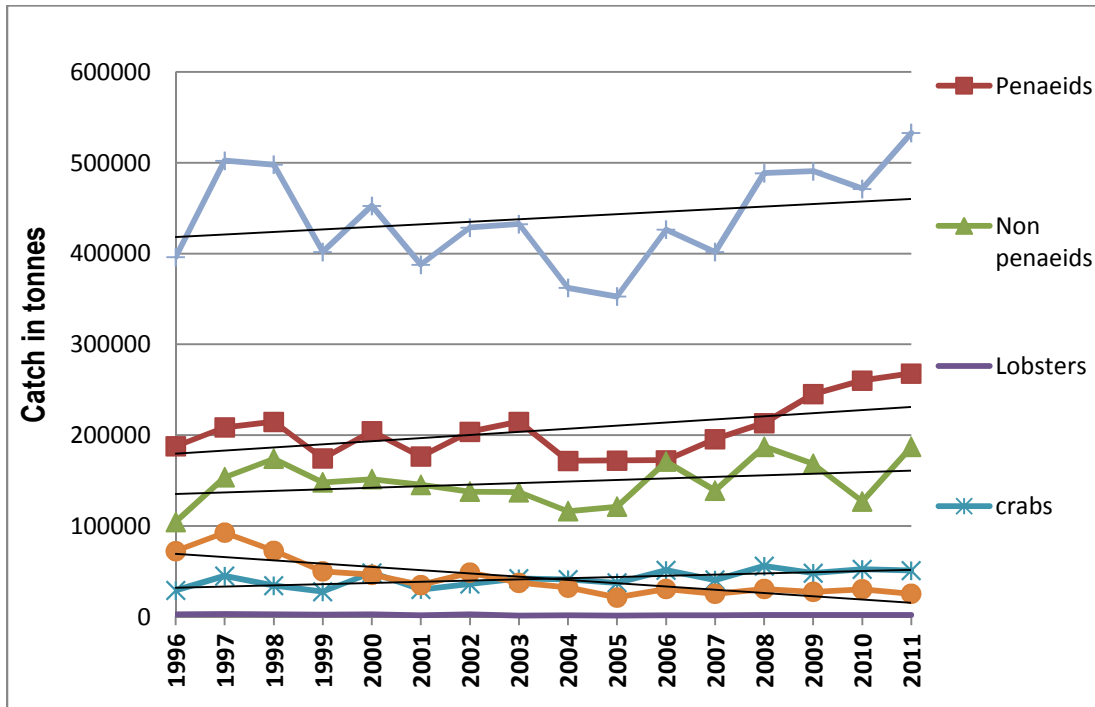


Fig.2. Group wise trends in crustacean resource landings during 1996-2011.

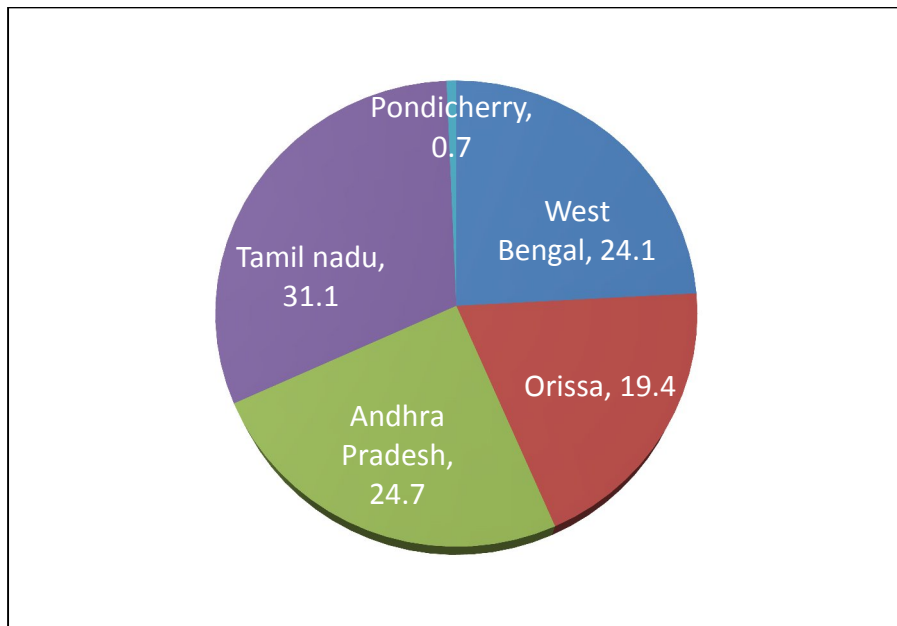


Fig.3. State wise contribution to the total crustacean resources of the east coast of India.

Table 2. State wise crustacean resources (t) and contribution of crustacean resources from the east coast to total crustacean resources of India.

Year	West Bengal	Orissa	Andhra Pradesh	Tamil Nadu	Pondichery	Total (east coast)	Total (India)	%
1996	7865	5494	22574	38588	556	75077	396135	19.0
1997	5163	5514	22257	40964	450	74348	502396	14.8
1998	12621	3569	26564	43435	1010	87199	498002	17.5
1999	8415	6742	35125	36133	507	86922	401895	21.6
2000	13212	12157	29340	38157	450	93316	452617	20.6
2001	22391	6809	21289	32808	485	83782	387752	21.6
2002	28719	7699	25072	40038	1000	102528	428690	23.9
2003	36104	8826	28382	34723	221	108256	432571	25.0
2004	23905	12587	26607	32395	704	96198	362214	26.6
2005	29646	17293	22158	27146	248	96491	352776	27.4
2006	28135	13094	30350	35775	1619	108973	426416	25.6
2007	28158	23077	33214	32078	500	117027	401688	29.1
2008	37703	29266	30656	35450	1441	134516	488669	27.5
2009	49191	54453	34001	37127	1861	176633	490722	36.0
2010	47952	73225	36922	35358	932	194389	471291	41.2
2011	68645	79111	33877	36840	581	219054	532851	41.1
Mean % to total crustacean landings of east coast	24.1	19.4	24.7	31.1	0.7			
Mean % to total crustacean landings of India	6.4	5.1	6.5	8.2	0.2	26.4		

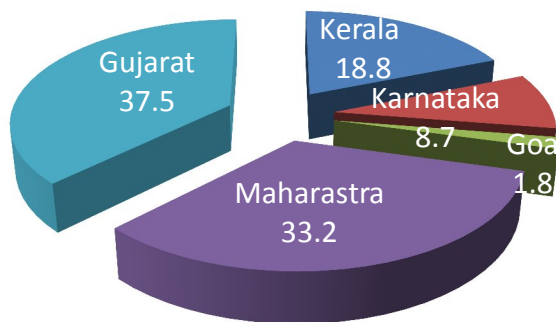


Fig.4. State wise contribution to the total crustacean resources of the west coast of India.

Table 3. State wise crustacean resources (t) and crustacean resources contribution from west coast to total crustacean landings of India.

Year	Kerala	Karnataka	Goa	Maharashtra	Gujarat	Total	Total for India	%
1996	59087	22742	9840	118836	110553	321058	396135	81.0
1997	91347	32820	11925	141990	149966	428048	502396	85.2
1998	74739	19832	7617	149978	158637	410803	498002	82.5
1999	63075	23150	2573	93253	132922	314973	401895	78.4
2000	84361	21429	4705	102145	146661	359301	452617	79.4
2001	64065	23659	4998	110012	101236	303970	387752	78.4
2002	64773	43996	9222	121965	86206	326162	428690	76.1
2003	64044	26836	10478	138291	84666	324315	432571	75.0
2004	50588	23161	5919	108166	78182	266016	362214	73.4
2005	45658	35580	2684	87964	84399	256285	352776	72.6
2006	57758	28539	2904	94227	134015	317443	426416	74.4
2007	52539	33905	1405	84451	112361	284661	401688	70.9
2008	56412	25634	5687	122282	144138	354153	488669	72.5
2009	55450	27331	2761	107546	121001	314089	490722	64.0
2010	44024	32839	4383	62462	132318	276026	471291	58.6
2011	44859	27323	4094	73113	160170	309559	532851	58.1
Mean % to total crustacean resources from west coast	18.8	8.7	1.8	33.2	37.5			
Mean % to total crustacean landings	13.8	6.4	1.2	24.1	27.6	73.1		

Table 5. State wise commercially important species of penaeids, non-penaeids, crabs, lobsters and stomatopods.

State	Penaeids	Non-penaeids	Crabs	Lobsters
Gujarat	<ol style="list-style-type: none"> 1. <i>Penaeus semisulcatus</i> 2. <i>Fenneropenaeus merguensis</i> 3. <i>Metapenaeus affinis</i> 4. <i>M. monoceros</i> 5. <i>M. kutchensis</i> 6. <i>Parapenaeopsis stylifera</i> 7. <i>P. hardwickii</i> 8. <i>P. sculptilis</i> 9. <i>Metapenaeopsis stridulans</i> 10. <i>Solenocera crassicornis</i> 	<ol style="list-style-type: none"> 1. <i>Acetes</i> spp 2. <i>Nematopalaemon tenuipes</i> 3. <i>Exhippolysmata ensirostris</i> 	<ol style="list-style-type: none"> 1. <i>Portunus sanguinolentus</i> 2. <i>Charybdis feriatus</i> 	<ol style="list-style-type: none"> 1. <i>Panulirus polyphagus</i>
Maharashtra	<ol style="list-style-type: none"> 1. <i>F. indicus</i> 2. <i>M. affinis</i> 3. <i>M. monoceros</i> 4. <i>M. dobsoni</i> 5. <i>P. stylifera</i> 7. <i>S. crassicornis</i> 8. <i>S. choprai</i> 	<ol style="list-style-type: none"> 1. <i>Acetes</i> spp 2. <i>N. tenuipes</i> 3. <i>E. ensirostris</i> 	<ol style="list-style-type: none"> 1. <i>C. feriatus</i> 2. <i>P. sanguinolentus</i> 3. <i>P. pelagicus</i> 	<ol style="list-style-type: none"> 1. <i>P. polyphagus</i>
Karnataka	<ol style="list-style-type: none"> 1. <i>F. indicus</i> 2. <i>P. monodon</i> 3. <i>M. canaliculatus</i> 4. <i>M. dobsoni</i> 5. <i>M. monoceros</i> 6. <i>M. affinis</i> 7. <i>P. stylifera</i> 8. <i>S. choprai</i> 		<ol style="list-style-type: none"> 1. <i>C. feriatus</i> 2. <i>P. sanguinolentus</i> 3. <i>P. pelagicus</i> 	
Kerala	<ol style="list-style-type: none"> 1. <i>M. dobsoni</i> 2. <i>M. affinis</i> 3. <i>M. monoceros</i> 4. <i>F. indicus</i> 5. <i>P. stylifera</i> 	<ol style="list-style-type: none"> 1. <i>Plesionika spinipes</i> 2. <i>Heterocarpus gibbosus</i> 3. <i>H. woodmasoni</i> 	<ol style="list-style-type: none"> 1. <i>P. pelagicus</i> 2. <i>P. sanguinolentus</i> 3. <i>C. feriatus</i> 4. <i>C. lucifera</i> 5. <i>Podophthalmus vigil</i> 	<ol style="list-style-type: none"> 1. <i>Thenus unimaculatus</i> 2. <i>P. homarus</i>

	<p>6. <i>Melicertus canaliculatus</i> 7. <i>P. semisulcatus</i> 6. <i>S. choprai</i> 7. <i>Metapenaeopsis andamanensis</i> 8. <i>Aristeus alcocki</i></p>		<p>6. <i>Scylla serrata</i></p>	
Tamil Nadu	<p>1. <i>F. indicus</i> 2. <i>P. semisulcatus</i> 3. <i>Melicertus latisulcatus</i> 4. <i>P. monodon</i> 4. <i>M. dobsoni</i> 5. <i>M. monoceros</i> 6. <i>M. moyebi</i> 7. <i>Parapenaeopsis maxillipedo</i> 7. <i>P. uncta</i> 7. <i>M. stridulans</i> 8. <i>Solenocera hextii</i> 9. <i>Aristeus alcocki</i> 10. <i>Parapenaeus fissuroides</i> 11. <i>Parapenaeus investigatoris</i> 11. <i>Penaeopsis jerryi</i> 12. <i>M. andamanensis</i> 13. <i>Solenocera alphonso</i></p>	<p>1. <i>Plesionika spinipes</i> 2. <i>H. gibbossus</i> 3. <i>H. woodmasoni</i></p>	<p>1. <i>P. pelagicus</i> 2. <i>P. sanguinolentus</i> 3. <i>C. feriatius</i> 4. <i>C. natator</i> 5. <i>C. smithii</i> 6. <i>C. annulata</i> 7. <i>C. lucifera</i> 8. <i>C. helleri</i> 9. <i>P. gladiator</i> 10. <i>P. arentatus</i> 11. <i>Podophthalmus vigil</i></p>	<p>1. <i>P. homarus</i> 2. <i>P. ornatus</i> 3. <i>P. polyphagus</i> 4. <i>P. versicolor</i> 5. <i>P. ornatus</i> 6. <i>P. penicillatus</i> 7. <i>Thenus unimaculatus</i></p>
Andhra Pradesh	<p>1. <i>M. monoceros</i> 2. <i>M. dobsoni</i> 3. <i>M. brevicornis</i> 4. <i>M. affinis</i> 5. <i>M. lysianassa</i> 6. <i>F. indicus</i> 7. <i>P. monodon</i> 8. <i>F. merguiensis</i> 9. <i>P. Japonicus</i> 10. <i>P. semisulctus</i> 11. <i>M. stridulans</i></p>	<p>1. <i>Acetes</i> spp. 2. <i>N. tenuipes</i> 3. <i>E. ensirostris</i></p>	<p>1. <i>P. pelagicus</i> 2. <i>P. sanguinolentus</i> 3. <i>C. feriatius</i> 4. <i>Scylla serrata</i> 5. <i>S. olivacea</i></p>	<p>1. <i>Thenus unimaculatus</i></p>

<p>Orissa</p>	<p>12. <i>M. barbata</i> 13. <i>M. mogiensis</i> 14. <i>S. crassicornis</i> 15. <i>S. melantho</i> 16. <i>P. stylifera</i> 17. <i>P. hardwickii</i> 18. <i>P. uncta</i> 19. <i>P. maxillipedo</i> 20. <i>P. coromandalica</i> 21. <i>Trachypenaeus curvirostris</i> 22. <i>T. granulosus</i> 23. <i>T. sedili</i> 24. <i>Parapenaeus longipes</i></p>			
<p>West Bengal</p>	<p>1. <i>M. dobsoni</i> 2. <i>M. monoceros</i> 3. <i>M. affinis</i> 4. <i>F. merguiensis</i> 5. <i>P. monodon</i> 6. <i>F. indicus</i> 7. <i>P. stylifera</i> 8. <i>P. hardwicki</i> 9. <i>M. lysianasa</i> 10. <i>Solenocera spp.</i> 11. <i>M. moyebi</i></p>		<p>1. <i>P. pelagicus</i> 2. <i>P. sanguinolentus</i> 3. <i>C. feriatus</i> 4. <i>Scylla serrata</i> 5. <i>S. olivacea</i></p>	