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# Prawn Fisheries

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The most outstanding development that has taken place during the past decade in India's fishing industry is the phenomenal increase of prawn export brought about chiefly by the introduction of modern processing methods. The insatiable demand for prawns from the United States and other foreign countries has been the incentive for most of the entrepreneurs to establish up-to-date processing plants for packing prawns. As a direct consequence of the high demand for raw material and due to the timely help and advice rendered by the various research and other organisations of the Government of India, a number of mechanised fishing vessels were introduced into the capture fisheries for prawns. While these developments had their effect in the fishing industry all over the country it is to be admitted that maximum development has taken place in the south-west coast of India from where more than 80% of the exportable varieties of prawn are now being landed.

## TREND OF PRODUCTION

According to the latest estimates average annual marine prawn landings of the country amount to 77,461 tonnes and it accounts for over 10% of the total catches. In addition to these quite a substantial quantity of prawns are landed from the backwaters, lakes and estuaries on the east and west coast of India.

Table I. Prawn landings and their percentages among crustaceans and overall marine fish landings of the country.

Year	Prawn landings in tonnes	Percentage in total crustacean landings	Percentage in total marine landings
1958	85,191	98.26	11.27
1959	65,436	96.90	11.19
1960	68,029	96.36	7.73
1961	62,768	96.85	9.18
1962	83,235	98.78	12.92
1963	81,593	97.54	12.45
1964	94,895	95.41	11.04
1965	78,544	97.08	9.64
Average	77,461	97.14	10.68

Although there are no reliable statistics, the landings from these sources are generally considered to be as high as half the quantity of marine landings. The trend of marine

prawn production indicates (Table I) that the catches remained more or less steady over a number of years and its proportion in the catches fluctuated between 12.92 to 7.73% during the period of 8 years. Although prawns are landed from all the maritime states of India more than 89% of the total resources comes from the west coast; the states of Maharashtra and Kerala contributing to the bulk of the landings (Table-II).

Table II—Statewise Prawn landings and their percentages  
(Average of 8 years)

State	Average prawn landings in tonnes	Percentage
West Bengal and Orissa	1,843	2.39
Andhra	3,426	4.45
Madras	2,625	3.41
Kerala	20,445	26.55
Mysore	950	1.23
Goa	123	0.16
Maharashtra	40,605	52.73
Gujarat	6,983	9.07
Andamans	1	—

#### THE FISHERY

The fishing methods employed in the capture of prawns from all over India have been described by various workers. The only new method that has come into practice in recent times is the trawling by mechanised fishing vessels. Most of these vessels are 7 to 11m long and are powered by 10 to 45 h. p. engines. They carry out daily fishing operations using ordinary cotton 2-4 seam shrimp trawls of 15 m head rope having a mesh size of 2 to 3 cm. A few large and well equipped trawlers capable of staying out in the sea are also operating from Cochin. The chief source of prawn landings is still the indigenous gear operated from dug-outs and canoes; the catches from the stake nets of Gujarat and Maharashtra and the boat seines of Mysore and Kerala even now forming the bulk.

The operations of the mechanised vessels have, however, extended the area of fishing into slightly deeper waters and have helped to keep up a steady supply of exportable varieties of Prawns. The present commercially exploited prawn fishing grounds lie within 40 m depth on the west coast. From the overall pattern of distribution of prawns it is seen that they are generally more predominant off the bar mouths of lakes and estuaries possibly because the discharge by the rivers would help to create the loose muddy sea bottom on which these animals abound. In spite of the indications that larger prawns are likely to be more in the deeper waters attempts are not so far made to fish such areas partly because these areas are not adequately surveyed and also due to the uncertainty of the economic aspects of such trial ventures by the industry.

## CATCH COMPOSITION

India's marine prawn catch can be divided into two broad categories—the penaeid and non penaeid—each of them contributing to nearly half the total landings. The penaeid prawns are relatively large sized and are represented in the commercial catches by about a dozen species, chief among them being *Penaeus indicus*, *Metapenaeus dobsoni*, *M. affinis*, *M. monoceros*, *M. brevicornis*, *Para-penaeopsis stylifera*, *P. sculptilis* and *Solenocera indicus* while the latter category consists of a few species of small sized prawns viz., *Palaemon tenuipes*, *P. styliferus*, *Hippolytina ensirostris*, *Acetes* spp. From the point of view of the export industry the former category is of utmost importance as virtually all the prawns exported from the country belong to this category. The catches from Gujarat and Maharashtra areas mostly consist of the non-penaeid prawns while those from Mysore, Kerala and Madras are the large sized penaeid prawns. (~~vide Tables I & II. The figures include a small portion of other crustaceans also~~) Details regarding their size, seasonal occurrence, gear employed in capture and approximate proportion in the commercial fisheries are given in Table III.

## FISHING SEASON

The prawn fishery is seasonal, but the seasons vary from place to place. Generally speaking, the fishing season for prawns extends from November to May in the west coast and from December to August in the east coast; in both cases interruption of the season being brought out by monsoon, the success or failure of which is believed to have influence over the fishery. In the Gulf of Kutch there is a monsoon fishery for prawns and so also in Kerala where the formation of mud banks in close inshore waters in June-July support a flourishing prawn fishery in some of the areas. The turbulent conditions of the sea and the stormy weather that are prevalent during monsoon render it difficult for the fishing vessels to successfully operate during this season. A few trawlers that are working from Cochin at present brave the rigours of monsoon and carry out fishing operations during this period. Their operations have shown that successful prawn fishing could be carried out even during monsoon.

## PROCESSING AND EXPORT

Some portions of the prawn catches are marketed in fresh condition. The long prevalent methods of processing such as simple sun-drying, extracting pulp by boiling and drying semi-drying, etc., are still in vogue. At present the modern processing methods like freezing, canning, pickling, etc., claim better part of the large sized prawns landed in the country. Simultaneous with the increase in export of the sophisticated products like frozen and canned prawns that of the dried prawns have come down considerably. In 1966 a total quantity of 11,470.014 tonnes of prawns and prawn products valued at Rs. 112,719,139 were exported from India. This included a variety of products like frozen prawns, canned prawns, dried prawns, prawn powder, prawn meal, prawn pickle, prawn curry, etc., and were exported to over 50 countries of the world. Most of these products now pass through a strict quality control by the Government and are well accepted in the world markets.

Table III Particulars regarding

Name of Species	Vernacular names	Area of occurrence as Commercial fishery	Season of fishery
<b>Penaeid Prawns</b>			
<i>Penaeus indicus</i>	'Naran Chemmeen'	West coast & East Coast	December to February
<i>Penaeus monodon</i>	'Kara Chemmeen' 'Bagda Chingiri'	West Coast & East Coast	Throughout the fishing season.
<i>Metapenaeus dobsoni</i>	'Poovalan' 'Thelly Chemmeen' 'Chingiri'	South-West Coast & East Coast	October to June
<i>Metapenaeus affinis</i>	'Kazhandan Chemmeen' 'Jinga'	West Coast & East Coast	Nov. - Dec. & May - June
<i>Metapenaeus monoceros</i>	'Choodan Chemmeen' 'Jinga' 'Koraney Chingiri'	West Coast & East Coast	Nov. Dec.
<i>Metapenaeus brevicornis</i>	'Dhanbone' 'Chingiri' 'Jinga'	W. Bengal Andhra Maharashtra Gujarat	Feb. - March
<i>Parapenaeopsis stylifera</i>	'Karikadi Chemmeen'	West Coast	Sept.-Oct. & May - June
<i>Parapenaeopsis sculptilis</i>	'Jinga'	Gujarat Maharashtra Andhra	Dec. - March
<i>Parapenaeopsis hardwickii</i>	'Jinga'	Gujarat Maharashtra Andhra	Nov.-Feb.
<i>Solenocera indicus</i>	'Jinga'	Maharashtra Andhra	Jan. - May
<b>Non-Penaeid Prawns</b>			
<i>Palaemon tenuipes</i>	'Kolbi'	Gujarat Maharashtra Orissa West Bengal	Dec. - Feb.
<i>Palaemon styliferus</i>	'Kolbi'	Maharashtra West Bengal	All round the year
<i>Hippolysmata ensirostris</i>	'Kolbi'	Gujarat Maharashtra Andhra	Sept.-Nov.
<i>Acetes spp.</i>	'Kardi'	West Coast & East Coast	Dec.-March
<i>Macrobrachium rosenbergii</i>	'Konchu' 'Golda Chingiri'	Fresh water rivers of India	May - Nov. in Kerala

*the commercial prawns of India.*

Principal Fishing gear employed in capture	Approximate representation in the annual catch	Maximum size: total length mm	Majority size in the catches mm.	Remarks
Shrimp trawl Boat seine Cast nets	10.0%	220	136-145	Juveniles fished from lakes, backwaters and estuaries as commercial fishery
..	0.9%	250	170-180	Largest of the marine prawns.
..	35.0%	130	86-95	Juveniles fished from lakes, backwaters and estuaries as commercial fishery
..	12.0%	180	121-130	Juveniles poorly represented in the backwater catches
..	10.0%	190	126-135	Juveniles fished from backwaters in significant quantities.
Stake nets Seines	4.0%	135	101-110	Ascends the tidal rivers in Bengal.
Stake nets Trawl nets Boat seines	18.0%	142	81-90	Purely marine species
Stake nets Trawl nets Boat seines	0.8%	152	76-85	
Stake nets Trawl nets Boat seines	0.6%	130	81-90	
Stake nets Boat seines	0.9%	125	76-85	
Stake nets Boat seines	3.0%	74	45-50	
Stake nets Seines	0.6%	100	51-60	
Stake nets Boat seines	0.9%	90	66-75	
Stake nets Boat seines	3.0%	25	16-20	
Traps, Cast net hooks & lines.	—	310	200-250	

Different methods of freezing and packing are in practice. The prawns are first beheaded and deveined before they are graded according to size. The larger grades are frozen with shell on in suitable cartons while the smaller grades are peeled and the meat is either frozen direct or cooked and frozen. After freezing the packed cartons are stored in cold storages until they are shipped. Generally smaller grades of prawns are used for canning. The raw material is shelled and deveined at the production centres and when it comes to the factory it is already in the meat form well iced. The meat is then cleaned, graded and filled in cans containing brine. It is then cooked, seamed and subjected to the necessary canning procedures.

#### BIOLOGY OF PRAWN

Almost all the penaeid prawns breed in the sea and their young ones enter the estuaries and backwaters when they are in post-larval stages. The only known exception to this is *P. stylifera* which, however, completes its life cycle in the sea itself without entering the estuarine environment during any stage of its life cycle. The question why these juvenile prawns enter the estuaries is not fully understood yet. The physical and chemical factors such as temperature, currents, tides, salinity, nutrients, etc., of the environment or the characteristics of the life cycle themselves may be responsible for these movements. The juvenile prawns that enter the estuaries feed and grow there upto a particular stage and return to the sea where they attain sexual maturity. In the trawling grounds these prawns show seaward and shoreward movements in different seasons and these movements are either sex oriented or size oriented. Investigations carried out by the Central Marine Fisheries Research Institute show that *M. dobsoni* and *P. stylifera* breed in 20-22 m depth regions and *M. monoceros* in 50-60 m regions. Although conclusive evidence is not available in respect of *P. indicus* and *M. affinis* indications are that these two species breed in still deeper waters. It is estimated that these prawns breed five times during their life time and that the interval between two successive breedings is about two months. The prawns fished from the backwaters are generally 4 to 10 months old while those fished from the sea mostly belong to late 0-year and 1-year groups.

It is interesting to report here that during some of the research cruises in 1965 it was found that a few species of deep water prawns (*Aristaeus semidentatus*, *Heterocarpus woodmasoni*, *H. gibbosus*, *Parapandulus spinipes*, *Penaeopsis rectacuta*, *Metapenaeopsis andamanensis* and *Plesionika martia*) were present in considerable quantities in deeper waters of 300 to 340 m off the south-west coast of India. Some of these species appear to have Commercial possibilities and it is likely that we may be able to exploit this resource in due course.

#### FUTURE WORK

The life history of the prawns and their movements are only partly understood at present. Reliable data on the various biological aspects of the individual constituents of the fishery are essential for planned development and rational exploitation of the resources.

While the introduction of mechanised boats has resulted in maintaining a steady supply of raw material for the export industry no appreciable increase in overall landings has been evident. This situation has to be very carefully studied and management policies framed, if found necessary, at appropriate time. The fast rate of development that is taking place in the industry calls for finding out additional resources to increase the catch. The potentialities of the east coast grounds are not fully known and remain to be studied. A detailed survey of the grounds lying off the river mouths in the east coast may prove fruitful. Possibilities of exploiting the recently observed resources of deep water prawns on the continental slope of the south-west coast have to be fully explored. Culturing of prawns in estuarine waters, as is practised in some of the south-east Asian countries, is another aspect to be examined. The present attempts at culturing the fresh water prawn *M. rosenbergii*, if successful, will open up vast scope for widespread stocking of this species in the reservoirs. Transplanting of this species to other river systems where it is not known to occur is likely to yield good results.

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