

The Prawn Fishery Resources of Cochin Backwaters

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Increasing utilization of prawns both in the internal and external markets has created a large demand for this commodity in recent years. While efforts are being made to meet such demands through more intensified exploitation of the resources from the conventional prawn grounds, oftenserious shortages of the raw material have been experienced due to the fluctuations in the fishery. From time to time apprehensions have also been expressed whether this natural resource could be sustained under the ever increasing exploitation of the stock. Scientists, administrators and industrialists believe that prawn culture on a commercial scale is inevitable and perhaps the only immediate answer to provide enough supply to meet the demand of the export oriented prawn industry.

The dynamic environment of the estuaries and adjoining backwaters

plays a vital role in the fishery of the coastal areas in general and the prawn fishery in particular. In the past few years, the industry had to some extent, depended on the juvenile prawn catches of the backwaters. Of late, there have been complaints that the backwaters are indiscriminately fished. This has led to an appeal from the State Fisheries authorities against the indiscriminate addition and use of stake nets in the backwaters during high tide which may adversely affect the recruitment to the fishery.

In general, the prawn fishery in Cochin backwaters can be divided into capture fishery and culture fishery. The capture fishery practiced in the open backwaters using various indigenous gears such as stake nets, cast nets, gill nets and chinese nets has been in existence for a very long time. Here, the prawns which enter the backwaters in

their post-larval stages are fished indiscriminately, irrespective of their size and season. In the culture fishery, the juvenile prawns are allowed to enter the fields (Pokkali fields) through sluice gates, to remain there and grow for some time and then are fished periodically. This has the distinct advantage of assured catch. The prawns also have a fast rate of growth in these fields. The available information suggests a promising future for the further development of this method in our backwaters.

The penaeid prawns, which are commercially important, have the habit of spending a part of their development stages in the estuaries and backwaters. They enter the estuaries in their late larval and early juvenile stages and grow to a certain size before migrating to the shelf waters in the sea. The estuarine environment plays a significant role in their survival and growth and they are called their 'Natural Nurseries'. The ecological features like water circulation, low salinity, high

nutrient content, suitable substratum and comparatively calm surroundings make it an ideal place for the rapid growth of the juveniles (4 to 10 months) during their estuarine phase.

Fishing season

The fishery for the commercially important penaeid prawns in the backwaters exists almost throughout the year, the main fishing season being November / December to May / June. The carideans such as the giant fresh water prawn - *Macrobrachium rosenbergii* - (Konchu), which migrates to the backwaters for spawning, are fished in good numbers during September/October. In the culture fields the season extends from November to April and the peak fishing season is during February-April. In some of the perennial fields prawn fishery exists throughout the year.

Fishing methods

In table I, the important gears used in the backwater area are given with the details.

TABLE - I

Name	Nos.	Season	Mesh size	Catch/unit/day
Stake nets	2976	Throughout the year	1 - 2 cm.	2 - 10 kg.
Cast nets } Gill nets }	Free nets 625	-do-	2 - 3 cm.	5 - 10 kg.
Chinese nets		1082	-do-	1 - 1.5 cm.

Considering the magnitude of the catch obtained, the stake nets and the sluice nets (used in prawn culture fields) are the most important fishing gears prevalent in these areas.

Stake net fishing

A stake net is a more or less conical bag net about 15 m long with the mesh size progressively increasing from the cod end towards the mouth (Fig. 1).



Fig. 1. A stake net ready for fishing

These are tied on to two stakes which are fixed across the backwaters in rows. These nets are operated in the evenings extending to the early hours of the night or at day break, during low tide, against the current. The fishing operation is closely related to the lunar phases and is carried out for about 8-10 days in each lunar phase (Thakkom.)

Sluice nets

This is operated in the prawn culture fields by fixing a conical net tied to a rectangular bamboo frame at the mouth of the sluice gate. It is almost similar in shape to the stake net, the length is about 6-8 m and the mesh size 10-15 mm. The details of operation are

given separately. Other gears like bag nets (koru vala), drag nets (vadi vala) and 'Paachil' are also employed for fishing in these areas.

Species contributing to the fishery

The commercially important penaeid prawns fished from the backwaters in the order of their abundance are *Metapenaeus dobsoni* (Thelli chemmeen), *M. monoceros* (Choodan chemmeen), *Penaeus indicus* (Naran chemmeen), *P. monodon* and *P. semisulcatus* (Kara chemmeen). In the stake net catches about 65-70% is contributed by *M. dobsoni* and 15-20% by *M. monoceros*. In culture fields usually more than 50% of the catch is of *M. dobsoni* and 30-35% of *P. indicus*. Fluctuations in percentage composition often occur. From February to April, the catches of *P. indicus* increase and during other months *M. dobsoni* becomes dominant.

Prawn production

The prawn fishery of Kerala backwaters contributes significantly to the total prawn production of the state. In the absence of accurate statistics, only gross estimates are available for the production of prawns from the estuarine and backwater regions. However, the estimated annual fish production from these areas is around 12,000 tonnes, 75% of which is contributed by prawns. During 1970 an estimated quantity of 1564 tonnes of prawns was landed by stake nets of Cochin backwaters while the catches from prawn culture fields amounted to 3698 tonnes. In the subsequent years of 1971 and 1972, the landings from stake nets and prawn culture fields were estimated at 1738 and 1756 tonnes respectively. The landings from various other gears operating in the backwaters can be put

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approximately at 40% of the above figures, which no doubt are arbitrary and the resource is likely to be much more.

Prawn culture

In Kerala about 4500 ha of fields are at present utilised for prawn culture practices. Adjacent to the Cochin backwaters (Kanayannoor and Parur Taluq) there are about 3500 ha of paddy fields and other culture fields utilised for prawn culture, which forms only 12% of the total fields available. Accurate data on the yield of prawns from these fields are not available at present. Fields utilised for prawn culture can be classified into three groups; those which are adjacent to the backwater; those which are a little away but are interconnected by canals; and those which are in the neighbourhood of backwaters connected by irrigation canals.

Prawn culture is usually carried out in Pokkali fields (seasonal fields) and other culture fields (perennial fields). Perennial fields are comparatively deeper and hence prawn culture alone is practiced. In the seasonal culture fields, paddy is cultivated from May to October and are leased out for prawn culture immediately after the paddy harvest. The bunds on the sides are strengthened and sluice gates are installed at selected points to regulate the flow of water from and into the fields (Fig 2). The flow of water is controlled by shutter planks. During each high tide, water is let in by removing these planks. Along with the inflow of water the juvenile prawns also enter the fields. During each low tide, the water is let out the same way, but a close meshed bamboo screen is kept at the inner mouth of the sluice to prevent the prawns escaping from the field.

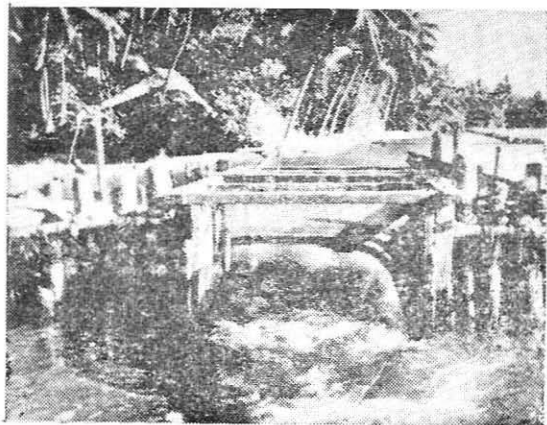


Fig. 2. *The sluice gate*

The fishing usually commences with neep tides, 3-4 days before every full and new moon and is continued for 7-8 days. When the level of water outside the field is sufficiently low, the net is fixed vertically at the outer exit of the sluice and the shutters are removed. The water rushes out with force and the prawns are filtered by the net and collected at intervals (Fig 3). Usually

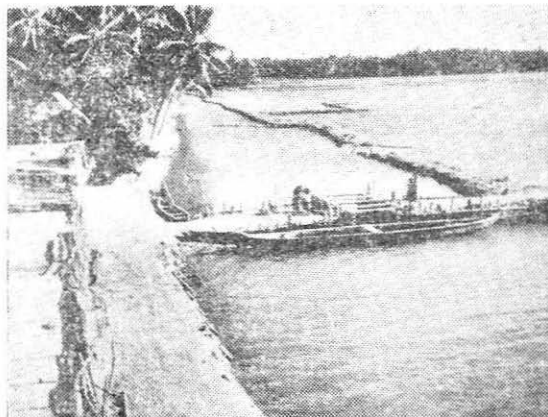


Fig. 3. *A typical prawn culture field*

the fishing operation is done at dawn or dusk depending on the tide, at night a

petromax or hurricane lantern is hung at the sluice to attract prawns towards the net. The average yield/ha can be taken as 600 to 1200 kg and the total production from these fields can be put around 3,500 tonnes per annum.

There are hundreds of ha of marshy fields and mangroove swamps lying adjacent to the backwater which at present remain unutilised. The earlier scientific studies have undoubtedly revealed that these culture fields are not mere areas for fishing alone but function as an exclusive ecological niche for the survival and growth of these valuable resources. It is beyond any doubt that if the above mentioned areas are converted into prawn culture fields in a scientific way, substantial yield can be obtained. The existing mode of recruiting the juveniles to these fields depends entirely on the tides. But if these seedlings are captured by using suitable gears and stocked in these fields, chances of increasing the production are much more.

At a time when our efforts should be to find means and ways to increase the production by finding additional resource potential, the man made changes in these waters are adversely affecting the prawn fishery. There is loss of area due to the extensive reclamation processes and schemes for salt water barriers going on for the last many years. Secondly, the backwaters are getting polluted from the industrial waste as well as by the extensive use of fertilizers and insecticides in the paddy fields, and also by dumping of domestic waste into these waters. This double pronged intervention resulting from

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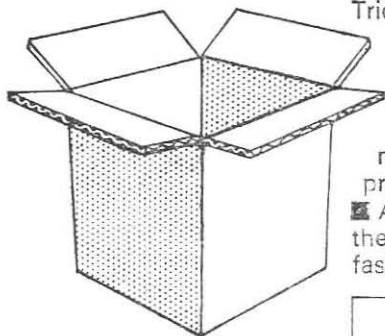
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these physical as well as chemical changes considerably limits the prawn fishery resource in these waters, especially because, the crustaceans in general are more susceptible to these types of environmental changes. It is high time to check these ecological damages by introducing some environmental control programmes after a proper assessment of the existing level of pollution and its effect.

However, we have plenty of unutilised area; we have enough resource, and the technical know-how is in no way inadequate. In the context of the availability of proper facilities for conversion of these to exploitable grounds, these low-lying areas could be of immense value in augmenting considerably our backwater prawn fishery resources.