

# Estuarine Fisheries Resources of South Kanara District, Karnataka

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## Introduction

South Kanara District has a number of estuaries but the fisheries resources of these are poorly known. The only published work\* till date is that of George *et. al.* (1959) on the mackerel fishery of Nethravathi estuary. This becomes all the more significant, since the estuaries are the main sources of fish production during the south-west monsoon period (May to September) when sea fishing operations remain suspended. It is therefore imperative to know the fisheries potential of the estuaries in the region both quantitatively and qualitatively. In order to assess the potential of these resources and to plan for their development, a preliminary survey of some of the important estuaries in the district was made during the period September 1969 to August 1970. The details of this survey are presented in this account.

## Observations

While a large number of estuaries are found in the region, the Nethravathi-Gurpur estuary and the estuaries at Coondapur are the most important ones situated at the southern and northern limits of the district respectively (Fig. 1). Therefore, fisheries resources of these two estuaries were examined in greater detail than those of others. The qualitative composition of the catches in all the estuaries was almost same, except where mentioned otherwise.

The fisheries resources of the estuaries in South Kanara District mainly pertain to fishes, crustaceans comprising prawns and crabs, and the molluscs.

**FISHES.** The importance and demand for the fishes of the estuaries is mainly restricted to the monsoon period as already mentioned. This is mainly due to suspension of sea fishing operations during the period which diverts the activities of the fishermen to the estuaries. Lack of sea fishes, especially the mackerel, *Rastrelliger kanagurta* and the oil sardine, *Sardinella longiceps* which are the main stay for local people along the coastal belt during this period increases the demand for estuarine fishes and hence their high price. The demand and value of the estuarine fishes steeply decreases with the end of the monsoon season and commencement of sea fishing operations.

Fishing in the estuaries of the region is quite diversified, the important

\* Since submission of this paper in January 1972, an account on prawns (Ramamurthy, *Indian J. Fish.*, 19: 143-155, 1972) and another on hilsa (Rajagopal and Manohara Ram, *Curr. Sci.*, 41 (20): 752, 1972) from Nethravathi estuary were published.

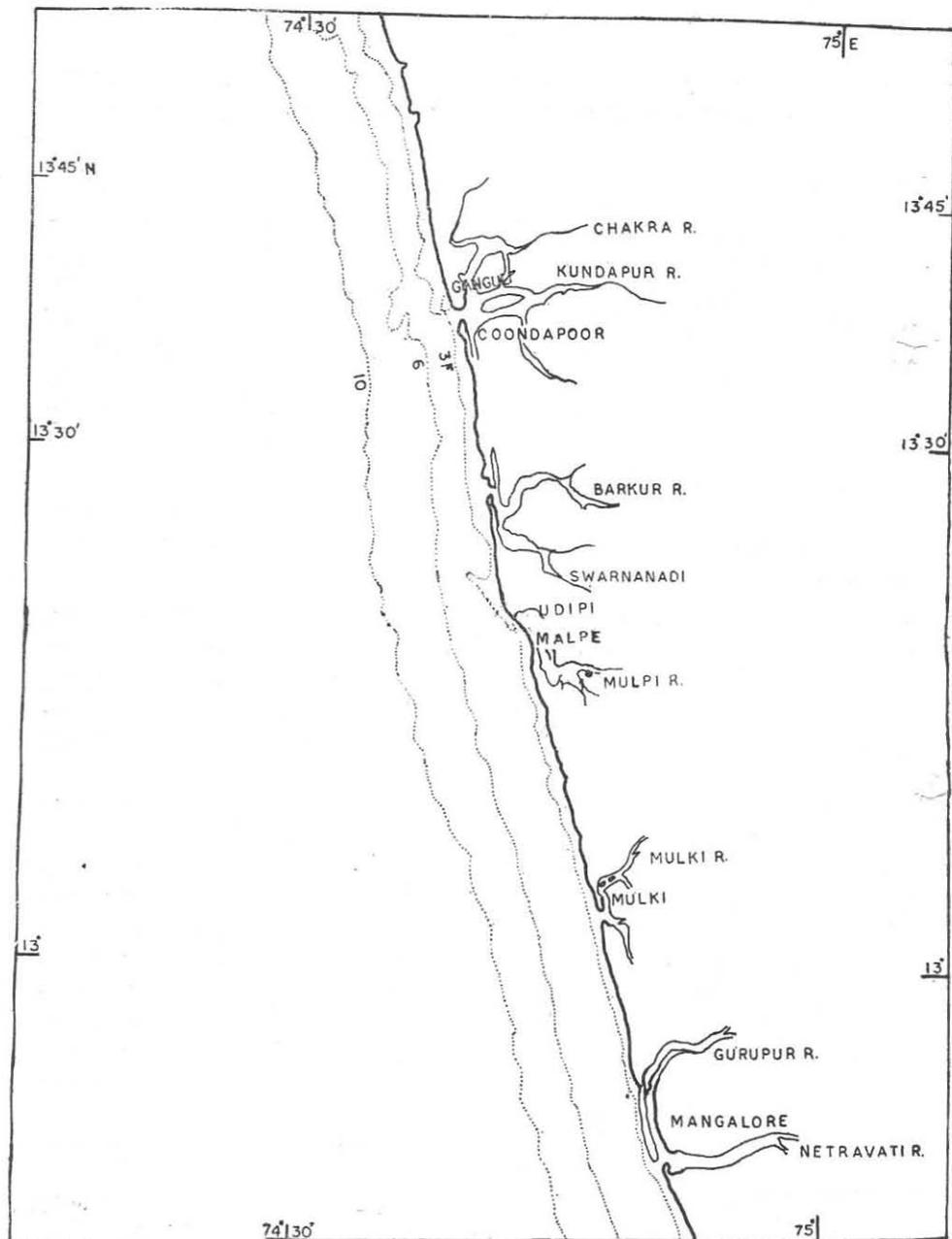


Fig. 1. Map showing the estuaries in South Kanara District.

gear being shore seines (*Kairampani*), gill nets, cast nets, hook and line and mini-otter trawls.

The fish catches in the estuaries consisted of *Sillago sihama*, *Thrissocles mystax*, *Anadontostoma chacunda*, *Ambassis gymnocephalus*, *Ilisha indica*, *Kowala coval*, *Platycephalus scaber*, *Lutjanus fulviflamma*, *Gerres spp.*, *Leiognathus brevirostris*, *L. daura*, *Sphyaena sp.*, *Pristipoma argyreus*, *Hemirhamphus sp.*, *Teuthis oramin*, *Mugil spp.*, *Stolephorus indica*, *Caranx carangus*, *Chorinemus sp.*, *Belone cancila*, *Epinephelus sp.*, *Tachysurus spp.*, *Pseudosciaena sp.*, *Gobius spp.*, *Therapon jarbua*, *Plectorhynchus spp.*, *Pseudorhombus triocellatus*, *Cynoglossus spp.*, and *Mystus gullio*.

While most of the fishes mentioned above do not attain big sizes in the estuaries, fairly large individuals of a few species like the *Mugil spp.*, *Sillago sihama*, and *Tachysurus spp.*, are regularly caught. The fish populations in the estuaries are generally composed of the juveniles and immature individuals of several species. In a few species like the mullets and *Sillago sihama*, the catches include all stages of maturity including spawners, especially in the latter. It is also significant to note that in a number of estuaries *Sillago sihama* is the dominant species in the catches, the most efficient gear for its capture being the hook and line. Polychaetes are exclusively and effectively used as bait for adults while juveniles are caught on hook with prawn as bait. Another important member of the fish fauna of the estuaries is the catfish *Mystus gullio* which forms huge shoals, especially around fish landing jetties in the estuaries where it appears to utilise as its food all waste materials thrown out from the fishing boats. The shoals consist of over a thousand fishes, ranging in size between 70 and 170 mm total length and weighing 9 to 60 gms. When such shoals are sighted, they are effectively captured by cast nets.

All the species of fishes caught in the estuaries are also caught in the inshore waters in the vicinities of the estuaries, the number of such euryhaline species in marine fish catches being more in the immediate post-monsoon period.

Apart from having a rich fish fauna, the estuaries in the region are potential sources of valuable brackishwater fish seed. While the seed of the milk-fish, *Chanos chanos* appears to be available mainly in the vicinity of estuaries at Coondapur and Mulki estuary for a restricted period in the summer (April-May), the seed of mullets (*Mugil spp.*) and *Sillago sihama* are available at several places for a longer period. Experimental fishing for brackishwater fish seed in summer months in some of the estuaries indicated the availability of the seed of the following species :

*Chanos chanos* (14-33)\*. *Mugil spp.* (15-33); *Lates calcarifer* (31-41); *Megalops cyprinoides* (19-29); *Ambassis gymnocephalus* (9-21); *Therapon sp.* (14-17); *Gobius sp.*, (19-20); *Schatophagus argus* (13-17). Further intensive surveys round the year may reveal the occurrence of the seed of other species.

\*Total length in millimeters.

These observations on brackishwater fish seed resources of the region indicate the scope for brackishwater fish culture in the vast areas of brackishwater available in the region.

The fish catches from the estuaries are poor in the non-monsoon period (September to May). Though sufficient data on the catch statistics from the estuaries round the year are at present not available, the poor catches during the non-monsoon period are due to deployment of all gear and manpower to marine fishing. The few observations made during this period, however, indicate the availability of several species of fishes in the estuaries.

From market surveys and examination of the catches from certain estuaries in the peak estuarine fishing season, it was estimated that from a 2-mile stretch of an estuary from the mouth of the river upwards, approximately 400 to 600 kg of fishes are landed per day. At other times, fishing effort is very low which is reflected in poor catches in the range of 50 to 100 kg per day. The price varies between fifty paise and one rupee per kilogram during monsoon season and about half of that during the rest of the period.

The above observations on the estuarine fish catches therefore indicate the existence of rich fish fauna in these areas and the scope for development of the fishery.

**CRUSTACEANS.** The crustacean resources include the juvenile and immature prawns and crabs, the dominant species of the former being *Metapenaeus dobsoni*, *M. monoceros* and *Penaeus indicus*, while *Scylla serrata* is the lone representative of the latter group.

Prawns are caught in the estuaries by cast nets and shore-seines. While prawns are available for longer periods in the estuaries, the peak catches are obtained between November and February. The catches at some of the important landing centres on the estuaries vary between 53 to 300 kg per month.

Size variations of prawns are characteristic of the species, *M. dobsoni* occurring in sizes below 60 mm; *P. indicus* below 125 mm and *M. monoceros* below 80 mm. total length.

The crab, *Scylla serrata* is often caught in bottom gill nets used for the capture of other fishes. The size range in the commercial catches varies from 10 to 20 cm in carapace width. During the monsoon period the catches vary between 20 to 30 kg per day, while at other times they are only of stray occurrence. Berried females were of quite frequent occurrence in the commercial catches.

**MOLLUSCS.** Large quantities of the clams, *Meretrix* and *Catalysia* are available in the estuaries in the region, in addition to different species of marine clams in the bar-mouth areas and oysters at higher levels in the estuaries. The clams form a regular fishery of considerable local importance. They are used both for consumption in fresh state and as a chief source of lime-shell. Vast beds of lime shell occur in some of the estuaries.

Live clams are picked regularly in the non-monsoon period. The areas exploited extend to about a mile up stream from the bar-mouth area though they occur upto about 6 miles upstream. The areas near the bar-mouth are known to yield catches of about 10 kg per square metre compared to areas further up which yield about half the quantity. The sizes of the clams in commercial catches vary between 2.5 cm and 7.0 cm.

Extensive and round the year fishing for clams is carried out in the estuaries at Coondapur where the total catch varies between 500 kg and 1200 kg per day. Peak catches of clams are obtained between September and May. Exploitation of the clams in the estuaries is mostly carried out by women at low tide. The price of the clams varies with size and season but generally it ranges from twenty paise to fifty paise per hundred clams depending on size.

### Discussion and conclusions

At present, the estuarine fishery is important only during the south-west monsoon period. Therefore, it is necessary to know the fisheries potential of these estuaries at other times as well. All the estuaries in the district appear to support a similar and rich assemblage of species of fishes of which *Sillago sihama* and *Mugil* spp. fetch very high prices and are much esteemed as food. In the immediate post-monsoon period, the inshore marine fish catches include a number of euryhaline species found in the estuaries. Compared to the fish fauna, the crustacean resources are of limited nature, prawns being more abundant than crabs. Here again, no significant differences have been found between the different estuaries of the district. The molluscan resources, especially the clams, are quite abundant in almost all estuaries, except the Nethravathi estuary where, apart from other reasons, dredging operations seem to affect their populations. The overall production of clams seems to be high from the estuaries at Coondapur when compared to all other estuaries. While fishes and crustaceans are mainly fished during the monsoon months, the reverse is true for the exploitation of the clams, lesser quantities being obtained during monsoon season than during the rest of the period. Information gathered indicates that abundant crops are obtained in a cyclic pattern once in two or three years, which could be due to fluctuations in the species composition.

The gear operated in the estuaries are quite varied and diversified. The shore seines are mainly restricted for operation in the shallow areas or along the banks of the estuaries. The catch is often of a mixed type, bringing in fishes and crustaceans together. The gill nets are especially suited for operation in the deeper regions of the estuaries and are effective for larger fishes, due to the large mesh of nets. Often a community type of fishing is organised where 5 or 6 units (consisting of 10 to 12 persons and a number of pieces of net) join together and barricade a larger area of the estuary. The cast nets have been found to be very effective for surface shoaling fishes like the mullets and larger prawns like *Penaeus indicus*. Hook and line was found to be the

best gear to capture *Sillago sihama*. The mini-otter trawls occasionally used in some of the estuaries, like the shore seines, bring in a mixed type of catch.

The estuaries are important sources of brackishwater fish seed, of which *Chanos chanos*, *Mugil* spp ; *Megalops cyprinoides* and *Sillago sihama* and several prawns are the most important and suitable for culture both in brackishwater and fresh waters with proper acclimatisation.

The clam resources of the estuaries in the district occupy a pre-eminent position, exploited round the year and consumed in fresh condition by people along the coastal areas.

The estuarine areas in South Kanara District are quite extensive but the exploitation of the fisheries resources, except that of clams, is limited to the south-west monsoon period. Several brackishwater areas may be suitable for culture of a variety of fishes for which seed resources are available. Further, all the estuaries are not exploited to the same degree, which if done in an organised way, is likely to yield additional resources. Therefore, round the year survey and observations on the fisheries resources of all the estuaries are needed for an adequate understanding and rational exploitation of the same.

### Summary

A preliminary survey of the fisheries resources of the estuaries in South Kanara District was made. The resources include a rich fish fauna, crustaceans and abundant clam populations. In addition, the estuaries also yield a variety of valuable brackishwater fish seed suitable for culture, which is possible in the extensive brackishwater areas in the region. Further development of the estuarine fishing in the region is expected to yield better catches.

### REFERENCE

- GEORGE, P. C., DHULKHED, M. H. and RAMA MOHANA RAO, V., (1959), Observation on the mackerel fishery of the Netravati Estuary, West Coast, South India, *J. Bombay nat. Hist. Soc.*, 56 (1): 32-38.