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# 2. DEVELOPMENT OF MOLLUSCAN FISHERIES IN INDIA

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ABSTRACT

**The-Molluscan fisheries resources are constituted bythe adible and non-edible species. The former, excluding the cephalopods, comprise mainly the bivalves and the latter a variety of bivalves and gastropods- Development of the edible resources is linked with popularisation and acceptability of the meat as an item of food and the marketing of the meat or the products in the domestic and export sectors. The non-edible species contribute greatly to Industrial raw material in the form of extensive subfossil deposits in the estuarine, brackIshwater and coastal areas. Othe's of this kind support a lucrative ornamental shell and cultured pearl trades.**

**Production of various bivalves through simple indigenous culture techniques opened up avenues fcr development of these resources through training, transfer of technology and commercialisation of the methods.**

**Monitoring-of the harvesting of molluscan resources assumes greater importance with reference to rational exploitation and conservation. Dredging operations for subfotsll deposits cause destruction of spat and changes In ecological characteristics of the beds. Transplantation of seed available in nature and sea-ranching of hatchery produced teed of bivalves and gastropods need special attention for augmenting natural productivity. A review of the existing laws and conservative measures would contribute to rational exploitation of the moHuscan resources of the country.**

The Molluscan fisheries resources of India constituted by a wide variety of edible and non-edible species occur in a wide range of habitats, typical of any tropical region. James Horneil the British biologist has exhaustively dealt with the Indian molluscan resources in his various publications and reports spanning over the period 1905 to 1951. The symposium on Motlusca conducted at Cochin in January 1968 by the Marine Biological Association of Ind'ra created interest for further research on rholluscan resources. Aspects of biology and fishery of oysters, mussels, clams and gastropods have been studied earlier (Rai 1928, 1932 and 1933; SetnaT933; Rao 1939; Jones 1950 and U73; Rao 1958 and 1969; Rao ef a/ 1962, Anon 1966; Gckhale 1963; Nayar and Mahadevan 1967; Narasimham 1969; Alagar-swami and Narasimham 1973; Jones and Alagarswami 1973; Mahadevan and Nayar 1973; Rasalam and Sebastian 1976; Nayar *et al* 1984; Narasimham *et al* 1984; Nayar dnd Rao 1985; Rao and Rao 1985. A comprehensive account of various molluscan resources have been given under the title 'Commercial Molluscs of India' (CMFRI 1974):

Molluscs are exploited from time immemorial, but of late, the exploitation rate has been found to be on the increase, especially in certain localised areas causing concern for planned development. Although the meat of molluscs is considered highly nutritious, it has limited market in the country at present. At best, they are consumed in coastal areas mainly by fishermen community and few others to a limited extent. With increasing demand for protein rich foods from the sea, the demand for molluscan meat injthe country has also been rising gradually and has even led to export markets in recent times.

The edible species (exclusive of Cephalo-pods which are not considered in this paper) comprise mainly of bivalves viz *Meretrix meretrix, M. casta, Katelysia opima. Villorita cyprinoides, Paphia malabarica, Anadara granosa. Solen kempi, Parna viridis, P. indica, Crassostrea madrasensis, C. gryphoides* and *Saccostrea cucullata* and few gastropods such as *Trochus niloticus, Turbo marmoratus, T. intercostalis, Xancus pyrum, Oliva gibbosa, Strombus canarium, Lambis lambis, Thais rudolphi* and others. The non-edible molluscs are represented by a variety of bivalves _and gastropods. While the edible varieties are directly used for human consumption in fresh

condition and also for export in the processed state, the non-edible varieties are used mainly for ornamental purposes.

The Andaman and Nicobar islands support a thriving licensed fishery for *Trochus niloticus* and *Turbo* spp mostly for ornamental purposes. Shells of a number of bivalves and gastropods are utilised by the ornamental shellfish industry at Mandapam, Rameswaram and Kiiakkarai (south-east coast) and elsewhere. The shells of both edible and non-edible varieties coupled with vast resources of sub-fossil deposits from the estuaries, brackishwater and coastal areas contribute greatly to industrial raw material for the manufacture of cement, calcium carbide etc. According to Rasalam and Sebastian (1976) th« sub-fossil shell deposits and fresh clam shells are utilised by cement industry to the tune of about 50,000 t annually from the Vembanad lake in Kerala; the calcium carbide industry consumes about 15,000 t besides the lime production in innumerable lime kilns. Rao (1983) reports that an average of 20,000 t of shell deposits are dredged annually with simple mechanical devices from the Kundapur estuary from 1975 onwards, major industries using these deposits being polyfibre, paper and rayon industry in 'Chemical recovery process' and plantation industry in the treatment of effluents and in neutralisation of soils of coffee and tea plantations.

Many estuaries, brackishwater and coastal areas abound in a wealth of moliuscan resources. But a precise knowledge of the natural resources is still wanting. This is due to the limited use to which the meat is put to. This again is linked with the food; habits of the population where the shellfish meat is frowned upon. Therefore, further development of the moliuscan resources would depend upon popularisation of the meat in the country as well as the export sectors.

In view of the recent demand for moliuscan meat and their products, the effect of fishing on the natural populations needs a closer scrutiny since the known beds which are in easy access are rapidly exploited. What is immediately needed is the proper assessment of exploited populations. Exploited shell fish resources do not find a place even today in the landing figures of the country. Recent investigations by the Institute provide some information on the standing stocks in some selected segments along the coast. The exploitation rate should be linked with the rate of regeneration including growth and biomass production. The settlement of spat and overcrowding in natural beds a'so need critical evaluation. In several parts of the country, the demand for raw materials for various industries from natural resources like subfossil deposits is ever increasing. The resultant dredging to recover shell deposits removes live clams as well as spats which would have settled down in such regions. Repeated dredging in the same area can cause extensive damage to the future settlement of spat thus leading to depletion of the resources. According to Rao (1983) continuous dredging in the Kundapur estuary which was yielding good quantities of live clams before the dredging operations, has completely destroyed the clam beds by disturbing the substratum thereby preventing fresh spat settlements. Moreover dredging results in heavy sedimentation which is not conducive for spat settlement.

Recent studies have indicated that various commercially important bivalves could be produced in commercial quantities through indigenous culture techniques. It has been demonstrated that it is possible to obtain high yields of bivalves in few months'time (Qasim *etal* 1977; Appukkuttan 1980; Kuriakose 1980; Narasimham 1980; Ranade and Ranade 1980; Rangarajan and Narasimham 1980; Silas er«A 1982 and Nayar and Mahadevan 1983). However, due to lack of necessary incentives and possibilities of marketing within the country and outside, the technologies developed have remained almost on an experimental scale only. Economically also, moliuscan culture is not as attractive as shrimp farming. Further development of moliuscan fisheries through culture would be successful only <wheh commercialisation of the results achieved through research are given serious consideration, coupled with identificatior^ and development of markets both within and outside the country.

While a number of technologies , have been developed tp produce bivalves in large scale (CMFRI 1983 a; 1983 b; 1986), further

survey for suitable areas for culture along the coast has to be conducted Seeds of commercially important species will have to be transplanted in suitable areas where they are not naturally available. Sea ranching programmes have to be taken up to replenish the natural stocks as well as to develop new beds.

With the possible increasing demand for production of molluscan meat through culture systems, the hatchery technologies already available will have to be improved and propagated

Monitoring of the harvesting of molluscan resources assumes greater importance with reference to rational exploitation and conservation. A review of the existing laws and conservation measures would contribute to judicial exploitation of the shellfish resources. Training and transfer of technology programmes need to be expanded to create an awareness of the importance of the molluscs In the economy of the country.

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