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56. MANAGEMENT OF MOLLUSCAN FISHERIES

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The development of molluscan resources in our country involves two problems, the first being creating of demand and the second improved and rational exploitation of the resources.

MUSSEL FISHERIES

Mussels are gregarious and sessile and favour damp ledges and platforms rather than verticals. They grow on rocks, shingle and mud flats of mid littoral. There is a marked increase in number and size towards the submerged lower levels.

In the shallow coastal and shelf waters, the amount of organic matter reaching the bottom and thus available to the attached forms like mussels is high for three reasons:

1. high phytoplankton production
2. distance through which it has to sink is less with less opportunity for consumption in the middle layer and
3. lateral transport from the areas intensely high, primary productivity in sea weed beds, estuaries and marshes.

With heavy rainfall in Kerala, Karnataka and Maharashtra, the 'Mytilus line' is in line with mean high water neap and immediately below the line, the mussel population is dense. Temperature plays a vital role in the reproduction of mussels.

Mortality during the free swimming larval period has been reported to be considerable, even upto 99%. The main mortality factors have been identified as predation, excessive dispersal to areas, where suitable sites for post larval survival do not exist and death due to extreme physical factors.

Production of seed or young ones is one of the vital aspects of any farming activity. In the culture of green mussels, where considerable advances have been made on the techniques of farming, the basic seed material has always been obtained from the wild. Removal of seed

mussel from the beds for farming comes in conflict with the interests of natural fishery. The natural seed resources on the beds cannot support mussel culture industry of some magnitude. These factors make it imperative to develop techniques for seed production. At present, for the mussel culture operation in India, seed collected from the natural grounds is used and these cannot meet the requirements of expansion of mussel culture as an industry.

Profuse spatfall takes place on granite embankments and groynes laid along the coast of central Kerala for prevention of sea erosion. Spatfall occurs in the mussel culture farm itself at Vizhinjam/Calicut. Possibility of production of seed in the farm by keeping a breeding stock of mussels as in Madras, will have to be examined and developed. The above three possibilities need further considerations and experimental work. Economic consideration will weigh upon such attempts, although technical feasibility may be established.

Induced spawning can be effected by rough handling, chemical stimulation and thermal stimulation.

In handling the larvae through development to settlement, success would depend on several factors of water quality, larval food and disease control. The sea water used for larval rearing has to be assessed for suspended matter, pollutants, temperature, salinity and pH range and nutritional value. Feeding the bivalve is a major constraint in the hatcheries—to give optimal nutritional support that is efficient and economical for culturing under controlled conditions.

There are potential dangers to be foreseen from different sources. It is therefore, important to take steps to prevent ill effects of pollution and outbreak of diseases. The following points deserve attention.

1. Selection of farm site free of biological and chemical contamination;
2. Selection of disease resistant seed for culture;

3. Avoiding overcrowded stocking to minimize ill effects of epizootics;
4. Care in handling cultured stock to avoid contamination;
5. Periodic inspection on the larvae of pathogenic organisms in the culture systems to assess the status of the stock;
6. Eliminating other sources of contamination and pollution; and
7. Timely harvesting of stock.

At present in a few centres like Tellicherry, Kozikode, Vizhinjam, Colachel and Goa, mussel is liked by the local population, but in other centres, it is consumed as food by fishermen. It is a common belief on the west coast that mussels are unwholesome/poisonous during the S. W. monsoon and possibly due to turbidity, mud, sand and refuse.

Treatment of mussels for sanitation and flushing of material from the digestive system and in the mantle cavity is essential, before marketing the mussels. This is highly essential and important.

Mussels, clams & Oysters, though in demand and as luxury items in the West & Far East they are not in much demand in the country. The production at present is from natural/wild stocks. Though technically, culture is possible, and that too only from wild seed stock, the economics and commercial feasibility studies are still to be made as also market promotion.

CHANK FISHERY

Chank Fishery (*Turbinella pyrum*) is commercially important in the Gulf of Mannar and Palk Bay, contributing to landing of 8 to 10 lakhs a year, valued at about Rs 3 million and offering employment to 2000-3000 divers, during the season.

The Chank fisheries were crown monopolies, enjoyed from time immemorial by the rulers of the region and became a state monopoly vested with the State Govt. under powers, conferred under Sec 6 of the Indian Fisheries Act 1897 under which fishing for Chank will be regulated under license or lease.

In 1971, it was decided to open Chank fisheries in all districts except in Tirunelveli District considering that it might give benefit to the divers and improve their socio-economic condition, except that divers should take a license with a fee of Rs 10/- per year. But a review after a period of five years showed that this system did not contribute to the desired effects, but led to undesirable results and it was felt that the conservation of the fisheries will face problems and the earlier system was restored. The management of the fishery is with the state Department of Fisheries.

PEARL OYSEER FISHERY

The Gulf of Mannar has pearl banks of some magnitude in the country. In 1909 the management of the fishery came under of the Department of Fisheries and it is conserved, managed and exploited by the Fisheries Department. There has been fluctuations in the fisheries and it is not an annual feature. As pearl oysters (Young ones) could be collected in large numbers in the Gulf and considering the potential, a Pearl Culture Project has recently been established as a Public Sector operation, based on the technology developed by CMFRI.

The reasons attributed for the oysters not reaching the fishable size in the natural beds are biological and physical viz. growth of *Modiolus* on oyster beds, abundance of fish browsing on oysters, of sea-stars, migration, natural sand drift, fierce underwater currents, etc.

As a large number of factors influence the spat fall and their growth in the pearl banks away from the coast, the management becomes difficult but they can be grown in sheltered bays & among coral Island and there is scope for culture pearl operation, the establishment of commercial farm is encouraging.

SQUIDS AND CUTTLEFISH FISHERY

Cephalopod fishery, comprising of squids, cuttle fish and octopus account for 1 to 1.5 million from all oceans. More than half of the total catch is at present taken in the northwest and northeast, Pacific and Atlantic Oceans. In

1981 Japanese fishing vessels accounted for over 7,00,000 t and Japan also is a major consumer.

The potential yield of squids in the Indian Ocean has been estimated as several hundreds of thousands of tonnes and that Bay of Bengal accommodates the largest nursery for squids in the Indian Ocean. The production potential of the region has been estimated to be 5,00,000 t. George et al (1977) assessed the exploitable production from the continental shelf waters of around 1,80,000 t of which 66% is from the east coast of India. As against this potential, the landings of cephalopods, especially squid & cuttle fish in India were about 20,000 t in 1984.

There is scope for increasing landings of squids and cuttlefish by introducing squid jigging and intensifying the efforts in the inshore waters and by collaboration with selected foreign companies for adopting new and improved technologies for fishing in the EEZ and for handling them to meet the demands of selected markets. This activity should be monitored by a study, survey and rational

exploitation with bases in Veraval, Malpe, Tuticorin, Vizag and Port Blair.

MANAGEMENT

Based on a thorough knowledge of the resources and their biological and environmental aspects, the management and conservation of these resources will have to be formulated (directed) for recommending a biological minimum size for exploitation for each of the commercial species closed areas and seasons for fishing after taking note of the peak spawning. These steps are necessary not only for collection of adult oysters, clams and mussels but also for the production of the seeds from wild stock for culture purposes.

Further, molluscs except cephalopods, are sedentary with restricted mobility and are therefore, more prone to depletion than fishes but this factor enables us to observe in advance the indication of depletion and resort to conservation measures on time.