

## CONSERVATION AND MANAGEMENT OF SEA-CUCUMBER RESOURCES OF INDIA

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### ABSTRACT

Conservation measures such as size regulation, closed seasons, sea-ranching for sea-cucumbers are described in detail. The management policies for sea-cucumbers are also outlined.

### INTRODUCTION

Sea-cucumbers being defenceless creatures with very limited movements neither offer resistance nor attempt to escape at the time of capture. For these reasons they have been indiscriminately fished. During low tide time, women and even children are engaged in collecting them in the intertidal region. Certain species of sea-cucumbers are fished for the preparation of highly priced export product known as *beche-de-mer*. The *beche-de-mer* industry in India is very ancient having been introduced by the Chinese. Hornell (1917) believes that *beche-de-mer* is one of the commodities taken to China during the last one thousand years when trade existed between South India, Sri Lanka and China. According to Eys (1986), one of the factors that discouraged the development of sea-cucumber industry is over exploitation. Trinidad-Roa (1987) reports that most of the collection areas are stripped of holothurians due to over exploitation in Philippines. James (1987, 1988) made observations on the resources, exploitation, conservation and management of sea-cucumbers in India.

There is no doubt that the sea-cucumbers are over exploited along the Indian Coast. This is clearly indicated by the small size of the sea-cucumbers fished and also in the poor returns per unit of effort. Apart from their vulnerability

for fishing, the whole fishing pressure is on one or two species in a narrow strip of sea bed. On the main land of India, fishing is conducted in the Gulf of Mannar and Palk Bay for *Holothuria (Metriatyla) scabra* and *Holothuria (Theelothuria) spinifera*. James (1985) has already pointed out that *Holothuria (Metriatyla) scabra* and *Holothuria (Theelothuria) spinifera* are likely to be depleted unless conservation measures are taken up. Silas *et al.* (1985) reported on the depletion of *Holothuria (Metriatyla) scabra* populations in the Gulf of Mannar. This should apply to Palk Bay resources also. Due to the high price offered for *beche-de-mer* in recent years, other species such as *Bohadschia marmorata* are also fished thus relieving the fishing pressure to some extent. The urgent need of the hour is to conserve and manage the sea-cucumber resources of India in a rational manner.

### CONSERVATION MEASURES

Unfortunately upto now no studies were made in India on the stocks of sea-cucumbers. Conand (1986) conducted studies on the stock assessment of *H. scabra* at New Caledonia. Production of *Holothuria (Metriatyla) scabra* from the Northwest of Sri Lanka (Palk Bay, Gulf of Mannar and Kalpitiya) is estimated to be around 100-150 tonnes per annum and there is no information on the yield (Anon., 1984). Although sea-cucumbers are fished in large numbers round the year from the Gulf of

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Mannar and Palk Bay from a number of centres, no data are available on the landings of sea-cucumbers. Without data on catch and effort it is not possible to estimate the potential yield, yield per recruit, maximum sustainable yield and the standing crop. This lacuna is now being filled up. The Central Marine Fisheries Research Institute has devised a Proforma and supplied to all survey staff along the Gulf of Mannar and Palk Bay to collect data on landings of sea-cucumbers. Trinidad-Roa (1987) mentions about dried samples as small as 4 to 5 cm and there are signs of overfishing in Philippines also. He is of the opinion that the most practical method is to regulate the sizes of dried sea-cucumber allowed for export as it is easier to monitor considering thousands of kilometres of coast involved. The Government of India did exactly the same thing by banning the export of *beche-de-mer* below 75 mm length in 1982 as a measure of conservation, but this has not been effective. Some of the conservation measures are given here.

#### **Size regulation**

Size regulation is the most important measure for conservation. Durairaj *et al.* (1984) stated that the percentage of shrinkage ranged from 56 to 60% for dried *beche-de-mer*. Therefore the *beche-de-mer* of 75 mm corresponds to nearly 190 mm length in the fresh condition. At this length *Holothuria (Metriatyla) scabra* is immature. It is essential to allow the animals to spawn at least once in their lifetime to replenish the stocks. If this is not done the populations will be depleted drastically as it happened in and around Tirupalakudi in the Palk Bay. The average size of the sea-cucumbers collected from Tirupalakudi is only 155 mm. At Tuticorin the industry has started recently and the average size of the holothurians fished is 217 mm which is above the safe level. In this connection, it is pertinent to note that the *beche-de-mer* of *Holothuria (Metriatyla) scabra* exported from East Africa, Indonesia and Singapore is 10 - 18 cm in length. Therefore it is not desirable to fish them before they breed and propagate. While there is a ban to export dried product below 75 mm, there is absolutely no ban on fishing small forms. This ban should be enforced

strictly by the Tamil Nadu Fisheries Department as they are doing for the chank fishery. Holothurians are usually brought along with chanks during the diving season. Therefore it is easy to monitor and regulate the catch. Sea-cucumbers live out of water for a long time and therefore the undersized specimens brought to the shore can be put back into the sea for further growth and propagation. The Lakshadweep Administration took some laudable steps to restrict the collection of *Holothuria (Microthele) nobilis* below the length of 150 mm when a person from Madras processed at Androth and Kavaratti some years back. Unfortunately the Andaman and Nicobar Administration completely banned the collection of holothurians under provision 11 of the Andaman and Nicobar Shell Fishing Rules, 1978. Considering the vast number of islands with very good resource of holothurians, this does not appear to be a wise move since the holothurians are short lived species and if they are not exploited they will die and decompose. Instead, the Administration can regulate the fishery by marking out various areas and limiting the material to be exploited as they have done in case of the shells *Turbo* and *Trochus*. In this way the country will not be deprived of the valuable foreign exchange. James (1981, 1987 b) has given an account of the resources, problems and prospects of *beche-de-mer* industry of Andaman and Nicobar Islands.

#### **Closed seasons**

On the mainland of India, holothurians are fished round the year in the Palk Bay and the Gulf of Mannar. In Palk Bay the fishing starts in March and extends upto October, the peak season being April to May. The fishing season starts in the Gulf of Mannar in October and extends upto March. The peak season in the Gulf of Mannar is during December and January. March and October are the transition months when they shift the operation from the Gulf of Mannar to Palk Bay and from Palk Bay to Gulf of Mannar. *Holothuria (Metriatyla) scabra* which forms the main stay for the industry breeds round the year with two spawning peaks one in July and the other in October (Krishnaswamy and Krishnan, 1967). It

is better not to fish in October which is a fag end of the season for Palk Bay and beginning of the season in the Gulf of Mannar when conditions for fishing are settling down. After the peak season during April to May in Palk Bay, they can give respite during June/July which is again the peak breeding season. The populations in the Palk Bay are more affected than in the Gulf of Mannar since the fishing pressure is more and also during the peak breeding season the fishing is in full swing in Palk Bay. The industry should concentrate their efforts during the summer months for two reasons. The first reason is that it can be quickly dried in the sun during January to May. Secondly sun dried material is preferred over smoke dried material in the export market. Smoke dried material also involves additional expenditure by way of fuel. The third reason is that in summer there is no breeding peak. The collection of the material in Palk Bay during July and in the Gulf of Mannar during October may be regulated if it is not possible to ban the collection altogether.

#### *Sea-ranching programme*

One of the ways to replenish the stocks in the sea is to sea-ranch the juveniles in large numbers on the holothurian beds. Such work is now being done in Japan for *Stichopus japonicus*. In India, a breakthrough was achieved for the first time when James *et al.* (1988) successfully induced *Holothuria (Metriatyla) scabra* to spawn in the laboratory. They reared them through various stages and obtained the juveniles. In Japan it is found that it is advantageous to sea-ranch them rather than to culture them in farms (Rao, per. comm.). Intensive seed production should be taken up to launch the sea-ranching programme in a big way. The very high fecundity and high rate of survival of *Holothuria (Metriatyla) scabra* are the factors responsible to sustain the fishery despite the pressure on fishing. One female liberated nearly a million eggs in the hatchery.

#### MANAGEMENT POLICIES

If the industry has to survive and grow, in addition to the conservation measures suggested, the following management policies also have to be strictly adhered. The industry has to diversify in space and species. The industry has to be managed on scientific lines. Industry has to be extended to other areas. This has to be urgently extended to the Lakshadweep and the Andaman and Nicobar Islands. James (1973, 1986 a) advocated the introduction of the industry to the Lakshadweep. This is very important since the best grade holothurian *Holothuria (Microthele) nobilis* is found in abundance in the Lakshadweep. James (1989) made some estimates of this species from some of the islands of Lakshadweep. The industry existed there once and this has to be now revived. The total ban on fishing for sea-cucumbers in Andaman and Nicobar Islands has to be lifted and regulated so that this valuable resource can be exploited judiciously over large areas. Another important management policy is to improve the quality of the product so that it can fetch better price in the foreign market. At present Japanese and Korean products are sold at a premium whereas the Indian product processed under unhygienic and improper conditions fetches poor price. James (1986 b) gave several suggestions to improve the quality of the product.

It is ironical that the least preferred and least valued holothurian *Holothuria (Metriatyla) scabra* is processed in India ignoring other valuable species. This is chiefly due of the ignorance of the value and also the processing methods for other species. From Lakshadweep, *Holothuria (Microthele) nobilis*, *Thelenota ananas*, *Actinopyga mauritiana* can be processed since the resource is good and from the Andaman and Nicobar Islands, in addition to *Holothuria (Metriatyla) scabra*, *Actinopyga mauritiana* and *A. echinites* can be processed. In Lakshadweep, *Bohadschia argus* and even *Stichopus chloronotus*, though of lesser value can be processed since the resource is abundant.

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