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MARINE LIVING RESOURCES OF THE UNION TERRITORY OF LAKSHADWEEP —

**An Indicative Survey
With Suggestions For Development**

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Limited Circulation

23. DEVELOPMENT OF FISHERIES IN LAKSHADWEEP — RECOMMENDATIONS

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INTRODUCTION

Investigations conducted by the Central Marine Fisheries Research Institute have indicated the possibilities of exploitation of the potential marine resources especially tunas and other commercially important fishes around Lakshadweep. Realising the need for the increased exploitation of the marine fishery resources, emphasis has been given to the biology and assessment of the resources of tunas, fishery and biology of tuna live-bait fishes and the environmental factors affecting their distribution and abundance. Of the various developmental schemes proposed to be implemented in Lakshadweep in recent years, exploitation of fishery resources has been given considerable importance by researchers and planners alike. As the land area being limited, the scope for the development of land based industries is very meagre and hence any major development programme envisaged has to be centred on the exploitation of marine fish resources.

PRESENT STATUS OF FISHING

The present average annual yield of 4949 tonnes (for 1983-86) of marine fishes from the islands is only a small fraction of the reported potential of the Sea around Lakshadweep which is as high as 90,000 tonnes (Jones and Banerji, 1973). Pole and line fishing for tuna practised in an organised manner only in Minicoy was adopted with the introduction of mechanised boats in the other islands of Lakshadweep after 1960 based on the suggestion made by Jones and Kumaran (1959). This has considerably enhanced the landings of tunas, especially the oceanic skipjack, the production of which has reached an annual average of 3983 tonnes during 1983-86, thereby bringing prosperity to the islands. However, a reasonable estimate of the exploitation potential of tunas around Lakshadweep is 50,000 tonnes (George

et al., 1977). The use of mechanised boats for pole and line fishing has resulted in considerable increase in the catch per boat. The other fish resources which constitute about a fourth of the total production are mainly exploited by traditional gears like hook and line, harpooning, surface trolling, drag nets and cast nets. The important resources other than tunas are *Acanthocybium solandri*, *Elagatis bipinnulatus*, *Coryphaena hippurus*, perches, sharks and rays. As the traditional methods of capture of fishes other than tunas have not undergone any change, landings of other fishes are more or less at a stand still when compared to the increasing trend in tuna landings by pole and line. The magnitude of the landings of other fishes depends on the fluctuation in the availability of tuna shoals around the islands.

IMPROVEMENTS SUGGESTED

Various suggestions have been made by different authors for the exploitation and utilization of the resources of tunas, bill fishes, sharks and other fishes (James *et al.*, 1986; James and Pillai, 1987; Kumaran and Gopakumar, 1986; Mannadiar, 1973; Nair, 1986; Silas and Pillai, 1982; Silas *et al.*, 1986). As the tuna fishermen are not able to go far out in small mechanised boats to scout for tuna shoals, Silas and Pillai (1982) suggested the introduction of large pole and line boats to increase the area of operations. The use of navigational aids and adequate storage facilities for enabling prolonged fishing operations beyond the traditional fishing grounds by pole and line and improving the operational techniques and post-harvest technology and marketing were proposed by James *et al.*, (1986). The prospects of acquiring and utilising vessels, equipment and expertise from technologically advanced countries were also considered (James and Pillai, 1987). Diversification of fishing effort for exploitation of fishery resources other than tunas and practising cheaper preser-

vation methods and effective marketing have been suggested by Kumaran and Gopakumar (1986).

IMPORTANCE OF LIVE-BAIT

Live-baits are of paramount importance for the success of pole and line operations for skipjack. Shortage of live-baits at times is found to be a constraint for pole and line operations in the islands especially after mechanisation. Seasonal changes in the availability of bait fish in the lagoon have been observed and their scarcity sometimes affects skipjack fishing operations. However, observations made at Minicoy have shown that the total catch of live-baits is only increasing year after year from 1981-82 season and that the catch per unit effort fluctuates in different years. The fluctuations in the seasonal recruitment to the populations of migrant live-baits like *Spratelloides delicatulus*, *S. japonicus*, *Lepidozygus tapeinosoma*, *Caesio* spp. etc., environmental deterioration and the demand exceeding the available live-bait stocks are the main reasons attributed to the apparent shortage of live-baits (Pillai *et al.*, 1986). The increase in the number of pole and line units consequent on mechanisation of boats has resulted in the progressive increase in the tuna catch and hence the demand for live-baits also has increased, while the area of collection of live-bait remains the same. Pillai and Madan Mohan (1986) are of the opinion that adverse changes brought about in the environment by human interference are responsible for the declining trend in live-bait. Excessive erosion and siltation of the lagoons by the fury of nature, blasting of reefs and dredging to deepen the boat channels and removal of coral stones for construction purposes damage the ecosystem causing mortality of corals and associated fauna including live-baits (Pillai and Madan Mohan, 1986). *Tilapia Sarotherodon mossambicus* was introduced in Minicoy as an alternate for live-baits. Though the species has established there, now in all the freshwater ponds, wells and tidal pools, it has failed as an alternative to other live-baits.

RECOMMENDATION

Development of tuna fisheries

Most of the earlier workers on the resource potential of the islands are of the view that tuna stocks are at present under exploited and that the production can be increased considerably. The pole and line fishery for tuna is the main fishing operation of the islands and hence developmental efforts should be directed towards the adoption of improved techniques. Indigenous manufacture of lure-hooks, fibre reinforced plastic poles, introduction of fishing boats with large holds for bait fish are worth the attempt to improve the tuna catch. The use of larger pole and line vessels will definitely be of advantage to increase the area of fishing operations and enable better catches. Drift gill netting and long lining from larger fishing vessels will yield large species of tunas. Fish aggregating devices could be set up around all submerged banks and isolated reefs in the archipelago for attracting tuna and other large fishes and thereby enable the fishermen to increase the landings.

Development of bait fishery

As the availability of live-bait is important for the development of pole and line fishing for skipjack, suggestions have been made already for the proper management of bait fishery, preservation of the ecosystem, identification of new varieties of bait fishes, locating fishing grounds so far remaining unexploited, culture of bait fishes and adopting improved methods of stocking live-bait tanks. However, concerted efforts have not yet been made on the above aspects so far. It has been observed that the requirement of bait fishes for pole and line fishery often outstrips the supply resulting from acute shortage of conventional species of bait fishes. As there is greater demand for live-baits than in the past due to the expansion of the pole and line fishery, the use of artificial baits could be tried. The availability of bait fish in regions of submerged reefs and around isolated islands have to be explored using better methods of capture which will definitely relieve to a great extent

the pressure on conventional species of bait fishes caught from the lagoon at present. Over stocking of the bait tanks and also the storage tanks floated in the lagoon results in mortality. Optimum requirement of live bait for a day's fishing operation as well as the maximum storage capacity of the tanks for retaining baits in captivity for long durations have to be estimated to avoid wastage. Preservation of the ecology of the lagoons and reefs is of considerable importance for the maintenance of flora and fauna. For sustaining the populations of coral associated live-bait resources, the coral reef ecosystem has to be conserved as far as possible. The possibilities of culture of *Chromis caeruleus*, *Chromis ternatensis* *Lepidozygus tapeinosoma* and atherinds which are hardy and forming a good percentage in the live bait catches during certain seasons can be explored.

Development of other fish resources

About one fourth of the total fish production of the islands consists of crangids, perches, wahoo, dolphin fish, rainbow runner, sharks, rays etc. As the capture of other fishes is inversely related to the availability of tuna shoals in close proximity to the islands, and the annual landings of other fishes are declining year after year consequent on the highly remunerative pole and line fishing, diversification of fishing gears will definitely increase the catches of other fishes. Drift gillnetting, surface trolling and long lining in the open sea are suitable propositions for the capture of larger fishes. Rays could be captured in good numbers by harpooning. Diversification will also generate employment opportunities for the youth of the islands. Surveys aimed at locating productive fishing areas and finding out the suitability of different gears have to be carried out. Experienced fisherman of the south-west coast of the mainland who are adept in trolling and long lining can be engaged in Lakshadweep for the capture of sharks and larger fishes. Immediate development of the shark fishery can boost the fish catches and lead to export of a number of products from this resource.

Improvement in fishery products

The local demand for tuna being limited, adequate attention has to be given for the storage, processing and marketing of the catches. 'Masmin', the smoked and dried product of tuna has good shelf life but deteriorates on keeping for several months by infestation by beetles. Steps have to be taken to improve the quality depending on the market preferences on the mainland and elsewhere. Large quantity of firewood is consumed for the preparation of 'masmin' and shortage of firewood is already felt in some of the islands. Alternate source of energy has to be used to remedy the situation. The production capacity of the tuna canning plant has to be increased to cope up with the increased tuna landings. Transportation and marketing the tuna in the mainland after freezing can also be done to dispose of the catches. The head and entrails of tuna are thrown while cutting tuna for the preparation of 'masmin'. These wastes can be converted into good quality manure or chicken feed.

Export of ornamental fishes

A good number of species in the lagoon and reefs of Lakshadweep are valuable ornamental fishes. Export of ornamental fishes on a limited scale can be attempted with suitable arrangements for storage, transportation and marketing. However, the impact of exploitation of ornamental fishes have to be carefully studied to obviate depopulation of the region.

Other minor resources

Crustaceans, holothurians, seaweeds, turtles and molluscs are some of the resources that are available to a limited extent. The exploitation of holothurians, seaweeds and crustaceans will not be an economical proposition and at the same time bring about deterioration in the ecosystem. Octopus in the reefs and squids in the open ocean which are likely to occur in good concentrations could be exploited on a limited scale. Attempts have to be made to assess the potentialities of the resources of squids around Lakshadweep.

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