

40 YEARS
OF
RESEARCH AND DEVELOPMENT
IN
MARINE FISHERIES IN INDIA



**A Souvenir issued at the National Symposium on
Research and Development in Marine Fisheries
held at Mandapam Camp, 16 - 18 September 1987, to mark
the 40th Anniversary of
Central Marine Fisheries Research Institute, Cochin
(Indian Council of Agricultural Research)
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Department of Fisheries, Lakshadweep

AN OVERVIEW

The Directorate of Fisheries Lakshadweep took its origin in 1959 as a small organisation headed by a Fisheries Officer and assisted by a couple of fisheries inspectors, making a significant turn in the history of fisheries development in the islands. The exploitation and proper management of fisheries resources to improve the economic condition of local inhabitants was the primary objective. Geographically scattered nature and remoteness of the islands turned out to be real hurdles in the implementation of fishery development schemes. During the sixties, fishing had been by primitive methods of harpooning, confined to the lagoon and reef areas. Tuna was not caught in any island except Minicoy and the fish catch was insufficient even for domestic consumption. Inhabitants were illiterate and with poor socio-economic set up.

The various fisheries developmental schemes implemented by the Dept. of Fisheries during the course of last 25 years have brought out drastic changes in the fisheries sector. Introduction of mechanised boats, training of local men in the modern fishing method and handling of boats, setting up of infrastructural facilities, experimental and demonstration fishing, issue of fishery requisites on subsidy, establishment of fish processing plants, etc were the important scheme launched. Pole-and-line fishing prevalent in Minicoy with rowing boats was mechanised and was popularised in other islands. New designs of fishing craft to suit the area and different types of fishing were experimented and the most ideal type was identified and introduced to the industry with remarkable success, all during the course of last two decades. The policy adopted was a practice-oriented approach to provide the maximum benefit to the fishermen with minimum input.

The fisheries developmental activities thus undertaken by the department have made significant impact on the socio-economic conditions of the people. From a meagre 500 tonnes in 1960 the fish catch had risen to 6000 tonnes by 1986. The value of export of dried fish rose from Rs. 11.2

lakhs in 1972 to Rs. 1.5 crores in 1985. In the place of small conventional country craft, there are now more than 300 mechanised boats doing fishing. Emergence of 4 islands hitherto new to the trade as potential pole-and-line fishing centres is indeed a remarkable achievement. The average catch of a pole-and-line fishing boat is 70 tonnes, worth Rs. 2.7 lakhs in a year of 6 months fishing. The income per fisherman works out to Rs. 15,000/-. The establishment of ancillary industries such as boatbuilding yards, canning factory, workshops, etc have provided additional source of employment with lucrative income. The low-cost diversified fishing methods such as troll line, long line and gill nets introduced are being profitably employed in islands like Andrott and Amini where there is no scope for pole-and-line fishing.

FUNCTIONS OF THE DEPARTMENT

- 1) Construction and issue of mechanised boats to fishermen
- 2) Management of two boatbuilding yards
- 3) Management of one canning factory
- 4) Management of 11 workshops
- 5) Management of marine aquarium and museum
- 6) Management of fishermen training centre
- 7) Experimental and demonstration fishing
- 8) Supply of fishery requisites, diesel oil and spare parts
- 9) Collection and processing of fishlandings data
- 10) Studies on the improvement of craft and gear
- 11) Marketing of tuna cans
- 12) Diversification in fishing

The skipjack of
Lakshadweep





The island women have been trained on more effective methods of filleting tuna under hygienic conditions

POLE AND LINE FISHING

Pole-and-line is the important commercial fishing gear for the surface fishery for tuna. In the Indian ocean this is being employed in Lakshadweep, Maldives, Sri Lanka, northern Madagascar and southeast of Australia.

At present a fleet of 120 Nos. of 7.62 metres long mechanised boats fitted with 14-16 HP inboard diesel engines are under regular pole-and-line fishing operation in Lakshadweep, landing 5000 tonnes of tuna annually. The boat carries live bait, which is an integral part of pole-and-line fishing. The gear is simple, consisting of a straight and strong bamboo pole about 4 metres long with a diameter of about 3 cm at the base. A line equivalent to the length of the pole is tied at the tip of the pole. The end of the line carries a barbless hook. The success of the fishery depends on various factors, viz availability of live baits, skill of the fishermen, knowledge of the behaviour pattern of tunas, etc. Live bait chumming and water spraying are the two techniques employed for aggregating tuna shoals around the fishing boat.

As soon as fish shoals are around the stern, the hook on the pole is put in the water. When the weight of the fish is felt on the pole, the fish is lifted above the boat and, with a jerk on the pole, the fish is dropped on board. If the fishermen are skilled and tuna shoals are in good biting mood the fishing could be so fast that it would make a spectacular sight.

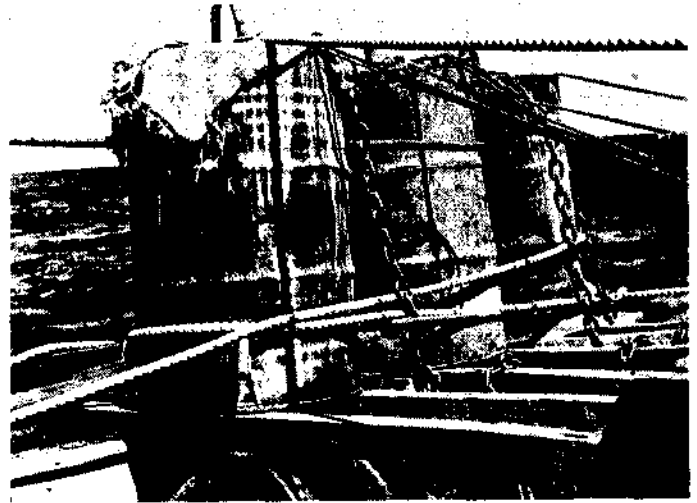
DEVELOPMENT OF TUNA FISHING

Currently, the tuna fishery in India is limited to the small-scale fishery sector of a few coastal states and Union Territory of Lakshadweep. Lakshadweep, a group of coral islands in the Arabian sea, has got the distinction of being the only region in India where an organised tuna fishery is in vogue. Lakshadweep waters support a fishable stock of one lakh tonnes of tuna. Against this, the present exploitation is 5000 tonnes annually, forming 75% of its total marine fish catch and 16% of the total tuna catch of India. Pole and line is the principal gear employed. The craft used consist of 7.62 meters pablo boats fitted with 12-16 HP inboard engines. Out of the four pole-and-line fishing centres, Agatti island is the most important, contributing 46% of the total tuna landed in Lakshadweep. The annual CPUE in 1986 for Agatti was 483 kg. The main species contributing to the fishery is skipjack (75%) followed by yellowfin (10%).

INTRODUCTION OF 'PAYAW'

A fish aggregating device known as 'Payaw', fabricated and installed by the Dept. during 1981, proved very good in Lakshadweep waters. The FAD is made by welding 200-litre capacity empty oil drums in a metal frame. The bottom portion is rigged with coconut leaves and the whole structure is anchored in selected spots in the sea with the aid of barrels filled with rock and cement. Two such aggregators were set up, one at south of Kavaratti and the other at southwest of Agatti. The installation sites were selected after a

thorough echo sounding survey. Both the payaws aggregate fish shoals and the spots serve the fishermen as ready source for fish catch. The fish caught off the payaws include not only tuna but also rainbow runner, dolphin fish, etc. The device is quite attractive to fishermen as they do not have to waste time and to spend expensive fuel searching fish shoals.



BOATBUILDING

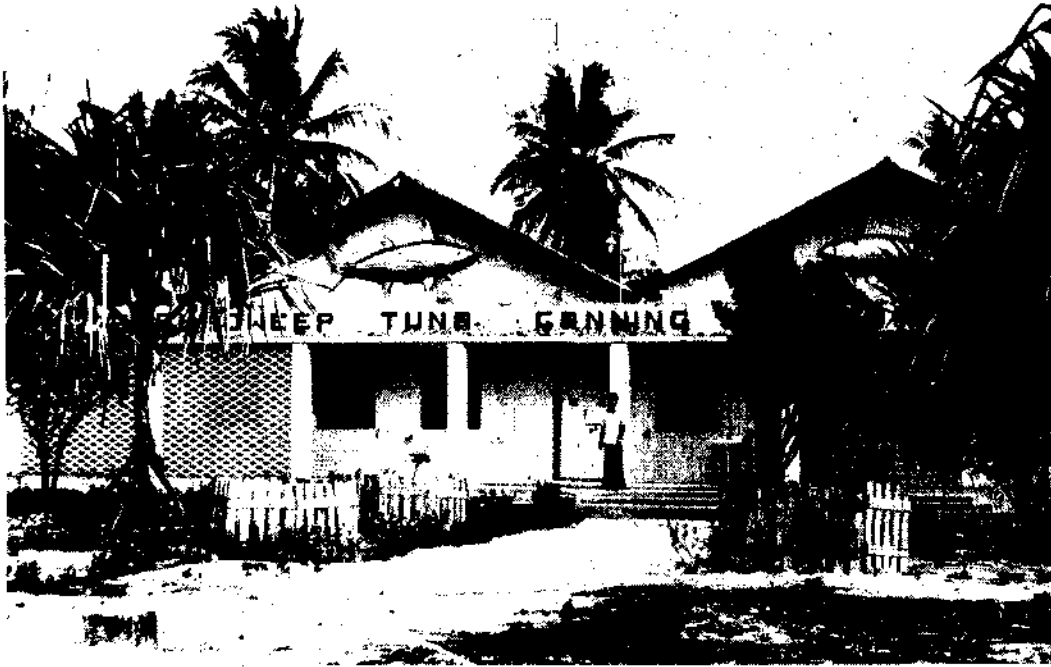
The programme of mechanisation was launched by the Dept. in order to step up fish production by the exploitation of the rich fishery wealth of the islands waters, especially tuna and shark. Two boatbuilding yards set up, one at Kavaratti and the other at Chetlat, could successfully meet the entire requirement of mechanised boats needed for Lakshadweep fishing industry. In addition to fishing boats, boats required for shipping works and tourism are also constructed and supplied by these yards. Boats of sizes 7.62 metres, 9.14 metres and 11.6 metres are being constructed in these yards. During the last two decades 247 Nos of boats have been launched from these two yards. During the year 1977 the yards supplied pole-and-line fishing boats to Andaman and Nicobar islands also.



TUNA CANNING

Setting up a canning factory in Minicoy in 1969 was a milestone in the development of Lakshadweep. Till 1969 the entire tuna caught in Lakshadweep was being processed into a traditional product called 'mas', which nevertheless has a shelf life of about a year. The establishment of the canning factory

Payaw, an ingenious device made out of empty oil drums and coconut leaves, was erected one at Kavaratti and one at Agatti



Lakshadweep
tuna canning factory

in Minicoy made possible the introduction of a sophisticated product out of tuna acceptable both at home and at foreign market. To the fishermen of Minicoy, the factory serves as a centre for ready disposal of their catch. The installed capacity of the factory is 10000 cans per day. It is also attached with an ice factory of 5 tonnes capacity and a cold storage of 20 tonnes capacity. Four varieties of cans are produced here, viz, Tuna solid pack in oil, Tuna solid pack in brine, Tuna flakes in oil and Tuna flakes in brine. The present production is around 1 lakh cans annually. The factory provides employment to 50 persons. In spite of various constraints, the factory was able to achieve the production target every year.

'MAS'

'Mas' is the most popular product made out of tuna in Lakshadweep, 90% of the tuna caught in islands are processed into this traditional product. This product resembling the Katswobhushi of Japan has a shelf life of about a year and excellent taste and is popular in southwest and south-

east coasts of India and Sree Lanka. The annual production of mas in Lakshadweep is 500 tonnes, worth Rs. 1.5 crores.

MECHANICAL SPRAYER FOR POLE-AND-LINE FISHING

The mechanical water spraying system developed and introduced by the department in 1984 replaces handspraying in pole-and-line fishing. The experiment with this device in 1984 was a great success. Besides saving labour costs, this has improved the efficiency of the gear considerably. Now pole-and-line fishermen at Agatti are clamouring for mechanical sprayer.

SHARK RESOURCES

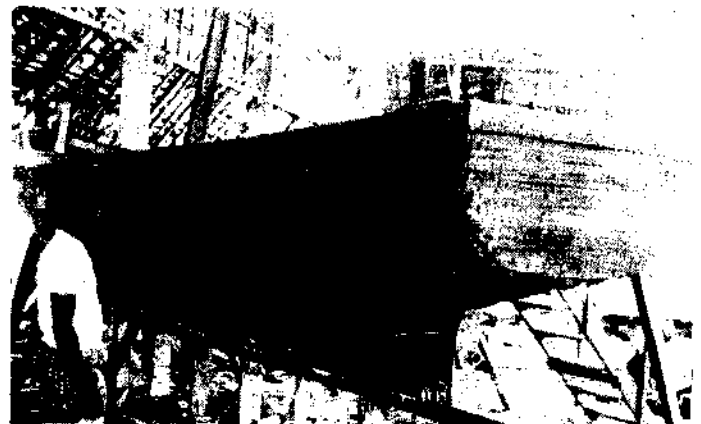
Lakshadweep waters support a rich and sustained fishery for shark, with 8% average hooking rate. The average weight of one shark is 54 kg, making shark fishing highly profitable. In recent years longline fishery for shark has become a fast growing enterprise.



**A Lakshadweep
boatbuilding yard**

PEARL OYSTER CULTURE

Culture of pearl oysters on experimental basis was started in Lakshadweep in the year 1981. The spat required for the culture were collected from the reefs during lowtide. Since they are rare in the island, the pearl oysters were brought from the Tuticorin centre of CMFRI. The oysters are being reared in plastic baskets suspended from rafts moored in the lagoon at Bangaram island. The technology for the culture and production of pearl was obtained from CMFRI. The first nucleus implantation operation was carried out successfully in 1983. So far four cultured pearls of size 4 mm to 7 mm have been produced. Experiments are being carried out to make it a viable venture.



**A boat under
completion**

MARINE AQUARIUM AND MUSEUM

The marine museum and aquarium set up at Kavaratti island in 1983 is one of the outstanding of its kind in India and houses approximately 1500 organisms in preserved and live forms. The complex environment natural to the coral

islands gives rise to an equally complex fauna, quite different from that of mainland. An excellent display of these fascinating fauna has made the museum swanky. Tropical coral fishes reared in 12 aquaria tanks form the most spectacular exhibit. The visitor would feel as if taken to an aquatic world where the forms of life are mysterious and lovely. Chaetodontidae, Scorpinidae, Acanthuridae, Pomacanthidae, Ostracodontidae and Tetraodontidae are the important families representing in the aquaria. Preserved specimens, models of craft and gear, underwater paintings, etc are other exhibits adding to the spectacle. This establishment has now become the major centre of attraction in Lakshadweep, offering for tourism, education and research. Every year, lots of students are brought to the museum from mainland as part of their curriculum. The museum stands as an index of the dedicated efforts and professional competence of the department of fisheries Lakshadweep.



Pearlculture raft
in Bangaram island

FUTURE PROGRAMMES

Tuna fishing is the mainstay of the islands. Efforts taken by the Dept. to improve the efficiency of pole-and-line gear has given fruitful results. The small-scale tuna fishing now existing in the islands can be further developed by increasing the strength of the boats and by making improvements in craft and gear, post-harvest technology and marketing. It is proposed to operate a mother vessel to enhance the range of operation of smaller boats.

COMMERCIAL EXPLOITATIONS OF TUNA

In order to exploit the bulk of the tuna resources left untapped beyond the operational range of the smaller boats, it is proposed to operate larger purse seiner and pole-and-line vessels on collaborative terms with other countries. Proposal for establishment of a Lakshadweep Fisheries Development Corporation in this regard has been submitted to the Ministry.

Communicated by Shri George Varghese, Director of Fisheries, UT Lakshadweep.