

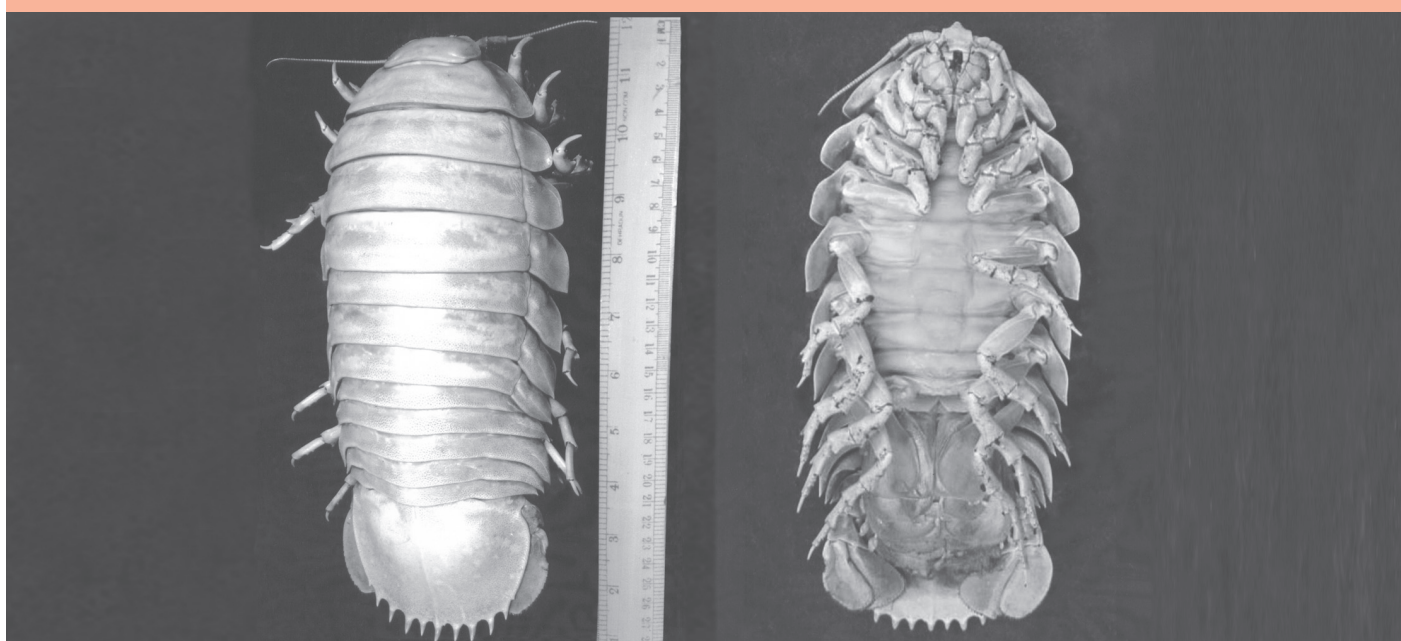
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Status of fisheries of Lakshadweep

The Union Territory of Lakshadweep (08 00'N and 12 30'N latitudes and 71 00'E and 74 00'E longitudes), consisting of eleven inhabited and 25 uninhabited islands, is scattered in the Arabian Sea at about 200-400 km from the Malabar Coast. Coconut and fish form the mainstay of the economy of the islanders. The islands became a Union Territory of India in 1956 and it was named Lakshadweep in 1973. Since then there has been rapid progress especially in the fields of agriculture, fisheries, education, health etc. Next in importance to agriculture, the fisheries sector plays an important role in the economy of the islands.

The archipelago consists of 12 atolls, three reefs and five submerged banks. Of the 36 islands, only 11 namely, Androth, Amini, Agatti, Bitra, Chetlat, Kadmat, Kalpeni, Kavaratti, Kiltan, Minicoy and Bangaram are inhabited. Among the uninhabited islands, Suheli is a coconut grove and fishing centre. Pitti or the bird island is a small reef with sand bank covering an area of 1.2 hectare lying northwest of Kavaratti where terns visit for nesting and is designated as a bird sanctuary.

Except Androth, all the islands have lagoon, some of which are fast getting filled up by calcareous sand. Bitra has perhaps the most magnificent lagoon. Minicoy has a large and deep lagoon with a boat channel on the northern side giving safe access and anchorage to vessels of about 3 m draught.

The outer edges of atolls drop precipitously to the ocean floor. Mostly on the eastern side the atolls overhang the precipitous shelf. The eastern side is generally more sheltered from wind and current. The islands, ranging in area from 1 ha to nearly 440 ha are little specks in the Indian Ocean. They are beautiful, idyllic and strategically located from the point of view of economic and defence considerations of India. Being oceanic islands, the continental shelf around them is limited to about 4336 sq.km. But considering the lagoon area of about 4200 sq.km, 20,000 sq.km. of territorial waters and about 400,000 sq.km. of oceanic zone, Lakshadweep is one of the largest oceanic territories of our nation.

Fishery resources

Lakshadweep sea is rich in fishery resources such as the tunas, billfishes

pelagic sharks etc., and the other groups of food fishes, live baits and ornamental fishes. The estimated marine fishery resources potential in the Lakshadweep waters are about 63,000 to 1,40,000 tonnes of various groups of fish, whereas the present annual production is around 10,000 t (10% of the potential). The fishery activities in Lakshadweep are concentrated in all the 11 inhabited islands and in the uninhabited island - Suheli. The main resource currently exploited is tuna and tuna-like fishes. Following are the tuna species commonly seen in Lakshadweep waters:

1. *Katsuwonus pelamis* (Skipjack tuna)
2. *Thunnus albacares* (Yellowfin tuna)
3. *Auxis thazard* (Frigate tuna)
4. *Euthynnus affinis* (Little tunny)

Of these, *Katsuwonus pelamis* is the major species on which the commercial fishery is established. In addition to the tunas, flying fishes, barracuda, seerfish, sail fish, dolphin fish, rainbow runner, gar fishes, half beaks, snappers, perches and other reef fishes, sharks, rays, trigger fishes, octopus etc. also form fishery. About 601 species of fishes have been recorded in the Lakshadweep waters by CMFRI. It is estimated that the annual catchable potential yield of tunas is about 50,000

tonnes and an equal quantity of other fishes are available.

Fishing methods

The main fishing method practiced is pole and line for tuna by using live baits. The operation is conducted from specially designed mechanised boats of 25' to 34' overall length (OAL). About 510 mechanised tuna pole and line fishing boats have been introduced so far. Out of these, 350 to 400 boats are actively engaged in fishing now. Pole and line fishing is done in all the islands except in Androth. In Androth, other methods such as trolling, hook and line, gill nets, long line etc. are used for fishing. Long lining for shark is also practiced, engaging mechanized boats. However, due to higher returns from tuna fishing compared to shark fishing, very few fishermen have opted for long lining for sharks. Besides there are about 900 country crafts which includes crafts fitted with outboard motors using troll line, hook and line, gill nets, long line etc. to catch other fishes.

Consequent to the successful introduction of mechanised boats for pole and line and other fishing, demand for boats increased. To meet the requirement and with an objective of employment generation, two boat building yards, one each at Kavaratti and Chetlat have been established for

construction of mechanised fishing boats. Under this programme 510 mechanised fishing boats have been supplied to the fisherman of various islands so far under hire purchase system (Table 1). This helped to increase the fish production from 500 tonnes per annum in the 1960s to the present level of about 10,000 tonnes per annum.

Table 1. Island wise availability of fishing boats

Island	Country crafts	Mechanised boats
Agatti	151	130
Amini	51	43
Androth	49	36
Bitra	16	9
Chethlat	31	34
Kadmat	100	26
Kalpeni	85	33
Kavaratti	260	89
Kiltan	40	60
Minicoy	137	50
Total	918	510

Live bait resources

Live bait fishes are used for chumming and attracting tuna shoals and are essential for tuna pole line fishing. The live baits are caught from the coral reef and lagoon of different islands. There are about 21 species of live baits available in Lakshadweep waters. Over a dozen species

are used in the fishing. The most common species in the order of abundance are *Spratelloides delicatulus*, *S. japonicus*, *Apogon sangiensis*, *A. savayensis* and *Chromis ternatensis*. Fishermen do report scarcity of live baits during the peak fishing season occasionally.

Status of captures fisheries

Fish landings by year and Island are given in Tables 2 and 3, respectively. The major fish landings are at Agatti, Suheli, Minicoy, Kavaratti and Androth. As an average, fish landings at Agatti contributed to about 23% of the total fish production in Lakshadweep followed by Kavaratti (14%), Minicoy (13%), Androth (11%), Suheli (9%), Kiltan (8%) and Chetlat (6%).

Table 2. Fish landings in Lakshadweep during 1995 to 2004 (in tonnes)

Year	Shark	Tuna	Miscellaneous	Total
1995	261	8250	717	9887
1996	119	8798	802	10250
1997	221	8072	1119	10412
1998	980	12308	899	14615
1999	139	7624	4188	13081
2000	145	7071	1604	10082
2001	75	9343	2382	12800
2002	62	6656	1014	9149
2003	84	8149	551	10080
2004	77	8232	790	10512
Average	216.3	8450.3	1406.6	11086.8

Table 3. Island-wise fish landing during 1992-2001 (in tonnes)

Item	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Average	%
Kavaratti	2011	1746	1150	1199	1292	2073	2031	1778	696	1179	1516	14
Agatti	1914	3131	1749	2196	2625	2307	2276	3244	2905	2995	2534	23
Amini	359	629	496	278	374	566	605	712	321	371	471	4
Kadmat	230	251	246	300	439	673	822	745	496	456	466	4
Kiltan	519	542	622	772	530	482	1134	1191	1130	1363	829	8
Chetlat	450	502	359	411	350	529	638	887	958	1057	614	6
Bitra	987	285	416	382	340	415	884	348	416	1268	574	5
Androth	603	964	1293	1364	1541	1535	1470	1310	1125	1230	1244	11
Kalpeni	158	266	280	192	270	470	513	485	314	314	326	3
Minicoy	955	1089	953	1326	1193	1152	2638	2575	1027	1313	1422	13
Suheli	2281	-	-	1575	1296	153	1615	705	694	1254	957	9
Total	8186	9405	9845	9995	10250	10355	14626	13980	10082	12800	10953	100

Tuna fishery

Productive fishing zones for tuna fishery in Lakshadweep seas are: Zone-I (Bitra, Cheriyananiyam and Baliyananiyam), Zone-II (Agathi, Bangaram, Perumul Par), Zone-III (Suheli Valiyakara, Suheli Cheriyananiyam) and Zone-IV (Minicoy). Fishing operations are done within 10-15 km off and around the islands. Introduction of mechanisation in the early 60's has resulted in the increase of tuna production at Minicoy, where a traditional fishery employing 'Masodis' was in existence. Coupled with this, the spread of pole and line fishing practice off the northern islands Agatti, Bangaram, Perumul Par, Suheli and Bitra has resulted in the increased production of tuna from a few hundred

tonnes in the 60's to about 12,300 tonnes in 1998. Whereas the pole and line live-bait fishery is practiced during the non-monsoon months (September to May), surface trolling for yellowfin, skipjack and billfishes is practiced especially during the monsoon period.

During the period 1980 to 2004, annual tuna landings in the Lakshadweep islands ranged between 1,760 t (1980) and 12,300 t (1998) with an average of 6,340 t (Fig.1) against a projected annual potential varying between 50,000 and 90,000 t. The major contribution to the tuna landings comes from Agatti (31%), Suheli (14%), Minicoy (17%), Kavarati and Androth (8%). Compared to the tuna catch of neighboring island nations such as

Maldives (1,48,500 t) and Sri Lanka (27,000 t), the catches from Lakshadweep are very low.

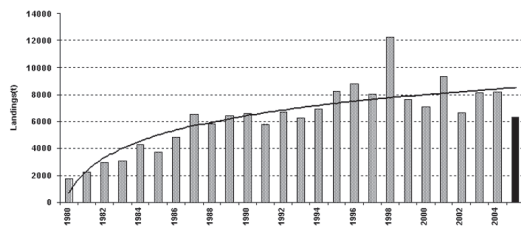


Fig 1. Tuna landing from Lakshadweep during 1980-2004

Potential resources of tunas in the seas around Lakshadweep has been estimated to be around 50,000 to 90,000 tonnes. But the average production for the last ten years is only about 6,340 tonnes. Many earlier workers have proposed strategies for development and management of tuna fishery to increase the production.

The major tuna species landed (1980-2001 average) was *K. pelamis* (86%) followed by *T. albacares* (12%) and the rest was *E. affinis*. Pole & lines account for 97% of the total tuna landings followed by troll lines. About 300 boats are annually in operation for pole and line tuna fishing during the last 15 years. Pole & line-fishing boats (OAL of 25-36') mostly conduct single day fishing trips and often operate 2 trips during the peak season. The difficulty in maneuvering larger sized boats within the lagoon is perceived as

bottleneck in introducing larger boats with higher fish hold capacity. Though there has been wide annual fluctuations in catch, catch per unit effort and the mean length in the fishery have not undergone any significant change. Since 1994, tuna catches and catch rates from Androth have increased due to adoption of drift gillnetting as well as fishing in distant fishing grounds such as Elikalpeni Bank.

Fish Aggregating Devices (FADs) were introduced in Lakshadweep waters in 2002 in the open sea as well as in the lagoons to aggregate fishes by the CMFRI under a World Bank Programme (NATP). Data buoys for Arabian Sea Monsoon Experiments- Phase-II deployed by the National Institute of Ocean Technology (NIOT), 16-26 nautical miles off Minicoy and Kavaratti are functioning as FADs, aggregating tunas as well as other fishes. It is observed that young tunas aggregate in large numbers than the adults. As a result the catch and catch rates tend to be higher. The negative aspect of FADs is that the young ones of tunas, especially of the yellowfin are attracted more, resulting in higher catch of juveniles in the FAD sites (18-20%) than in the non-FAD sites (4-5%). This may affect the stocks and the future catches if not managed properly. However, assured catches from the FAD sites made the fishermen to venture to these

distant fishing grounds with the help of GPS.

Ornamental fishes

Over 300 species belonging to about 35 families are known for their attractive colour and shapes and can be termed as ornamental fishes for aquarium keeping. A recent survey conducted by the CMFRI indicated that, 20 of the 35 families are common and are represented by 252 species. Among these, 165 species constitute the major ornamental fishes and have great demand in the ornamental fish trade. The policy of the Lakshadweep Administration is to prevent exploitation of ornamental fishes from the wild as a conservation measure. However the Administration is encouraging setting up of hatcheries and production of ornamental fish under controlled conditions.

Utilization/Marketing

At Lakshadweep over 85% of the total landings constitute tunas of which about 50% of the total tuna landings is used for 'masmin' production, 20% for canning and the remaining 30% consumed fresh. Presently masmin is prepared by traditional way by cutting tuna in to longitudinal fillets, boiling in seawater, smoking and then sun drying for about 7 - 8 days. The traditional method of masmin production has to be modernized for

product quality and increased production. The modified methods developed by the CIFT for the production of high quality masmin can be adopted. In recent years, the Lakshadweep Development Corporation (LDCL) is promoting frozen tuna export.

Recommendations

- Introduction of deepwater monofilament longlining for Sashimi quality yellowfin tuna, mechanical splashers and new generation pole and line boats with chilling and storing facility (Maldivian type).
- Increasing the endurance of the existing Pablo boat in line with the concept of dory fishing/mother-ship type fishing.
- Potential Fishing Zone (PFZ) forecast with help of satellite imagery from INCOIS may be passed on immediately to fishermen to aid fishing.
- Installation of cheaper and long lasting FADs.
- Frozen storage (-55°C) facility may be set up at Agatti to develop export of frozen tunas parallel to the development of tuna fishery.
- Upgrading and standardizing technology for production of masmin

and the same may be popularized in the Lakshadweep Islands.

- Popularisation of tuna and tuna products in domestic markets. Retail outlets for Lakshadweep brand tuna and tuna products may be created in the metros and the major cities in

India.

- Control of poaching by foreign fishing vessels.

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