



Annex 7 Fisheries

Baseline Data in Preparation for Developing a Management Plan for the Community Reserve

Reef and Lagoon Islanders' Dependence on South-West Monsoon

1. Introduction

The people of Lakshadweep Islands have traditionally been dependent on fishing and coconut growing for subsistence for centuries.

The sea around Lakshadweep and its reef lagoons are of great ecological significance as it influences the fauna and flora associated with the coral reefs and the high sea resource to great extent. The water has been found highly productive at primary and secondary levels. The major fishing season in Lakshadweep is the period between November to May; during the rest of the year i.e. south-west monsoon period, fishing activities are restricted to the lagoons and the leeward side of the islands.

There are different methods in capturing aquatic organisms including traditional methods in Lakshadweep. The fishing methods used in Lakshadweep islands are a mixture of those used in subsistence and commercial fisheries. During the south-west monsoon fishermen of little islands are mainly depending on subsistence fishing even though they use country crafts, Thoni and Tharappam etc. (see below).

2. Climatic Conditions

Knowledge of the general wind system and currents prevailing in the north Indian Ocean and Arabian Sea in particular is essential to understand the environmental characteristic of the islands. The climatic conditions of the islands are not differing from Kerala even though the south-west monsoon and north-east monsoons both contribute their shares of rainfall to these islands.

The average annual rainfall is around 1,200 mm, most of which reaches the islands between June and September. Atmospheric temperature is of uniform pattern with slight increase from South to North. The temperature starts rising in February and reaches its peak in May. The average temperature of the islands ranges between 25.31°C and 31.52°C. The temperature decreases one or two degrees with the onset of the south-west monsoon in June and again shows a slight rise in October. Then till January it remains almost uniform.

Throughout the year the air is humid, the relative humidity is from 81.33 to 83.08 %. During the south-west monsoon south westerly to westerly winds are experienced. The



direction of wind changes to north easterly or northerly between December and February. Thereafter the wind slowly dies down to revive by the end of May.

3. Fishable Areas

During south-west monsoon the fishing activities are shifted to the inshore waters. The inshore waters are associated with the reef including shallow lagoons, reef flats, reef fronts and reef slopes. Almost all of the fishable areas are found in inshore water with the exception of a few pelagic areas. Fish found in inshore waters include bait fishes, aquarium fish, reef food fishes and other species like lobsters, sea cumpers, octopus etc. The waters in and around these areas are rich in exploitable natural resources.

4. Potential Resources during Monsoon

As the fishermen depend on inshore waters in south-west monsoon, all varieties of reef fishes and octopus are mainly targeted this time.

Table 1 Commonly occurring and targeted fish species during monsoon

#	Scientific name	Local name
1	<i>Lutianus gibbus</i>	Chemkali
2	<i>Lutianus bohar</i>	Pularian
3	<i>Lutianus kssmira</i>	Manjhan
4	<i>Caranx crumenophthalmus</i>	Bangada
5	<i>Caranx stellatus</i>	Kuluval
6	<i>Caranx Sexfasciatus</i>	Maduthala
7	<i>Gerres oblongus</i>	Purachi
8	<i>Epinephelus meera</i>	Fullichamman
9	<i>Holocentrus lacteoguttatus</i>	Kaduva
10	<i>Lethrinus mahsena</i>	Metti
11	<i>Mulloidichanthys samoensis</i>	Manakkam
12	<i>Mulloidichanthys auriflamma</i>	Manhamanakkam
13	<i>Parupeneus bifasciatus</i>	Kalmanakkam
14	<i>Kyhosus vaigiensis</i>	Punji
15	<i>Siganus stellatus</i>	Kalloran
16	<i>Acanthurus lineatus</i>	Varipad
17	<i>Acanthurus elongatus</i>	Neythala
18	<i>Pempheris oualensis</i>	Ambatta
19	<i>Tylosurus annulatus</i>	Karuthonakunhi
20	<i>Hemirampus marginatus</i>	Kudukka



5. Crafts and Gears

Most of the traditional fishing crafts in Lakshadweep are made of wood. In olden days the islanders were mainly depended on the so called 'country craft' (odam), an indigenous fishing craft of islanders. Other types of crafts used include Thoni and Tharappam. Thoni (craft made of local woods) is common in all of the islands. However, recently Tharappam (the traditional craft used from olden days) is getting reduced due to the entry of Thoni (see below).

The traditional fishing gear is as old as the traditional craft. The fishing gears used traditionally and even today include 'hook and line', Kandalivala and Olavala, Veechuvala (cast net), Adivala (Shore seine), Muddu Vala (Traditional gear), Pattu vala (Gill net), Spike (Spike fishing –traditional method for gar fishes and flying fishes), Seek, (method for catching Octopus and lobsters by using pointed Iron Rod) etc. (see below).

5.1. Country Crafts

Islanders' indigenous fishing crafts – except in Minicoy - are all made of wood. For the construction of these traditional crafts islanders still use specially made coir rope made from coconut fibers instead of iron nails. The wooden planks are fastened together and also fixed fast to the ribs with the aid of specially made coir. All the crafts have pointed stem and round stern. The keel is straight. Commonly used country craft names are based on their size and corresponding by the number of oars that go with them.

1. Ettuvalikkunna odam----- (8 oars)
2. Aruvalikkuna Odam ----- (6 oars)
3. Naluvalikkuna odam ----- (4 oars)

These types of crafts operated inside the lagoons and also in the open sea for fishing sharks, rays, yellow fin tuna and seer fish etc.

Table 2 Comparison of Traditional Fishing Crafts in Lakshadweep

Type of craft	Length (m)	Beam (m)	Draught (m)	Timber used	Propulsion	Crew strength
Ettuvalikkunna odam	8	2	0.7	Therpesia or any hard wood	Out board engine or sail	8
Aaruvalikkunna odam	6	1.7	0.5	-do	-do	6
Nalluvalikkunna odam	5	1.3	0.4	-do	-do	4
Thoni (Dikky)	3 to 4	1.2	0.4	Neem, plywood and some local wood	Oar/sail	2 or 3
Tharappam	2.5 to 3	-	-	Locally available soft woods	Oar/sail	2

Odam



Figure 1 Odam
Photo: Jafer Hisham

Thoni

Thoni is about three to four meters, much smaller than the country craft. Thoni is made of locally available woods. Occasionally islanders also use wooden planks and plywood. This craft is known, very common in all the islands. Mainly used for gill net operation, long lining, hand line, and also octopus fishery.



Figure 2 Thoni
Photo: Jafer Hisham

Tharappam

Tharappam is an other type of traditional crafts. It is mostly used in olden days and not too popular in the islands today. Tharappam is fabricated by tying four to ten long softwoods together to create a platform, with length about 2.5 to 3 meter. These types of crafts are mainly used for hand lining and octopus fishery etc. which are operated inside the lagoons and reef flats where the water is calmer.



Figure 3 Tharappam
Photo: Jafer Hisham

5.2. Gears and Fishing Techniques

Table 3 Characteristics of Different Types of Fishing Nets in Lakshadweep

Name of net	Materials used	Length (m)	Breadth (m)	Mesh size
Kandalivala (gill net type)	Cotton/nylon	117	3.6	4.5
Adivala (Shore seine)	-do	36	1.8	4
Pattuvuala (Set gill net)	-do	22	3.6	3 or 4
Veechuvuala (Cast net)	-do	1.8 to 3 dia.	----	---

Kandalivala and Olavala

Operations of these nets are restricted to lagoons, mainly areas of seagrass patches and corals. Using these nets can damage the coral growth.

The word 'Olavala' literally means a net made of coconut leaves but it is not a net as the name suggests. It is simple devise of long rope along which strips of coconut leaves are hung. Kandalivala is the same as that of shore seine. Both the nets are operated as a unit inside the lagoons to catch coral fishes. Olavala is only a scaring net. During the operation the persons holding the Olavala keep on shaking it. Agitation created by the leaves scares the fishes out of their haunts which leaves the fishes are trapped by Kandalivala. A larger number of persons are required for the operation. Now-a-days these nets are very rarely operated.



Figure 4 Kandalivala



Figure 5 Olavala

Photos: Deepak Apte

Adivala (Shore Seine)

Operation is carried out in shallow water near the shore and catch is hauled on to the shore, mainly operated in grassy area. Though it is old method but still practiced in islands. Seining can be carried out at any time during the day .Almost all types of lagoon fish can be caught by adivala.



Figure 6 Adivala



Figure 7 Adivala (close-up)

Photos: Jafer Hisham

Pattuvala (Surround Gill Net)

A long wall of netting made of nylon or cotton twine is used in islands, operated both inside and outside the lagoon. Plastic floats or small buoys with good buoyancy and lead sinkers used. Once school of fish is spotted, two people carrying net will start laying it in an arc around the school. A group of others scare the fish towards the net by hitting the surface of the water with hands. These people gradually move towards the net driving the fish into the net. Finally the fish are surrounded and are caught.



Figure 8 Pattuvala

Photo: Jafer Hisham

Veechuvala (Cast Net)

This type of net is used to catch small fish moving in shoals along the seashore. Cast nets are operated from shore or standing in a shallow lagoon. No bait is used for the operation. When fish are sighted the net is cast. As the fisherman throws the net over a school of fish the net opens out and fall over the fish. The lead weight quickly makes the net sink, trapping the fish underneath it. The net is then hauled in and the trapped fish is removed. Net is operated by professionals as well as non professional fishermen.



Figure 9 Veechuvala
Photo: Idrees Babu

Hook and Line

This is the most widely used traditional fishing gear in Lakshadweep. The traditionally operated hook and line gear can be categorized into two (1) hand line and (2) pole and line.

Hand lines are normally used near the islands in areas which are not so deep. The gear consists of a few meters of monofilament of size 0.5mm to 1mm, to the end of which is attached a hook and a sinker. This is a passive gear. The bait attached to the hook. As soon as the fish bites on the bait, the line is pulled up and the catch is removed. Hook and line gear can be operated from sea shore or from any type of crafts. The catches mainly consist of snappers, trigger fish, caranx etc. Hand line is a commercially operated gear. For yellow-fin tuna fishery during south monsoon period islanders prefer this gear mostly.

Pole and line is not only used for tuna fishing in Lakshadweep but also used widely by the common people for Bangada and Kuluval (*Caranx crumenophthalmus* and *Caranx stellatus*) fishing by standing on shore or jetty etc.

Spike (Chilla)

Spike fishing is a traditional method for gar fishes, half beaks and flying fishes. They are caught by the piercing implement locally known as 'Chilla'. It consists of a stout wooden shaft of coconut wood to the end of which 12 pointed spikes are fitted in two concentric circles of 6 each. The spikes of inner circle are shorter than the outer. The fishes are attracted to the surface by light from kindled coconut leaves and then spiked with the Chilla. Highly professionals use this gear during day time, when they notice their target. Fishermen throw or spike on it and the fish is caught. Spike gear is mainly used during low tides, now-a-days these gears are not that much popular. Even though some people still use this gears.

Octopus Fishing

Octopus belongs to the Cephalopoda Class of Mollusca and it is considered a delicacy in South-East Asia. At present octopus is caught on a very small scale from the lagoon of all islands forming only 0.25 % of the total marine creatures landing in Lakshadweep. The octopus is highly relished by the local people. Octopus usually lies hidden in crevices of coral reef. When an octopus is spotted, it is pierced with a pointed iron rod, as the octopus writhes out of its hiding place the iron rod is taken out of water with the octopus. This type of fishery is usually practiced during low tides. It is more dangerous to catch octopus during high tide by this method though some professional fishermen do it during high tide also. This method of fishery is still popular in all the islands.



Figure 10 Octopus hunter
Photo: Jafer Hisham



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Resources

Department of Fisheries, Lakshadweep Administration

<http://www.lakshadweep.nic.in/depts/fisheries/Dpt.%20of%20fisher.htm>

Marine Fisheries Information Service, Special Issue on Lakshadweep, Technical and Extension Series, No 68:1986. Central Marine Fisheries Research Institute, Kochi, India

Thirty years of Fisheries Development in Lakshadweep. 1990. Department of Fisheries, Union Territory of Lakshadweep, India