Modification of Pablo boats for longlining in Lakshadweep waters

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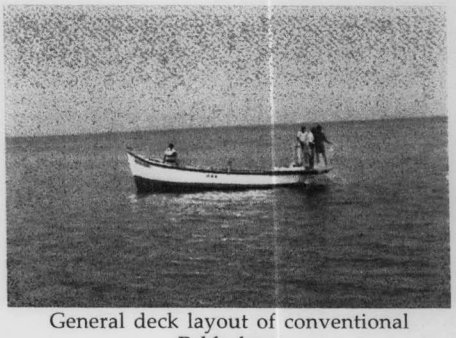
Focal Points at a Glance

Nature has endowed a predominant status in respect of tuna stocks in Lakshadweep area. In order to avail of the fishery, the fishers who are traditionally accustomed to fishing for tuna using handlines have now taken to longlining using Pablo boats and this work is now in a promotional mode. The authors have presented an excellent account of the development of longline fishing in Lakshadweep waters now in progress.

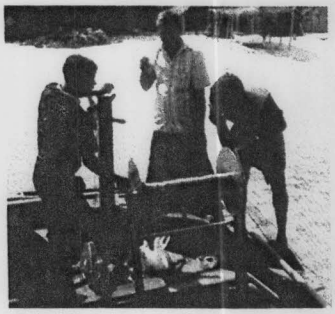
Introduction

The Union Territory of Lakshadweep consists of 36 small islands and islets lying scattered in the Arabian sea in around 200-400 km on South- West coast of India between 8^0 and 12^0 - 30′ latitude (North) and 71^0 and 74^0 longitude (East). Of these, only 10 islands are inhabited and the rest are uninhabited.Lakshadweep sea is approximately 46% of total EEZ of west coast of India.The main fishery of the waters of the islands is based only on skipjack tuna and fishing is carried out only on a small scale. The mechanised fishing boats of Lakshadweep islands range from 7 to 10 m L_{OA} and mostly these boats carry out pole and line fishing and mainly targeting skipjack tuna *Katsuwonus pelamis*. Other fishing methods include trolling, hand lining,shore seining, and gill netting.The Lakshadweep islands also have very good resources of other large pelagic fishes, especially yellowfin tuna, *Thunnus albacares*. The potential annual yield of tunas of Lakshadweep waters, is estimated to be about 50,000 tonnes and the average annual catch is about 10% of the harvestable potential.



General deck layout of conventional Pablo boat

Modified Pablo boat



Modification works in progress

Installing insulated FRP fish hold in the boat ☞

There is very good scope for diversifying the fishing methods, especially long lines, to exploit other large tunas, like yellowfin tuna, bill fishes, sharks etc. In this context, modifications were carried out on few Pablo boats at Agatti and Androth Islands of U.T. of Lakshadweep for carrying out pelagic longline fishing operations **under the National Agricultural Innovative Project (NAIP), *'A Value Chain on Oceanic Tuna Fisheries in Lakshadweep*** Sea'

Modifications of Pablo boats at Lakshadweep islands for long line fishing

Pablo boats are operated for pole and line fishing by the fishermen of Lakshadweep mainly for catching skipjack tuna. The fish landed by pole and line fishing are mostly used for the preparation of Masmin, a traditional smoke dried product of the island. For diversification of the fishing method, few Pablo boats of length ranging from 7 to 10 m L_{OA} with engine power ranging from 16 to 24 hp were selected.A total of seven Pablo boats were modified at Lakshadweep islands, five boats from Agatti Island and two boats from Androth Island. Each Pablo boat was fitted with a stainless steel winch and guide pulley, two insulated Fibre Reinforced Plastic (FRP) boxes, one for storing the fish catch and other for storing the baits, and FRP bin for storing branchlines.

Details of the selected Pablo boats for the tuna Longline modification are given in Table. 1. The maximum capacity of the PUF insulated FRP box for fish catch is 0.6 m^3 and that of PUF insulated FRP box for baits is 0.3 m^3. Both these boxes are firmly fixed on the boat. The manually operated winch was fixed at the aft side of the boat. The drum of the winch has the capacity to hold 5,000 m long Polyamide monofilament mainline. Winch is made of stainless steel (grade IS 304). A handle was provided in the drum with bearings for smooth rotation during hauling operations. A control slit was made to pause the hauling whenever required during operation. The winch was fixed in the boat on strong wooden panel with nuts and bolts and could be easily dismantled and removed during the off season for the oiling, painting and maintenance.

Modification of Pablo boats

General deck layout before and after modification are given in Fig. 1 and Fig. 2.

Stainless steel winch and guide pulley

A stainless steel (grade IS 304) hand operated winch (1250 mm x 600 mm) is provided for hauling the line. The drum can store 5,000 m of 3.0 mm dia Polyamide monofilament (PA) twine (Fig. 3). A stainless steel (grade IS 304) guide pulley is provided in the forward port side of the boat for guiding the mainline towards the drum (Fig. 4).

Insulated FRP box for fish catch

A Poly Urethane Foam (PUF) insulated Fibre Reinforced Plastic (FRP) box (1.6 m x 0.6 m x 0.9 m) was provided for storing the fish catch. It is placed in the forward portion of the

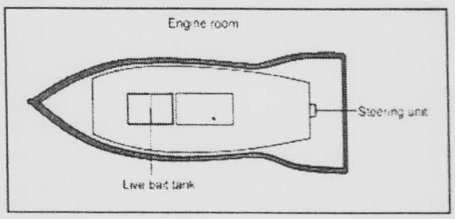


Fig.1: General deck layout of Pablo boat at UT of Lakshadweep

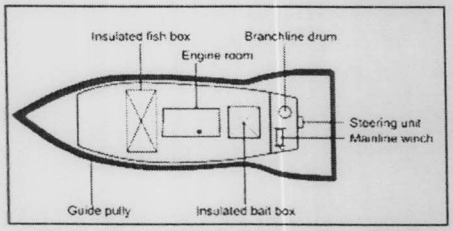


Fig. 2: General deck layout of modified Pablo boat

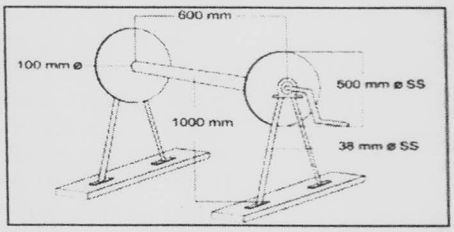


Fig. 3: Stainless steel winch

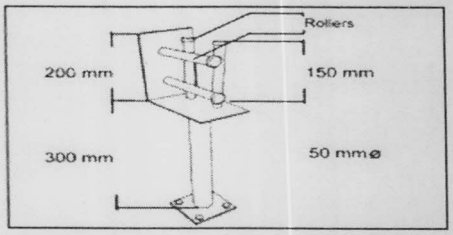


Fig. 4: Stainless steel guide pulley

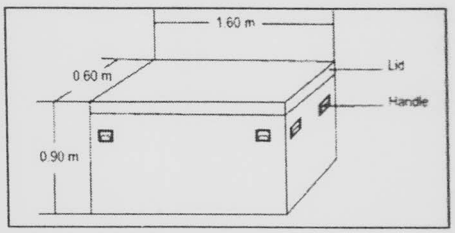


Fig. 5: PUF insulated FRP box for fish catch

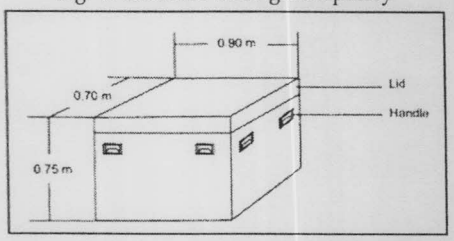


Fig. 6: PUF insulated FRP box for bait fish

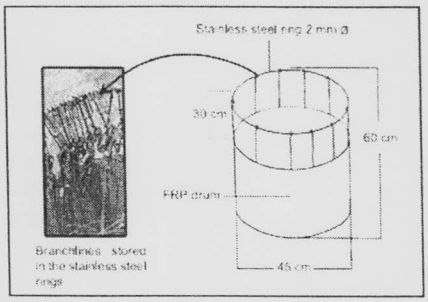


Fig. 7: FRP bin for storing branchlines

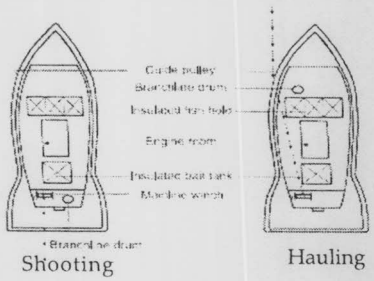


Fig 9: Shooting and hauling of the longlines from the Pablo boat

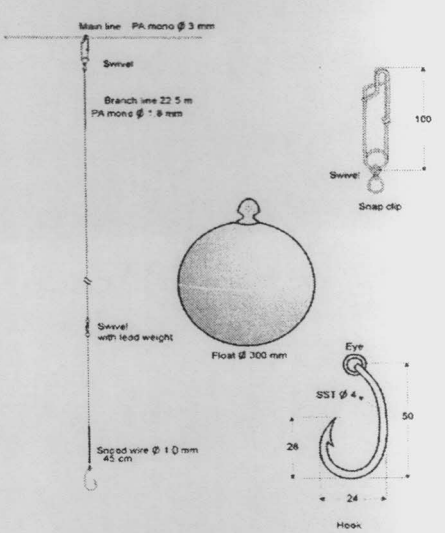


Fig. 8: Branch line of tuna longline

fishing craft and fastened tightly as shown in Fig. 5.

PUF insulated fibre box for baits

A PUF insulated FRP box (0.9 m x 0.7 m x 0.75 m) is provided for storing the bait fishes. It is placed in the aft of the fishing craft as shown in Fig. 6.

FRP bin for storing branchlines

A FRP bin(Fig. 7) is provided with stainless steel rings for storing the branchlines. 100 such branch lines can be stored in this drum. This facilitates easy storing of the branch lines and avoids entanglement of lines for easy and smooth shooting of the branch lines.

Longline gear design

The main line used is 3 mm dia PA monofilament and the branch line used is 1.8 mm dia PA monofilament twine. The length of the mainline is 5,000 m which is wound on the stainless steel winch, whereas the length of branchlines varied from 15 m to 22.5 m. Branch line consists of a snap clip,leaded swivels, sleeves, luminous heart, snood wire, and hook. The details of the tuna longline gear accessories are given in Table.1. the details of branch line is given in Fig. 8.

Longline gear operation

The Pablo boat has a platform with an area around 1.3 X 2.8 m which is mainly used by the fishermen for pole and line operations. The size of the platform varies with the total length of the boat. Maximum utilisation of the available space is taken care of for the modification work of the boats for lone ling operations.The platforms are used for baiting the hooks and also for shooting the long lines.

Shooting of the longlines

The shooting of the lines is carried out just before the dusk or dawn with four crew members on board to operate the longlines. The shooting speed of the boat is maintained at about 1 – 2 knots/hr. The flag with the long bamboo pole is released first. This helps to relocate the line after the shooting is completed. During the night operations, the floats are fixed with lights powered by battery. The main line is appropriately marked with two aluminum sleeves to facilitate the clipping of snaps of the branchline. The hooks are baited with different types of locally available fishes. On few occasions, frozen fish like mackerel, sardine are used as baits and these are transported from mainland for the fishing operations. Details of the bait fish used for the longline operations are given in Table. 2. Different types of hooks are also used.

Table. 1: Details of the boats selected for the modification at U.T. of Lakshadweep

SI. No.	Name of the boat	Place	L_{OA} (m)	Breadth (m)	Depth (m)	Engine type	(hp)
1	Noorjahan	Agatti	7.60	2.00	0.80	Kirloskar	(16.5)
2	Jeelani	Agatti	7.60	2.00	0.80	Ruston	(23.5)
3	Pondichery	Agatti	8.50	2.00	0.90	Ruston	(23.5)
4	M.L.Bahraini	Agatti	7.60	2.00	0.90	Ruston	(23.5)
5	M.D.Hinayath	Agatti	8.50	2.00	0.90	Ruston	(23.5)
6	Saifullahil Maslool	Androth	9.14	3.04	0.90	Ruston	(23.5)
7	Shaik Shafeek	Androth	9.75	3.04	0.90	Kirloskar	(16.5)

Table. 2: Details of the gear accessories used for the tuna longlining on board Pablo boats

Gear Accessories	Specification
Main line (PA) monofilament	3.0 mm dia
Branch line (PA) monofilament	1.8 mm dia
S.S. Snap with Swivel	2.6 x 100 mm (6 mm dia) (4/0)
Leaded Swivel	10/0 (45 gm)
Aluminum sleeves	1.5 mm dia / 3.1 mm dia
Copper Sleeves	1.2 mm dia
Japan Tuna hook	No. 3.2
Circular hook	No. 14/0
'J' Type hook	No. 2
Armour spring	1.5 mm / 1.2 mm dia
Polyester Tube	1.5 mm dia
Snood Wire	1.0 mm dia
Floats	300 mm dia
Luminous heart	3.0 mm dia
Float line (PP) Multifilament	8.0 mm dia
Float line (PP) Multifilament	4.0 mm dia

Table. 3: Bait fish used for tuna Longline operations

SI. No.	Local Name	Common Name	Scientific Name
1	Chala	Sardine	*Amblygaster* sp.
2	Bangada	Big eye scad	*Caranx crumenophthalmus*
3	Ayala	Indian Mackerel	*Rastrelliger kanagurta*
4	Neichala	Indian oil sardine	*Sardinella longiceps*
5	Oola	Dussumier's halfbeak	*Hyporhamphus dussumieri*
6	Parava	Flying Fish	*Exocoetus* sp.

Details are given in Table.3. The depth of the long lines is adjusted by increasing or decreasing the float lines or sometimes by using small or long branch lines. The position of the shooting site (Fishing ground) will be recorded by the fishermen by using GPS and the long lines are allowed to soak for 3 to 4 hours (fishing or soaking time) and then hauled.

Hauling of the longlines

The longline gear could operate a maximum of 100 hooks in one operation. During hauling, the mainline is taken back into the drum manually through a guide pulley after removing the branchlines by detaching the clip from the mainline. A branchline bin is provided to store the branchline by clipping it on to the rods of the bin along with the hooks so as to avoid the entanglement and to keep the lines ready for the next shooting. When a fish is caught on a line, the vessel slows down. At this time, the fish is brought alongside the vessel and taken on board using a gaff hook. Hauling of the line is carried out from the forward side of the vessel. Specially designed guide pulleys are fitted for smooth hauling operations and to prevent the tearing of branch lines by abrasion. Diagramatic representation of shooting and hauling of tuna long lines from Pablo boats is shown in Fig. 9.

Longlines are passive fishing gears widely used in both traditional and modern fishing to harvest a variety of commercial fish species such as tuna, swordfish, sharks, etc. It is known to be highly fuel efficient, eco-friendly and size and species selective, compared to fishing methods such as trawling. Longlining is suitable for scattered schools of tuna in deeper layer of water, such as in equatorial counter current or similar currents where the thermocline exists at a depth of 100 to 200 meters. Pole and line and troll lines are traditionally used in Lakshadweep to catch skipjack tunas. Modification of Pablo boats for tuna long line fishing is a humble beginning and a great step towards diversification of the fishing methodin Lakshadweep islands.

Release of Technical Brochures

Mumbai Research Centre of CIFT has released nine technical brochures on the occasion of 'Innovations 4 Industry meet in fisheries' held on 23 November, 2013 at Royal Orchid Hotel, Vashi, Navi Mumbai. The brochures detailing the technical features of some of the technologies developed by CIFT including chitosan and its derivatives, collagen peptide, chitosan sponge, seafood analogues, fish silage, fish oil for food fortification, instant fish gravy mix, fish sausage and fish de-scaling machine were released by the Chief Guest of the function Mr. RustomIrani, President, Seafood Exporters Association, Maharashtra Chapter in the presence of Director, CIFT. The function was witnessed by 35entrepreneurs from seafood Industry.

Release of the brochures (L to R: Dr. T.V. Sankar, HOD, QAM, CIFT, Mr. RustomIrani, President, Seafood Exporters Association, Maharashtra Chapter, Dr. T.K. SrinivasaGopal, Director, CIFT, Dr. C.N. Ravishankar, HOD, FP, CIFT and Dr. S. Vishnuvinayagam,SIC, Mumbai Research Centre of CIFT