Fishing vessels in India: An update

M.V.Baiju
ICAR-Central Institute of Fisheries Technology, Kochi
vishnubaiju@yahoo.com

Introduction

According to CMFRI, 2016 the total number of fishing vessels in India is 1,66,333. Of this 30,772 are mechanized trawlers, 6,548 are gill netters 3,396 are Dolnetters. The total mechanized fishing vessels are 42,985. The total number of motorised fishing vessels is 97,659.

Types of fishing vessels

The fishing vessels can be classified as follows:

1. Artisanal fishing vessels
2. Traditional fishing vessels
3. Motorised vessels
4. Mechanised vessels
5. Training/ Research/ Survey vessels

Artisanal Fishing vessel: Small-scale, low-technology, low-capital, low- energy, relatively small fishing vessels, making short fishing trips, close to shore by individual fishers of coastal or island ethnic fishers and mainly for local consumption. In practice, definition varies between countries- India wooden dugout canoes and catamaran (Fig.1).

Fig.1. Artisanal canoes of Andaman and some coastal sates.

Traditional fishing vessel: Traditional vessels use small engines for propulsion, but there is no insulated or cold storage for fish. The traditional gillnetters and liners used in Andaman is shown below (Fig.2)

Fig.2. Traditional fishing vessels of Andaman

Fig.3. A traditional plank built canoe

These are vessels using traditional methods for fishing and use no deck equipment such as winch. No insulated/cold storage onboard these vessels. No wheel house and accommodation onboard. In general, these boats are simple traditional fishing vessels only.

Motorised vessels: Vessels fitted with motors for propulsion, like the ring seiners- inboard engine fitted as shown below.

Fig.4. Motorised fishing vessels

Mechanised vessels: Mechanised vessels use engine power for cruising and fishing. They use mechanical/hydraulic/electric power for fishing gear handling. These vessels are installed with insulated/cold storage/freezer storage onboard.

Accommodation, galley and toilet are also made in the modern for multiday commercial fishing vessels. Communication, life saving, fire control, light and sound signals, etc. onboard. The most common commercial fishing vessels are trawler, gillnetters, Liners, seiners and combination fishing vessels. Trawlers include stern trawlers, side trawlers, factory trawlers and pair trawlers. Liners consist of hand liners, long liners and pole and liners. Seiners are purse seiners and ring seiners.

Types of mechanised fishing vessels are:

1. Trawler

1.1. Side trawler

1.2. Stern trawler

Fig. 5. Stern trawler

Fig. 6. Hydraulic trawl winch

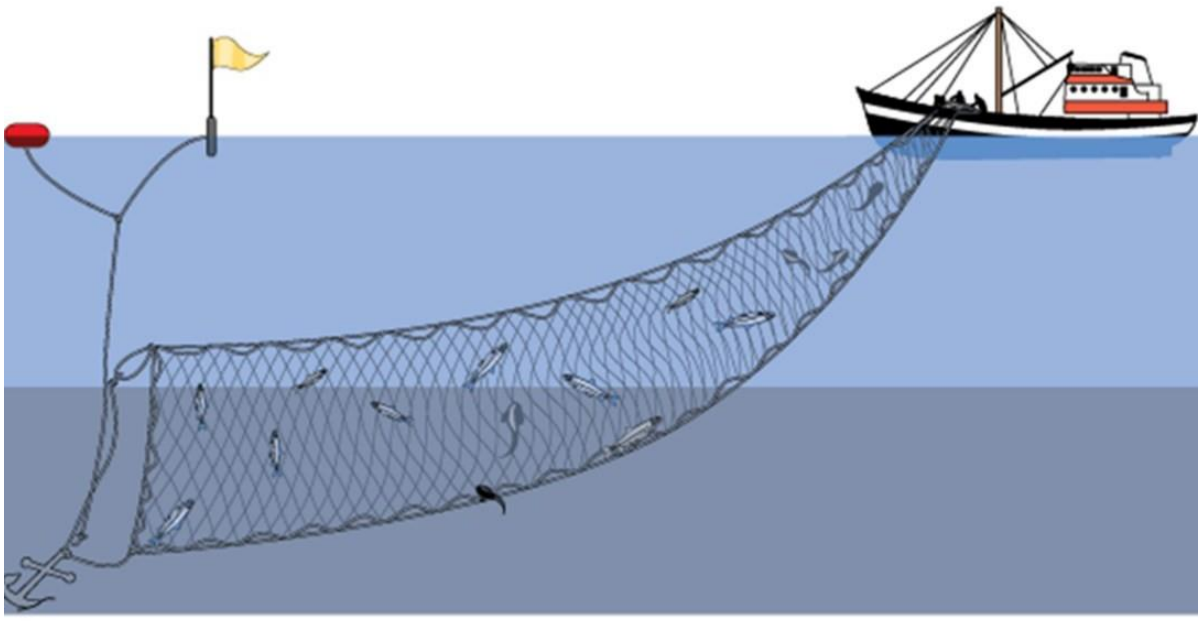
2.Seiner

2.1. Purse seiner: A commercial Purse seiner operating in Goa is shown below.

2.2. Ring Seiner: A traditional Ring seiner is shown below.

3. Gill netters

Boats and canoes use gill net in inland waters. The decked small gill netters fish in coastal waters and medium sized vessels operate gillnets in offshore. Small gillnetters have their wheelhouse either aft or forward. On medium sized vessels, using drifting gillnets and called drifters, the bridge is usually located aft.



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On small vessels setting and hauling operations are performed by hand. Larger vessels are often equipped with hydraulic net haulers or net drums. A gillnetter is shown above

Fig.4. A gillnetter

4. Liner

4.1. Hand liner

4.2. Long liner

4.3. Pole and liner; In Lakshadweep, Pole and liner are used to catch tunas shown below.

Fig.5. A pole and liner from Lakshadweep

5. Trollers: Use many lines with hook attached to the mast. The vessels move forward and fish tries to catch the baited hook and gets caught as shown below.

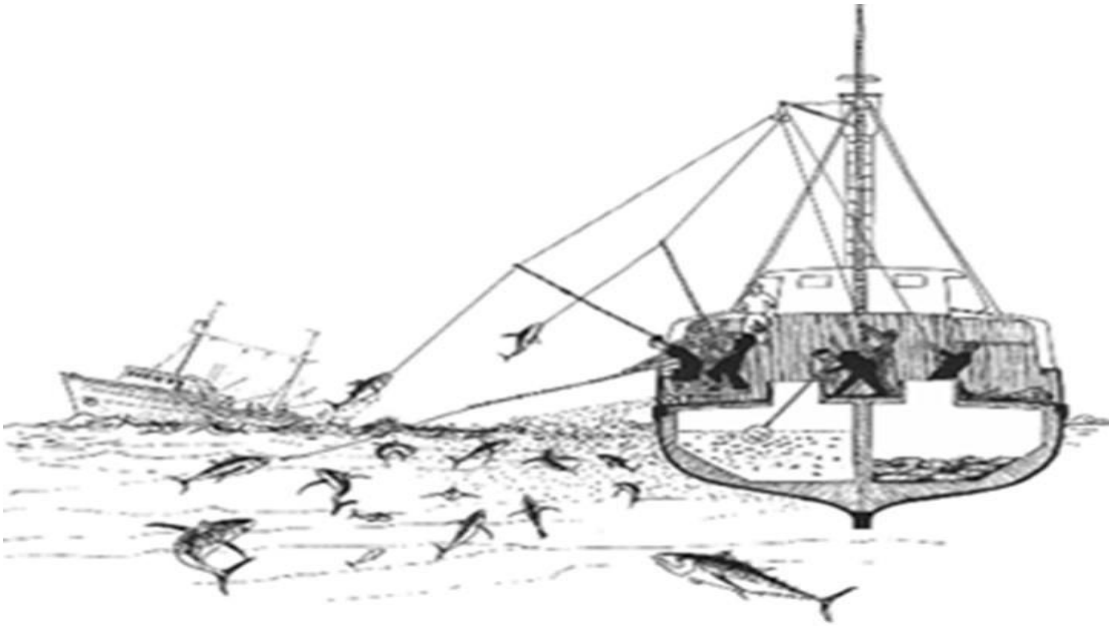

Fig. 6. A pole and line vessel in operation

6. Multipurpose fishing vessels: A most common combination is Gill netter cum Long liner and Trawler cum Long liner. is shown below

Fig.7. A multipurpose fishing vessel operates gill net and long line

There are also fishery research, carriers, fishery training vessels and fishery survey vessels. A research vessel of CIFT is given below.

Fig.8. F.V. Sagar Harita, research vessel

Design and construction of fishing vessels

The sea going boats and ships are designed and constructed based on the rules of the classification societies and the registering authorities of the flag nation. This ensures the structural and operational safety of the vessel as well as the crew, cargo and other items

onboard. Class or National Standard organisation approved raw materials only shall be used for the construction. Main engine, valves and other machinery ate to be approved type. Design of fishing vessel plays a vital role in fuel efficiency. Optimization of hull forms is the most effective and logical way to reduce the drag force for increasing fuel efficiency and the result is minimal carbon emission and considerable saving in expenditure of fishing operations.

The design and construction of fishing vessel is to be carried out as per classification rules and according to the registration rules of the country. But generally, this has not been followed till the last three years. Under the Blue Revolution and PMMSY schemes the boats are designed and constructed as per the rules as mentioned. The comparison of traditional design and class approved design of a commercial deep sea fishing vessel is given below (Fig. 11).

Fig. 10. Modern combination fishing vessel in India

Alternate energy application in fishing vessel propulsion

The commercial fishing vessels require an engine for propulsion. The trawler, gill netter and long liner uses main engine power to function the winch for hauling the fishing gear. Economic speed of fishing vessels depends on the speed and length of the vessel. For propulsion the following are used as fuel.

1. Petrol
2. Diesel
3. Kerosene+ Petrol – are the common type of fuel used for commercial fishing.

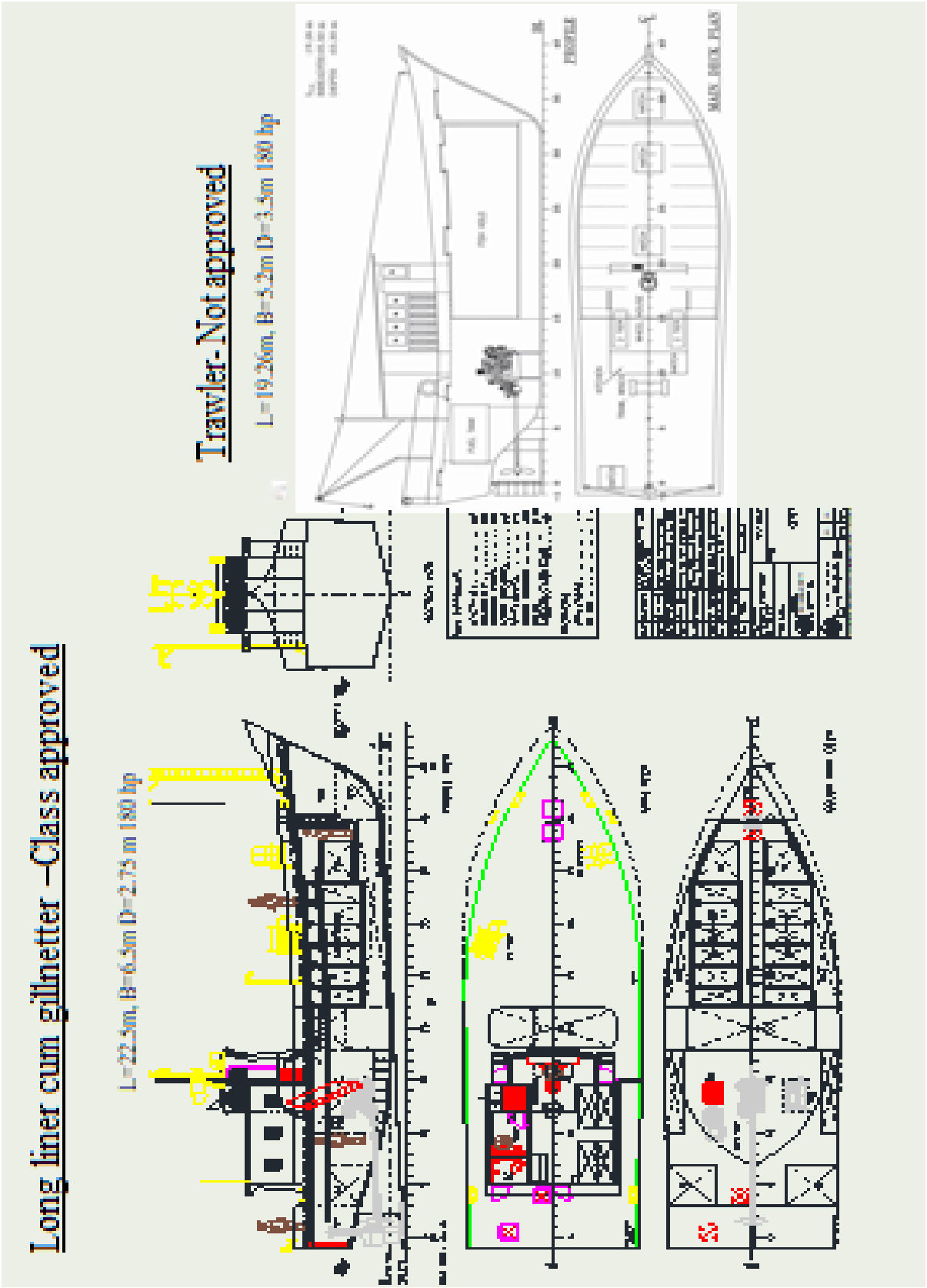

Fig. 11. design of a commercial deep sea fishing vessel

But recently ICAR-CIFT has started experiments with solar power and LNG. CIFT Solar fishing boat is shown in this picture. Solar panel mounted on top also act as a protection from sun and rain.

Fig. 12. Solar boat developed by ICAR-CIFT

There is no atmospheric pollution from solar boats since no fossil fuel is used in this. The sound pollution is also very low. Solar power for inland fisheries and LNG/LPG combination for marine fisheries as fusel for propulsion has been found to be successful after trials.

Fig. 13. LNG powered vessel

Fig. 14. LNG tank inside fishing vessel

Materials of vessel construction

The popular materials used in the construction of boats and ships are wood, steel, Aluminium, and Fiberglass reinforcement plastic. Among these wood utilizes least energy and is the most efficient material. But wood is costly now maintenance of wooden vessel is very expensive. Steel is the most popular material and has been used worldwide for ships and deep sea fishing vessels. This is corrosive in the marine environment and requires high care and maintenance. FRP is suitable for small vessels especially beach landing type fishing vessels due to its lightweight.

References

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