Fishing Gear Marking: A technique for traceability of lost gears

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Gear marking is an important mechanism for regulating legal and illegal fisheries. If a gear is well marked and has sufficient identification and it can be linked to vessel or gear registers. This is evidently a useful tool for enforcement agencies checking on gear set in certain areas (FAO, 2016). There are at present no effective regulations, guidelines or common systems for marking gear in India. The basic purpose of gear marking is to determine ownership and to trace back information regarding the gear. It also enables the state to take effective action against defaulters in case of Abandoned, Lost and Discarded Fishing Gear (ALDFG).

A study was conducted by ICAR-CIFT, to assess the extent of gear losses in different sectors, and ascertain the presence of any indigenous or institutional mechanism for gear marking prevalent. Three locations were selected for the study from the west and east coasts of India i.e., Veraval, Cochin and Visakhapatnam and data collected from trawl, gillnet and purse seine sectors. The respondents identified for the study were fishers/ net makers, net manufacturing units, monitoring, control and surveillance (MCS) authorities and research institutions. A total of 350 questionnaires were given to the respondents of which only 195 contained details sought for and were taken as valid.

Gear marking in the trawl sector

The survey conducted in the three major trawl fishing centers viz. Veraval, Cochin and Visakhapatnam showed that no marking system is followed in trawl fisheries. However, colours or special knotting are used on the webbing part to identify the nets for convenience of sorting and selecting a gear from a group. The colouring is mainly done with paints on the head ropes and sometimes the knotting made on the webbing is specific to the individual fishers. The webbing pieces with contrasting colours are also used to mark and differentiate gears. The pattern of replacement of old webbing with new webbing is also taken as an identification mark by some fishers in Cochin. However, no set pattern for marking was observed and it differed from fisher to fisher, if used at all. Fishers estimate an average loss of 500 – 1200 kg of webbing for each vessel per year. In addition, accessories like floats, sinkers, iron chain and otter boards also are abandoned in case of emergencies like rough weather. Unserviceable webbings are sold to agents who collect it either from beaches, landing centers or households. The fishers also dispose the old webbings through scrap dealers that purchase old nets. The old trawl nets are sometimes used by fishers themselves for fabrication of Fish Aggregating Devices (FADs). 90% fishers reported loss of parts of trawl nets during operation.

Fig 1. Discarded trawl on the shore

Gear marking in the gillnet sector

It was observed that in the gillnet sector of Veraval there are numbering and special markings on thermocole floats attached to the head rope. In Cochin area, there was no marking system for gillnets. In Vishakhapatnam float colour, shape and arrangement in head rope were used for differentiation. Special knotting on the head rope and float line is also practised, but no marking is seen on the webbing portion. Cement sinkers were marked by carving letters, symbols and numbers. The artisanal fishermen of Kerala operating small gillnets in back-waters use small plastic bottle/piece of polyurethane foam (PUF) sheet as identification marks.

Fig. 2 Gear identification mark in gillnet floats and discarded monofilament gillnets

It is reported that that 25% of fishers are forced to abandon gillnets every year. Main parts abandoned include webbing, floats and sinkers. The webbing that gets caught in obstacles under water like wrecked ship, sunken fishing boats, rocks, debris of wartime wreckages etc. are usually abandoned. It is estimated that an average of 500-900 kg webbing are discarded per vessel per year. All gillnetters surveyed from the study area reported 38% loss of parts of gillnets per year. Main reason for the loss is due to passage of ships and bad weather. Fishers also reported that 37% of the webbing were discarded in the sea.

Gear marking in purse seine sector

There is no gear marking system in the purse/ring seine sector in Cochin region. The gear is stored onboard the vessel even after operation and it was felt by the fishermen that a system for gear marking is not required and practicable. The nets that get entangled in obstacles like drowned boats and rocky bottom are abandoned. The webbings are mostly lost and accessories retrieved. About 100-300 kg of nets are being replaced each year from a single vessel. The chance of losing the net is rare in the case of seines but when the sea is rough due to water currents, portions or whole nets are lost. From 50 respondents, it was found that all vessels are forced to abandon net at least once in a year. About 50% of the discarded net were used for recycling, 22% for aquaculture purpose and roofing support of the houses, 10% for other household activities, 8% to protect vegetation and fencing, 6% for net mending and 4% for fish drying purposes.

Fishing nets are manufactured by the private and government sectors. According to the textile manufacturers, gear marking is not done during production for webbings, twines sold in the domestic market. The ropes produced by large manufacturing houses sometimes have an inlaid marking and logo for identification. However for gears (readymade) exported such markings/tags are provided on customer request. These is no practice of registration of gears separately. The officials of the department of fisheries confirmed that there are no guidelines on marking of fishing gears and they were unaware of any indigenous system followed for the same in any part of the country. Kerala is the first state in the country to have implemented gear marking through the amendment of the Kerala Marine Fisheries Regulation Act in 2017 (Gazette notification No. 16838/Leg.11/2017/Law. dated 18th September 2017). ICAR - Central Institute of Fisheries Technology (CIFT) is the only nodal center in the country dealing with research, development and standardisation in fishing gear technology and have not come across with any system to mark gears/ gear materials and accessories in gear materials.

Key issues and challenges in gear marking in India

The challenges with regard to gear marking, as mentioned above, is because of the vast diversity in the gears used. Also there has been no clear cut policy on gear marking. Some of the reasons for this issue being given less priority so far, may be due to India being a characteristic multi species, multi gear tropical fisheries—long coastline with multiplicity of harbours/ landing centers (>1500). A rough estimate shows that 0.5 - 0.6 million fishing gears are operated in the marine sector. Fabrication of gears are done by artisans locally and there is no system of registration of gears. The fisheries departments of the various states in the country have multiple functions from registering vessels to implementing social schemes and the manpower is fairly stretched with work to be given additional responsibilities.

Suggestions for introduction of gear marking in India

A Unique Identification Code that can be machine read for each gear being operated from registered fishing vessels can be used for gear marking which provides the encrypted information on the gear used. The implementation of same in India would require the creation of awareness among fishermen on the international requirements and the use of gear marking system, providing gear manufacturers with clear guidelines on marking of gear, making mandatory that all registered fishing vessels should operate only marked gear, documenting the specification details of each gear available onboard a vessel and details of operation. At the same time, considering the large section of artisanal fishers of India factoring the costs of marking into the cost of gear will be difficult for the fishers to bear and it would be difficult to prevent defaulters without stringent monitoring.

Encouraging Results of Bycatch Reduction Devices (BRDs) in shrimp trawls – A Preliminary analysis

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The flower shrimp (*Penaeus semisulcatus*), fishery is restricted to the Gulf of Mannar and Palk Bay region of south eastern Tamil Nadu. Gillnets contribute about 12% of the landings along northern Palk-bay (Josileen et al. 2019) and the rest by indigenous sail assisted fishing (*Thallu valai*) (Sampson et al., 1987). The rest of the landings is contributed by mechanized trawl sector. The landings of this species are reported to reach about 80% in trawl fishery during peak seasons (Kumar et al., 2017) but considering the average yearly landing, *P. semisulcatus* may contribute 3-5% of total shrimp landing (Siva et al., 2012). The fishery is seasonal and starts from the month of July and extending till February each year. The most common mesh size used in the codend is 20-25 mm and a chaffing gear made of HDPE twine of 2.5 mm dia. is used by all the vessels, to prevent damage to the codend. The depth of operation varies from 15-25m and beyond 3 nautical miles from the shore. There are a total of 2262 mechanized trawlers of sizes varying from 12-14 meter in length fitted with inboard engine with horsepower varying from 68-193 (Kasim, 2015).

Recent stock assessment based on catch and effort data shows that the flower shrimp stocks fluctuate around the MSY level, however stock