

# PROTECTION OF WOODEN FISHING CRAFT

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India with a long coastline of 8041 km and an Exclusive Economic Zone of 2.02 million km<sup>2</sup> depends on the traditional as well as the mechanised sector for exploitation of fishery resources. There are at present about 1,70,000 traditional craft, 36,000 mechanised boats and about 200 deep sea trawlers operating in our coastal waters. The capital investment in this sector amounts to about Rs. 6,000 crores. The traditional craft are constructed using wood alone whereas larger mechanised vessels are made from steel, fibreglass reinforced plastic, ferrocement etc. These materials, especially wood, are subjected to deterioration due to their constant interaction with the seawater. In this context the need for protection of fishing craft gains much importance.

## Protection of wooden craft

The main agencies causing biodeterioration of wood are fungi and borers. Abrasion and heat also affect wood drastically.

The wood is subjected to the attack of fungi such as *Ascomycetes* and *Dueteromycetes*. The high temperature and humidity of the coastal areas are conducive to the growth of fungi especially in the sapwood portion. As these organisms do not have chlorophyll they derive nutrition from the wood and spread fast making the wood light and porous. Once the wood is attacked by fungi it is difficult to prevent its growth. Cutting off the attacked portion and burning it is the best method of destroying fungi.

The main features of fungal attack are :

- Change in colour : The colour of wood turns dark brown.
- Softening of wood : The wood becomes soft and spongy. Besides, it absorbs more water.
- Change in density: The wood becomes less dense and disintegrates.
- Change in odour : The wood exudes a fungal odour.

## **Main areas of fungal attack**

All portions of the boat are prone to fungal attack. The attack appears concentrated in wet areas. Vessels that remain in water for a long time are not subjected to heavy fungal attack. The beam and frames are the areas that are attacked more. The intermittent wetting and drying is conducive to fungal attack.

Sapwood and wood with high moisture content are more prone to fungal attack. Hence wood should be seasoned and sapwood should be avoided while constructing wooden boats. To prevent water seeping in through the joints they should be sealed with oil based putty. Once the wood is attacked by fungi the marine borers soon gain entry to feed upon wood contents and destroy them.

## **Protection of small traditional fishing craft**

The traditional craft are protected by applying sardine oil, cashewnut shell liquid mixed with charcoal, resin etc. This makes the surface of the wood resistant to absorption of moisture. But these traditional methods of treatment are costly and are not very effective.

The life of fishing boats can be increased by using chemical preservatives and preventing fungal attack and abrasion. The main types of chemical preservatives are creosote, copper creosote, arsenical creosote and creoscor. Creosote is a coal tar derivative which distills between 200-400°C and is a mixture of a variety of hydrocarbons, acids and alkalis.

The toxicity of creosote is enhanced by chemical reactions with salts of copper, arsenic compounds or resins. Such preservatives offer more resistance to biodeterioration. ASCU is a water borne chemical preservative used for the protection of wood. This contains salts of copper, chromium and arsenic in definite proportions. If three or four coats of this preservative are applied, insect attack, fungal attack and attack of marine borers can be minimised, but the surface of the wood becomes slightly brittle. To prevent this, it is desirable to adopt a dual preservative treatment consisting of applying ASCU followed by creosote.

The protection of the hull is different in the case of mechanised boats. Biodeterioration by marine borers like

*Martesia*, *Sphaeroma* etc. can be minimised by using durable timber species like jungle jack, teak, sal, *karimaruthu* or by using chemical preservatives. Besides, fouling organisms such as barnacles, mussels, oysters etc. which grow on the underwater portion of the hull reduce the speed of the vessel and increase fuel consumption thereby increasing operational cost.

The hull below water line can be protected by giving a sheathing of Al-Mg alloy. Indal M57S, Hindal 5052, Hindal 5086-Aluminium of 22 SWG or 24 SWG can be used for this purpose.

This aluminium sheathing protects the underwater portion from borers but it does not give protection from fouling and corrosion. Corrosion can be prevented by applying one coat of wash primer followed by two coats of zinc chromate primer on the aluminium sheets. Besides, sacrificial anodes should be fixed on the hull surface to prevent corrosion. Zinc of 99.99% purity or ternary aluminium alloy anodes (CIFTAL) developed by CIFT can be used. Steel hulls of large class of vessels are protected by this method.

Antifouling paints having a life of more than one year can be used to prevent fouling. After application, a drying time of 8 hours should be allowed and the vessel should be launched before completion of 12 hours of application of the paint. These paints are to be handled carefully as toxic substances are incorporated in them.

Fibreglass reinforced plastic sheathing is given to mechanised wooden vessels. This does not have any chemical reaction with seawater and has long life. This method of protection is costly and requires skilled labourers.

Effective and economical methods have to be used for prolonging the service life of fishing vessels. This will reduce the cost of operation and help to preserve our forest resources. CIFT is engaged in research and development in this field and has developed different methods for the preservation and protection of craft.

Recently, a dual preservative treatment technology has been developed by CIFT. This involves the use of a water borne preservative followed by an oil borne preservative and is found to be better suited for protection of wooden structures in tropical waters.