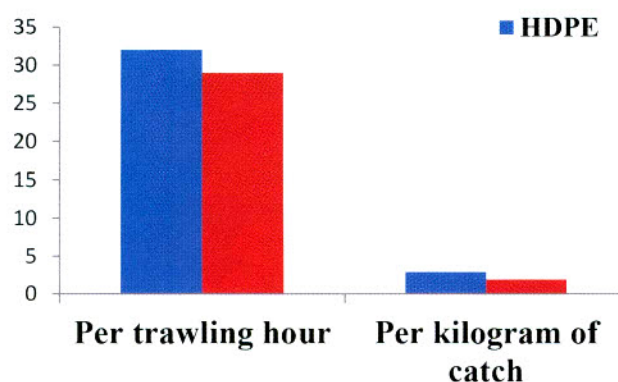


Average drag of HDPE and UHMWPE trawls during one hour of trawling



Comparison of fuel consumption of conventional and low drag trawls

trawling for HDPE trawls was estimated to be 30 L and for UHMWPE trawls 26 L. The average reduction in fuel consumption was found to be 10%. The fuel consumption per kg of fish captured

estimated was 2.9 L. for HDPE trawls and 1.9 L. for UHMWPE trawls and the average reduction was 35%.

The drag and the fuel consumption of low drag trawls are 17% and 10%, respectively lower when compared to conventional HDPE trawls. Hence it is evident from the study that, use of energy saving material like UHMWPE will reduce the drag and thereby fuel consumption of trawlers considerably.

## References

- Boopendranath, M.R. (2000) - Studies on energy requirement and conservation of selected fish harvesting systems. Ph.D. Thesis. Cochin University of Science and Technology, Cochin, India, 273 p.
- Endal, A. (1980) - Fuel saving, *Fishing News Intl* 19(10): 16-17.
- Fødevareøkonomisk Institut (2011): "Fiskeriets Økonomi 2011" Economic Situation of the Danish Fishery, København 2011.
- Gulbrandsen, O. (1986) - Reducing Fuel Cost of Small Fishing Boats, BOBP/WP/27, Bay of Bengal Programme, Madras:15 p.
- Thomson, D. (1988) - Conflict within the fishing industry, Naga, *ICLARM Quarterly*, July 1988: 3-4.
- Tyedmers, P.H., Watson, R., and Pauly, D. (2005) - Fueling global fishing fleets, *Ambio* 34(8): 635-638.

## Handmade wooden boats of Gujarat: Craftsmanship for the ocean

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Indian boat technology and navigational knowledge dates back to the III<sup>rd</sup> Millennium BC. Historical records show that Harappans not only built unique docks but also provided facilities for

handling cargo. In Gujarat, Traditional wooden fishing boats and cargoes building takes place mainly in Kutch, Valsad, Mangrol and Veraval. Mandvi is the one of the oldest place synonymous



for the wooden boats and cargoes construction for centuries. Even the boat construction in other parts of the state is done under the supervision of people from Kutch region locally known as “Kutchees”.

Boat construction in Gujarat is carried out throughout the year and maximum numbers of boats are built during non-fishing season. Fishing season in Gujarat is usually of nine months from September to May. In the remaining months, fishing activities remain closed from 10 June to 15 August as per the Marine Fishing Regulation Act of Gujarat - 2003 and also due to monsoon as well as rough conditions in the sea. Types of trawlers common in Gujarat are wooden and FRP trawlers. Wooden and FRP trawlers are common in Gujarat. While wooden boats are constructed fully with wood, in FRP boats, only the main ribs are constructed with wood and the external cover is provided with FRP sheath. Shri Prabhudas Bensala, an active fishermen of Veraval says “Initially the space between each ribs in FRP boats were maintained as 15-20 inches. This resulted in less stability and tilting of vessel during navigation, especially at high speed wind conditions. Realizing



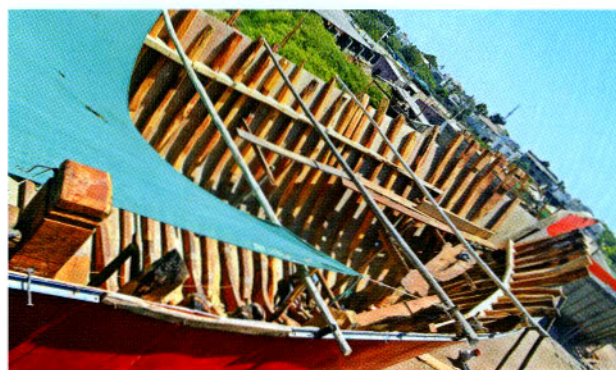
Data collection in progress

this difficulty, presently, the distance between the wooden ribs are maintained as 9 inches. This



Various stages of boat construction and tools used for construction





Mould used for FRP Boat construction and inner wooden ribs of FRP boat



Wooden Boats under construction



FRP Boats under construction

increases the stability of vessel". The length of the vessel ranges from 12.8-20.0 m and the construction (including engine) cost of FRP and wooden boats are approximately ₹ 30 and 40 lakhs, respectively. 12.8 m boats are considered as the old classes of vessels and construction of such vessels are almost stopped. Presently most of the vessels are coming under the length class of 14-15 m. The wood used for construction is coming from various parts of the state. Babul and Sal wood are the major wood used. In the case of wooden boats, big wooden planks are curved with the help of fire. Babul wood is used for the construction of

the inner ribs and Sal wood is used for the rest of the construction. Teak wood is used for the construction of wheel house. Almost 40 and 60 tons of wood is used for the construction of an FRP and wooden boats, respectively. The time required for constructing the entire vessel is four months. Engine power of the vessel ranges from 165-230 hp. Construction is mainly done with the simple traditional tools like harmer, chisel, driller etc. Electric instruments for cutting and polishing the wood were introduced recently. Once the construction finishes, treated fish oils and antifouling paint coating is applied in the parts which are susceptible to boring and degradation. The design of the vessel is decided by the person locally known as *Mesthri*. There will be a main contractor for monitoring the work. He will manage the workers and assign duties to the workers. About 8-10 workers will work under the supervision of contractor. Boat owner will provide ₹ 3-4 lakhs to the contractor as the labour charge. The contractor will distribute wages to the workers from this share. The per day wage of skilled labour is ₹ 500-1000 depending on the nature of work. Once the construction is over, the boat will be





Wooden Kotia under construction

lifted to specially designed lorry and transported to the respective berthing area. With the help of cranes, the boat will be transferred to water. This transportation cost for the lorry and crane will be ₹ 15,000 and 10,000, respectively. Average life of the wooden vessel is estimated as 20-25 years and it depends on the hydrographic conditions and maintenance. FRP trawlers were introduced in fishing sector of Saurashtra region nearly 5-7 years back. Presently, there is no report on steel fishing vessels from Saurashtra coast.

#### **Kotias: Wooden cargoes connecting India to Middle East and North Africa regions**

Besides fishing vessels, there is another class of vessels used for cargo purposes. In local parlance, these vessels are known as Kotias, Vaahan etc. These vessels have a total length of 30-40 m and a width of 12-14 m. Similar kind of vessels known as 'Dhow' are constructed in the Middle East countries. The wooden cargo vessels of Kerala are known as "Uru". The construction details are same as that of the fishing vessel. As

these are very big vessels, it may take 2-3 years to complete the construction. The cost of construction will be around ₹ 3-4 crores. After construction, vessels are transported to Middle East countries. During this voyage the vessels transport rice, wheat, sugar, cattle, sheep etc. from India. During the journey, there will be 15-18 crews including *Tandal*, *Malam* and one mechanic from the engine side. *Tandal* is considered as the captain and navigational operation is done by the *Malam*. From the respective port, further transportation of various goods will take place within Arab nations and African countries like Mozambique, Somalia, etc. If the owner gets a good price for the *Kotia*, he will sell the vessel even to the persons outside the country. For this, registration of the vessel needs to be cancelled from India, and reregistration should be done in the respective nation. Wooden fishing vessels and Kotias are the symbol of exceptional craftsmanship of the Indian traditional boat builders and these are part of our great culture, history and civilization.

## **Melanosis inhibition in ice stored *Litopennaeus vannamei* using alternatives to sodium metabisulphite**

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**M**elanosis or black spot formation is a serious but, common quality defect in Crustaceans during post harvest handling and storage. Although melanosis

causes no health issues, it diminishes the sensory appeal of the product, ultimately leading to low commercial value. This is being considered as a