

**RESEARCH ARTICLE**

# Inboard diesel engine fitted with gill netters operating along Ratnagiri coast

**■ S.L. BHANDKOLI, R.K. SADAWARTE AND A.S. MOHITE****ABSTRACT**

Mirkarwada is one of the important mechanized fish landing center of Ratnagiri. It is well constructed major fishing harbour, which provides a birthing and fish landing facilities for all kinds of vessels, since 1988-89. Wooden gill netters (4), FRP gill netters (6) fitted with marine diesel engine were operated from Mirkarwada, Ratnagiri. Kirloskar W/C model diesel engines (90%) and of Ashok Leyland AL-370 model diesel engine (10%) were fitted on the gill netters. Overall length (OAL) of gill netters ranged from 28.30 to 38.62 ft, breadth 7.15 to 10.15 ft, depth 2.83 to 5.32 ft, gross tonnage 4.14 to 9.54 tonnes, net tonnage 3.6 to 8.29 tonnes, horse power 10 to 99.27 hp, RPM 500 to 1500 rpm, fuel consumption litres per hour 7 to 12 l/hr, propeller diameter 15 to 29.9 inch and propeller pitch 10 to 19.6 inch.

**KEY WORDS :** Diesel engines, Gill netters, Fuel consumption

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**INTRODUCTION**

Being one of the low energy fishing techniques, gillnetting occupies a unique position from the energy conservation point of view. The gillnet fishery has not undergone much advancement from its initial state. Even though the process of mechanization primarily started with gillnetters, mechanization in gillnetting is still used only for propulsion to and from the fishing ground. The handling of the gear and catch has not undergone any change from the initial practice of manual operation of the gear. Fuel cost forms a major component of the operational expenditure and it has increased continuously over the years (Panikker *et al.*, 1990). So far, no attempt has been made to study the relative fuel consumption and effective fishing time patterns of the mechanized gillnet operations, off Ratnagiri. An understanding of the above factors will help to improve the efficiency of fishing operations and hence the present study was undertaken to find out the vessel classes having optimum fuel use.

The diesel engine also known as a compression-ignition engine which is internal combustion engine that uses the heat of compression to initiate ignition to burn the fuel, which is injected into the combustion chamber. Engine cost, fuel cost, hours of engine operation and the need for beach landing are factors that vary from one fishery to another and from country to country. The viability of an inboard diesel engine is highly dependent on the number of operating hours per year. With rising fuel costs the odds are in favour of the diesel engine (Gulbrandsen, 1986).

A small beginning was made by the Madras government in 1949, by introducing a small 6 meter OAL boat, powered with 5 hp engines. The real stage for introduction of mechanized fishing fleet was set in India during 1951-

1953, when the GOI took the decision to developed fishery in the modern lines, by introducing modern mechanized fleets (Badapanda, 2012).

## **EXPERIMENTAL PROCEDURE**

Mirkarwada fishing harbor is situated on the west of the Ratnagiri city about 2 km away from Ratnagiri with a geographical distribution of 16° 59' 42" N latitude and 73° 16' 14" E longitude was chosen as one of the sampling stations. The study was carried out during the years 2012-14. The interview schedule was formulated to collect data required for the present study. During the study period four wooden gill netters, six FRP gill netters fitted with marine diesel engine were operated from Mirkarwada, Ratnagiri. The detail information regarding different types of marine diesel engine used in fishing boats was undertaken by physically sampling the units and by collecting the information from gillnetter's operators of Mirkarwada, Ratnagiri. The information regarding the marine diesel engine used for fishing vessels operated from Mirkarwada fishing harbor was collected from the Department of Fisheries, Ratnagiri Government of Maharashtra.(Department of Fisheries, 2012).The data collected with respect to the length, breadth, depth, gross tonnage, net tonnage, horse power, RPM, fuel consumption (l/hr), endurance period, propeller diameter and propeller pitch etc. of the marine diesel engines fitted to the gill netters operated from Ratnagiri, Maharashtra.

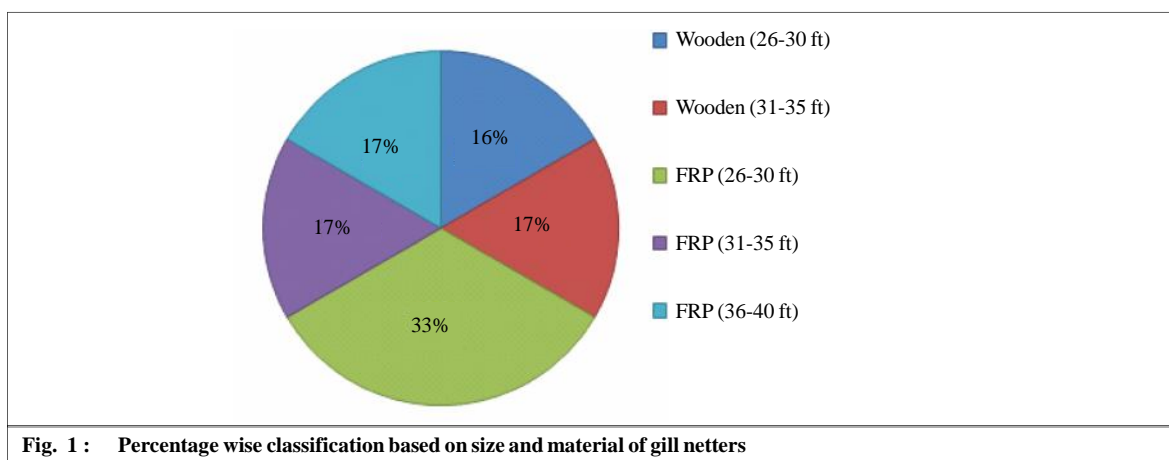
## **EXPERIMENTAL FINDINGS AND ANALYSIS**

An attempt was made to understand variation in engine horse power, variation in vessels with respect to tonnage and the variation in engine and propeller pitch.

For making sampling frame, the number of mechanized crafts based on the size *viz.*, 26-30 ft LOA, 31-35 ft LOA, 36-40 ft LOA, below 40 ft LOA, 40-50 ft LOA, 50-60 ft and above 60 ft were selected (Table 1 and Fig. 1). Same category was recorded by Shibu and Hameed (2001) and (Boopendranath and Hameed, 2007).

Along the coast of Ratnagiri, gill netters operated were made of two types of material wood and FRP. Kirloskar make diesel engine (90%) and Ashok Leyland make diesel engine (10%) were fitted on the gill netters. In wooden gill

Size	Gill netters		Total
	Wood	FRP	
26-30 ft	02	04	06
31-35 ft	02	1	03
36-40 ft	0	1	0
Total	04	06	10



**Fig. 1 : Percentage wise classification based on size and material of gill netters**

netters operating from the Mirkarwada fishing harbor four gill netters were fitted with Kirloskar make diesel engines (Kirloskar W/C model).

Wooden gill netters (26-30 ft) overall length varied between 28.63 to 29.30 ft average overall length (28.971 ft), breadth (9.24075 ft) and depth (3.4965 ft). The Gross tonnage ranged between 4.79 to 5.84 tonnes and Net tonnage ranged between 4.16 to 5.08 tonnes. Kirloskar make engine fitted with 16 hp engine horse power the average speed of the engine was 1500 rpm. Average fuel consumption was 7.5 lit./hr, average propeller diameter was 15 inch and pitch 10 inch.

In wooden gill netters (below 100 hp) overall length varied between 28.63 to 29.30 ft. average (28.971 ft), breadth (9.24075 ft) and depth (3.4965 ft). Gross tonnage ranged between 4.79 to 5.84 tonnes and Net tonnage ranged between and 4.16 to 5.08 tonnes. The average speed of the Kirloskar make engine fitted with 16 hp were 1500 rpm. Average fuel consumption per hour was 8 l/hr, average propeller diameter were 15 inch and pitch were 10 inch.

In the FRP gill netters, five gill netters were fitted with Kirloskar make diesel engines model kirloskar W/C and one were fitted with Ashok Leyland make diesel engines model Ashok Leyland s AL – 370. The length of FRP gill netters was found to be 36-40 ft with average length of the boats 38.62 ft, 16 hp engines was fitted on the boats with engine speed 1500 rpm, fuel consumption 15 liters per hour, propeller diameter were 15 inch and its pitch were 10 inch. In FRP gill netters engine power (below 100 hp) average length of the boats was 32.28 ft, average engine horse power 28.87 hp, average speed of the engine 1333.33 rpm, average fuel consumption 11 litres per hour, average propeller diameter were 17.48 inch and its pitch were 11.6 inch. Same length class and engine were found by Thirumilu *et al.* (1994) and Boopendranath and Hameed (2013).

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