



**MARINE ENGINES OF WOODEN PURSE SEINERS OPERATING  
ALONG RATNAGIRI COAST, MAHARASHTRA**

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**ABSTRACT**

*A total of 123 wooden Purse seiners were in operation from Mirkarwada fishing harbour of Ratnagiri of which 99.18% were wooden purse seiners fitted with Ashok Leyland make diesel engines. The length class of wooden purse seiners ranged from i.e. 40 ft (3%), 40-50 ft (45%), 50-60 ft (11%) and above 60 (41%) and the horse power of the engines ranged from, below 100 hp (39%), 100-200 hp (54%), and 200-300 hp (1%). During the present study, Ashok Leyland (AL-400, AL-402, AL-412, AL 680 and AL 680 TC) diesel engine was found to be the most popular and commonly installed marine engine on the wooden purse seiners.*

**KEY WORDS** Purse seiners, diesel engines, propeller pitch, efficiency, fuel consumption

## **INTRODUCTION**

Mirkarwada is one of the important mechanized fish landing center and fishing harbour of Ratnagiri operational since 1988-89, providing berthing and fish landing facilities for all kinds of fishing vessels. The present study was undertaken with respect to the purse seiners operated from Mirkarwada Fishing Harbour.

Unnithan *et al.* 2005 studied different classes of vessels in Kerala. he observed that small classes of vessels were generally fitted with ALM 370 engine with a maximum of 70 hp. The medium size vessels were fitted with engines of about 100 hp (ALM 400 and 402) whereas the large vessels were installed with engines mostly of 126 hp (ALM 412). Boopendranath and Hameed (2007) studied the mechanized fishing activities at Cochin Fisheries Harbour situated at Thoppumpady (Kerala, India), under the administrative control of Cochin Port Trust. Purse seiner's length ranged from 12.1-19.0 m LOA and diesel engine horse power was 106-235 hp. Jeva *et al.* (2012) observed that all the mechanized craft of Cuddalore and Nagapattinam in Tamilnadu ranging from 15-18 m LOA had engine horse power of 100-140 hp.

## **MATERIAL AND METHODS**

Mirkarwada fishing harbor situated 2 km away on the west of Ratnagiri city (16° 59' 42" N latitude and 73° 16' 14" E longitude) was chosen as the sampling station for the present study. Total 123 wooden purse seiners fitted with marine diesel engine were operated from Mirkarwada, Ratnagiri during the study period. The interview schedule was formulated to collect the required data comprising of the detail information regarding different types of marine diesel engine used on wooden purse seiners, by physically sampling the units. The data included the length class and other specifications of the wooden purse seiners as well as the specifications of marine diesel engines, like horse power, fuel consumption (l/hr), propeller diameter and propeller pitch.

## **RESULTS**

A total of 123 wooden purse seiners operating from Mirkarwada fishing harbor, Ratnagiri were classified on the basis of length class and engine horse power. The marine diesel engines of purse seiners were classified according to the length class as below 40 ft (3%), 40-50 ft (45%), 50-60 ft (11%) and above 60 (41%) and also according to the engine horse power as below 100

hp (41%), 100-200 hp (57%), 200-300 hp (1%) and above 300 hp (1%); as detailed in Table 1 and 2.

Table 1. **SPECIFICATION OF WOODEN PURSE SEINERS ACCORDING TO LENGTH CLASS**

Sr. No.	Specification of Wooden Purse Seiners / Length Class	Below 40 ft	40-50 ft	50-60 ft	Above 60 ft
	No. of Wooden Purse seiners	04	56	13	50
1.	Length (ft)	39 ± 0.46	48.4 ± 0.22	54.48 ± 0.34	61.73 ± 0.38
2.	Breadth (ft)	16.16 ± 0.85	19.12 ± 0.41	22.46 ± 0.23	24.09 ± 0.53
3.	Depth (ft)	6.78 ± 0.57	7.744 ± 0.10	8.29 ± 0.11	9.49 ± 0.33
4.	Gross tonnage (tonnes)	44.54 ± 1.41	47.66 ± 1.03	61.47 ± 1.54	84.47 ± 5.59
5.	Net tonnage (tonnes)	39.8 ± 1.09	42.2 ± 1	53.96 ± 1.27	74.52 ± 5.30
6.	Engine horse power (hp)	106.13 ± 4.89	105.62 ± 2.26	117.48 ± 4.18	186.5 ± 20.19
7.	Engine RPM	1833.3 ± 166.67	1947.05 ± 42.11	2077.77 ± 27.78	2055.55 ± 64.44
8.	Fuel tank capacity (liters)	300 ± 100	529.76 ± 46.14	740.32 ± 68.10	650 ± 84.66
9.	Fuel consumption liters / hour	17 ± 1.22	18 ± 0.29	18.33 ± 0.29	19 ± 0.60
10.	Propeller diameters (inches)	36.5 ± 0.5	37.58 ± 0.28	36.98 ± 0.28	37.2 ± 0.61
11.	Propeller Pitch (inches)	29.12 ± 0.25	29.6 ± 0.12	29.31 ± 0.12	29.43 ± 0.27

Table 2. **SPECIFICATION OF WOODEN PURSE SEINERS ACCORDING TO ENGINE HORSE POWER**

Sr. No.	Specification of Wooden Purse Seiners / Engine Horse Power	Below 100 hp	100 – 200 hp	200 – 300 hp	Above 300 hp
	Wooden Purse seiners	50	70	02	01
1.	Length (ft)	49.21 ± 0.56	53.25 ± 0.61	60.27 ± 0.67	63.27
2.	Breadth (ft)	19.68 ± 0.37	21.54 ± 0.39	23.14 ± 0.83	24.97
3.	Depth (ft)	7.72 ± 0.10	8.33 ± 0.13	8.57 ± 0.58	9.32
4.	Gross tonnage (tonnes)	48.17 ± 1.28	61.13 ± 1.77	72.93 ± 1.51	91.77
5.	Net tonnage (tonnes)	42.74 ± 1.19	53.92 ± 1.58	63.30 ± 1.43	79.8
6.	Engine horse power (hp)	98.08 ± 0.45	125.14 ± 3.21	249.50 ± 30.5	350
7.	Engine RPM	1961 ± 52.55	2000 ± 28.21	2500	2100

8.	Fuel tank capacity (liters)	518.57 ± 43.68	658.88 ± 55.85	1200	1000
9.	Fuel consumption liters / hour	15.00 ± 1	18.00 ± 0.99	18.66 ± 0.13	23
10.	Propeller diameters (inches)	37.61 ± 0.31	37.03 ± 0.22	37.00 ± 1	36
11.	Propeller Pitch (inches)	29.61 ± 0.13	29.35 ± 0.10	29.38 ± 0.50	28.88

## DISCUSSION

Wooden purse seiners operating from the Mirkarwada fishing harbour were classified according to the length class i.e. below 40 ft, 40-50 ft, 50-60 ft and above 60 ft and according to the engine horse power below 100 hp, 100-200 hp, 200-300 hp and above 300 hp. Same length class and horse power based classification was recorded by Unnithan *et al.* (2005) as well as by Bhoopendranath and Hameed (2007) along the Kerala coast. Breadth, Depth and Tonnage of wooden purse seiners operating from the Mirkarwada landing center of the various length class have been recorded during the present study and presented in detailed in Table 1 and 2.

One hundred and twenty two wooden purse seiners were fitted with six cylinder Ashok Leyland make marine diesel engine and only one wooden purse seiners was observed to be fitted with Sinotruk make marine diesel engine. Five models of Ashok Leyland engine were observed viz. AL- 400 (48), AL-402 (41), AL-412 (13), AL-680 (15) and AL 680 TC (05).

Wooden purse seiners with length class below 40 ft, 40-50 ft, 50-60 ft and above 60 ft were fitted with diesel engine of horse power ranging from 99.27-120 hp, 85-172 hp, 97-280 hp and 106-350 hp; respectively. Unnithan *et al.* (2005) along Kerala coast have reported three models of Ashok Leyland engine but their horse power were different from that recorded during present study. Same horse power was recorded for purse seiner by Bhoopendranath and Hameed (2007) along Kerala coast and higher power recorded by Bhoopendranath and Hameed (2013) along the Cochin coast.

In the wooden purse seiners operating from the Mirkarwada fishing harbour the speed of the vessels engine were recorded as 1500-2000 rpm (length class below 40 ft), 1800-2500 rpm (length class 40-50 ft), 2000-2500 rpm (length class 50-60 ft) and 1500-2500 rpm (length class above 60 ft) and based on the engine horse power i.e. below 100 hp (1800-2500 rpm), 100-200 hp (2000 -2500rpm), 200-300 hp (2500 rpm), and above 300 hp (2100 rpm).

Fuel consumption of 15-20 l/hr, 17-19 l/hr, 15-23 l/hr and 16-24 l/hr were observed for length class of wooden purse seiners below 40 ft, length class 40-50 ft, length class 50-60 ft and

length class above 60 ft vessels; respectively. Similarly, based on the engine horse power the fuel consumption was recorded as, below 100 hp (15 l/hr), 100-200 hp (18-19 l/hr), 200-300 hp (16-22 l/hr), and above 300 hp (23 l/hr). Unnithan *et al.* (2005) indicated that one liter of fuel can generate the power of 5 hp in medium and large vessels along Cochin coast, which is almost same as recorded in the present study. For 50-60 ft vessels low fuel consumption was noted by Unnithan *et al.* (2004) along Cochin coast and by Jeeva *et al.* (2008) along the Andhra coast.

Similarly, the range of the diameters and the pitch of the propellers, fitted to the wooden purse seiners of the various length class and engines with varying horse power have been recorded during the present study and presented in Table 1 and 2.

## CONCLUSIONS

Thus, it was observed that Ashok Leyland make marine diesel engines (models AL-400, AL-402, AL-412, AL-680 and AL 680 TC) with their horse power ranging from 85 to 350 hp and having fuel consumption ranging from 15 l/hr to 23 l/hr were found to be the most popular and commonly installed marine diesel engines on the wooden purse seiners of overall length ranging from 39 to 61.27 ft, operated along the Ratnagiri coast of Maharashtra.

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