



UNIVERSITI TEKNOLOGI MARA
CAWANGAN TERENGGANU

MEC299

**PROPULSION SYSTEM DESIGN OF GLASS
REINFORCED BEDAR**

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SEM MARCH – AUGUST 2022

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

The term Bedar (spelled "bedor" in Terengganu) refers to a wide range of boats on Malaysia's east coast that carry one or two junk sails and lack the typical prahu pinas transom stern. (Wikipedia Contributors, 2022). The shape of this type of boat sets it apart from other traditional vessels. Straight but high keels on the front and back have a piece of wood protruding out like a spoon or a duck's beak on either side. The back spoon has a longer handle than the front one. Boats come in a variety of sizes. Small and medium-sized boats used for fishing while large and medium-sized vessels for transported passengers or goods. They use paddles and sails to propel themselves.

The original structure Bedar boat will be replaced by another material as a result of this project. Glass-reinforced plastic, also known as fibreglass, is being considered as a possible replacement for the boat's original material, Cengal wood, in an effort to reduce construction costs. Fishing boats, yachts and another small boats, have been built with fibreglass for decades, commonly known as FRP or GRP in the industry (Han et al., 2020) (Zawahid, 2003). For this boat's propulsion system design, there will be no more sails used at all. An outboard motor was chosen over a sailboat because of its greater efficiency and widespread use.



Figure 1.1 Bedar boat (Nakhoda1981, 2011)

1.2 Problem Statement

Bedar is a type of traditional boat that was once used by locals as a sailing ship out on the open ocean in previous eras. Not only are traditional Malay boats utilised as a means of water transportation, but they are also utilised as symbolic receptacles for the formation of Malay thought and civilization. The innovative use of technology and techniques in the building of boats reflects the intellectual thought that goes into the production of things in Malay society. Traditional boats, on the other hand, have been marginalised as a result of the onslaught of modernization and the intrusion of technology from the outside, and the use of these boats is continuing to decrease. There are also several types of traditional Malay boats that have become completely extinct and are no longer used by the Malays. In addition, there are boats whose shapes and types can no longer be identified because they have become extinct. (Wahab & Zuliskandar Ramli, 2012)

Bedar boats are seeing less use and involvement these days due to a variety of factors, the most significant of which is the high amount of maintenance that is required to keep the boats operational. Because it requires very little upkeep, glass-reinforced plastic, more commonly known as fibreglass, will take the place of cedar from woods as the primary building material for the boat. This change is being made in order to reduce the amount of maintenance that is required.

The use of sails and paddles as a propelling system to keep the boat move is seen to be somewhat outdated and less efficient due to certain factors. It requires high expenses to hire the crews to paddle the boat and it also make things more challenging in avoiding navigational hazards or staying ahead of bad weather conditions. Outboard motors are the best and most reliable option to replace the original propulsion system.



*Figure 1.2 Example for Glass Reinforced Plastic boat with an outboard engine.
(Cooper, 2016)*

1.3 Objectives

The main objectives for this project are:

- i. To design the propulsion system for glass reinforced plastic Bedar by using PolyCAD.
- ii. To analyse the resistance from glass reinforced plastic Bedar's propulsion system.

1.4 Scope of Work

The designing and analysing of the boat's resistance using PolyCAD is included in the work that needs to be done for this project. After that, the RHINO software will be used to sort out the weight estimation, as well as the general arrangement.

1.5 Significance of Work

The students will get an increased level of expertise in running polyCAD systems. Students also have the opportunity to develop their creative and imaginative thinking skills through the use of Rhinoceros, which may be used to create ship designs. And let us not forget that traditional boats like the Bedar will not become extinct, and future generations will still be able to observe traditional Malay boats coming the rivers and seas.