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Delivery Issues in Traditional Ship Production

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ABSTRACT

A study regarding the factor contribute toward the delivery issues of traditional ship production process in Malaysia was conducted with aims to identify the factor contributing to the issues and also offer some suggestion and recommendation to overcome the issues. This study was conducted based on literature material available from many resources such as the Malaysia timber council, journal publication, reports, magazines and other. The factors derived that can contribute to delivery of traditional ship building product are the issues of availability of the raw material, law that exist to protect the material and its trade, the production process, the issues of the worker's skill and availability, the diminishing number of master shipbuilder and the payment methods. Some suggestion in overcoming the issues also been proposed like special permit to traditional shipbuilder for easier material obtain and the need of documentation of the traditional ship production process itself so that the actual problem existed can be further examine and solve.

KEY WORDS: *Ship Design; Traditional Shipbuilding.*

NOMENCLATURE

NFC	National Forestry Council
PRF	Permanent Reserved Forest
FMP	Forest Management Plan

1.0 INTRODUCTION

Traditional ship building had been existed since the ancient times. Nowadays, it's no longer hold the same degree of importance toward its function in modern society but more toward the historical value it hold especially in Malaysia and Indonesia culture heritage (Ingram K. 2007, Chin M. P. 2009). Traditional ship numbers and its builders are diminishing all around the world, some even lost against the progression of today's advance technology. However, in some country, for example, Malaysia and Indonesia, wooden ship is still widely used, albeit with the used of modern machinery as a way of propulsion and operation. Most wooden ship in South East Asia countries like Malaysia, Indonesia are used in inland waterways transportation and for fisheries activities.

Traditional wooden ships in Malaysia and Indonesia are mostly constructing out of Chengal tree or Ironwood, *Neobalanocarpus heimii*,and Resak tree, a type of heavy hardwood timber with incredible durability and among the strongest timber in the wood. The construction process follow the skill of master shipwright or shipbuilder that were handed down from generation to generation and can be trace back towards the time of Protomalay migration that colonize this archipelago area.

Although there are many issues related with the traditional shipbuilding, this investigation aim to focus on the delivery issues of traditional shipbuilding, it is contributing factors and suggestion to overcome the issues. This is because, delivery of a product hold the same degree of importance as other steps in ship building process, what's good for a product that couldn't be deliver on necessary time, hence prompting the rise of some problem such as cost efficiency and other.

There are delivery issues in traditional ship production that causes delay in traditional ship production to produce it product, thus give rise to other issues such as the credibility of the shipwright and in some cases, increasing the cost needed. Current research seeks to highlight the issues exist in delivery system for traditional ship production and to offer some suggestion to deal with the delivery issues

2.0 MALAYSIA FORESTRY MANAGEMENT

In Malaysia, matters related to forest management are manage and/or handled at the federal level by two ministries-the ministry of natural resources and environment, and the ministry of plantation industries and commodities. Figure 1 shows location of Malaysia. Although each of the state of Malaysia had their autonomy on their resources, they all adopted common set of laws and regulations for forest management with National Forestry Council (NFC) who act as facilitator to coordinate this particular matter (Malaysia Timber Council, 2010).

Figure 1: Map of Malaysia.

Malaysia is one of the highest percentages of forested land among developing countries such as Brazil, Indonesia, Philippines and Thailand with 74% or 14.29 million hectares of the forest are enlisted as Permanent Reserved Forest (PRF) under the National Forestry Act 1984 and relevant state enactments and ordinances. Another 1.83 million hectares outside PRF are considered as national parks and wildlife sanctuaries under various legislations. Only 78% within PRF is designated as production forest where commercial of timber on a predetermined rotational cycle is permitted, making only 57% of total forested area are compromise of production forest (Malaysia Timber Council, 2007).

Each state in Malaysia is required to draw up Forest Management Plan (FMP) using the concept of rational land use and multiple function of the forest which cover up the conservation of forest area, safeguarding water supplies, sound climatic conditions and other. Through these means, Malaysia capable of safeguarding its valuable national reserve and forest (Malaysia Timber Council, 2010).

Logging and associated activities are under the control of each of the state forestry departments through district forest offices and these rights to logging were given to companies under license in accordance with National Forestry Act 1984, rules and regulation. The licenses may be granted by the state authority by means of invited tenders, negotiated agreement or such other manner that fit with the circumstances of any particular case (Rusli M., Amat R. Y., 2001). However this particular license can be revoke at any time if the license holder committed any wrong doing while carried out the logging activities (Traffic International, 2004).

2.1 Chengal, *Neobalanocarpus heimii*

Chengal (Malaysia), penak-bunga, penak-tembaga, penak-sabut (Indonesia), takian chan (Thailand) or the ironwood, scientific name *Neobalanocarpus heimii* is a type of endemic tree that can be found in Malaysia, Thailand and Indonesia (CIRAD, 2012). Endemic tree means that it can be only found in certain place in Malaysia (Tnah L. H, *et al*, 2011).

Chengal trees are very tall tree with height can be more than 60 meter and with 1 meter or more in diameter. The bole is straight and branchless for 30 meter while the young twigs are lenticellate, resinous, with prominent bitterness. The bark can be characterized as dark and scaly, exuding an almost colorless resin. The tree is a slow growing type which requires many years to grow that is 75 years to achieve 64 cm in diameter (Orwa C, *et al*, 2009).

After freshly cut, it is called a sinker as it is denser than the water itself. Chengal is a type of heavy hardwood timber that have incredible resistant, regarded as one of the strongest timber in the world with breaking strength several time higher than oak and can last up to 100 years. Chengal trees nowadays are heavily overexploited either by illegal and legal logging, has poor regeneration and in need for conservation especially in Malaysia (Orwa C, *et al*, 2009).

Due to it incredible resistant and durability, Chengal is mostly used in construction of traditional ship, bridges, heavy carpentry, industrial or heavy flooring, railway sleeper and other (Orwa C, *et al*, 2009, CIRAD, 2012). As it reputation as one of the strongest timber and also its multiple usage, Chengal become one of the most expensive timber in Malaysia which is more than MYR15000 per tonne nowadays (Tony N., 2011).

3.0 MALAYSIA TRADITIONAL SHIPBUILDING

The traditional shipbuilding in this archipelago area is already existed since the migration of Protomalay which colonize this region (Ismail A., 2009). The technique is passed down from generation to generation of shipwright master. In the early days, wooden ship were widely use by the Malay communities to travel the region and with the craftsmanship of their ship, they can travel up to Madagascar island in the west and the Polynesian islands in the east, a feat that show how much seaworthy their ship can be (Naga Pelangi II – History, 2011).

There are many type of Malay ship, among them were big ship or called perahu besar that can be further categorize such as Pinis and Bedar of Terengganu type, Phinisis of Indonesia, and also the small one which is called perahu. Most traditional shipyard nowadays tend to focus more in producing the smaller perahu and fishing vessels as the role of perahu besar were taken over by modern ship and cruise yacht, moreover the production of perahu besar required more time and money to be finish up.

Wooden ship is still widely use in Malaysia and Indonesia, mainly for inland transportation and near shore fishing activities although more and more boat and ship made out of fiberglass and composite material begin to replace this kind of wooden ship, especially the transportation boat. Traditional wooden ship nowadays, although retain most of its traditional features, some modification are still being made that is the usage of engine for propulsion purposes (Pisol M., 2003).

3.1 Workers

The worker involve in traditional shipbuilding usually will be lead by a master called the master shipbuilder or master shipwright or master craftsman. He alone will have the plan inside his head by usually do consult with other experience worker and owner to ensure the ship they want to build will not

only satisfied the owner but also capable of sailing (Mohd Y. A, 2002, Pisol M., 2003, Naga Pelangi II – History, 2011).

The worker assisting him will consist of a very many different of type, some were merely carpenter, hired to help him, some were friends, with knowledge and capabilities almost rival him, and some can even be inexperience family members or friends who wishes to master the art of shipbuilding. The inexperience worker however, will be under full supervision of the master to ensure everything will go accordingly.

This however, are not usually be the case, sometimes, the work also been done cooperatively with the villagers, for example moving heavy mast to be submerge into the river, if no machinery present, the log will be transfer using solely manpower and some traditional technique, same with lifting heavy planks and so on. However, safety wise, most traditional shipbuilder didn't follow many safety requirements in building ship, exposing them to high risk of being injured (Naga Pelangi II – History. 2011).

3.2 Availability of Raw Materials and Price

Chengal tree is slow growing type of tree. It takes almost 75 years to reach the diameter of 64 cm plus with its endemic nature, protection measure had been taken by Malaysian government in preserving the number of the tree. Various law and regulation had been implemented so that Chengal tree lumbering is conducted in manners that will not harm the future of this tree species. However these measures do affect the traditional shipbuilding as its result the low number of raw material available in the market.

Availability of raw material is one of factors contribute toward the delivery issues. As Chengal numbers begin to decrease because of over exploited and also its endemic nature, most Chengal trees nowadays can only be easily found in the protective area that is the national park, virgin forest reservation and other sort of sanctuary. This give rise to the scarcity of the material, making finding a suitable Chengal tree to build a ship will consume a lot of time; some even go as far as importing the material, mainly from Thailand or Indonesia. When the availability of the raw material is low, it also gives rises to new problems and also one of the contributing factors in delivery issue, which is the price.

Nowadays, Chengal timber is one of the most expansive timbers that priced MYR15000 per tonnage. This increase in price tends to give difficulties for many traditional shipbuilders to actually obtain the said material. More time are needed to actually search for material that provide both quality and good price suitable with the financial capability of the shipbuilders. This search consume a lot of time which may later result in delivery delays of the product.

3.3 Traditional Shipbuilding Process

The traditional shipbuilding process follow a certain unique procedure, a procedure which been handed down from generation and generation. However, certain flaw does exist in these procedures. Among the procedures involve, there were step where after the timber being cut into planks, it will be dry out under the sun for almost one year.

The procedures itself are weather dependent thus making the time needed to finished up the process become inconsistent as the weather itself is always changing. To make matter even worse, Chengal wood itself, according to Malaysian Timber council is highly exposed to risk of distortion, meaning if the procedure hadn't been done carefully, distortion in planks can easily occur. If distortion does occur, then time will be wasted to search for replacement material and as discuss in previous sub chapter, the material itself is not easily found and can be very expensive and not to mention that the procedure do require a very long time to finish up.

To change the procedure does not always means to change what being handed and practice from generation to generation but it can sometime be an improvement from the previous method. The previous generations of shipbuilder does have the luxury of today's technology thus forcing them to use whatever method available to them to carry out the process so that they can finish up the construction of the ship.

Modern technology nowadays however, does allow the method to be carried out differently that is by simulating the process in a room instead of just drying outside under the sun. This allows a better and consistent result as the process can be fully controlled. However this way as an alternative to solve the factor contributing to delivery issues might give rise to another issue that is the production cost.

3.4 Master Shipbuilder and Worker

Master shipbuilder is the person which led the construction team of the ship. No design, blueprint and other planning, just relying on his experience, he started from the very beginning that is the material selection until the delivery of the ship to the owner. Helping him is a few trustworthy workers which the master employed to help him build the ship.

Nothing wrong with how the operation were conducted but this kind of operation required dedicated master shipbuilder with high discipline to pull off this kind of operation, meaning that if something do happen to the master, the whole operation might be in risk of delay. The workers also do serve as factor in the delivery issue that is the skill they possessed and the status of their job either part or full time.

Some of the workers are only working part time, helping the master ship builder to construct the ship thus resulting in inconsistent of number of worker available in constructing the ship. This may result some work that require many man power will need to be delay. This particular operation also requires the master shipbuilder to be fully involved at the work site and may cause fatigue toward the master shipbuilder.

3.5 Contract and Payment Methods

The main problem regarding traditional ship production contract and payment method that it is mainly based on trust, something that very easily been manipulated nowadays. Unlike the modern counterpart who will first assess the capability of each side that is the capability of the shipyard to actually build the ship and the capability of the owner to pay for the ship, traditional way of handling things are a bit risky.

Based on trust means there are no guaranteed that both side will have benefit from the agreement. If somehow one side betray the trust, the delay in production of the ship will almost likely to happen as without money, the project could not be carry on and without worker to built it, the project could not be carry on also.

However, seeing how other big projects were successfully carried out in the past means this method is not a total failure and its credibility although can be questionable, seems pretty high. All they lack is the some sort of improvement in the method where

the well being of both party are being guaranteed so that this industry's credibility will be far better than what it is now.

4.0 CONCLUSION AND RECOMMENDATION

This study manage to identify some of the factor contribute toward the delivery issues of traditional ship production process. However, the study itself cannot be consider as complete as it lacking much more information to derived various other factor which contribute to this issue and further study and researcher is highly recommended to ensure this issues can somehow be overcome or minimize.

Nowadays, in Malaysia alone, the number of master shipbuilder is less than 20. Their number is diminishing, threatening their skill and knowledge to extinction, so a proper documenting of how exactly the traditional ship being construct should be done, avoiding this heritage from dying out and preserving it.

With this step taken, everything will be much clearer, the process, the planning, and the design, hence allowing easier allocation of any flaws that can be improved so that this issues can be better improve and solve. Certain measure can be taken, especially by the government such as special permit for traditional shipbuilder so that they can obtain the raw material easier as protecting the heritage that well defined Malaysia should be as important as protecting the flora and fauna of Malaysia.

Certain rule and regulation in meeting with the delivery time can be established to protect the customer right and also as an enhancement to improve the work etiquette of traditional ship builder but this recommendation should be carried out carefully to avoid discouragement toward the traditional shipbuilder. The establishing of school or training center in producing well skilled worker is also recommended so that every work can be done effectively.

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