

THE BOATBUILDING PRACTICES AMONG BOATBUILDERS (TUKANG TIMBAL) IN TERENGGANU, MALAYSIA: A CASE STUDY IN WATER TRANSPORTATION, MARITIME HERITAGE AND CRAFTSMANSHIP IN ASEAN

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ABSTRACT

This case study explores the boatbuilding practices among boatbuilders (Tukang Timbal) in Terengganu, Malaysia, and their significance in preserving maritime heritage and craftsmanship in ASEAN. By examining the techniques, materials, and cultural influences involved in contemporary boat construction, the research aims to document and analyse the unique practices of these skilled artisans. Employing a qualitative research approach, the study combines interviews, observation, and analysis of boatbuilding processes to uncover the knowledge and skills passed down through generations of boatbuilders in Terengganu. It investigates the factors that shape their practices, including local ecological conditions, cultural traditions, and modern advancements in technology. The research emphasises the role of boatbuilders as cultural custodians, highlighting the importance of their craftsmanship in preserving Southeast Asian maritime heritage. By documenting their practices and understanding their cultural significance, the study contributes to the recognition and appreciation of this unique cultural tradition. The findings of this study provide valuable insights into contemporary boatbuilding practices in Terengganu, Malaysia. Examining the techniques and materials employed by boatbuilders, the research deepens our understanding of both the cultural and technological aspects of boat construction in ASEAN today. Ultimately, this case study sheds light on the boatbuilding practices among boatbuilders in Terengganu, Malaysia, contributing to the broader discourse on maritime heritage and craftsmanship in ASEAN. By documenting their unique techniques and materials, the study underscores the importance of preserving and promoting these traditional skills in order to sustain cultural heritage in a rapidly changing world.

1. INTRODUCTION

Maritime heritage and craftsmanship hold tremendous cultural and historical significance, representing the heritage and traditions of coastal communities (Ali & Sulistiyono, 2023). In the ASEAN region, boatbuilding practices have stood as essential components of local identity and a testament to historical connections with the maritime environment. Boatbuilding practices in Southeast Asia have retained their significance in the region, reflecting both local identity and historical connections to the maritime environment. One example can be found in the Philippines, where traditional pump boat construction continues to flourish. Skilled craftsmen employ age-old techniques and locally sourced materials to create pump boats, which serve as not only a means of livelihood but

also sustain coastal industries such as fishing and transportation (Funtecha, 2000). Similarly, in Sulawesi, Indonesia, the Bugis people uphold their boatbuilding heritage by constructing Piniisi @ Phinisi boats (Ali, 2022). Expertly crafted with a blend of traditional methods and modern adaptations, these vessels navigate Indonesian waters efficiently, preserving cultural traditions while catering to contemporary needs (Ali, 2013). These ongoing practices convey the enduring relevance of boatbuilding in ASEAN, forging a seamless connection between cultural identity, the maritime environment, and the demands of the present. In the region of Terengganu, on the eastern coast of Malaysia, the art of boatbuilding has remained a vibrant part of the local heritage. The boatbuilders (*Tukang Timbal*),

skilled local boatbuilders, have meticulously crafted traditional wooden boats known as *perahu* for generations (Abd Wahab, 2023)

The earliest community that lived in Terengganu mostly built settlements in coastal areas. This caused them to be completely dependent on nature, like the sea and rivers (Abd Wahab et al., 2023). In fact, waterways are the only channel through which the community can connect with the outside world. This situation has led to the birth of a skill tradition, which is boatbuilding (Abdullah, 2019). In the beginning, a watercraft was introduced as a log that was floated on the surface of the water. Then, the community used their body parts, such as legs and hands, as paddles to make it move. As humans gained new knowledge, it led to the innovation of rafts, which were a better medium of transportation as they were able to hold more goods and passengers. Rafts were built by tying several sticks of bamboo or wood together using roots or rattan. Usually, rafts were used in areas with deep currents and to travel to areas that were quite far away (Jusoh, 2002). The change of times and the power of innovation have led to the use of iron tools, such as pickaxes and pitchforks, that have begun to be explored by the community. With the use of these tools, logs could be split to make planks. Then, boats started to be built using planks and nails to form the walls of the boat (Muda, 2022). This, in turn, led to the creation of larger boats. *Perahu Jalur* was the earliest boat created and has become the foundation for the construction of other boats such as *Perahu Sekoci*, *Perahu Payang*, *Kolek*, and *Perahu Besar* (Abdullah, 2015). In the beginning, the construction of *Perahu Jalur* only used hard logs or *lempung* that were split in half and dug into on the inside to create space on the inside of the boat (Said, 1989). The traditional production of *Perahu Jalur* was the breakthrough of the local boatbuilders' idea that consequently led to the creation of boat keels (*lunas*) (Abdullah, 2021). The keel is the bottom part of the boat or the base and is an important foundation in the construction of a boat (Muda, June 22, 2022).

The creation of these boats has indirectly contributed to the rise of local boatbuilders. The role of boatbuilders is not just to build boats; they also function as a driving force in ensuring maritime activities in Terengganu can run smoothly. In addition, these boatbuilders are craftsmen who are skilled in the process of planking (*menimbal papan*). The planking process is the most important process in determining the balance of a boat when it is on the surface of the water. Moreover, they also emphasise aspects of nature in their creations. The use of wood in building boats is a distinct identity for every local boatbuilder. Recognising the properties of wood, whether it is flexible or durable, is a skill that has become the norm among boatbuilders. In fact, they also double as technologists and engineers who contribute to economic activities. Both of these roles make them builders who bring development to the lives of the traditional community (Maidin, 2003).

In the face of rapid modernisation and technological advancements, traditional wooden watercraft around the world risk fading into obscurity. These vessels not only hold historical and cultural

significance but also reflect the craftsmanship and skills of past generations. This is particularly true in ASEAN, where traditional boatbuilding techniques have flourished for centuries. However, as society evolves and contemporary materials and methods become more prevalent, the practice of traditional boatbuilding faces the looming threat of becoming a lost art. The practice of traditional boatbuilding in ASEAN faces the imminent threat of becoming a lost art as societies evolve and contemporary materials and methods gain dominance. For instance, the Moken community in Thailand, known as the 'Sea Gypsies', is experiencing a decline in traditional boatbuilding due to the allure of modern lifestyles, the emergence of modern materials like fibreglass, and external pressures from tourism development and government policies (Dancause, 2009). The situation that prevails in Terengganu is that the practice of traditional boatbuilding faces a looming threat of becoming a lost art. However, there are still a few remaining boatbuilders who are fighting hard to preserve this heritage in Terengganu. This situation highlights the significance of these individuals in conserving maritime heritage and craftsmanship not only in Malaysia but also in ASEAN (Lai & Mohd Salleh, 2021).

This research is highly relevant and addresses critical issues faced by the practice of traditional boatbuilding in ASEAN. By studying the factors contributing to the decline of this art form, such as changing lifestyles, modern materials, and external pressures, the research provides insights into potential solutions to preserve and revitalise traditional boatbuilding practices. One significant aspect is the promotion of cultural conservation and heritage preservation. Traditional boatbuilding represents the historical, social, and cultural identity of communities in the region. By conducting research and highlighting its significance, policymakers, organisations, and communities can understand the value and importance of preserving this art form. Additionally, the research identifies the economic and tourism potential associated with traditional boatbuilding. By showcasing the unique craftsmanship and heritage of traditional boats, sustainable tourism can be promoted, generating economic benefits for local communities. Incorporating traditional boatbuilding into cultural tourism initiatives, offering educational workshops, and creating platforms for traditional boatbuilders to showcase and sell their creations are potential strategies. Furthermore, the research focuses on fostering intergenerational knowledge transfer. By understanding the challenges and reasons behind the declining interest in traditional boatbuilding, strategies can be developed to attract and engage younger generations. This may involve apprenticeship programmes, educational events, and integrating traditional boatbuilding into the formal educational curriculum. The research also emphasises the importance of regional collaboration and knowledge sharing among ASEAN countries. Studying the practices, techniques, and innovations of traditional boatbuilders in different countries allows for the exchange of experiences and best practices. This collective effort can lead to the preservation of traditional boatbuilding as a shared heritage of the ASEAN community.

2. LITERATURE REVIEW

A study on boatbuilders has not yet been conducted, especially focusing on boatbuilding in Terengganu. Most of the existing studies focus on the boat, but not the boatbuilders. Therefore, the study of boatbuilders, the ones who carry out the boatbuilding process, needs to be deepened in order to expand the knowledge of Malay carpentry heritage art. However, it is undeniable that there are also studies that are quite synonymous with boat engineering, such as Maidin & Ahmad (2015), who emphasised that the critical stage in boat construction was divided into five parts, namely choosing wood, determining the design, placing the keel and keel, planking the body of the boat, and drilling the shaft hole. This complicated process was successfully carried out by local boatbuilders due to their long experience and skills in the art of carpentry, which involved genius methods. Despite that, the study only provided a general overview of the boatbuilding process by boatbuilders based on Ibn Khaldun's theory and did not focus on boatbuilders in Terengganu. In addition, Maidin (2013) stated that boatbuilders controlled all boatbuilding processes from start to finish and were responsible for determining the design of the boat. They would carry out the process of planking the boat, which required high expertise. This shows that they have special abilities that other craftsmen do not possess. There are also other researchers who conducted studies on boatbuilding by local boatbuilders, such as Abdullah (2015), who found that the local boatbuilder possessed local wisdom and emphasised the need to study deeper into the knowledge of boatbuilding techniques. The designs of the boats produced by local boatbuilders differ from each other according to their own functions. The acquired local wisdom in boatbuilding was not through a formal learning process but only through a training process while carrying out the boatbuilding work in stages. Despite that, his study on the abilities of the boatbuilders in the boat-making process in Terengganu also did not focus on the impact on ASEAN. In addition, Abd Aziz (2020) stated in her study that the boatbuilding process has experienced changes according to the passing of time. This can be proven by the change in technology used in building wooden boats. The use of more sophisticated tools could indirectly help speed up the boatbuilding process. This study focused on traditional boat companies based in Pulau Duyong, Terengganu, from 1960 to 2017.

3. RESEARCH METHODOLOGY

This study employs qualitative methods with reference to the use of primary and secondary sources. This research was conducted with research methods such as library research, field research that includes interviews, and observations on the planning and process of boatbuilding in Terengganu.

3.1 Library Research

Through library research, secondary sources such as articles, books, conference papers, and dissertations were studied. These resources were mostly obtained from the Main Library of Universiti Malaya

(UM), *Perpustakaan Za'ba* of Universiti Malaya, *Perpustakaan Tun Sri Lanang* of Universiti Kebangsaan Malaysia (UKM), Wisma Federal Kuala Terengganu Resource Room, Terengganu State Museum, Terengganu State Public Library, Departmental Resource Room History of UKM, and the Resource Room of the History Department of UM. The documents were analysed, criticised, and compared with other records.

3.2 Field research

In data collection, field research is an important research method for determining the validity and reliability of the data that has been obtained. Therefore, through field research, there were two methods used, which were interviews and observations.

3.3 Interviews

The interview was conducted with informants who were boatbuilders and still carry out boatbuilding activities in Terengganu. Informants were interviewed to obtain clear and detailed information about the planning and process of boat making. Questions were also provided to help interpret the data more easily. A voice recording will be used to facilitate the interview session. The informants are as follows:

Name of Informant	Year of Involvement in Boatbuilding	Location	Time
Ali@Abd Razak bin Muda	1964	Kampung Pulau Rusa	27 June 2022
Abdillah Abd. Ghani	1978	Kampung Pulau Ketam	29 June 2022
Shaffei Abdullah	1963	Kampung Pulau Duyong	1 August 2022
Yusof Nawi	1978	Kampung Bukit Tumboh	22 August 2022

3.4 Observation

In addition, observations were carried out in phases at the selected boat workshops in Terengganu, such as *Kampung Pulau Duyong*, *Kampung Batin*, *Kampung Bukit Tumboh*, and *Kampung Pulau Rusa*, to better understand the process and planning made by boatbuilders. This is because most boats are large and would take at least a year to complete. Each boatbuilding process was also different, as they used different techniques, according to boatbuilders. For this reason, the observation was carried out to get a clearer picture of boatbuilding in Terengganu. The observation was divided into several phases, as follows:

Phase	Boat Workshop	Time (Month)
Phase 1	<i>Kampung Batin</i>	May
Phase 2	<i>Kampung Pulau Rusa</i>	June
Phase 3	<i>Kampung Pulau Ketam</i>	June
Phase 4	<i>Kampung Pulau Duyong</i>	June
Phase 5	<i>Kampung Bukit Tumboh</i>	August

4. RESULT AND DISCUSSION

4.1 Proper Planning and the Process of Planking the Boats in Terengganu

4.1.1 Wooden Elements as the Foundation in Boat Construction

Local boatbuilders maintain traditional characteristics by using wooden elements as the foundation of boat construction. This wooden element is the identity of the builder's creation and allows the process of planking the boat to be carried out differently compared to fibre boats. The important wood used by them are *chengal* wood, *penaga* wood, and *gelam* bark.



Figure 1: Boat planks from Chengal Wood are being dried.

Chengal wood is the most important element in the construction of boats since boatbuilders in Terengganu use the wood to make boat planks. At the initial stage, the wood will be dried for six months. Six months or more is the best period to produce high-quality planks in boatbuilding. However, the wood needs to be planed first before being dried to ensure that any defects and damage can be detected at an early stage. This is because the quality of the wood is crucial in boat construction to ensure that the boats produced are able to last a long time. The wood will also be dried under the scorching sunlight. This drying process aims to prevent the wood from shrinking, especially on the hull of the boat. After the wood is dried, it will be planed again to obtain a smooth surface (Abdullah, 2015).



Figure 2: Gelam Bark Before Being Placed on the Wall of the Boat

In addition, boatbuilders do not exclude the use of other natural elements in their creations, such as *gelam* bark. *Gelam* bark works as 'glue' on the boat wall, making the boat waterproof (Musa et al., 2014). The *gelam* bark will be cut to the required size. In the interviews conducted, it was found that the boatbuilders would put *gelam* bark in the gaps of the planks after the pegs were placed. This is to prevent the boat from leaking while in the water. The bark will expand when it comes into contact with water, causing the planks to stick to each other firmly and thus preventing water from entering the boat. There is no doubt that the unique character of *gelam* bark can close the gaps between the boat's wall planks, which are assembled piece by piece by boatbuilders (Abdullah, interview, August 1, 2022).



Figure 3: Trunnels Used to Strengthen Boat Walls

In maintaining the traditional method, rather than nails, boatbuilders use trunnels to strengthen the boat wall. These trunnels are made of *penaga* wood, which is tough. The *penaga* wood will be cut using a saw to produce blocks that are approximately 3/8 inch x 3/8 inch x 3 1/2 inch in size. After that, the block will be cut and then pounded with an iron hammer to produce a uniform size of 10 mm or 3 1/2 inches. The produced trunnels will be cylindrical for installation on the boat wall. The size of the trunnels produced also has to be the same size to facilitate the process of making peg holes in the planks. The wooden trunnels will be moulded using iron cast (*besi maji*) (Abdullah, 2021).



Figure 4: Iron cast (*Besi Maji*) is Used to Make Trunnels

4.1.2 Installing Keel and Stem



Figure 5: Keel and Stem Installed by Boatbuilder

The keel and stem are important foundations in the initial steps of building a boat. The size of a boat, whether it is large or small, depends entirely on the length of the keel (Abdullah, 2015). The keel is a piece of wood located at the base of the boat and is square in shape. Meanwhile, the stem is divided into two, namely the front stem and the rear stem, or some also call it the inner stem and the outer stem. The height of the stem will determine the height of the boat produced. Once the keel is installed, the front and rear stems will be placed using the nipple and hole method. The front and rear stems should have the same inclination, except for the construction of large boat *pinis*, which have a more vertical rear stem. To determine the inclination of a boat, the builders use the 14:7 formula. For example, on a boat measuring 70 feet, the inclination represents as much as 14 feet high at the stem and 7 feet at the end of the keel. The tools

used by builders to determine the inclination of the stem are weight stones, ropes, and measuring tapes. The inclination is important in determining the balance of the boat (Maidin, 2013). After that, the position of the front stem and rear stem is tightened by using studs or bolt nuts, which are more common nowadays. Each part of the keel will have a hole to release water when the boat is raised, known as a limber hole (*lubang kakap*) (Abdullah, 2021).

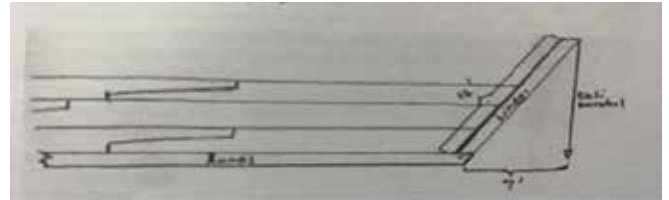


Figure 6: Illustration of the Angle and Position of the Keel

In studying boatbuilding fine art among local craftsmen, another unique feature that cannot be missed from the research is the construction of sleeping crocodiles (*buaya tidur*). It is a part located on the top of the keel that aims to give the boat better durability. However, not all boatbuilders in Terengganu build them because they are part of the traditional method. Most of the time, they are excluded from the process to speed up the construction of the boat. The purpose of installing a sleeping crocodile is to prevent leakage when the boat collides with rocks or strong waves. There is also no doubt that Malay boats built by local boatbuilders have their own uniqueness by having three different types of keels. This special feature demonstrates that the boatbuilders apply elements of creativity and innovation to their creations. The three types of keels consist of keels made from strip boats, curved keels, and straight keels. A straight keel is a keel that is commonly used in the current construction of a boat (Abdullah, 2015).

4.2 Boat Planking Process

4.2.1 Installing *Lepang* Planks



Figure 7: A Boatbuilder Attaching the Planks onto the Keel

The planking (*menimbal*) process begins with the installation of the first wall plank, known as a *lejang* plank. In a nutshell, planking is the process of building the walls of a boat. The word ‘*timbal*’ describes the actions performed by the boatbuilders in ensuring the balance of the wallboard pieces so that the boat is not tilted when launched into the water (Maidin, 2013). In the beginning, the plank will be parched first. In this process, the plank will be gradually twisted until it produces the desired arch shape. It is because the planks need to be compatible with the position of the keel and stem. Therefore, the process of parching and twisting needs to be carried out in pairs using a moderate-temperature fire (refer to Figure 8). Parching the planks is important to make sure the planks are not easily broken when hit by strong waves. Then, the planks will be put against the keel part first and marked using a marker. After that, the boards are drilled to attach pegs (Abdullah, interview, August 1, 2022).

After that, the planks will be fixed with pegs before being attached to the keel. Each boatbuilder has his own technique for producing the best design. There are boatbuilders who leave a 10 cm distance between the trunnels, and the hole has a depth of 7 cm. (Abdullah, 2021). There are also boatbuilders who drill trunnel holes by using a drill and leaving a 5 cm distance between the holes. This method depends on their own creativity and experience from previous work. Each boatbuilder has their own principles, as the boat is their identity. Then, the trunnels will be hammered in (Abdullah, 1985). On the keel side, the pegs will be placed half as deep as the trunnels’ total length. The keel corners are milled according to the thickness of the plank. Then, sickles are used to taper the trunnels in order to facilitate the process of joining and inserting the *lejang* planks into the keel (refer to Figure 9). The *lejang* planks will be hammered slowly using a *gegandeng* (wooden hammer) until they are close-ups (Muda, interview, June 22, 2022).



Figure 8: Process of Parching using Gas Fire



Figure 9: Sickles are Used to Produce Pointed Trunnels

4.2.2 Planking (*Menimbal Papan*)



Figure 10: Attaching the Planks

The boatbuilding process continues with planking. The planking process will continue until it reaches the desired height by going through the same process as installing *lejang*. However, according to an interview conducted with a boatbuilder, Muda, the process of producing the shape of the belly of the boat is the most complicated and critical process. They need to organise a proper strategy using their experience to produce the shape of the belly of the boat that suits its function. There is no doubt that this process is very important because the shape and nature of the boat depend on the planking process. The planks that have been parched will be twisted or pulled little by little using G-clamps. If the board is twisted short, which is less than five feet, the body of the boat will be longer and more stable when in the water. As a result, the boat can move in the water relatively easily because it is being dragged while in the water. However, if the boatbuilder makes a twist to the far back, known as a ‘*pulas lanjut*’, the planks will form the letter ‘V’ in the bow section. This causes the boat to be more efficient at navigating the waves (Maidin, 2003).

In appreciating the fine art of carpentry owned by the local boatbuilders, there are a few other unique and symbolic features. To join the planks, the boatbuilder uses *serang* (joint) *tindih kasih* for small boats and *serang temu* with the help of *tuli* pegs for large boats. This step is employed if the planks used are not long enough for the boat, so another plank that has the same size will be placed and connected to form a plank that has the required size. At the same time, the boatbuilders used wooden levers and hard needles to facilitate the installation of planks for the boat's walls. The size of the boat desired by the customer is influenced by the number of boards used by the boatbuilders (Abdullah, 2021).

4.2.3 Installing the Poop Deck (*Joran*)



Figure 11: Installing the Poop Deck

The next process is the installation of the poop deck (*joran*) on the rear stem. Glue is used to further strengthen the joint on the deck and the rear stem. Screws and pegs are also used to provide a stronger attachment to the planks. The boatbuilders will build temporary support as a safety measure to prevent the poop deck from falling apart. Moreover, wire is also used to tie and pull the deck to prevent it from moving and shifting from its original position (Nawi, interview, August 22, 2022). Each boat has its own specialty; for example, the big boat *pinis* also uses a plank connected to the rear stem to allow the installation of *papan kipas udang*. This is because the identity of the big boat *pinis* is that its back looks like a duck's back. This style is also applied to boats with a cutback so that a sideboard can be installed later (Abdullah, 2015).

4.2.4 Installing the Frames or Ribs (*Kun*)

After all the walls of the boat are installed, the boatbuilder will start installing the frames (*kun*). They are like the bones of the boat, which function as an axis for strengthening the walls of the boat. Only then will *setel* be installed on the frames to hold and strengthen the position of the *kun*. There are two types of *kun* that are installed on a boat, namely the belly *kun* and the title *kun*. Belly *kun* is located at the bottom and shaped like a 'V'. It plays a role in holding several pieces of the boat's wall planks and the keel. Meanwhile, the title *kun* is on the upper part, which seems to be shaped like the letter U. It functions to hold the planks that are located on the upper part of the belly *kun*. The title *kun* is also connected to the belly *kun*.

Once the boat wall is half finished, the belly *kun* will be installed. The boatbuilders place a distance of 17 inches between one *kun* and another. The *kun* is carved several times using a chisel to make sure the belly *kun* is in the same position as the other planks that have been installed. It also needs to be installed from the front stem towards the back stem, for a total of 15 *kun*. A balance stone is used to correct the position of the sleeping crocodile and the front and rear stems. In the middle, the belly *kun* will be drilled to the bottom of the keel to place the screw. Next, the two holes that have been drilled will be cut to produce only one hole that is 4 inches x 1 inch wide (Nawi, interview, August 22, 2022). Next, studs will be placed on the *kun* from the outside to further strengthen the boat wall, and then nails or copper screws will be installed. In contrast to the traditional *kun*, which was made of curved wooden branches, the modern *kun* is made of a plank that has been sawn. Each belly *kun* will have a title *kun* (Abdullah, 2021).

However, for small-sized boats, *sekan* will be installed on the *kun* for the floor installation later. This is different from a large boat or a fishing boat, as the installation of the *sengga* board will be done on the belly *kun*. At the end of the title *kun*, a hole will be made to place the stud used to tie the sail rope, which is called a stud hole (*lubang kacing*). In certain cases, additional wood will be added to the belly *kun* to make a hole. The hole is known as *lesung*, which acts as a plinth to insert a sail pole (Abdullah, 2021).



Figure 12: Installation of Belly Kun



Figure 13: Installation of Title Kun

After the title *kun* and belly *kun* are installed, planks will be installed up to the desired height. The level of the uppermost planks must be level with the end of the title *kun*. Therefore, the title *kun* is the benchmark of the boat height produced by a local boatbuilder (Sulong, interview, August 1, 2022).



Figure 14: Planks have been Attached to Form the Boat Wall

4.2.5 Installing Poop Deck's Frames (*Batang Joran*)



Figure 15: Installation of the Poop Deck's Frames to the Rear Part of a Boat

After that, the boatbuilders install the poop deck's frames to further strengthen the rear part of the boat. Frames are strengthened using bolts and nuts. A hole is drilled until it penetrates the bottom of the boat to place nut bolts. The rod is placed horizontally, above the belly *kun*, on the rear part of the boat. This process demonstrates the diligence of boatbuilders in building a high-quality boat and their creativity in strengthening the frame of the boat to ensure its durability while in the water (Nawi, interview, August 22, 2022).



Figure 16: A completed Poop Deck (*Joran*)

4.2.6 Installing *Genggang* or *Setel* (Horizontal Frames)

Setel, or *genggang*, is installed on a large boat and it functions to further strengthen the boat. In addition, the *setel* is also able to reduce the vibrations caused by the engine. In fact, the *kun* can be strengthened by a *setel*, which also serves as the base for the boat floor. The total number of *setel* depends entirely on the type, function, and size of the boat as well as the customer's requests. Screws are used to secure the *setel* position on the boat (Abdullah, 2021).



Figure 17: *Setel* that has been Installed on the Boat Wall

4.2.7 Installing *Pelekun* (Thwart)



Figure 18: *Pelekun* that has been Installed

Hanging *pelekun* and *kayu sekeli* are two types of *pelekuns* found on boats. The hanging *pelekun* is the joint between two *kuns*. Meanwhile, *kayu sekeli* is the wood that is used to connect one *pelekun* to another *pelekun*. *Pelekuns* are installed in a curved shape so that water will not pool in the middle. Even so, for small-sized boats, *sekar* wood will be attached to the *kun* that acts as the base for the floor. However, there are exceptions for small-sized boats such as *payang* boats and western-made boats because *setel* is arranged on the floorboards in these types of boats. Another name for *pelekun* is *kalu galang*, and it serves to strengthen the bond between the *kuns* of the boat. It can also prevent water from entering the hull of the boat when the waves are rough (Abdullah, 2021). In addition, it also functions as a support frame to install the floorboards and cabin. This part will be the frame on which to place the deck floor. The deck floor is then fastened with screws measuring 9 inches long and 25 inches in diameter (Sulong, interview, August 1, 2022).

4.2.8 Installing the Floorboards and Deck



Figure 19: Floorboards are being Installed

Next, boatbuilders install floorboards on *pelekun* for larger boats. However, the floorboards are purposely not installed for small boats like *anak bedar* boats, on top of the square compartments in large boats, or on cabin parts. The purpose of the floorboards and decks

is to provide a sitting place and storage space. Floorboards can also prevent water from entering the hull of the boat (Abdullah, 2021).

4.3 Installing the Cabin (*Jerombong*), Rudder, *Kup* and Mast

After the floor is installed, the next step is to install the square compartment. It is also known as a cabin, or *jerombong*, for yachts. However, a space for the sail masts will be spared, especially for large boats that use sails. This is to make sure the construction of compartment lids, *jerombong*, and sail masts can be done. Boatbuilders also build a *jerombong* using planks and canvas cloth that is layered, or according to the traditional method, the roof is made of nipah leaves and is covered with split bamboos. Once completed, the rudder will be attached to the boat. For large boats, compartment hole covers are built to ensure that water cannot enter the boat. What is unique in Malay boat construction is that there are three types of rudders used according to the size of the boat. First, for small-sized boats, the rudder is the oars or paddles. Second, a slightly larger boat uses a *kemudi kelek*, also known as a big oar. Next is the outboard rudder, or *kemudi cawat*, which is hung on the stern of the boat. Although it is more suitable for larger boats, there are also small boats that use the third type of rudder (Abdullah, 2021).

After the process of installing the rudder is complete, *dandan* is built to further construct a *kup*, especially for *Bedar*, *Dogol*, and *Pinis* boats. *Kup* is where the captain and crew can take shelter, store goods, and rudder. Next, the boatbuilders will smooth the connecting part of the board using a hand planer to apply *gala-gala* (a type of resin). It is made of rice sacks, kuin oil, *damar*, and hot water. Rice sacks will be shredded first before being mixed with *damar*. Then, the kuin oil is added, and they mix it until well combined. The produced *gala-gala* will be very thick, and the texture is hard, but when hot water is added, the texture becomes lighter and softer. If the texture is too thick, it will be more difficult to apply the resin to the gaps between the planks (Abdullah, 2021).



Figure 20: The Construction of the Cabin



Figure 21: A Completed Cabin

4.4 Launching the Boat



Figure 22: A Boat that has been Launched into Waterway

After the process of applying the resin to the boat wall is completed, the boat will then be painted according to the desired colour by the customer. Once the finishing and painting are done, the boat will be launched into the water. The boatbuilder and the owner of the boat are usually responsible for choosing the appropriate date and day, such as Monday, Thursday, or Friday, to launch the boat. In the past, some people would even ask for the opinion of pious individuals and the guidance of shamans. After they have agreed on the chosen day, meticulous preparations will be carried out. The boatbuilder will place round-shaped sticks known as ‘pillows’ in two important places, which are the bottom of the boat and the front of the boat. The purpose of the pillow is to lessen the human workload of pushing the boat into the water, commonly understood as the wheels, to move the boat traditionally without the help of any machine. At the same time, areas with a soft soil structure will be placed with ‘slippers’, which are boards arranged in an elongated state under the pillow to facilitate the pillow rolling. After that, a rope will be tied tightly around the body of the boat to be pulled using human strength as in the traditional method (Abdullah, 2021). According to an interview conducted with Nawi on August 22, 2022, they will also get help from other boats to slowly tow it with a strong rope tie on the new boat. Support sticks are also used if the boat is unstable and at risk of capsizing. They will push and tow the boat when all the preparations are ready until the boat finally gets into the water safely.

4.5 Lessons From The Study

The study of boatbuilding in Terengganu serves as a noteworthy example within the context of ASEAN for cultural preservation and traditional practices. This case demonstrates the importance of safeguarding and promoting cultural heritage and traditional knowledge, not only in Terengganu but also across other ASEAN countries. By preserving and revitalising these traditions, ASEAN nations can collectively celebrate their diverse cultural identities and showcase the richness of their shared heritage. The implications of boatbuilding in Terengganu extend to sustainable development within the ASEAN region. Traditional industries, like boatbuilding, can contribute to inclusive and sustainable economic growth while preserving cultural heritage. ASEAN nations can embrace and enhance traditional crafts, integrating them into sustainable tourism practices that contribute to local economies and promote intercultural exchange. Furthermore, the study of boatbuilding highlights the importance of recognising and protecting intangible cultural heritage throughout the ASEAN region. This includes the knowledge, skills, and practices that have been passed down through generations. By valuing and preserving intangible aspects of cultural practices, ASEAN countries can ensure the transmission of traditional knowledge and skills, maintaining their distinct cultural landscapes (Abdul Wahab & Ramli, 2020).

Moreover, the empowerment of local communities through traditional industries is central to the boatbuilding example in Terengganu. This principle resonates with various communities across ASEAN. By harnessing and promoting traditional practices,

ASEAN nations can empower their local communities to participate in sustainable development processes, fostering social cohesion and economic inclusion. The study of boatbuilding in Terengganu carries lessons that are pertinent and applicable to the entire ASEAN region. Through knowledge sharing and collaboration, ASEAN nations can work together to strengthen cultural preservation efforts, support sustainable development, protect intangible cultural heritage, and empower local communities across the region. This can be seen in the design of the racing jong, which originated in the region of Singapore, as the shape and hull, including the characteristic curved heads to the stem and stern posts, closely follow the Malaysian style, which is Johor *Kolek* (Hill, 1950). In summary, the study of boatbuilding in Terengganu serves as a compelling example within ASEAN for the preservation of cultural heritage and traditional practices. It emphasises the importance of embracing sustainable development, safeguarding intangible cultural heritage, empowering local communities, and fostering collaboration across ASEAN nations. By recognising and leveraging the shared cultural wealth of the region, ASEAN can promote cultural preservation and sustainable development that respects and celebrates its diverse heritage (Daly & Winter, 2012).

The study of boatbuilding in Terengganu can also be extrapolated to understanding power dynamics in the broader ASEAN context. Examining these dynamics in ASEAN allows for a deeper understanding of the complexities and challenges faced in preserving cultural heritage and traditional practices within a regional framework. ASEAN is composed of diverse member countries with their own unique cultural traditions and practices. Power dynamics vary across these countries, influenced by historical, political, economic, and social factors. Understanding these dynamics is crucial to ensuring that cultural preservation efforts within ASEAN are conducted in a fair and inclusive manner. Power imbalances can arise within ASEAN when dominant member countries or external actors hold more influence and resources, exerting control over cultural preservation initiatives. In such cases, there is a risk of cultural hegemony, where the traditions and practices of more powerful countries or groups are prioritised while those of less influential communities are marginalised or overlooked. Recognising and addressing these power imbalances is essential for maintaining the diversity and integrity of cultural heritage within ASEAN (Abdullah et al., 2023).

The relevance of the findings from Terengganu extends to the commodification and commercialisation of traditional practices across ASEAN. For instance, consider the method of planking used by boatbuilders in Indonesia and Malaysia. The traditional method, which consists of wood elements such as *penaga* wood and *chengal* wood, led to the preservation of knowledge that can only be learned through experience and inheritance in both countries. The '*pinisi*', which are the schooners of Indonesia, may have the exact same origin as the Terengganu, Malaysia *Perahu Pinis*, as both boatbuilding techniques involve planking (Longuet, 2009). Power dynamics

may come into play when certain countries or communities have more access to resources and tourism infrastructure, leading to a concentration of economic benefits in specific areas. It is necessary to foster an equitable distribution of economic gains to avoid further disparities and ensure that all communities within ASEAN can benefit from the preservation and promotion of their cultural practices. Additionally, power dynamics influence the representation and participation of local communities in shaping cultural preservation initiatives within ASEAN. Meaningful engagement and inclusion of local communities are essential for authentic and sustainable preservation efforts. Empowering these communities to actively contribute to decision-making processes can help mitigate power imbalances and ensure that their voices are heard and respected (Abdha & Rohani, 2023).

Addressing power dynamics within ASEAN in relation to cultural preservation involves fostering collaboration and cooperation among member countries. By working together, ASEAN can establish guidelines and frameworks that promote equitable preservation practices, respect diverse cultural identities, and recognise the agency of local communities in protecting and promoting their traditional practices. In summary, the findings on power dynamics in boatbuilding in Terengganu have relevance for understanding power dynamics in broader ASEAN countries such as Indonesia and Singapore. Analysing this issue within ASEAN is essential for promoting equitable cultural preservation, sustainable development, and the empowerment of local communities. By recognising and addressing these dynamics, ASEAN can foster a more inclusive and respectful approach to cultural heritage preservation across its member countries.

5. CONCLUSION

A boatbuilder is an important figure in boat making, which is also symbolic of local wisdom in Terengganu and ASEAN. In addition, the process of making a boat requires high precision and planning, especially during the planking (*menimbal*) process of the boat. This process involves raising the planks of the boat's walls piece by piece, evenly, on both sides of the boat. The study of boatbuilding in Terengganu offers valuable insights that can be applied by ASEAN to the preservation of cultural heritage. The findings highlight the significance of recognising the power imbalances that can arise in preservation efforts and the potential negative impacts of commodification and commercialisation. ASEAN can learn from Terengganu's experience by adopting a more inclusive and community-centred approach to cultural preservation. Policymakers can draw on these findings to develop guidelines and policies that prioritise the participation and empowerment of local communities. By involving the communities directly affected by cultural preservation initiatives, ASEAN can ensure that their voices are heard and that the preservation efforts are aligned with their values, traditions, and needs.

Furthermore, ASEAN can also learn from Terengganu in terms of the equitable distribution of economic benefits. Taking into consideration the potential concentration of economic gains in specific areas, policymakers can design strategies that promote the fair distribution of tourism revenues and support economic opportunities for all communities involved in cultural preservation. Scholars can contribute to this discussion by further exploring the power dynamics and their implications for cultural preservation both in Terengganu and within the broader ASEAN context. Research on the preservation of traditional practices in other ASEAN member states can provide a comparative perspective and deepen our understanding of the challenges and opportunities in diverse contexts. Scholars can also investigate the role of external actors and the impact of global tourism trends on traditional practices, guiding policymakers in developing effective measures to maintain cultural integrity amidst these dynamics. The practical implications of this study for policymakers and scholars lie in the importance of community engagement, equitable economic development, and a holistic approach to cultural preservation. By upholding these principles, ASEAN can foster sustainable cultural preservation initiatives that celebrate and respect the diversity of traditional practices across the region. In conclusion, the study of boatbuilding in Terengganu offers valuable lessons for ASEAN in cultural preservation. By prioritising inclusivity, community engagement, and equitable economic development, ASEAN can learn from Terengganu's experience and shape policies and initiatives that safeguard and promote the rich cultural heritage within the region. Encouraging further discussions and research can contribute to the development of comprehensive strategies that preserve and celebrate traditional practices within ASEAN.

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