

**Types of river transportation in the east coast of
Sumatra before the 19th century: an analysis based on the findings of boats in
North Sumatera Province
and Siak districts, Riau Province**

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Abstract

In the east coast of Sumatra, there were kingdoms that relied on river as the main transportation. In this region, there are big rivers with the same characteristics that empty into the Strait of Malacca, including Asahan River, Siak River, and Batanghari River. Not only relying on the river as the main transportation, some kingdoms even established their center of the kingdom on the river bank. These included the Deli Kingdom nearby Deli River, Siak Kingdom nearby Siak River, Serdang Kingdom nearby Serdang River, and the Ancient Malay Kingdom nearby Batanghari River.

In 2013, the Cultural Heritage Preservation Office carried out a study on the findings of a boat in Siak River. The type of the boat is considered a rarity for the east coast of Sumatra region. However, it bears a similarity with the boat founded in Deli Serdang District in 1997, which was analyzed by Medan Archeological Agency. In addition of bearing a similarity, the study also concluded that the two boats are believed to be the type of boat that is used before the 19th century. From the findings of both boats, we can then describe the type of boats as the means of transportation in the east coast of Sumatra before the 19th century.

Key words: River Transportation, East Coast of Sumatra, before the 19th Century

Introduction

Indonesia with its marine potential, is a country about $\frac{3}{4}$ of which is covered by sea. As a country with around 17,508 islands, Indonesia is known as the largest archipelago in the world with sea areas of 5.8 million square kilometers, and has the second longest coastline in the world (81 thousand km). With its location and condition, Indonesia has various natural resources, and unique floras and faunas throughout the country (Ardiwidjaja, 2011).

Archipelago or inter-islands means an area comprised of islands that are separated by water, making the area consists of water or sea water. Therefore, it is impossible for the inhabitants to move from one area to another without being supported by a floating object. The object called boat is reputedly the oldest means of transportation in the world. Yet, its history of origin is still not known. Archaeological evidences of the existence of boats have been widely revealed, including in the form of cave paintings, referred to and described in the ancient inscriptions, and in sculptures of stone temples (relief). The depiction of boats in these archaeological evidences also show the development of boat building technology based on the shape of the boat in the corresponding era.

The shape and technology of the boats seem to adjust the everyday function and the cruising challenges; whether the boat was used as a means to facilitate the movement of people in search of food, trade and habitat movement or migration. According to experts, in the past there have been movements of people that brought along their culture. Evidence of these events can be seen through similar cultural works from one place to another (Siswanto, 2010). Migration cannot be separated from the advancement in technology achieved by the people itself.

East Sumatra (Ooskust van Sumatra or Sumatra's Ooskust) is a term that developed in the 19th century to refer to an area around the eastern coast of Sumatra island. In this region, some Malay kingdoms successfully imposed its hegemony over the river that was a major transportation at that time. Some of these kingdom also established the center of the kingdom by the bank of small and big rivers, including: Siak Kingdom with the center of its kingdom in the downstream of Siak River, Langkat Kingdom near the Langkat River, Deli Kingdom nearby Deli River, Serdang Kingdom nearby Serdang River, Asahan Kingdom nearby Asahan River, Bilah Kingdom in Bilah River and Labuan Panai Kingdom nearby Panai River.



*Fig.1: The east coast of Sumatra (red line)
(Source: www.indonesiataglace.files.wordpress.com)*

The eastern coast of Sumatra has a long history as the traffic route of trade. Its strategic location makes this area as the main line of trade since centuries ago. In the mid-18th century until the late 19th century, the Kingdom of Siak had been a dominant force in the east coast of Sumatra. The dominance of Siak Sultanate over the areas in the eastern coast of Sumatra and the Malay Peninsula was quite significant that they were able to replace the previous Johor influence over the control of trade routes (Marsden, 2008). Long before that, in the 7th until the 11th century AD, the Sriwijaya Kingdom that controlled the Malacca Straits was known as a maritime kingdom that possessed mastery in the ship and shipping navigation technology. The Sriwijaya Kingdom relied the life of its kingdom on trades and maritime activities. Therefore, Sriwijaya had extensive relationships with other countries, not only in the archipelago, but also with China, India, and the Middle East (Riyanto, 2011). Besides Sriwijaya, the Old Malay kingdom (Malayapura) also relied on the river as a major transportation. This kingdom was originally centered in Jambi inland on the banks of the Batang Hari River and moved to Dharmasraya and then to the upstream area of Batang Hari River in Tanah Datar, West Sumatra.

Boats and Sailing in Indonesia

Boat is one of the maritime cultures that since prehistoric times has played important role in human's life in the world, including Indonesia. The oldest written record of water transport in the form of a boat in Indonesian waters mentioned in Kedukan Bukit inscription of 683 AD stated the existence of a Sriwijaya's king that was travelling on a boat (Riyanto, 2010). In addition, information about boat and sailing in Indonesia was derived from Chinese news that told a story about a priest travelling to India by boat in 672 AD. Other notes are the interpretation of Pierre Paris based on other foreign sources stating that in the 3rd century BC to the 1st century AD there had been sailing activity using boats from Sumatra to India.

A research by F.L. Dunn and D.F. Dunn (1977) stated that between 20,000 to 18,000 years ago the sailing technology in Southeast Asia was still very limited. There was no sailing activity in the open ocean, and sailing activity was possibly still limited in shallow waters such as swamps and mangrove forests which were influenced by the sea tide.

Then, 9000 years ago boat and raft were started to be known. They were used in swamps and for limited sailing in the open water. Area exploitation using boats was only carried out in line with the enhanced knowledge in boating skills. Furthermore, it is estimated that approximately 5000 years ago there was exploitation of the South China Sea region through mastery of the ever developed marine navigation and boat technology. The use of outriggers and simple sail made of woven leaves enhanced the exploitation area with cruising range far enough from the beach.

Boat is understood as a manifestation of maritime needs (or other waters; rivers and lakes) as well as the aspiration of the supporting communities. The shapes or characteristics of local boats will be influenced by factors such as surrounding environment and local traditions at that time. Boat tradition is embodiment of a system of ideas about what boat is and how they should design and build the boat. Terminology of engineering design parameters and how to build a boat is a social practice that contains symbolic and ideological aspects. In practice, the shape, size and complexity of a boat will be limited or determined by the desires of the community over its usefulness, availability of materials and the purpose of a boat to be operated. Therefore, the shape or characteristics of local boats, structural characteristics, appearance and usefulness, are predominantly influenced by local values, both physical and non physical (Budiman, 2010).

Based on the types, sailing can be divided into sailing in open waters and in inland waters (rivers and lakes). In Sumatra Island, there are large rivers that become the main road heading to inland areas. The interaction between human and rivers in Sumatra is estimated to have taken place since thousands of years ago. Even in this modern era, the relationship can still be seen to this day. Some of the major rivers empty into the east coast of Sumatra (Malacca Strait). These include the Deli River, Serdang River, Padang River, Siak River, Batang Hari River, and Musi River. Physical evidences of sailing in the inland areas of Sumatra include findings of relatively intact ancient boats. From this finding, we can then describe the types and shapes of boats used as a means of river transportation in the east coast of Sumatra, especially before the 19th century.

Besar II Terjun Village, Serdang Bedagai Regency, North Sumatra Province

In 2003, a local resident found a boat at the base of Terjun River. The boat was then lifted by the community and placed in the house of the boat founder. The boat was a dugout canoe (hollowed) made of an intact, large, and long wood. Dugout/hollowed canoe are made by removing the center part of the wood. For local communities, this type of boat is known as sudur itik boat, because the overall shape of the tip of the boat resembles the beak of a duck. The boat was 910 cm long, 86 cm wide and 28 cm deep. The boat wall has an average thickness of 3 cm. In each of the inner side of the hull, there are thirteen sangkar (local term for these components in South Kalimantan), which is the rectangular protrusion engraved directly on the tree trunk that is used to make the boat. These sangkars are 20-26 cm long and 8-10 cm wide. Their function is to support the boards or logs that are laid crosswise on the body of the boat as wall reinforcement and can be used by passengers or rowers (Koestoro, 2010).

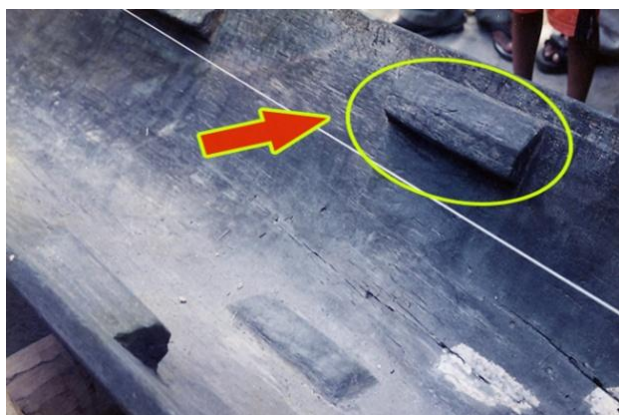


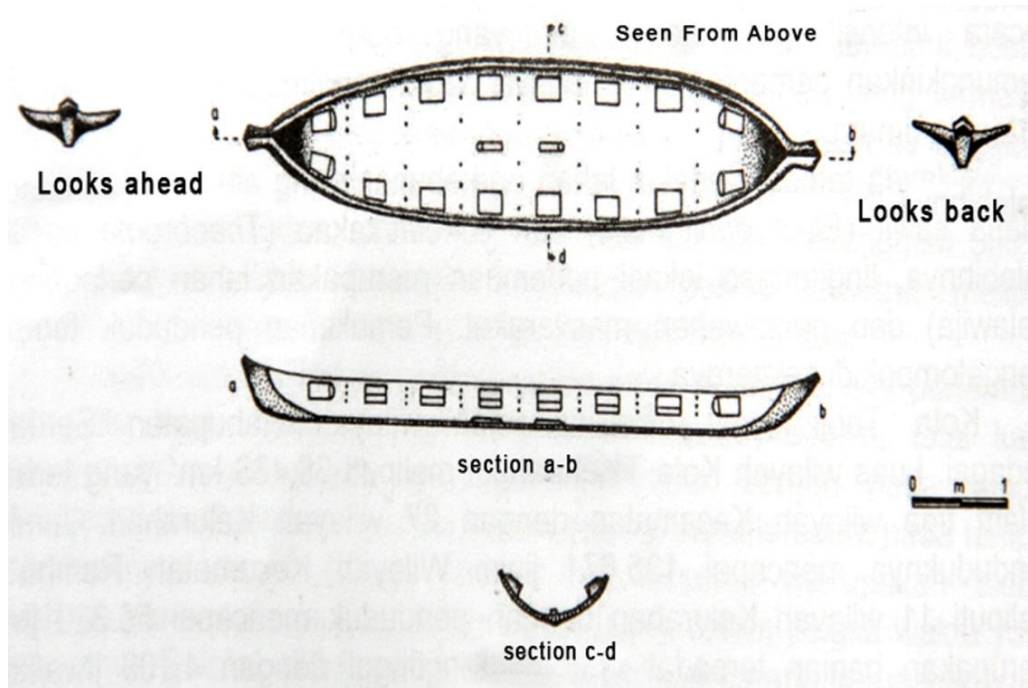
Fig. 2: Sangkar components on boat (Source: Medan Archaeological Research Office)



Fig. 3: Sudur Itik boat (Source: Medan Archaeological Research Office)

Padang River, Tebingtinggi, North Sumatra

The boat was founded by local resident at the base of Padang River in 2006. This boat has the same shape and construction as the boat found in Serdang Bedagai Regency. The construction is made of solid wood, and perforated in the middle. The boat is 610 cm long, the widest section is 113 cm wide, and 29 cm deep. The middle part of the boat has a slightly rounded shape and elongated at both ends. Both ends are somewhat tapered.



1 Fig. 4: Itik boat sketch (Source: Medan Archaeological Research Office)

Inside of the boat hull, there are eight sangkars. The sangkars are 22-27 cm long, 12-14 cm wide and 10-15 cm thick (Koestoro, 2010). In the boat wall, both at the base and at the hull, there are parallel holes with diameter of 1 cm that penetrate the wall of the boat. The holes are covered with a round wood that has the same size as the thickness of the body of the boat. Communities in Riau call this hole as kakap hole that serves to equalize the thickness of the hull of the boat. The kakap hole serves a guide or a basis for the process of dredging the inside of the boat. After perforation is complete, the kakap holes eyes are closed or clogged with wood so that water does not get into the boat.

Muara Bungkal Village, Siak Regency, Riau Province

Boat in Muara Bungkal village was founded by local residents in 2012. The boat was founded at the base of Minas River (a tributary of the Siak River). Once lifted by the residents, the boat was then placed in the yard Muara Bungkal village office. This boat is made of a piece of wood that is hollowed in the middle. Its shape is like a mortar, the middle part is somewhat rounded and slightly tapered at both ends (mortar-like shaped). Tapered shape, especially in the bow, was probably selected to make it easier for the boat to travel in shallow water, in fast-flowing water, with rocky and muddy river bottom. This is related to the river terrain. Overall, the length of this boat from the tip of the bow (front) up to the end of the stern (rear) is 8.3 meters. The middle part of the boat (the widest) has a width of 77 cm with a height from the stern of the ship to the base of 20 cm. In each part of the inside of boat hull there are sixteen penuku (sangkar). Penuku is a term used by local community. Penuku has similar function with sangkar in a boat found in North Sumatra, namely to support the boards or logs that are laid crosswise on the body of the boat as a wall reinforcement and can be used by passengers or boater. There are different components between penuku/sangkar in Muara Bungkal Village and penuku/sangkar found in North Sumatra. Penuku in the boat of Muara Bungkal has a hole in the middle with average size of 6 cm long and 4 cm wide. Penukus on both sides of the hull are connected by wood. These connecting woods are called gading-gading. Gading-gading has a function as a peg between penuku. In the boat wall, both at the base and at the hull, there are parallel holes with diameter of 1 cm that penetrate the wall of the boat. The holes are covered with a round wood that has the same size as the thickness of the body of the boat. The local community calls this hole as kakap hole that serves to equalize the thickness of the wall or the hull of the boat.

Types of river boat in the east coast of Sumatra before the 19th century

Water environment is an important element in supporting the life of human being. Rivers, lakes, and oceans are environment that provide sources of foods and, at a certain time, become the most effective transportation infrastructure to move further and faster. The rivers in Sumatra became an important means of transportation from inland to coastal areas and vice versa. Interaction between humans and rivers in Sumatra has been going on for thousands of years. Boat as a means of transportation can be



Fig .5: Boat in Muara Bungkal Village (Azwar Sutihat, August 2013)

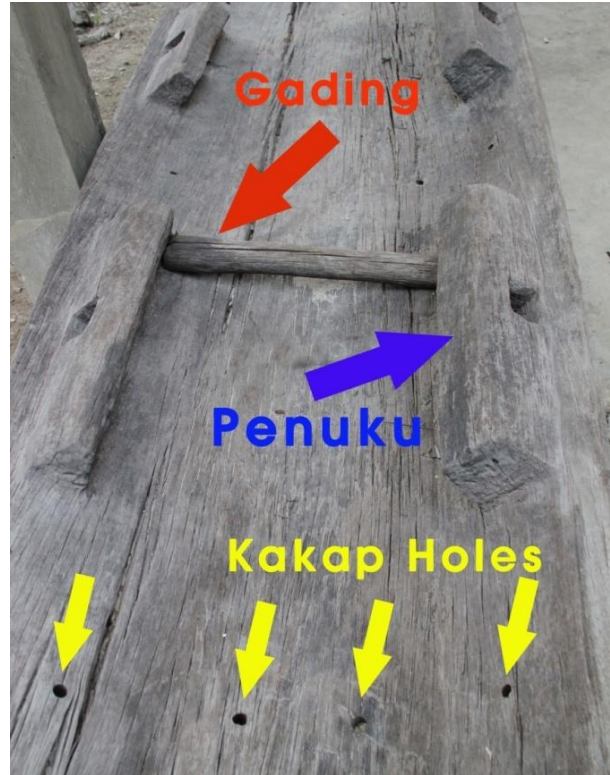


Fig .6: Boat components (Photo and Modification by Azwar Sutihat, August 2013)

understood as a form of adaptation of human interaction with the environment. According to Johnston (1980), based on shape, material and construction, the development of boats can generally be classified into several types, namely:

- a. Raft boat, which is boat that was formed from the composition of a single piece of wood tied together horizontally. The next stage is marked by the addition of a layer of wooden beams tied together with the direction of crossed wooden beams on top of the first layer, so that the raft is composed of several layers of wooden beams.
- b. Dug-out canoe, which is a boat which is formed of a hollowed tree trunk in the middle so that the shape resembles the mortar.
- c. Planked-boat, which is a boat which construction of its body is formed from arrangement of boards with specific merging technique.

Based on the shape, materials and construction, boats found in North Sumatra and in Siak Regency, Riau Province fall under dug-out canoe type. The three boats have similarities in term of construction and components. The similarities are:

- a. There are penukus/sangkars to support the boards or logs that are laid crosswise on the body of the boat as wall reinforcement and can be used by passengers or boater.
- b. There are kakap holes that serve to equalize the thickness of the walls or boat hulls.
- c. There are gading-gading that functions as peg between penukus/sangkars. In the boat found in North Sumatra, these gading-gading components no longer exist. While in the boat found in Siak there are still 2 pieces of gading-gading.
- d. Both ends of each boat have a tapered shape that resembles the shape of duck beak. Because of this shape, the Malay community called the boat as sudur itik boat. In the manufacturing process, the tapered shape was selected to achieve better boat speed, and to facilitate better navigation in shallow waters that have many plants. This is clearly related to the river terrain in the east coast of Sumatra that is dominated by mangrove swamps.

Koestoro (2010) indicated that the trees used in the manufacture of boats found in North Sumatra are possibly *Artocarpus champeden*, *Intsia palembanica* that is resistant to moisture or *Hopea sangal* that falls under *Dipterocarpaceae* family. While the materials used in the manufacture of wooden boats found in Muara Bungkal village, Siak Regency is believed by local people as Giam wood (*Cotylelobium* spp, *Vatica* spp) that fall under *Dipterocarpaceae* family.

A description of boat building technique on the east coast of Sumatra can at least be obtained from traditional boat building techniques in Kuantan Singingi community of Riau province that is still ongoing. Traditional boat building, that is called jalur by the Kuantan Singingi community, has been going on for hundreds of years. The cultural connection, and close geographical location makes it possible to do a reconstruction of building techniques of boats found in North Sumatra and Siak Regency based on the

traditional boat building techniques in Kuantan Singingi Regency, Riau Province. According Koestoro (2010), the existence of sudur itik boat in the Besar II Terjun village is part of the historical formation of large plantation estates in the east coast of Sumatra in the late 19th century. Besar II Terjun village is one of residential areas located in the middle of plantation of what used to be the area of the Sultanate of Serdang. The boat finding in Padang River cannot be separated either from its historical context. This area was once one of residential areas in the middle of plantation which was once a territory of the Sultan of Deli.

The existence of a boat in Muara Bungkal village, Siak Regency has a historical relationship with the Kingdom of Siak as a maritime kingdom. The eastern coast of Sumatra has a long history as the traffic route of trade. Its strategic location makes this area as the main line of trade since centuries ago. Marsden (2008) mentioned that at that time Siak was a supplier of wood material to Batavia (Jakarta) to build ships in large numbers. Even the woods for construction of naval warships in Penang Island were also sourced from Siak. Furthermore, it is said that Siak was a powerful maritime kingdom. The naval force of Siak often attacked Johor, Malacca, and various places in the east and west coast of the peninsula. In term of trade, it was mostly carried out by Keling ships. They traded clothing materials, raw silk, and other goods that they provided in Penang or Malacca. In return, they received gold, wax, sago, salted fish, fish eggs, ivory, gambier, camphor, and various types of rattan. The role of Siak River as part of the core region of the kingdom had a major effect on the economic growth of Siak Sri Indrapura. In the 18th century, in 1767 to be precise, Siak Sultanate led by King Ismail had become a dominant force in the east coast. The advancement of Siak economy is evident from Dutch notes that stated that in 1783, there were about 171 merchant ships from Siak heading to Malacca. Siak became a trade triangle between the Dutch in Malacca and the British in Penang Island (www.wikipedia.org).

Conclusion

Rivers in Sumatra Island become an important means of transportation from inland to coastal areas and vice versa. Interaction between humans and rivers in Sumatra has been going on for thousands of years. Some kingdom in Sumatra even made the river

as the main force in maintaining their existence. Boat as a means of transportation can be understood as a form of adaptation of human interaction with the environment. Findings of boats in three locations in the east coast of Sumatra show that before the 19th century, there were river cruising boats in this area. The first feature can be seen from the shape and construction that fall under the type of dug-out canoe. The two ends of each boat have a tapered shape that resembles the shape of duck beak. The Malay communities call such boat as sudur itik boat. The second feature is the boat components such as penuku/sangkar, kakap hole, and gading-gading. In some locations in the Indonesian archipelago, we can still find dug-out canoe made of one piece of wood. However, nowadays, we can no longer find dug-out canoes that have similar components as sudur itik boat. In the future, we need to have a more in-depth study of sudur itik, particularly regarding the manufacturing technology, the identification of the types of wood, radiocarbon analysis (to determine the absolute age of the boat) and the conservation techniques (waterlogged wood conservation).

Acknowledgments

Thanks to Cultural Heritage Preservation Office of West Sumatera, Riau, and Riau Island - Ministry of Education and Culture, Medan Archaeological Research Office, Siak Regency Government, especially the Office for Education and Culture of Siak Regency, Sungai Mandau Government Sub-District, Muara Bungkal Government Village, Research and Development Centre for Marine and Coastal Resources, Ministry of Marine Affairs and Fisheries, and to all people who always support us in conducting study and preservation on marine archaeological resources.

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Biography



Azwar Sutihat was born in Yogyakarta on February 11, 1983. In 2008, he completed his study in the Department of Archaeology, Gadjah Mada University. From 2009 to the present, Azwar works at the Cultural Heritage Preservation Office of West Sumatra, Riau, and Riau Island, Ministry of Education and Culture, Republic of Indonesia. Over the last 5 years, he has various experiences working in the field of preservation of cultural heritage and has participated in several international level activities such as Workshop on “Document Preparation of World Heritage Nomination” (2013), Workshop on “Managing Indoor Climate Risks” (2013), “Sub-Regional Training Workshop on “Disaster Risk Preparedness and Management” (2013), and World Culture Forum (2013).