The Beauty of New Outrigger Craft Structures on Fisherman Boat After Tsunami at Pangandaran 2006

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Abstract
On July 17th 2019, the tsunami struck in the coastal area of Pangandaran that make some of this area is devastated. This disaster made a significant effect on the economic system in those areas. The level of destruction was quite substantial that impact to the fisherman equipment, especially of their boats, that named Jukung and it was the main of the problems in this research. Otherwise, in less than two years that coastal area at Pangadandaran begin to recover and they look forward and move a step forward to see a new hope and immediately get back into the fishing business. The researcher studied at the Outrigger structures, which is a part of a jukung or a boat that function for stability at the boat and to help fisherman make some new economic activities. The main Problem which will study is a transformation of new outrigger shape, the new of joint system between outrigger and buruyungan (outrigger support beam), and also transformation new material for the outrigger itself. The methodology in conducting this research uses phenomenology. The ascent is used in order to find a statement that will answer all the problems mentioned above. The Transformation Design method will also use to find the different structures that mention above before the disaster happens. This research aims to find new structures of the outrigger, and to discover the possibility of the beauty of the new shape.

Key Words: Beauty, Fisherman, Outrigger Structure, Tsunami

INTRODUCTION

Background, the topic of research selected by the researcher base form a corriouscity or hypothesis from a new design of outrigger after Pangandaran tsunami has accrued. In this research, there is a potential new development in social science and engineering study of boat or fisherman vessel that functions to stabilize it in water transport. Base on geographical we can find that coastal of Pangandaran is a one of a mainstay at district area of Pangandaran is located at Pannajung Village, West Java Province. An earthquake with a magnitude of more than six on the Richter scale on Monday, July 17, 2006 shook the southern coast of West Java and Central Java. The earthquake was then followed by tsunami waves that reached more than 6 meters. The area hardest hit by the tsunami was Pangandaran beach, West Java. This wave crashed and damaged the Pangandaran beach area. Villagers and hundreds of people who were on the coast of Pangandaran did not have time to run and save themselves. The disaster in the afternoon killed at least 659 people; the waves lost hundreds of others. At first, the migrants made the Pangandaran Coastal Area as a place to lean on the boat while

fishing, but because they felt at home in the Pangandaran coastal area and there were some of them married to residents. Eventually, they were reluctant to return to their hometowns. The wave of migrant fishers is getting higher as the area develops into a fishing village. (Rachman, 2014).

Psychological conditions of victims of natural disasters which during, in general will experience stress. Fear is very experienced by victims, because they feel threatened their lives from disaster. They experience uncertain feelings, fears, anxiety, and high emotions, so that the feeling of stress arises. However, they rarely experience chronic stress disorder. But such conditions must be dealt with immediately. If a psychological condition that is stressful is not immediately dealt with, then over time it will cause depression, and will lead to psychiatric disorders. (Iskandar, 2013). This tsunami had a large impact on changes in Pangandaran given that most of the migrants in Pangandaran had the livelihood of fishermen and living around the coast. The large number of boats moored on the coast indicated a stretch of activity growth began to recover after the disaster.

Outrigger boats in Pangandaran have indeed existed for a long time in which the history of local fishermen and migrants have known and made boats as their transportation tools to catch fish. There are 2 types of boats based on the function of the boat, namely: the boat is used as a means of tourism transportation and the boat as a means of transportation for fishermen. At first the boats used still used wood as the main basic material for its founding in the area around Pangandaran. The material or basic material for making boats only changed after the natural disaster of the earthquake followed by a tsunami that struck the Pangandaran coast. The material change was due to many of the boats being natural disaster relief. In addition to seeing the ease in making this boat, several boat manufacturers found in Pangandaran participated using the same material as the natural disaster relief boat. The boat uses fiberglass material. This causes uniformity in the shape of the tourist boat and fishing boat. Not only is it found in the material, the boat's mover changes from using a paddle to using a motorbike, along with changing needs at this time.

All of these shapes maritime culture which is actually ideal for modern society, such as the characteristics of culture that are democratic, mutual cooperation, recognition of other existences, community oriented, not gender biased (some even tend to prioritize more women / femininity than men / masculinity especially machoistic ones). (Dagun, 2012). A nation that has a maritime character does not have to mean a nation where most of the people are fishermen, but a nation that realizes its future life depends on the ocean. The point is that the sea is vital for the survival of the nation and state, the sea as the backbone of the nation's and state's economy. Therefore, a nation that has a maritime character will always look, explore, exploit the strength of the marine sector. (Salim, 2014).

In this study the type of craft in the Pangandaran Coastal Area is a type of support. Jukung was divided into two, namely there were djoekoengs who were in a compound and there were also djoekoengs who were not in a fusion. The difference lies in the number of waves faced by the djoekoeng. Mixed form of djoekoeng is used in coastal locations, while those that do not use outrigger or outrigger but only on one side are widely used in non-surging water conditions such as in lakes or rivers.

Image 1. Outrigger Canoe at Pangandaran Beach before tsunami

Problems

Fishing boats originating from the islands, on average, have outrigger or katir. Outrigger serves to maintain the balance of the boat so it is not easily overturned by strong winds. Outriggers and Some canoes have outriggers. The boat can float still with poles called booms. Its function is to keep the boat stable and not overturned due to strong winds. One example of an outrigger boat is a boat called a jukung. This djoekoeng is originally from the Madura area of Indonesia. The main Problem which will study is a transformation of new outrigger shape. The shape here shows the length, shape and material used as outrigger forming. Outrigger lengths on pangandaran fisherman djoekoengs have differences with fisherman djoekoeng boats from other regions in Indonesia. Now we can see thst outrigger Pangandaran fishing boat length is only half of the overall length of the boat body itself. this is due to the experience of fishermen at the time when they started going to sea faced with quite large waves in the southern sea. Before the tsunami hit the coast of Pangandaran, outriggers used materials from bamboo or wood as seen in Ida Adriati's research in her book entitled Perahu Sunda, even though the boat itself was made of fiberglass. the present study formulated the problem that the researcher wanted to find out why outrigger lengths on boats at Pangandaran beach were relatively shorter than or half the length of the entire boat body? and also transformation new material for the outrigger it self.

The next problem is that the researcher wants to know the tools, types and ways of binding the outrigger to the outrigger bumblebee or pole or beam. So, is there any difference in treatment as mentioned before with outriggers on other fishing boats outside the coastal area of Pangandaran? Tehe research is how to find the new of joint system between outrigger and buruyungan (outrigger support beam).

The aim of this research is to find new structures of outrigger, and to discover possibility the beauty of the new shape. Besides that, does the new structure of the Pangandaran beach outrigger have an aesthetic value or get appreciation from the local community? at least the outrigger was also appreciated by the jukung craftsmen

themselves? in this section the problems of art and culture become the basis of researchers to seek knowledge.

METHOD

The method used to observe objects to enrich research is one of them with a phenomenological method approach. Phenomenology as a way of looking at things for self-presenting symptoms to be described through this research. To understand the beauty of a phenomenon with outrigger research objects on fishing boats with a sensory approach, Save M. Dagung has mentioned a number of meanings of the word phenomenology including objects of perception, what is observed, what appears in our consciousness, sensory experience, what appears on our five senses and events that can be experienced.

The investigator's search began with the harbor of Pangandaran fish, where in the harbor there were many fishing boats or Pangandaran's traditional djoekoeng boats. At that time the writer chose the djoekoeng as a result of the author's experience of having worked in a shipping industry, so that the writer felt resurrected memories and desires that were buried in his passion as a boat builder.

Through in-depth observation, an object that was previously nothing and as something external to an observer will become an internal part as well as the experience of the observer concerned. So, when the observer will be facilitated when he has to say or write about the object in question through oral language or in written form, because the object has become part of his empirical experience. (Zohar, 1994).

I undertook this journey to discover the subjective and objective causes of the characteristics of a shadowing object of sensory experience to complete the experience of consciousness through a dialectical exposure to actual knowledge.

What has been found is the structure of outrigger phenomenal bodies which with the stock of knowledge possessed are quite basic differences compared to another outrigger archipelago (Nusantara). Another discovery is that nature is subject to the conditions of Pangandaran coastal communities whose lives depend on marine products, causing creative processes to run as they are adjusted to natural conditions. the psychic motivation of the craftsmen and fishermen together in the formation of outrigger characteristics so exotic in the eyes of the researcher

I really pay attention to outrigger on a djoekoeng that is anchored on the edge, I see this outrigger is very exotic as a work of engineering. Starting from the long structure, the material used, the binding between the outrigger and the pole connecting the outrigger has been made carefully and very professionally for a craftsman. Turned to the craftsman said that this work was made based on the climate that occurred on the coast of Pangandaran, the rough waves and erratic weather forced the craftsmen to cultivate reason to think creatively to cope with the situation for the survival of their lives. especially after the arrival of the tsunami waves that have killed their relatives, the necessity of positive thinking triggers good ideas when viewed from the aspect of modern craft art.

Images 2. Situation of Port PPI Cikidang, Babakan, Pangandaran

RESULTS AND DISCUSSION

Theoritical Background

In an outrigger canoe and in sailboats such as the proa, an outrigger is a thin, long, solid, hull used to stabilise an inherently unstable main hull. The outrigger is positioned rigidly and parallel to the main hull so that the main hull is less likely to capsize. If only one outrigger is used on a vessel, its weight reduces the tendency to capsize in one direction and its buoyancy reduces the tendency in the other direction. (en.wikipedia.com). In a previous research study titled *Study of Boat Design for tourism in Pangandaran Beach 2016 thesis*, only revitalized outrigger as its original form, which was re-engineering the binding structure that had been carried out by post-tsunami craftsmen. the difference with this research is that researchers will only see why craftsmen carry bonds like this and the second is why outriggers are half the length of the boat's body?

In other research entitled: *Comparison of the stability of the Boat with and Without the Use of Cadik*. The purpose of this study was to assess the stability of the boat with and without the use of cadik over the stability. The method used in this study is asurvey method. Boat primary measure obtained is 8 m and 1 m wide boat. results of the analysis indicate that the boat using cadik rate stability is better than that not using cadik boats, the difference is caused by the addition of cadik because the cadik on the boat could improve the stability of the boat and if the boat motion, cadik also reserve buoyancy for the boat. This article has not mention specification of the outrigger but it helps me to know that using outrigger is better than not.

There is something interesting from the research done by Budi Santoso that I consider as a reference for this research with the topic *Outrigger Length Optimization on 3GT Vessels*, explains that the total resistance value of the ship against variations in outrigger distance (outrigger) at a ship speed of 10 knots produces a value of resistance at a distance outrigger 2 meters 10.6 kN, outrigger distance 2.5 meters 10.7 kN, while at outrigger distance 3 meters 10.8 kN. Thus, the variation of outrigger distances does not significantly affect the total resistance value of 3 GT vessels because the value of the obstacles is not much different. By contrast, in areas closer to Java (e.g. Bali, Madura) outriggers are usually significantly longer than the canoe they are fixed to. Typically,

relatively large and fast sailing canoes have a crew of only one or two persons and depend on the buoyancy and hydrodynamic lift of the lee outrigger for stability (Bertrand. Admiral 1992). All of these theories and articles mention that the length of the outrigger is not quite significant in affecting the speed or being stabilaze to the boat but still have a small effect.

Art and Design Perspective

In relief that shown at Borobudur Outrigger Boat, Outrigger boat chart construction is no different from the others. The only difference is the outrigger, the float device on either side of the boat whose function is to maintain balance. The Borobudur ships do not exhibit longitudinal symmetry and do not have rigs that could be easily reversed. It therefore seems unlikely that the Borobudur ships were single-outrigger craft. Double outrigger canoes are not widely used on the coasts of Java but they are more common on neighbouring islands, including Madura and Bali, where sophisticated designs exist. The Borobudur outriggers have a number of characteristics that make them significant- ly different from the outriggers of more recent sailing canoes. (Beale, 1982). This case representing that Indonesia have give the first contributor the outriggers design and spread out to the world of marine. This statement strengthened by the statement of Gary Dierking in his book: *Building Outrigger Sailing Canoes: Modern Construction Methods for Three Fast*, *Beautiful Boats*, that the single outrigger canoes was faster and better adapted for chasing school of fish or for courier use. In some cases, the same hull could be used with a partner as a catamaran or equipped with a single outrigger depending on its intended use. The double outrigger canoe (trimaran) is not generally seen in Polynesia or Micronesia, but rather in Indonesia and The Philipines islands. I would like to say that Indonesian marine architects or designer a long time ago have been thinking and experienced to constructed many types of outriggers. Another Nusantara Boat, In the archipelago there are various forms of boats, including the Bugis boat, the Mayang boat from Cirebon, the sampan boat from Betawi, the jonggolan boat from Semarang and Surabaya, the Sekong boat from Pasuruan and the jukung boat from Bali and Lombok, Sekong boat and jukung as well outrigger mounted. (Dirjen Kebudayaan, 1996).

How to find the beauty. The theoretical source of the book is entitled *Modern Art* by Prof. Dr. Dharsono, M.Sn as the basic inspirational fundamentals in studying art. As modern art develops it slips deeper into the world of the deepest hearts in humans and disrupts the nature of matter. The visual relationship of the form with the meaning becomes vague by itself due to the acceleration of change is higher and with wild movements, the artwork is no longer able to be read by millennial men. This theory is directly related to seeing a product design work in its transformation into a designation of art that will eliminate the element of fear or fear in humans in the process of appreciating art. This scientific discourse shows that outriggers should be valued by the community, especially by local residents from Pangandaran coast. Why is that? This is caused by the awareness of the people's appreciation of the work of local craftsmen who can be expected to be appreciated by themselves as a first step. Herbert in his book *The Meaning of Art* that all craftsmen in this context are equated with artists who have the goal of trying to create a pleasant form, find harmony in the form of harmony consciousness (Read, 2000) In this research discussion, what I want to say is that artisaned boat craftsmen have awareness of beauty through the structure of the shapes they create. awareness of pleasant relationships is awareness of beauty. Herbert also added that someone who studies art is that whatever the awareness of its own beauty, it can be interpreted that the craftsmen of the boat have it too. In fact, that outrigger shape is not beautiful according to the observations of ordinary people, which in this case

also that the work of art is not always beautiful (Read, 2000, 3), and as explained above that beauty in general and the simplest can be said to be something fun. if an observer sees the outrigger and feels pleasing and beautiful then the outrigger can be said to be a work of art.

Table 1. Categories, Slices, Associations and Intersection between Engineering, Engineering, Craft and Art

Engineering Product	**Utility Design**	Emotional Design	Craft Product	Art

Budi Santoso's research results in the study of the effect of the addition of moveable outriggers on 3 GT fishing boats fishing communities to the total resistance of the ship give value to the speed of the ship. Outrigger distance variations do not have a significant effect on the total resistance value because the calculation results are relatively the same. It can be concluded that the variation of outrigger distances is very influential on the formation of wave resistance. the results of this scientific research are now used as a basis for determining the length and distance of outriggers with jukung by fishermen on the coast of Pangandaran, but in practice in the sea planning the shape and length of outriggers remain from the results of their own experience, cooperation between fishermen and craftsmen.

For the length of the outrigger that was cut into half of the length of the boat, this was based on the experience of fishermen when they were going to go to the ocean with a large wave from the Indian Ocean. This situation forced the fishermen to collaborate with the craftsmen in dealing with this situation.

Aesthetic awareness arises from an urgent situation like this, that craftsmen who are assisted by fishermen do fun work, working together to a point where their intuition leads to the work of art. Outrigger work is an expression of the overflow they work. Expressions are expressed in their observations of the quality of material, color, and other physical reactions, the next is the arrangement of the results into patterns that are pleasing to them, and finally the arrangement of their making is related to emotions and feelings felt before.

CONCLUSION

The aesthetic differences of fishing boat especially in the outrigger part are a gift to the Indonesian people that reflects cultural diversity through local wisdom of each local area. The reliefs on the walls of Borobudur provide a fantastic insight into life around the time of the 7th to 8th centuries in Indonesia. In particular, reliefs provide an unparalleled study of the maritime technology of the time. This is a prove that Indonesia have leading in outriggers or many catamarans design and structure as a pioneer.

Another difference is also seen in outrigger as a counterweight to the jukung boat. Outrigger found in Madura and Bali djoekoeng or other areas look longer than the jakung hull itself. While outriggers found in the Pangandaran djoekoeng are shorter than the djoekoeng hull. This happens due to efficiency considerations from the material aspects and expertise of local Pangandaran craftsmen according to local fishermen based on myths and other urgent needs of their ancestors as having settled in Pangandaran and after the tsunami in 2006.

Outrigger length is only a third part of the entire length of the djoekoeng, so if the djoekoeng length is approximately nine meters, the outrigger or katir is 3 meters in size. It is not without reason why it is made like that, unlike outrigger lengths in general. The main reason according to research observation and experience is that the djoekoeng or boat is easily controlled, especially during large waves. If outrigger size is extended, the resistance to water is getting bigger, due to the function of the breakwater which is based on the hull of the boat not functioning optimally. The experimental analysis suggested that the position of the trimaran outriggers will have a significant effect on vessel motion characteristics. It was found that response magnitudes for both heave and pitch decreased with aft- ward shifts in the outrigger position. This trend was consistent over the range monohull would have a reducing effect on the motion characteristics of the vessel.

If it is understood carefully and correctly, there will no longer be questions about the outrigger status as part of art work in Pangandaran coastal communities, that they must trust their belief that beauty in an outrigger work contains moral goodness.

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