

Analysis of the Fulfilment of Sailing Safety Equipment on Traditional Ships on Lake Towuti, South Sulawesi, Indonesia

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Abstract

The motorboat on Lake Towuti is the main transportation for the people in the village of Tokalimbo, Bantilang, Lengkobale, and Loeha to Timampu Harbour as the center of destination main. The purpose of this study is to analyze the fulfillment of safety equipment and to find out the user community's perception of the current safety condition and what is expected. Based on the Importance Performance Analysis, it was found that four out of ten indicators are in Quadrant IV, which means that these aspects/attributes are very needed to get attention to improve its performance, namely the existence of a life jacket, firefighters, life rafts, and information on the whereabouts of equipment facilities safety. Of the four indicators, the existence of a life jacket is essential and mandatory for every sailor to wear a life jacket to minimize the risk of death from sinking. It is necessary to build awareness of the importance of using life jackets for crew and ship passengers and strict supervision from port authorities.

Keywords: *Life Jacket; Shipping Safety; South Sulawesi; Towuti; Traditional Ships*



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INTRODUCTION

In line with the Strategic Plan of the Ministry of Transportation, safety and security aspects are the main focus of the development targets of the transportation sector, which include reducing the number of transportation accidents and decreasing the number of security disturbances in transportation operations (Transportation, 2020).

The level of traffic accidents in river and lake transportation in Indonesia is still relatively high even though the government has issued regulations on safety policies for river and lake transportation (Fitriani, 2017). Small ships will have a higher accident rate than large ships (P. J. Molberg, 1993). Ship accidents involving people's shipping vessels are bigger than private commercial shipping vessels (M. Johny, 2021). Investigation data from the National Transportation Safety Committee (KNKT) states that in 2017 there were 34 shipping accidents, which increased to 39 shipping accidents in 2018. In 2019 there were 25 shipping accidents; in 2020, there were 12 accidents; and in 2021 as many as 18 shipping accidents in Indonesia (KNKT, 2021). The following figure shows the number of shipping victims resulting from the KNKT investigation up to October 18, 2021.

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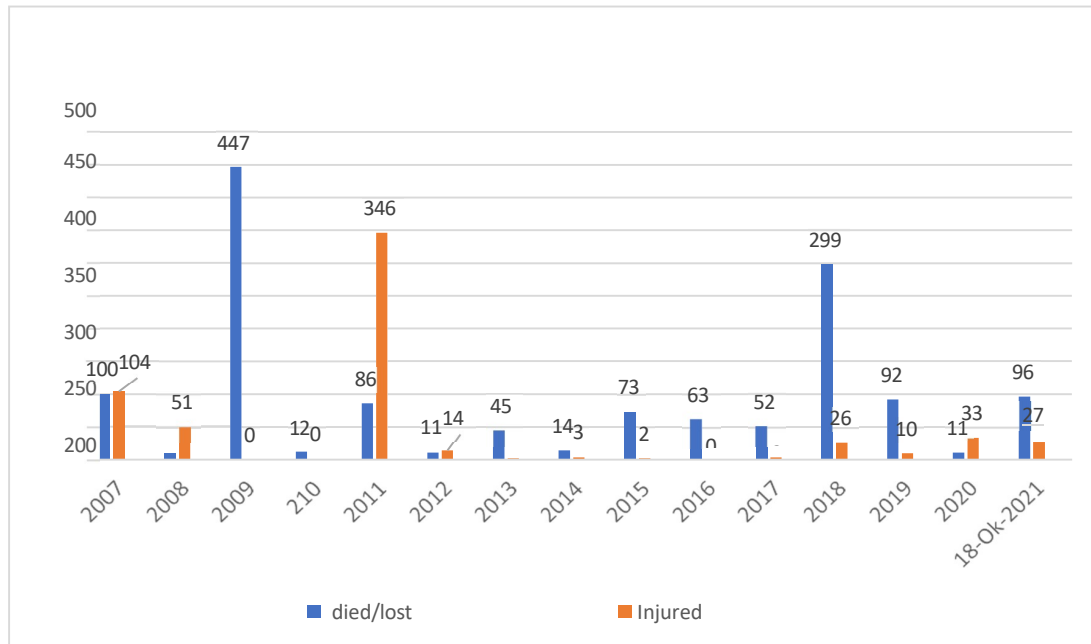


Figure 1. Number of Sailing Accident Victims Investigated by KNKT

Some research results state that the cause of accidents is due to human factors, unfit ships, lack of safety equipment, bad weather, and lack of socialization. In line with that, Budi Hartanto said that the cause of the accident was due to the lack of proper transportation, the human factor ignoring safety standards, and the lack of safety socialization in transportation (Esha, 2019). Most accidents occur during the voyage, which is a routine job, and the crew tends to underestimate the things that are usually done (Bowo and Furusho 2019). Observations on river transportation in the provinces of North Sumatra, South Sumatra, South Kalimantan, and Bali, facilities for rescue equipment such as life jackets, life jackets, rigging, and lifeboats were not fully available on board the ship. Bowo stated that ship accidents are caused by irresponsible crew members' lack of complete safety equipment (Bowo et al., 2017). The lack of using life jackets causes many victims to die from drowning. There are still many traditional ships that are not equipped with safety equipment. The existence of a life jacket provides an opportunity to stay alive during a shipping accident. For example, in the Tallo River waterway mode operation, none of the ships is equipped with shipping safety devices, either a life buoy or a life jacket (T. Rachman, 2019). In other conditions, the ship is equipped with safety equipment but is not used by the driver or passengers. Life jackets are only piled up and placed at the end of the ship.

Lake Towuti, with an area of 561.1 square kilometers, and a depth of 203 meters, is a lake formed from tectonic processes during the formation of Sulawesi Island. Lake Towuti, an ancient lake, is the second largest lake in Indonesia after Lake Toba and the largest lake among the five lakes in the Malili Lake complex (Lehmusluoto, 1997).

Ferry boat transportation on Lake Towuti is the only transportation that connects areas around Lake Towuti in Towuti District, South Sulawesi Province, and several villages in Southeast Sulawesi. The visit of the Indonesian House of Representatives Commission V on September 7, 2018, stated that all ships operated on Lake Towuti did not meet safety standards, resulting in many ship accidents (Comision V DPR RI, 2018). The Indonesian National Consumer Protection Agency

has sent a letter to the Ministry of Transportation to immediately fix the security and safety arrangements for motorized ferry passengers (Indonesian Consumer Protection Agency, 2019). In line with the Strategic Plan of the Ministry of Transportation, safety and security aspects are the main focus of the development targets of the transportation sector, which include reducing the number of transportation accidents and decreasing the number of security disturbances in transportation operations (Transportation, 2020)

The lack of attention to safety aspects has become an interest in research specifically related to the fulfillment of safety equipment. The fulfillment of safety equipment is not only due to frequent accidents but also to the regulations/rules that must be met. This research aims to analyze safety equipment's fulfillment and determine the user's perception of the current and expected safety conditions.

LITERATURE REVIEW

Many traditional ships are not equipped with safety equipment such as life jackets. The existence of a life jacket is still considered trivial and unimportant (Arya Dewanto & Faturachman, 2018). The problem of life jackets on traditional ships is complicated to apply. Several factors influence the lack of awareness of the importance of life jackets. First, because there are no life jackets available, or they are open but not accessible. Second, life jackets are considered non-essential equipment. The third is uncomfortable wearing the life jacket (A. R. Giles, 2010; Cox et al., 2022). In every case of accidents involving traditional ships, the unavailability of personal protective equipment/life jackets is a factor in the number of victims who die due to drowning (Peden et al., 2020). Passenger survival rates after an accident will decrease without flotation equipment or life jackets. Using a life jacket estimates the victim's survival is 94% (S. J. Pitman, 2019). Using personal protective equipment/life jackets can reduce the death toll by 50 - 80% (Gungor, 2016).

Not wearing a life jacket is one of the causes of the many victims who died. In the case of the sinking of the Sinarbangun Ship on Lake Toba, three people died, and 164 people have not been found (KNKT, 2018). The sinking of the Ageless Ship on January 3, 2018, in the Lower Waters of the Banyuasin River, South Sumatra, resulted in 15 deaths (KNKT, 2018). In the sinking of the Arista ship in Makassar, as many as 17 people died (KNKT, 2018)

The high price of a life jacket, the ability to swim, and discomfort are factors in the common use of a life jacket. The hot weather causes the use of a life jacket to feel hot, plus the large size causes the use of a life jacket to be uncomfortable, especially when moving (Matin & Namayandegi, 2017). The effort to increase the use of life jackets is to modify them with sizes that are not too large to encourage consistent use of life jackets. Raising parental awareness of the importance of using life jackets can be an example of safety behavior in wearing life jackets when boating with children. Law enforcement on the use of life jackets needs to be done to increase awareness among operators of the use of life jackets (D. A. Quistberg, 2014). Life Jackets will not help save lives if not worn.

For this reason, the Government must take strategic steps to protect the community to prevent the emergence of more victims through socializing the importance of life jackets. Procurement of life jackets also needs to be considered, either through government assistance or cooperation with the private sector/private services, or through a borrow-to-use system, and of course, stricter supervision of operators in the fulfillment of safety equipment (O'Connor, 2006). The importance of using life jackets is not only for the crew's awareness but also for the passengers' awareness, under strict supervision from the competent authorities.

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RESEARCH METHOD

The research uses quantitative and qualitative descriptive analysis or the mixed method. Mixed research is a procedure for collecting, analyzing, and mixing quantitative and qualitative methods in a study or a series of studies to understand the research problem (Creswell, 2009). Mixed research is research in which the researcher mixes or combines quantitative and qualitative research approaches and techniques in a single research study. Mixed research produces a comprehensive understanding of the phenomenon under investigation because it integrates quantitative and qualitative data. Mixed research is appropriate when the goal is to describe, explain, or evaluate. Mixed methods are used in social science and behavioral research related to societal change or social action (Leave, 2017)

The survey was conducted on traditional boats in Lake Towuti, South Sulawesi. Respondents consisted of regulators, namely BPTD XIX Sulsebar, Transportation Service of East Luwu Regency. Operators/crew of the Angin Mamiri 01 Ship, Angin Mamiri 02 Ship, Nayla 02 Ship, Nurul Jaya Ship, Anugrah Abadi 02 Ship, Asifa Jaya Ship, and the Angin Mamiri 01 Ship passengers and Angin Mamiri 02 Ship passengers.

Primary data were obtained directly from the actors/related sources through interviews, observations, and filling out questionnaires. Secondary data is obtained through relevant literature studies obtained from various sources, either through institutional means or through the collection of documents that can support this research. Questionnaires were distributed to 30 respondents from ship passengers, Angin Mamiri 01 and KM Angin Mamiri 02 passengers.

The analysis used in the study uses gap analysis, which compares the actual conditions with the desired conditions. Gap analysis is a measurement method to determine the gap between the performance of a variable and consumer expectations of that variable.

FINDINGS AND DISCUSSION**Motor Boat Routes on Lake Towuti**

Twelve ships are operating on Lake Towuti. There are three traditional boats on Lake Towuti, Monohull, Catamaran, and Trimaran, with wooden decks. As the port of origin and destination is Timampu Port, with the route shown in the table below (Table 1).

Table 1. Boat Routes on Lake Towuti

No.	Ship Name	Destination
1.	Km. Anugrah Abadi 02	Timampu - Loeha
2.	Km. Bintang Towuti	Loeha - Timampu
3.	Km. Angin Mamiri 01	Timampu - Tokalimbo
4.	Km. Angin Mamiri 02	Tokalimbo - Timampu
5	Km. Indah	Bantilang - Timampu
6	Km. Derba	Bantilang - Timampu
7.	Km. Nayla 02	Timampu - Lengkobale
8.	Km. Basmalah	Timampu - Lengkobale
9.	Km. Nurul Jaya	Timampu - Lengkobale
10.	Km. Garuda / Vania	Batu Mataha - Timampu
11.	Km. Sahabat Baru	Batu Mataha - Timampu
12	Km. Asifa Jaya	Timampu - Lengkobale

Source: East Luwu Regency Transportation Service

The accident data in Lake Towuti can be seen in Table 2.

Table 2. Data on ship accidents in Lake Towuti in 2016 – 2020

No	Date	Location	Type of Accident	Type of ship	Reason
1.	November 13, 2016. At 14.15 WITA	Lake Towuti	The crew fell from the Bintang Towuti Ship.	Motor Ship	- The crew woke up and still lacked concentration, then walked on the edge of the stern of the sailing ship. Then fell and sank into the lake.
2.	August 06, 2018. At 7:15 WITA	Lake Towuti, Timampu Pier, District Towuti	Explosion in the cabin	Speed boat	- Oil spill on the cabin floor - Short circuit in the power source (Battery / Accu), which triggers a flame in the spilled oil - Negligence of speed boat operator
4.	October 24, 2020. At 13.20 WITA	Lake Towuti	Sink	Motor Ship	- Suspected Overload - Hull rupture in the middle of the ship

Source: East Luwu Regency Transportation Service

Results of interviews with BPTD XIX Sulselbar, Department of Transportation of East Luwu Regency, ship operator/crew KM Angin Mamiri 01, KM, Angin Mamiri 02, KM. Nayla 02, KM. Nurul Jaya, KM. Anugerah Abadi 02, KM. Asifa Jaya and the ship's passengers have identified several problems that affect the safety of traditional ship shipping :

1. In the current conditions, traditional ships operating on Lake Towuti have not met the safety and security aspects of shipping. None of the ships has complete safety equipment as required.
2. The implementation of shipping safety and security has been delegated to BPTD.
3. In the context of ship safety and security, socialization has been carried out to ship operators regarding anticipation and safety in shipping. Inspection of the completeness of safety equipment on board and ship engines. The provision of life jacket assistance in collaboration with Jasa raharja.
4. The passenger cannot find the existence of Life jacket; the life jacket is stored in a box for the reason of avoiding theft.
5. The operator does not provide a life jacket because passengers use the life jacket as a pillow; some take it home.
6. The Department of Transportation has held BST training in collaboration with shipping schools in Makassar for free to ship crews, but not many are interested. The crew was reluctant to join the BST because they had to leave work.

There were only two crew members of the ship which took the BST course, the crew of the KM Indah Lestari ship.

Importance Performance Analysis

It was analyzed using the Importance Performance Analysis technique to find out the gap between expectations and public perceptions. With the IPA technique, respondents were asked to rate based on the level of importance and the reality of the quality of Fulfillment of Traditional Ship

Safety Facilities at Lake Towuti, South Sulawesi, until the time the research took place. Using this concept can capture a clearer perception of the importance of the attributes in this dimension for the community and how satisfying it is for the community so far, as the mapping results in the following quadrant.

Quadrant 1 – Maintain Performance:

Contains aspects/attributes considered important by respondents and have above-average performance. It means these aspects/attributes have good performance and must be maintained.

1. Availability of Radio Devices
2. Availability and adequacy of equipment for dealing with accidents (P3K)

Quadrant 2 – Reduce Emphasis:

Contains aspects/attributes considered less important by respondents than other attributes but have above-average performance. It means that efforts to improve aspects/attributes included in this quadrant can be reconsidered because their impact on people's expectations is smaller, even though trying to do so may require large amounts of energy and costs.

1. Operator's understanding of Shipping Safety regulations
2. Availability and adequacy of life vests

Quadrant 3 – Medium Low Priority:

This quadrant contains aspects/attributes considered less important by respondents but has below-average performance. Overall, some attributes are currently not or are not a priority.

1. Availability and adequacy of Navigation Tools
2. Availability of information on how to use ship safety facilities

Quadrant 4 – Focus Effort:

This quadrant contains aspects/attributes considered important by respondents but below-average performance. It means that these aspects/attributes need attention to improve their performance and not to disappoint customer expectations. Overall, some attributes need to be a priority to improve their performance, namely:

1. Availability and adequacy of life jackets or life jackets
2. Availability and adequacy of fire extinguishers
3. Availability and adequacy of life rafts
4. Availability of information on where to store safety equipment facilities

Quadrant analysis compares the interests and performance mapped in the Cartesian diagram. Later each indicator will be grouped into four quadrants. This quadrant can later become the basis and reference for taking action on the attributes the respondent asks for improvement. For more details regarding the results of the quadrant analysis from the survey results for the fulfillment of traditional Lake Towuti ship safety facilities, it is presented in graphic form as follows:

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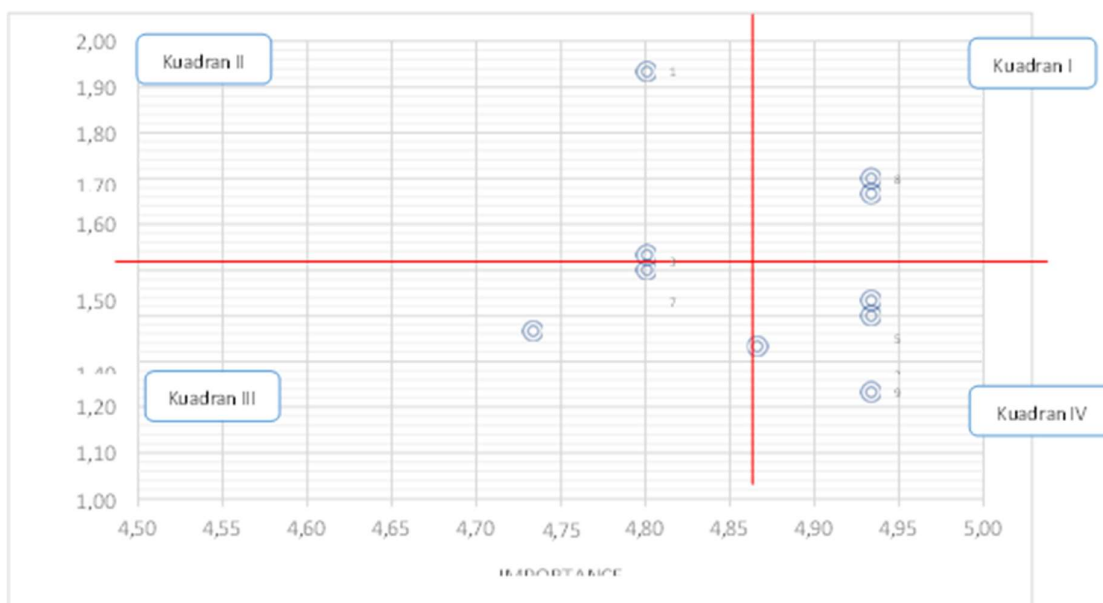


Figure 2. Results of The Quadrant Analysis

Based on the graph above (See Figure 2), it can be seen that most of the indicators are in Quadrant IV. That is the quadrant that contains indicators that tend to have high expectations that must be met and also high-performance values.

Following the regulation of the Director General of Sea Transportation Number HK.103/2/8/DJPL-17 dated April 18, 2017, concerning the Instructions for Traditional Passenger Carrier Ships contained in article 13, passenger ships must have a life jacket of at least 125% of the total number of people on board and 10% of that amount for children's life jackets. Lifebuoys are useful for helping people fall into the waters in an accident on the ship. The life buoy must be equipped with sufficient straps.

The steps that have been taken in order to improve the safety and security of ships for ship operators that have been carried out by the Department of Transportation of East Luwu Regency include:

1. socializing ship owners about anticipating accidents in shipping,
2. checking the completeness of safety equipment on ships and ship engines, and
3. providing life jacket assistance in collaboration with Jasa Raharja

However, it was discovered that the traditional ships operating on Lake Towuti had not met the safety and security aspects of shipping because none of the ships had complete safety equipment. The minimum safety equipment that must be equipped by traditional ships is a life jacket, life buoy, and a light fire extinguisher (APAR). From the minimum safety equipment that must be equipped, only life jackets are provided, but the current condition is not on the ship because the life jacket is used by passengers as a pillow to sleep, taken home by passengers, and even stolen from locked storage.

CONCLUSION

From the gap analysis results, the fulfillment of safety equipment on board is in quadrant IV. Attributes that need to be a priority to improve their performance are the availability and adequacy of life jackets or life jackets, availability and adequacy of firefighters, availability, and adequacy of life rafts, and availability of information on safety equipment storage facilities. From the four indicators, the existence of a life jacket is vital and mandatory for every sailor to wear a life jacket. For this reason, the rules for using life jackets must be strictly enforced.

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