

Research Article

# Strategy for Recovery of Water Transportation Modes after the KM Sinar Bangun Tragedy on Lake Toba, North Sumatra

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## ABSTRACT

This research aims to analyze the recovery strategy for water transportation modes after the KM Sinar Bangun tragedy. Lake Toba Harbor has weaknesses that have been identified through observation and primary data studies. Water transportation is a mode of transportation that uses water as its main route, such as rivers, lakes, seas, or canals, to transport goods and passengers from one place to another. Aspects that are weaknesses of KM Sinar Bangun as a restoration mode of water transportation in Lake Toba include, among other things, the problem of incompatibility between the flow of ship visits and loading and unloading, problems with infrastructure and facilities in the port, problems with the age of port buildings. Based on the results of the SWOT analysis, it is concluded that the performance of Lake Toba Pier as a shipping facility on Lake Toba is in quadrant I with position (1.5; 2.25). The strategy for recovering water transportation modes after the KM Sinar Bangun tragedy occurred is an SO (strength opportunity) strategy. The SO strategy is strengthening the function of restoring the mode of transportation as a means of shipping and income for the local community, developing the Lake Toba area to maximize the function of restoring the mode of water transportation.

**Keywords:** Service quality; Recovery Strategy; SWOT Analysis

## 1. INTRODUCTION

Strategy is a plan or pattern to achieve certain goals through resource allocation and adaptation to a changing environment, as well as through consistent and integrated decisions in various aspects of the organization (Subyantoro, 2020). Transportation is the movement of people, animals and goods from one location to another (Hariyani & Agustin, 2020). So, transportation can be said to be the specific movement of living things and goods from one location to a certain location. The modes of transportation include air, land, water, cables, pipes and space (Tamin, 2003). Water transportation is a mode of transportation used to move goods from ships to other continents (Jack, 1988). Historically, water transportation has been used since the Stone Age, where water transportation still uses human and animal power. However, as science and technology developed, water transportation began to develop using machines and various types of ships were created. The main characteristic of this industrial revolution is the integration of information and communication technology in the industrial sector. The emergence of the industrial revolution caused changes in various sectors (Dharma, 2022). If initially it required quite a lot of workers, now everything can be replaced by the use of technological machines (Nurbaiti, N. et al, 2021).

KM Sinar Bangun can usually carry 43 passengers along with 20 motorbikes. In the midst of celebrating Eid al-Fitr in 2018, Samosir Regency has become a tourist spot visited by many people. This triggered an overflow of passengers boarding KM Sinar Bangun. This resulted in the KM Sinar Bangun passenger accident on June 18 2018. It is known that the ship's cargo at that time had reached 5 times its maximum capacity. The ship sank due to overloading, where the ship which was supposed to have a capacity of only 40 people was actually filled with up to 200 people. The occurrence of this incident has given rise to a negative image of water transportation, especially in the waters of Lake Toba and has given the impression that water transportation in the waters of Lake Toba is less safe, uncomfortable and dangerous. After Lake Toba, it gives the impression that water transportation in the waters of Lake Toba is less safe, uncomfortable and dangerous. After this incident occurred, many tourists and residents postponed their departure to cross and canceled tour boat packages. Remembering that water transportation in Lake Toba is one of the main infrastructure and facilities in the Lake Toba area, both used in terms of tourism and used as public transportation for crossings. As explained by Allah SWT in the Al-Qur'an, surah Al-Maidah verse 32, which reads:

مِنْ أَجْلِ ذَلِكَ كَتَبْنَا عَلَى بَنِي إِسْرَائِيلَ أَنَّهُ مَنْ قَتَلَ نَفْسًا يُغَيِّرْ نَفْسًا أَوْ فَسَادٍ فِي الْأَرْضِ فَكَأَنَّمَا قَتَلَ النَّاسَ جَمِيعًا وَمَنْ أَحْيَاهَا فَكَأَنَّمَا أَحْيَا النَّاسَ جَمِيعًا وَلَقَدْ جَاءَتْهُمْ رُسُلُنَا بِالْبَيِّنَاتِ ثُمَّ إِنَّ كَثِيرًا مِنْهُمْ بَعُدَ ذَلِكَ فِي الْأَرْضِ لَمْسْرِفُونَ

Meaning: "Therefore, We decreed (a law) for the Children of Israel, that whoever kills someone, not because that person killed another person, or not because he did damage on earth, it is as if he had killed all humans. Whoever preserves the life of a human being, it is as if he has preserved the life of all humans. Indeed, Our Messenger has come to them with (bringing) clear information. But then many of them after that went beyond the limits of the earth." (QS. Al-Ma'idah 5: Verse 32).

With this phenomenon, I want to examine the strategies of the government and water transportation managers in restoring this negative image and researchers also want to see whether the strategies used by the government and water transportation managers have succeeded in restoring this negative image and can restore public confidence in water transportation in the waters of Lake Toba. For a company, image is very important. Companies do many things to maintain their positive image. Even when they do things that damage their image, they do many things to improve the positive image they previously had. Oliver (2007: 50) says image is a mental picture; ideas generated by imagination or personality shown to the public by a person, organization and so on.

The previous research related to this research is entitled Preliminary Study of the Utilization of the Jongaya and Panampu Canals as Water Transportation in Makassar City by Ahmad Dahlan. In the results of his research, contextual planning with the sustainability of the canal is in accordance with its function as urban drainage and as water transportation in the future. Raising awareness among communities around the canal to preserve the canal by socializing the importance of the canal's function as flood control and channeling water to the sea and also the potential that the canal has when it becomes a water transportation in the future (Dahlan, 2019). Then the research entitled Analysis of Movement Patterns of People and Goods Using Water Transportation Modes was researched by Muhammad Riantara Lubis with the research results that: Through analyzing the movement patterns of people and goods using water transportation modes, operators can identify trends, needs and opportunities that exist in their transportation system. This helps in better decision making, more effective planning, and improved services to water transportation users. The main components of budgeting are planning, operations and resources, finance (budgeting), distribution and coordination (Nasution, Y. S. J. et al, 2024).

Information becomes very valuable even if only for a very short time. These changes not only affect investment decisions, namely how to use the collected funds optimally, but also involve decisions on selecting sources of funds or investment payments. For example, the globalization of capital markets will provide opportunities for companies to obtain funds more freely. Apart from that, there is an opportunity to diversify investments better. In other words, the tasks of financial managers are becoming increasingly complex and larger (Nurlaila, 2021). By applying analysis of movement patterns of people and goods using water transportation modes, operators can increase operational efficiency, reduce costs, increase customer satisfaction, make better decisions, and contribute to environmental sustainability. This has a positive impact on operators, water transportation users and the environment as a whole (Lubis, 2023).

In the research entitled The Impact of Changes in Water to Land Transportation on the Community of South Banjarmasin District in 1990-2008, researched by Muhammad Sofian Syauri also explained that based on the results of his research, it can be concluded that the impact of changes in water transportation to land transportation in the Kelayan River, South Banjarmasin District in 1990-2008 was that there was a negative impact, namely land transportation pollution, namely increased air pollution. In general, the definition of air pollution is the difference in actual air composition with normal air conditions where the actual air composition does not support human life. Air pollution materials or substances themselves can be in the form of gases and particles. Then there was a conflict over land acquisition in the context of road construction. The amount of land compensation demanded by the community because their land was affected by a road construction project was not in accordance with the budget owned by the Banjarmasin City Government. Apart from that, individuals usually play for their own interests in order to reap profits (Syauri, 2024).

Furthermore, research related to this research is entitled Feasibility of Water Transport on the Batanghari River (Case Study of Ketek Motorbike Transport in Canal Village, Batanghari Regency) by Rendy Al Akbar with research results. From the user's perspective, overall the feasibility of Ketek motorbikes as transportation on the Batanghari River was assessed from 15 questions, including: Canal Village-Canal Market 8 Questions which have a Feasible score with a percentage of 53.33%. 6 Questions which have a Fairly Decent score with a percentage of 40% and 1 Question which has a Very Inappropriate score with a percentage of 6.67%, Canal Market-Canal Village 11 Questions which have a Decent score with a percentage of 73.33%. 3 Questions have a Quite Decent score with a percentage of 20% and 1 Question has a Very Inadequate score with a percentage of 6.67%. Based on the assessment and satisfaction of ketek motorbikes from users of the Batanghari river crossing transportation service in the village of Lulus, the level of suitability of ketek motorbikes from the Passage Village-Paranal Market and the Passage Market-Channel Village as crossing transport is rated as Adequate at this time (Al Akbar, 2021). Then in the title Factors that Influence Movement from Singkil to Pulau Banyak with

Transportation by Water, Irma Dewi with the results of research results from observations of the two types of water transportation modes, namely, Fast Boats and Ferry Boats, the Ferry Boat is superior because the value of the level of satisfaction with the Adjusted R Square value of the three variables, travel costs, departure schedules and security and safety is 91.2% while the Fast Boat is 87.9% (Dewi, 2022).

In the research entitled *The Relation of Settlements and Modes of Transportation in the City of Padang 1957-2017* by Daumar Mike Pahutar with the results of research after the 2009 earthquake, Padang did not want to be lost in sorrow, they started to improve by designing and reorganizing their city's RTRW. Plans that start from events that have occurred, and efforts to carry out mitigation. The distribution of settlements even up to 2017 adjusted to disaster mitigation policies targeting high areas, such as towards the North and East of the old city, specifically towards the current city center (Koto Tangah) and others. The previous modes were dynamic by continuously adjusting their respective paths or routes, the Trans Padang mass transportation mode emerged in 2014, followed by the new phenomenon of the emergence of online-based transportation modes, both two-wheeled and four-wheeled, towards the end of 2017.

Next is research with the title *Water Transport Development Model in Areas with Many Rivers: Case Study of Teluk Bintuni Regency* by Fikri Fadhilah with research results. There are three types of river transportation in Teluk Bintuni Regency, namely boats or ketinting, river boats, and water taxis. Water taxis are operated commercially, but until now they have not operated optimally; (2) Three available water taxi fleets operate with a multiport scheme in three predetermined operating areas. Water taxis operate every day from 05.00 – 17.00 WIT. The selected routes in each operational area are as follows: (a) Northern Operational Area I with the route Bintuni – Tomu – Aranday – Kamundan – Aranday – Tomu – Bintuni; (b) Northern Operation Area II with route Bintuni – Manimeri – Wamesa – Manimeri – Bintuni; (c) Southern Operational Area with route Aroba – Sumuri – Babo – Kuri – Kaitaro – Kuri – Babo – Sumuri – Aroba; (3) The benefit-cost ratio (BCR) analysis that has been carried out produces a ratio of 1.09, which means that the planned water taxi operation pattern is feasible from an economic perspective (Fadhilah, 2021). And research conducted by Nur Aisah with the title *Analysis of the Choice of Transportation Modes in Tourist Visits* with research results. The superior mode of transportation or the main priority in all criteria, namely private transportation modes. This is in accordance with the results in the field that almost all tourists who come to Cilacap Regency tourist attractions use private modes of transportation for tourist trips. On the criteria of safety and comfort, the priority mode of transportation for tourists when traveling is private mode of transportation, the next priority is train, bus, plane and ship; In terms of time, access and cost criteria, alternative priority modes of transportation are private vehicles, with the next priority being buses, trains, planes and ships. The alternative mode of transportation that is the first priority for tourist trips is private transportation. The next alternative priorities are trains, buses, planes and ships (Aisah, 2021).

Research related to water transportation modes, as mentioned in the seven studies, has direct relevance to the research entitled "Recovery Strategy for Water Transportation Modes After the KM Sinar Bangun Tragedy in Lake Toba, North Sumatra." Although the focus of each study is different, they all discuss aspects of the movement of people and goods via water transportation modes as well as the factors that influence the use of these transportation modes. By Overall, these seven studies provide a relevant basis for designing strategies for restoring water transportation modes in Lake Toba after the KM Sinar Bangun tragedy. They help in understanding safety factors, movement patterns, transportation mode preferences, as well as the importance of adequate infrastructure, all of which are crucial to restoring and repairing public confidence in water transportation modes in the region.

## 2. RESEARCH METHOD

This research uses qualitative research methods with research results from interviews aimed at exploring an in-depth understanding of the subject's perceptions, experiences and views on a particular phenomenon. The data in this research was obtained from the results of primary data collection and secondary data. Primary data is the result of distributing questionnaires to port service users and stakeholders in Lake Toba. Secondary data collection was obtained from the literature. The data obtained was used to analyze strategies for recovering water transportation modes after the KM Sinar Bangun tragedy (Nartin, 2024). This research uses SWOT analysis data analysis techniques to identify the quality of KM Sinar Bangun services at Lake Toba Harbor. SWOT analysis is the process of making strategic decisions and organizational policies. Therefore, as a strategic planner in carrying out analysis, you need to pay attention to various aspects related to the factors that influence it (Fristasya, Az-Zahra, Sumiati, Fauziah, & Ahmad, 2021).

The steps in a SWOT analysis are: Internal environmental analysis is used to identify the strengths and weaknesses of the quality of KM Sinar Bangun's services. Then determine the external environmental analysis used to identify opportunity and threat factors. Next, a SWOT analysis strategy matrix is carried out, namely the formulation of the strategy that will be used and seeing which quadrant the company is in. In this research, there were four people who were sources, one of

which was the captain and local residents who witnessed this incident. Quadrant I is a favorable condition where there are opportunities and strengths, so the strategy taken is aggressive growth (growth-oriented strategy). Quadrant II is a condition where there are threats but still has internal strength, so that a diversification strategy (goods/services) can be used for the long term. Quadrant III is a condition where there are quite large opportunities, but internal conditions have decreased. So the strategy that can be used is to minimize existing internal obstacles. Quadrant IV is a detrimental condition. Where threats and internal problems experience quite serious problems. (Salim & Siswanto, 2019).

### 3. RESULTS AND DISCUSSION

Every ship is required to have a clear passenger capacity certificate and must be complied with by the ship manager. Stricter supervision is carried out on ship permits and operating certificates to ensure that ships in operation are truly up to standard and roadworthy. The next recovery strategy focuses on improving safety facilities on the ship and special training for the crew and crew. Ships operating on Lake Toba are required to have basic safety equipment such as life jackets, fire extinguishers and life jackets. This is based on the researcher's interview with a local resident, namely:

"As a user, I feel it is important for all parties to work together. The government can ensure safe transportation, while the public and ship operators must maintain service standards. Tourists like me must also be educated about safety procedures, for example by posting signs on ships or docks."

These tools should be checked periodically to ensure they are in good condition for use in emergency situations. In addition, ship owners are encouraged to improve the quality of safety facilities to better comply with international maritime transportation standards. The ship's crew also received intensive safety training. They are trained in rescue procedures, use of safety equipment, and how to handle emergencies. This training program aims to ensure that all crew members have sufficient skills to manage crisis situations quickly and appropriately. Based on the results of the researcher's interviews with the sources, namely:

"Strengthening infrastructure is the main step. Standard-compliant docks, modern navigation and real-time weather monitoring systems are essential to reduce the risk of accidents. Apart from that, regulations must be stricter. For example, ships that do not meet the requirements must not operate, and enforcement must be uncompromising. Safety education is also very important to ensure all parties, including operators and passengers, understand safety procedures."

Through this step, it is hoped that a more swift and effective response can be carried out if an emergency situation occurs in the future. Regular monitoring and evaluation of the implementation of water transportation safety regulations is another important strategy. With regular evaluations, the government can ensure that all regulations are implemented in accordance with established procedures. This evaluation process is carried out by involving the transportation service, local government and related parties to conduct field inspections and monitor ship operators' compliance with safety standards. As the results of an interview with one of the resource persons, namely a captain.

"The most important strategic step is to improve the safety aspects of water transportation. We have started implementing new regulations regarding passenger capacity limits, mandatory use of life jackets, and periodic inspections of ship seaworthiness. Apart from that, we have also increased training for ship operators to ensure they understand safety procedures. We are sure that if the public sees real changes in the management of this transportation, their trust will be restored."

The Lake Toba National Search and Rescue Agency (BNPP) post located in Parapat received reports of Sinar Bangun sinking from the community at around 17.40 WIB and immediately prepared a team to provide assistance. Twenty minutes later, the rescue team left for the scene. At around 18.45 WIB the BNPP team together with the Water Police and the local community assisted in the evacuation process. The location of the incident is approximately 3 km from Tigaras Harbor, precisely at coordinates 02°47' 01" N98° 46' 34" E. The distance of the incident location from the Parapat SAR Post is around 12.19 NM in a northwest direction (308°). The administrative area of the ship accident is located in Tigaras Village, Dolok Pardamean District, Simalungun Regency North Sumatra. The joint search and rescue operation which was led directly by the Head of BNPP was attended by various elements such as the TNI, Polri, BPBD, Regional Government and the community who voluntarily took part in the SAR operation. The SAR operation to search for Sinar Bangun took 16 days and the SAR post was placed at Tigaras Harbor, Simalungun Regency. The following are the activities for implementing SAR operations carried out from day 1 to day 16.

Quadrant I is a favorable condition where there are opportunities and strengths, so the strategy taken is aggressive growth (growth-oriented strategy). Quadrant II is a condition where there are threats but still has internal strength, so that a diversification strategy (goods/services) can be used for the long term. Quadrant III is a condition where there are quite large opportunities, but internal conditions have decreased. So the strategy that can be used is to minimize existing internal obstacles. Quadrant IV is a detrimental condition. where threats and internal problems experience quite serious obstacles.

(Salim & Siswanto, 2019). Even though there are strengths that support the smooth operation of wooden ships, such as routine maintenance and appropriate captain's licenses, weaknesses related to ship safety and technicalities are still a serious problem. The availability of complete safety equipment, adequate technical training for the crew, and passenger education about safety must be considered so that ship operations are safer and more efficient.

Based on the total value of the IFAS matrix score of 2.7 minus the score for the weakness factor of 1.2, we get 1.5. Meanwhile, based on the results from EFAS, the score for the KM Sinar Bangun opportunity was 3.2 minus the total threat factor score of 0.95, the result was 2.25. This can be mapped in the form of a SWOT (space matrix) analysis diagram. This diagram can determine the position of the Water Transportation Mode Recovery Strategy after the KM Sinar Bangun Tragedy. By knowing the strategy position based on space matrix analysis and its depiction in vector lines, the results of mapping the strategy position can be seen in the following image. The results of the SWOT analysis diagram show that the strategy that is suitable for use in the analysis of the Water Transport Mode Recovery Strategy after the KM Sinar Bangun Tragedy is the SO (strength opportunity) strategy. The SO strategy is strengthening the function of restoring the mode of transportation as a means of shipping and income for the local community, developing the Lake Toba area to maximize the function of restoring the mode of water transportation.

Presidential Regulation (Perpres) Number 83 of 2016. The Basarnas Institute or National SAR Agency is a government agency that operates in the field of search and rescue, which was originally under the auspices of the Department of Transportation. Carrying out its main duties requires support and participation from all parties in utilizing various facilities, infrastructure, personnel and materials owned by various government agencies, the private sector, organizations and the community (Roisyah & Purnomo, 2017).

For natural disasters, SAR operations are one of a series of emergency management cycles for natural disaster management. from prevention (mitigation), preparedness, emergency response (response) and recovery, where SAR operations are part of the actions in emergency response. Basically, SAR activities are carried out by countries throughout the world, therefore the regulations regarding SAR have also been agreed upon in international conventions which of course will be binding for all. Countries that have ratified the agreement. ([www.basarnas.go.id](http://www.basarnas.go.id)). The following is a SWOT analysis related to the Strategy for Restoring Water Transportation Modes After the KM Sinar Bangun Tragedy on Lake Toba, North Sumatra:

a) Strengths

1. Existing Water Transportation Infrastructure: Water transportation on Lake Toba already has sufficient infrastructure, such as docks and ships, so that it can be immediately used for post-tragedy recovery.
2. Ships with Routine Maintenance: Some ships on Lake Toba have routine maintenance, which ensures that the ships are in good condition and fit to operate.
3. Licensed Masters: Several captains on ships operating on Lake Toba already have official licenses in accordance with applicable regulations, which increases security and compliance with safety standards (Hidayat, 2022).

b) Weaknesses

1. Inadequate Ship Safety: One of the glaring weaknesses is the lack of safety equipment on ships, such as insufficient life jackets, as well as the absence of information or education about the use of safety equipment.
2. No Technicians or Mechanics on Board: The absence of technicians on any ship hinders the ability to address technical issues during the voyage, which can increase the risk of accidents or damage to the ship.
3. Lack of Accuracy on Crew: Crew (Boat Crew) are sometimes less careful in important checks such as engine oil, which can cause dangerous technical problems during the journey (Dian, 2024).

c) Opportunities (Opportunities)

1. Increasing Public Awareness about Water Transportation Safety: After the KM Sinar Bangun tragedy, there is an opportunity to increase public awareness about the importance of safety in water transportation, both in terms of education and infrastructure improvements.
2. Government Support and Investment for Recovery: The tragedy prompted the government to focus more on the recovery of water transport modes with stricter regulations and possible increased investment in safety infrastructure and ship maintenance.
3. Potential for Tourism Development in Lake Toba: Lake Toba is a strategic tourist destination, so that the restoration of safe and comfortable water transportation modes can support better tourism development in the area (Komariah, 2020).

d) Threats

1. Public Distrust of Water Transportation Modes: After the tragedy, people may feel afraid or hesitate to use water transportation due to a lack of sense of security and trust in the safety of operating vessels.
2. Lack of Supervision and Law Enforcement: If regulations regarding safety and water transportation operations are

not properly monitored and enforced, there is a risk that similar tragedies could occur again in the future.

3. Erratic Weather Changes: Lake Toba is vulnerable to extreme weather changes, which can be an additional risk factor in water transportation operations, especially if safety equipment and procedures are not strengthened (Buditiawan, 2020).

Recovery of water transportation modes after the KM Sinar Bangun tragedy requires a strategy that optimizes existing strengths and opportunities, such as available infrastructure and tourism development potential, while overcoming main weaknesses related to safety and technical management of ships. Government support and public education regarding water transportation safety can be a key factor in restoring public trust and improving operational safety on Lake Toba.

#### 4. CONCLUSION

The KM Sinar Bangun tragedy on Lake Toba was an important turning point in efforts to improve and increase the safety of water transportation modes in Indonesia, especially in the Lake Toba area. This tragedy highlights various weaknesses in the water transportation system, including weak regulations, a lack of safety facilities, a lack of supervision, and inadequate infrastructure. Post-tragedy recovery strategies are designed with the aim of ensuring user safety and preventing the recurrence of similar events. By tightening regulations regarding ship operations, including standardization of passenger capacity and crew certification. Provision of safety equipment such as life jackets, lifeboats and emergency communication equipment on each ship. Port modernization, improvement of loading and unloading facilities, as well as adjusting the age of port buildings to ensure operational feasibility. Increase awareness of the public and water transportation businesses about the importance of safety through campaigns and training. Involving the private sector to support the provision of advanced technology and more professional management of water transportation modes. Ensure that the regulations implemented are followed by routine monitoring of ships and ports. The results of the SWOT analysis show that the recovery position of water transportation modes at Lake Toba Harbor is in quadrant I with coordinate positions (1.5; 2.25). This shows that the most appropriate strategy is the SO (Strength-Opportunity) strategy, namely utilizing existing strengths, such as Lake Toba's tourism potential and geographical advantages, to improve water transportation. This strategy also aims to overcome weaknesses, such as a mismatch between the flow of ship visits and loading and unloading facilities, as well as infrastructure that is not yet optimal. By consistently implementing this strategy, it is hoped that water transportation on Lake Toba will become safer, more efficient and more reliable. This will not only increase public trust but also support tourism development in the Lake Toba area as a leading tourist destination.

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