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Need for Signs on the Segara Anakan River, Cilacap Regency

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Abstract

The Segara Anakan River is a shipping channel with a channel length of 17.8 miles that serves the Seleko – Kampung Laut Route in Cilacap Regency. The condition of shipping flows in Segara Anakan is irregular due to the lack of river signs as a means of regulating traffic to create safe, secure and smooth river transportation. This research aims to determine the number of river signs needed and evaluate existing river signs. This research was carried out by reviewing field conditions and then conducting qualitative descriptive analysis in accordance with Perditjenhubdat Number: KP. 4755 / AP005 / DRJD / 2020 concerning Technical Guidelines for River and Lake Signs. Conditions in the field are that the number of signs installed is 5 compared to the supposed number of 9. The research conclusion is that the number of river signs needed in the Segara Anakan channel is 25 signs with details of 6 prohibitive signs, 3 mandatory signs, 2 warning signs. The required river signs must meet technical specifications in accordance with applicable regulations both in terms of size of sign leaves, sign poles and manufacturing materials.

Keywords: *Safety, Shipping, Signs and River Transport*

INTRODUCTION

The development of the transportation sector is crucial for providing reliable and efficient services to users. River transportation, highlighted as a sustainable and cost-effective mode of inland transportation, holds particular significance in regions like Cilacap Regency, as emphasized by Stella Maris (2017) and Molotov et al. (2021). In Cilacap, river transportation plays a key role in facilitating economic and social development by connecting sub-regions, with Kampung Laut standing out as a prime example. The reliance of the Kampung Laut community on river areas for their livelihood underscores the importance of this mode of transportation. The journey to Kampung Laut, lasting between 1.5 to 2 hours, depends on boat conditions and the current of the Segara Anakan River, which spans 23.8 km and serves as the primary water route to the district.

This natural river channel accommodates ship passage and is flanked by piers such as Motehan, Krases, and Karan Anyar, which facilitate transportation activities. However, ensuring safe navigation along the Segara Anakan River necessitates adequate Shipping Navigation Facility (SBNP) infrastructure, as highlighted by Abidin (2016). This infrastructure plays a crucial role in bolstering safety measures and mitigating risks inherent in river transportation. The responsibilities of ship captains and government

authorities are pivotal in ensuring the safety and efficiency of river transportation systems, as emphasised by Santosa and Sinaga (2020).

Navigating rivers with shipping obstacles requires strict adherence to the signage displayed along the river, as noted by Nurdianti et al. (2016). Ship captains bear the primary responsibility of safely navigating vessels along river routes, adhering to established guidelines and protocols to mitigate potential hazards. Government bodies, on the other hand, oversee regulatory compliance, implement safety standards, and invest in infrastructure development to support river transportation operations. In Cilacap Regency, enhancing the safety and sustainability of river transportation necessitates collaborative efforts among stakeholders, including government agencies, ship operators, and local communities. Investments in infrastructure upgrades, such as navigational aids and waterway maintenance, are crucial for enhancing navigational safety and reducing transportation risks. Additionally, capacity-building initiatives aimed at enhancing the skills and knowledge of ship captains and crew members can further enhance the safety and efficiency of river transportation operations.

Training programmes focusing on navigation techniques, emergency response procedures, and environmental stewardship can empower personnel to handle various challenges effectively. In addition to safety considerations, efforts to promote the sustainability of river transportation should also encompass environmental conservation measures. Minimising the environmental impact of vessel operations, such as reducing emissions and preventing pollution, is vital for preserving the ecological integrity of river ecosystems. Furthermore, promoting social inclusivity within the river transportation sector is essential for ensuring equitable access to transportation services and opportunities for local communities.

Initiatives to improve infrastructure accessibility, such as constructing accessible piers and terminals, can enhance the mobility of residents living along riverbanks and promote economic development in remote areas. River transportation plays a crucial role in facilitating economic development and social connectivity within Cilacap Regency. However, ensuring the safety, sustainability, and inclusivity of river transportation operations requires concerted efforts from stakeholders. By investing in infrastructure upgrades, capacity-building initiatives, and environmental conservation measures, Cilacap Regency can harness the full potential of river transportation as a viable mode of inland transportation while safeguarding the well-being of local communities and preserving natural resources.

Ensuring the safety of passengers and river traffic is paramount in the realm of shipping, necessitating a harmonious blend of shipping safety protocols and human resources equipped with a strong safety ethos. The significance of safety awareness among human resources in the shipping sector cannot be overstated, as underscored by Elfita Agustini et al. (2024). However, in Cilacap Regency, the integrity of river signs has been compromised, posing a threat to the safety of water transportation on the Segara River. Furthermore, accidents on waterways are exacerbated by a dearth of knowledge among shipping personnel and lax oversight from relevant authorities, contributing to a heightened risk of ship accidents, as noted by Chairul Insani Ilham et al. (2020).

Between 2013 and 2021, the Segara Anakan River witnessed three boat accidents, attributable to the inadequate understanding of river signs among operators and insufficient governmental efforts to promote the importance of river signage. These incidents underscore the pivotal role of human negligence in compromising safety standards. Indeed, human negligence remains a significant contributing factor to accidents on rivers, as highlighted by Surnata et al. (2022). To address these challenges and enhance safety in river transportation, several key strategies can be implemented. Firstly, there is a critical need for comprehensive safety training programs targeting ship operators and other stakeholders in the shipping industry. These programs should focus on enhancing safety awareness, improving understanding of river signs, and promoting best practices for safe navigation. Additionally, regular safety inspections and audits should be conducted to ensure compliance with safety regulations and identify potential hazards.

Furthermore, there is a need for increased collaboration and coordination among government agencies, shipping companies, and other relevant stakeholders to improve safety standards in river transportation. This includes the development of standardized safety protocols, the establishment of emergency response mechanisms, and the implementation of effective communication systems to enhance situational awareness and facilitate timely response to emergencies. Moreover, public awareness campaigns should be conducted to educate the general public about the importance of safety in river transportation and encourage responsible behavior among passengers and operators.

These campaigns can help create a culture of safety and accountability, reducing the risk of accidents and improving overall safety in river transportation. Ensuring safety in river transportation requires a multifaceted approach that addresses the underlying causes of accidents and promotes a culture of safety among all stakeholders. By implementing comprehensive safety training programs, improving oversight and regulation, and enhancing public awareness, Cilacap Regency can significantly enhance safety standards in river transportation and reduce the risk of accidents. The Segara Anakan River has many winding bends and there are fishermen's floating nets that are not visible so they become obstacles along the Soon Anakan River. Ship operators need to be careful when carrying ships to avoid ship accidents. All transportation users in the shipping sector must prioritize safety, security, punctuality and comfort so that ship accidents can be prevented as early as possible (Febriansyah, et al, 2020).

River transport signs were created in order to create safe and secure river transport traffic. In research conducted by SB Arianto and Dwi Heriwibowo, 2014, it was stated that river signs are very necessary in order to regulate ship operators passing through so that they comply with the provisions for carrying out shipping using a legal basis based on the Decree of the Director General of Land Transportation Number: HK.206/1 /20/DPRD/ 93 concerning Technical Guidelines for Signposts in Inland Waterways and Crossings. In this research, what differentiates it from previous research is the most recent basic legal reference regarding river signs, namely Perditjenhubdat Number: KP. 4755/AP005/DRJD /2020 Concerning Technical Guidelines for River and Lake Signs.

This research aims to determine the need for Segara Anakan river signs, Cilacap Regency, Central Java Province in order to improve the safety and order of ship traffic on the Segara Anakan River and to find out the technical specifications for river signs based on the implementation of the Director General of Land Transportation Regulation Number: KP.4755 / AP005 / DRJD / 2020 concerning Technical Guidelines for River and Lake Signs.

METHOD

Qualitative research methods are invaluable in exploring complex phenomena, particularly in contexts where the researcher's values, choice of paradigm, and contextual factors play a significant role in shaping the research outcomes. As noted by Romlah (2021), qualitative research allows for an in-depth exploration of the need for signs in the Segara Anakan River, Cilacap Regency, by considering various perspectives and contextual factors that influence the interpretation of data. This approach is particularly relevant in the context of river transportation safety, where the effectiveness of signage is influenced by a myriad of factors, including local customs, environmental conditions, and user behavior.

By employing qualitative analysis methods, researchers can capture the nuanced complexities of the need for signs in the Segara Anakan River. This involves collecting and analyzing data in its natural setting, without imposing preconceived notions or generalizations. Instead, qualitative analysis focuses on understanding the specific context and the unique factors that influence the need for signs in the river. One of the key strengths of qualitative analysis is its ability to provide rich, detailed insights into complex phenomena. By using methods such as interviews, observations, and document analysis, researchers can gather a wide range of data that reflects the diversity of perspectives and experiences related to the need for signs in the river. This approach allows researchers to explore the underlying reasons behind the need for signs, as well as the impact of contextual factors on their effectiveness.

Furthermore, qualitative analysis allows researchers to engage with the data in a flexible and iterative manner. Unlike quantitative research, which relies on predetermined variables and statistical analysis, qualitative analysis allows researchers to adapt their approach based on the emerging findings. This iterative process enables researchers to delve deeper into the data and explore unexpected avenues of inquiry, ultimately leading to a more comprehensive understanding of the research topic. In the context of the Segara Anakan River, qualitative analysis can shed light on the various factors that influence the need for signs, such as the prevalence of accidents, the behavior of river users, and the effectiveness of existing signage. By examining these factors in detail, researchers can provide valuable insights that can inform policy and practice aimed at improving river transportation safety.

Qualitative analysis is a valuable tool for exploring the need for signs in the Segara Anakan River, Cilacap Regency. By considering the diverse range of factors that influence the effectiveness of signage, qualitative analysis can provide rich, detailed insights that can inform efforts to improve river transportation safety. This research is guided by the Regulation of the Director General of Land Transportation Number: KP. 4755 / AP005 / DRJD / 2020. In accordance with this regulation, there are a number of river signs in

Indonesia. This regulation also regulates the technical specifications of river signs in Indonesia. In carrying out data collection in this research, it was carried out using a field observation survey, namely by directly observing and recording the condition and number of river signs on the Anakan Segara River, Cilacap Regency. The observation method is carried out by direct observation in the field using the five senses (Hasanah,H,2017). The equipment used is using GPS to find out and determine the position of river signs, cameras for documentation purposes and applicable regulations and legislation related to river signs.

RESULTS AND DISCUSSION

Results

Riverin Cilacap Regency has an important role in the smooth running of transportation activities. Cilacap Regency has two large rivers, namely the Segara Anakan River and the Bengawan Donan River, which have large river infrastructure and have great potential. The river has a very long and wide character. The ships used for river transportation in Cilacap are traditional types such as boats and jukung boats. Cilacap Regency has 15 piers consisting of 13 piers belonging to the Department of Transportation and 2 piers under the Ministry of Law and Human Rights: Sodong Pier and Wijayapura Pier.

The means of transportation for river transportation in Cilacap Regency, Central Java have different types and characteristics of ships, including: 1) Compreng Ship. Compreng Ship is one of the ships operating in Cilacap Regency, Central Java Province, especially the Seleko - Kampung Laut route which is widely used. by the community to carry out activities. Compreng ships are used to transport passengers, two-wheeled vehicles and various types of goods such as: basic necessities, sand, wood, etc. 2) Jukung Ships Jukung ships are ships used by people in Cilacap Regency, especially on the Kalipanas - Kutawaru route and the Prenca - Alas Malang route as a means of transporting passengers and goods to the surrounding areas and are also often used as boats for fishing.

Fig 1. River transportation in Cilacap

TransportationAdequate rivers have reached most of the Cilacap Regency area, making it possible for the movement of people and transportation of goods along river channels, especially for areas that cannot be reached by land transportation.

Currently, it is felt that the use of the Soon Anakan River channel is not optimal enough, so the Cilacap Regency government needs to maximize the role of river transportation so that shipping channels can be more orderly and safe to navigate. In Cilacap Regency there are 2 shipping channels, namely the Segara Anakan channel and the Bengawan Donan channel which are used by local communities to carry out daily activities, especially in areas where there is no land access. The following is a map of river transport shipping routes in Cilacap Regency.

Fig 2. Map of river channels in Cilacap

The following are the characteristics of river channels in Cilacap Regency, Central Java Province.

Table 1. River Channel Dimensions in Cilacap Regency

River Name	Length (miles)	In (m)
Segara Anakan River	17.8	2-8
Begawan Donan	8.1	4-9

Based on observations of the Segara Anakan river channel on the Seleko - Klaces route, it was found that 5 signs were still installed out of the 9 signs that had been installed by the Cilacap Regency Transportation Service. Following are the details of the signs:

a) Prohibition Sign
   There are 2 river signs with number 2 (no overtaking sign) and number 12 (no sailing to cause waves)
b) Warning sign
   There is 1 river sign with the number 12 (whirlpool).
c) Guidance/instruction signs
   There are 2 river signs with the number 37 (many bends)

The following is a picture of the condition of the river signs on the Segara Anakan River, Cilacap Regency.

Fig 3. River signs on the Segara Anakan River

The following is a recap of the existing condition of river signs on the Segara Anakan River, Cilacap Regency, Central Java Province.

Table 2. Segara Anakan River Sign Survey Data

Coordinate	Types of Signs	Sign Condition
07 º 41 ' 42 ” S 108 º 51 ' 31 ” E	Prohibition	Good
07 º 42 ' 41 ” S 108 º 55 ' 50 ” East	Instruction	Light Damage
07 º 42 ' 40 ” S 108 º 55 ' 43 ” East	Instruction	Good
07 º 42 ' 43 ” S 108 º 55 ' 52 ” E	Prohibition	Good
07 º 42 ' 43 ” S 108 º 59 ' 53 ” E	Warning	Good

Discussion

The condition of the existing signs for the Segara Anakan river is that only 5 types of signs remain from a total of 9 signs that have been installed, therefore it is necessary to add signs at several locations. Based on the survey results, there are still many locations where river signs should be installed, especially at data points where ship accidents occur. At several locations, river signs are really needed because the location is quite dangerous for navigation. The plan to fulfill river signs aims to maintain security, safety and smooth shipping traffic. Based on the analysis results in table 3, 25 river signs were produced along the Segara Anakan channel with the following details: (a) Prohibition signs 6 pieces; (b) Mandatory 3 signs; (c) 2 warning signs; and (d) 14 guidance signs.

The following is the need for signs on the Segara Anakan River:

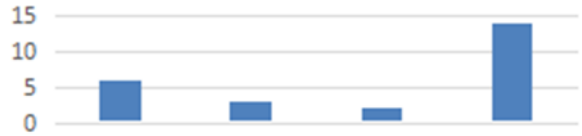

Fig 4. Need for Signs on the Segara Anakan River

Based on Figure 4, the need for signs on the Segara Anakan River is the highest, namely 14 guidance signs. In accordance with the characteristics of the Segara River, it is winding and has a pier which currently has no instructions. Detailed requirements for river signs on the Segara Anakan River can be seen in Table 3.

Table 3. Need for River Signs on the Segara Anakan River

Coordinate	Type of sign	Qty	Note
07 º 42 ' 21 " S, 108º 52 ' 15 " E	prohibition	1	mooring is prohibited " for 60 m
07 º 42 ' 49 " S, 108º 56 ' 03 " E	instruction	2	double bend
07 º 42 ' 41 " South Latitude and 108º 55 ' 50 " East Longitude, 07 º 42 ' 40 " South Latitude and 108º 55 ' 43" East Longitude	instruction	2	lots of turning
07 º 42 ' 44 " S, 108º 55 ' 51 " E	instruction	2	narrowing of the groove
07 º 43 ' 00 " South Latitude and 108º 57 ' 31 " East Longitude, 07 º 43 ' 14 " South Latitude and 108º 56 ' 24 " East Longitude	instruction	2	turn right
07 º 43 ' 12 " South Latitude and 108º 57 ' 56 " East Longitude, 07 º 43 ' 15 " South Latitude and 108º 56' 24 " East Longitude	instruction	2	turn left
07 º 42 ' 42 " S, 108º 55 ' 45 " E	prohibition	2	No passing
07 º 42 ' 32 " S, 108º 53 ' 05 " E	must	1	do not interfere with the main route
07 º 42 ' 28 " S, 108º 52 ' 21 " E	must	1	sail carefully
07 º 41 ' 27 " S, 108º 51 ' 01 " E	instruction	1	Directions : 2.5 km distance to Kampung Laut
installed at every pier	instruction	3	ship mooring place
07 º 42 ' 21 " S, 108º 52 ' 15 " E	must	1	maximum height of free space 5.5 m

installed at every pier	prohibition	3	prohibited from causing waves
07 º 43 ' 17 " S, 108 º 58 ' 40 " E	warning	2	there is a whirlpool

The following is a plan for placing river signs on the Segara Anakan River shipping channel

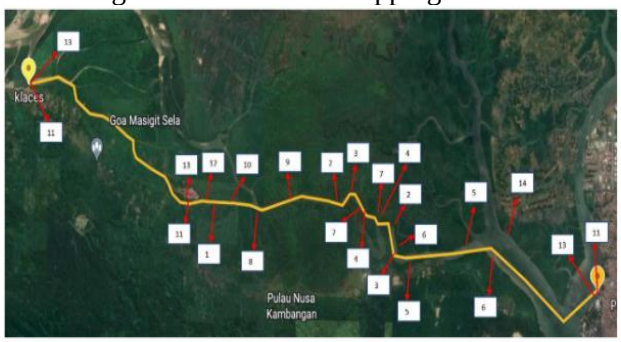

Fig 5. Sign Placement Plan

The priority for procurement and installation of signs is determined by the level of safety, order and smoothness of ship traffic in river waters. The procurement and installation priorities are related to passenger safety and security, ship safety, shipping order, and finally the smooth running of traffic. Specifications for River Sign Requirements. River and Lake Signs consist of Leaf Signs (made from aluminum composite material (ACP) with a thickness of 3.0 mm). Leaves Warning signs: Square in shape, measuring 100 cm x 100 cm, has a white base, red outline, and black writing with a thickness of 10 cm; Rectangular shape, measuring 100 cm x 140 cm, has a white base, red outline, and black writing with a thickness of 10 cm.

Leaves Prohibition signs: Rectangular shape, measuring 100 cm x 140 cm, has a white base and has diagonal lines and red borders 10 cm thick, for black instructions 60 cm high and writing 10 cm thick; Circular shape, 100 cm in diameter, has a white base color and diagonal lines and red edges with a line thickness of 10 cm. Command Sign Leaf: Rectangular shape, measuring 100 cm x 140 cm, has an inner circle diameter of 50 cm, has a white base, red outline, black writing with a height of 60 cm and a thickness of 10 cm. Rambu Leaf instructions: A square shape measuring 100 cm x 100 cm with a blue base color with white instructions. Rectangular shape with dimensions of 140 cm x 100 cm, blue base color with white instructions; and Signpost, in the form of a round pipe with a diameter of 6 inches, a thickness of 4.5 mm according to SNI standards with galvanized steel pipe material). Types of sign pole construction consist of (1) Single poles are used for all river signs, and (2) The letter F pole is used for kilometer stakes.

CONCLUSION

The current river signs on the Segara Anakan River are still not appropriate to the needs in the field, thus affecting safety. The number of river signs required is 25 river signs. Signs required include:There are 6 prohibitive signs, 3 mandatory signs, 2 warning signs and 14 guidance signs

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