



Analysis of Ship Operational Costs (SOC) in Determining Passenger Tariffs for River Transport on The Batang Serai-Sundari Route, Deli Serdang Regency, North Sumatra Province

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Abstract. River transportation (Getek) is a mode of transportation that connects Batang Serai with Sundari. The problem often faced by users of river transportation services (getek) is the large fees paid for traveling. In connection with this problem, it is necessary to conduct research regarding river transportation rates based on vehicle operating costs (BOK), ability to pay and willingness to pay. BOK in this research will be calculated based on the Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 61 of 2021.

Based on the results of the analysis and discussion regarding the suitability of river transportation tariffs, the current tariff for the Batang Serai - Sundari route is IDR 13,000 and is still in accordance with the tariff calculation based on current Ship Operational Costs of IDR. 13,367 per passenger per trip for Class I ships (Anugerah Sakti Ship), Rp. 12,030 per passenger per trip for Class II ships (Indra Jaya Ships), and Rp. 15,037 per passenger per trip for Class III ships (Kurmia Ships). The Ability to Pay value of IDR 13,000 is in accordance with the applicable tariff, which means that the majority of passengers have the ability to pay the tariff. Meanwhile, the value of willingness to pay is IDR. 12,381 This condition shows that the ability to pay is greater than the willingness to pay.

Keywords: River Transportation, Tariffs, Ship Operational Costs, Ability To Pay, Willingness To Pay

1. Introduction

Batang Serai Pier is a pier that serves the Batang Serai-Sundari route. This route can be reached using river transportation in the form of getek with a distance of 7 km and a travel time of 45 minutes. Based on the results of field surveys, it is known that the current fare for the Batang Serai-Sundari route is Rp. 13,000/pnp for adults and children. This tariff is set without reference to special regulations and a clear legal basis for setting tariffs.

Based on the Decree of the Governor of North Sumatra Number 188.44/977/KPTS/2022 concerning Cross-Regency/City Transport Tariffs in North

Sumatra Province, the rates for river transport on the Batang Serai-Sundari route have not been included. In the rates stipulated in the attachment to the Decree of the Governor of North Sumatra Number 188.44/977/KPTS/2022 concerning Inter-Regency/City Ferry Transport Tariffs in North Sumatra Province. So this condition becomes the background for carrying out further analysis regarding river transportation rates based on Ship Operational Costs (BOK), Ability to Pay (ATP) and Willingness to Pay (WTP). To find out the appropriate rates for river transportation passengers on the Batang Serai-Sundari route, see Appendix I to Regulation of the Minister of Transportation of the Republic of Indonesia Number 61 of 2021 concerning the Implementation of River and Lake Transportation.

2. Research Methodology

The method used in this research is a quantitative research method. This research method uses quantitative methods because the data to be processed is ratio data. The focus of this research is to determine the magnitude of the influence between the variables studied. Quantitative research is the use of data obtained from the internet, literature, journals and field observations with statistical procedures or other quantification (measurement) methods based on the Regulation of the Minister of Transportation of the Republic of Indonesia Number 61 of 2021 concerning the Implementation of River and Lake Transport and then analyzed for use. Analysis.

Research instruments are tools that will be used to collect data, research instruments can be in the form of questionnaires, observation forms, other forms related to data recording and so on. In this research, the instruments that will be used are passenger productivity survey forms at Batang Serai Pier, Ship Operational Cost (BOK) surveys, ATP and WTP surveys.

3. Analysis and Discussion

3.1 Data Presentation

The data presented in this research is passenger productivity survey data for 30 days. This data is used to determine the load factor by looking at the number of passengers for 30 days using river transportation. Calculate fares based on Ability To Pay (ATP) and Willingness To Pay (WTP) from passenger survey results. The amount of Ship Operational Costs (BOK) will be calculated using the formula contained in Appendix I of the Regulation of the Minister of Transportation of the Republic of Indonesia Number 61 of 2021 concerning the Implementation of River

and Lake Transportation.

3.2 Data Analysis

As can be seen from the conditions in the field, the author found problems with the applicable tariffs, the author tried to analyze these problems so that conclusions could be drawn which could later be used as solutions in resolving these problems, for this reason the author used references based on Regulation of the Minister of Transportation of the Republic of Indonesia Number 61 of 2021 regarding the Implementation of River and Lake Transportation as a reference in resolving problems.

3.3 Discussion

Analysis of Load Factor Data for May 2023 on River Transport on the Batang Serai-Sundari Route

Load factors The departure and arrival of ship passengers can be calculated as follows.

$$\frac{KP}{KT} \times 100\%$$

It is known that the load factor for departure passengers on traditional ships is 37.225% and the load factor for arrival passengers is 36.645%, so the average load factor is 36.93%.

The current analysis of river transport tariffs for the Batang Serai-Sundari route is reviewed based on the passenger's ability to pay (Ability To Pay) and the passenger's willingness to pay (Willingness To Pay).

For Average ATP (Ability To Pay) Across Job Categories:

$$\frac{\text{Alokasi rata-rata biaya transportasi}}{\text{Frekuensi penggunaan transportasi}} = \frac{\text{Rp.13.000} + \text{Rp.13.000} + \text{Rp.13.000} + \text{Rp.13.000} + \text{Rp.13.000} + \text{Rp.13.000}}{6}$$

= Rp. 13,000,-/person

Respondents' ATP (Ability To Pay) per month from all jobs is the same, namely Rp. 13,000,-

For Average WTP (Willingness To Pay) for All Job Categories:

$$\frac{\sum(\text{tarif yang dipilih} \times \text{jumlah responden})}{\text{Jumlah responden untuk setiap jenis pekerjaan}} = \frac{\text{Rp.12.913,04} + \text{Rp.12.578,95} + \text{Rp.11.918,03} + \text{Rp.11.785,71} + \text{Rp.12.428,57} + \text{Rp.12.625,00}}{6}$$

= Rp. 12,374.88

From the explanation above, it can be seen that the respondent's willingness to

pay WTP (Willingness To Pay) is high, the average tariff expected or in accordance with passengers' willingness to pay for river transportation services which are predominantly paid is Rp. 13,000,- this shows that most passengers are able to pay according to the applicable tariff.

Calculation of Ship Operational Costs (BOK) for river transportation for the Batang Serai-Sundari route based on attachment I to Regulation of the Minister of Transportation of the Republic of Indonesia Number 61 of 2021 concerning the Implementation of River and Lake Transportation.

The annual fixed cost calculation analysis is the average annual total of Ship Crew Salary Costs, Ship Crew Health/Welfare Costs, Ship Crew Food Costs, Ship Crew Work Equipment Costs, Land Employee Salary Costs, Land Employee Food Costs, Land Employee Work Equipment Costs. , Daily Ship Maintenance Costs, Ship Insurance Costs, total fixed costs per year are Rp. 149,645,-/hour.

The annual variable cost calculation analysis is the total annual average cost of fuel oil (BBM), lubricant costs, dock service costs, and clean water costs for passengers. Total annual variable costs are Rp. 10,755,-/hour. So the total Ship Operational Cost (BOK) is Rp. 160,400,-/hour.

Analysis of Tariff Amount Based on Ship Operational Costs (BOK)

Based on the analysis, the rates are as follows.

Table 1 The rate is based on the calculation of ship operational costs (BOK).

Ship name	G T	Tariff with 100% Load Factor (Rupiah)		Tariff with Load Factor 36.93% (Rupiah)	
		/Passengers /Km	/Passenger/ Trip	/Passengers /Km	Passenger/ Trip
Magical Gift	5	781,-	5,468,-	1,909,-	13,366,-
Indra Jaya	6	687,-	4,812,-	1,719,-	12,030,-
Kurnia	7	818,-	5,729,-	2,148,-	15,037,-

Comparative Analysis of Current Tariffs with Rates Resulting from Calculation of Ship Operational Costs with Existing Load Factors Based on Minister of Transportation Regulation Number 61 of the Year Concerning the Implementation of River and Lake Transport.

Table 2 Comparative Analysis of Current Tariffs with Tariffs from Existing Load Factor Calculation Results Based on Minister of Transportation Regulation Number PM 61 of 2021

Ship name	GT	Applicable Tariff (Rupiah)	Tariff with Load Factor 36.93% (Rupiah)	Difference	
				Rupiah	%
Magical Gift	5	13,000	13,366	366	2,815
Indra Jaya	6	13,000	12,030	-970	- 7,461
Kurnia	7	13,000	15,037	2,037	15,66 9
Average					3,674

4. Conclusion

River transportation on the Batang Serai-Sundari route which was used as the population in this study was sampled using Cluster Sampling based on the ship's GT grouping, has a different load factor based on passenger productivity from 2 May 2023 to 31 May 2023, the average ship load factor -average passengers at departure were 37.225% and 36.645% at arrival. So an average load factor of 36.93% is obtained. The fare amount is based on the passenger's ability to pay (Ability To Pay), which is IDR. 13,000 while the passenger's willingness to pay (Willingness To Pay) is Rp. 12,381.27. The tariff obtained based on the calculation of Ship Operational Costs in Appendix I of the Regulation of the Minister of Transportation of the Republic of Indonesia Number 61 concerning the Implementation of River, Lake and Ferry Transport (2021) is IDR.13,366per passenger per trip for the shipberGT 5 (Sakti Gift Ship), Rp.12,030per passenger per trip for the shipberGT 6 (Indra Jaya Ship)and Rp.15,037per passenger per trip for the shipberGT 7 (Kurnia Ship).

Tariffs based on BOK calculations are higher by IDR. 366,- per passenger per trip for shipsberGT 5 (Sakti Gift Ship), lower Rp. 970,- per passenger per trip for shipsberGT 6 (Indra Jaya Ship)and higher Rp. 2,037,- per passenger per trip for shipsberGT 7 (Kurnia Ship)of the applicable tariff, which is Rp. 13,000,- per trip per passenger. There was an increase in the rate of 3.674% due to the difference in the rate based on Ship Operational Costs (BOK) from existing conditions to the current rates. This shows that there is no conformity between the applicable tariff and the tariff based on the calculation of Ship Operational Costs (BOK).

Supervision and evaluation were carried out on the calculation of passenger fares per trip on the Batang Serai-Sundari route in accordance with the calculation formulation based on Ship Operational Costs (BOK) in Appendix I of the Regulation of the Minister of Transportation of the Republic of Indonesia Number 61 concerning the Implementation of River, Lake and Ferry Transport (2021). In

determining the tariff for river transportation for the Batang Serai-Sundari route, it is necessary to adjust it to the conditions of service users in terms of the ability to pay passengers (Ability To Pay) and the willingness to pay passengers (Willingness To Pay). The tariff can be increased by improving the level of river transportation services to be better without exceeding the ATP (Ability To Pay) value. Recommends the drafting of a Decree addressed to the relevant authorities so that they can establish a regulation regarding the determination of passenger transport rates, especially River Transport on the Batang Serai-Sundari route. Service users must understand that there are changes in tariffs, due to an increase in Ship Operational Costs (BOK) which can impact on an increase in transportation rates.

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