

# Fleet Management of The Travel Boat Sopek Type in Semarang

*by* Sunarso Sugeng

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## Fleet Management of the Travel Boat “Sopek Type” in Semarang

Sunarso Sugeng<sup>1,\*</sup>, Sahala Hutabarat<sup>2</sup>, Muhammad Zainuri<sup>2</sup>, and Daniel M. Rosyid<sup>3</sup>

<sup>1</sup>School of Vocational, Diponegoro University, Semarang Central Java, Indonesia

<sup>2</sup>Faculty of Fisheries and Marine Science, Diponegoro University, Semarang Central Java, Indonesia

<sup>3</sup>Ship Engineering Faculty Institute of Technology 10 November, Surabaya, East Java, Indonesia

Fleet Management of The Travel Boat “Sopek Type” in Semarang is influenced by conditions of topography, Demographics, and Hydro-oceanography of Semarang coastal. The travel boat development is focused on the traditional boat-Sopek types to improve its capacity and function into a representative travel boat. The design modification of travel boat-Sopek is adjusted to the interest of tourists while enjoying a panoramic view of the beach (travel boat design models-Leisure) and traveling to apply the hobby of fishing in the sea (travel boat design models-Fishing). Technical and economic studies about the existence of the travel boat have passed worth sailing and business feasibility. The worth sailing was carried out by seakeeping test. The business feasibility was shown by the value of Benefit-Cost Ratio. Availability was demonstrated by the calculation of the amount of optimization of the travel boat needs which is based on the number of tourist demand. Furthermore, increase in the number of tourist arrivals is indicated by the multiple linear regression statistical models.

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### 6 INTRODUCTION

Semarang city is the capital of Central Java Province, Indonesia. Semarang region owns the form of exotic topography of mountains and coastal areas which are often referred to The Upper Semarang and The Lower Semarang. Such conditions are highly conducive to the development of tourism, including marine tourism. Part of Semarang serves as coastal area, located at the coordinates 6° 50' 46" and 7° 10' 47" South Latitude and 109° 50' 19" and 110° 35' 06" East Longitude.

The number of residents in the Coastal District as a whole is as many as 458,537 inhabitants in 2012, consisting of 188,316 men and 232,071 women, with an area of 9,393.79 ha. Semarang city owns a tropical climate with two kinds of seasons, dry and rainy seasons and has alternating cycle for about six months. According to data from the The Meteorology and Geophysics Agency, generally from June to November is the dry season. The climate affects the marine tourism activities in Semarang City Beach (Semarang in Figures 2012).

## 2. MATERIALS AND METHODS

### 2.1. Study Sites

The Government of Semarang City in The Coastal Spatial Management policies has established strategic area development

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\*Author to whom correspondence should be addressed.

Waterfront City, namely the areas which are potential to be developed as an integrated area by taking advantage of the beach as a location for development. The areas are the ones that have the coastal-oriented embryo of development and potential to be an integrated area supported by development of activities. These strategic areas are on the Marina Beach reclamation areas.

Waterfront City of The Marina Beach has been developed in accordance with The Semarang government programs, including a small port for anchoring-mooring of travel boat and yacht. The existence of this small port for anchoring-mooring of travel boat is an important infrastructure to develop marine tourism. The condition of this travel boats does not yet currently reflect a representative tourism transportation type.

### 2.2. The Number of Visitors and Categories

The marine tourism in the city of Semarang consisting of The Maron Beach, The Marina Beach, The Muara Kali Semarang is presented by the number of visitors at each tourism area. Feasibility of management of tourism area that are rated by the public/tourists was carried out through a questionnaire with 15 sub-variables of the 4 variables including: Attractions, Facilities/Infrastructure, Accessibility, Information/Promotions. The results of the rating are as follows.

Natural tourism, especially marine tourism, serve as one of the prospective tourism areas developed and attracts many tourists. Semarang coastal area is stretching along the coastline upto

25 miles. The beach area possesses beautiful and distinctive panorama and becomes a nautical tourism destination in the city of Semarang.

The coastal region includes (Space Plan of Semarang, 2011–2030):

1. Marina Coast Area; located in the District of North Semarang. The specificity of this region is a expanse of beach sand and sea waves. Marine tourism area at the Marina beach has been developed intensively by the local government in cooperation with the private sector/investors. This is indicated by the presence of an integrated management of the existence of these marine tourism area. Marine tourism attraction that develops in the tourist area is very diverse with the availability of accommodation/facilities supporting tourism adequately.
2. Maron Coast Area; located in the District of West Semarang. The beach is located to the east of the River Cilandak Estuaries and interacts directly with the military region and the Ahmad Yani international airport in the Village Tambakharjo. The development of this tourism area has not been carried out intensively. Activities running in this area are of non-governmental organizations.
3. West Banjir Kanal River area; normalization and structuring of West Banjir Kanal River lead to the potential development of the area to be a water tourism destination to the beach and sea water of Semarang.
4. Port of Tanjung Emas area (The Estuary of Semarang River); the existence of Tanjung Emas Port provides other benefits for the particular travelers, namely fishing along the port pool wave barrier that make marine transportation services grow in the form of fishing boats which change to passenger transportation type to serve the tourists.

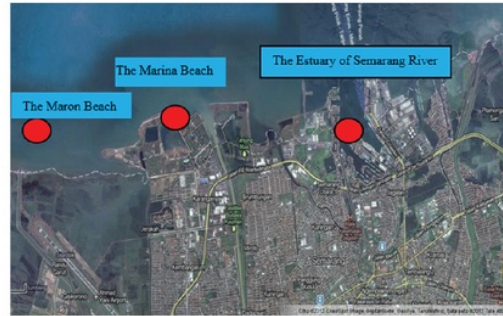


Fig. 1. Marine tourism area location in Semarang city from google map.

A boat design that is suitable for leisure and fishing activities is needed. Based on the results of the study of marine tourism in the Semarang City, the two types of tourism are the most attractive to tourists. Technically, travel boat has to meet criteria of safety, comfort and viability in the marine tourism. Based on the research about the needs of transportation type of marine tourism, models of design type for travel boat-Leisure and Fishing type of traditional types-Sopek boat has been developed. The design of Leisure travel boat has a capacity of 15 passengers and 5 boat crews and restoration facility, simple karaoke, bathroom and sufficient security of shipping facilities. While the travel boat-Fishing type owns a capacity of 10 passengers and 3 boat crews with restoration facilities, fishing tools, live bait and security of shipping facilities.

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### 3. RESULTS AND DISCUSSION

The number of tourist arrivals visiting the three tourism areas for the period of January 2015–December 2015 was 334,009 people. The pattern of multiple linear regression of the number of tourists arrivals for each of the tourism area investigated was as follows:

1. Maron Beach  $Y = 3647.068 + 74.820X_1 - 3.094X_2 + 4.237X_3 + 8.913X_4$
2. Marina Beach  $Y = 12561.432 + 68.170X_1 + 26.808X_2 + 17.054X_3 + 33.901X_4$
3. Muara K Semarang  $Y = 643.416 + 20.888X_1 + 6.663X_2 + 4.21X_3 + 9.950X_4$ .

Description:

Y = The number of visitors.

Independent variables applied to test multiple regression statistics, namely  $X_1$  (Attraction),  $X_2$  (Facilities),  $X_3$  (accessibility) and  $X_4$  (Information/Promotions). As a whole, the visit of marine tourism in the city of Semarang takes the pattern of multiple linear regression as follows:

$$Y = 1689.159 + 120.822X_1 + 36.706X_2 + 134.803X_3 + 53.101X_4$$

By the pattern of regression, there is a calculated  $t = 3.680$  with a significance of  $0.008 < 0.05$  in variable Attractions, this indication shows that the development of the Semarang marine tourism management should put emphasis on the addition of tourist attractions. According to our analysis, the most desirable attractions by tourists is Fishing and Culinary.

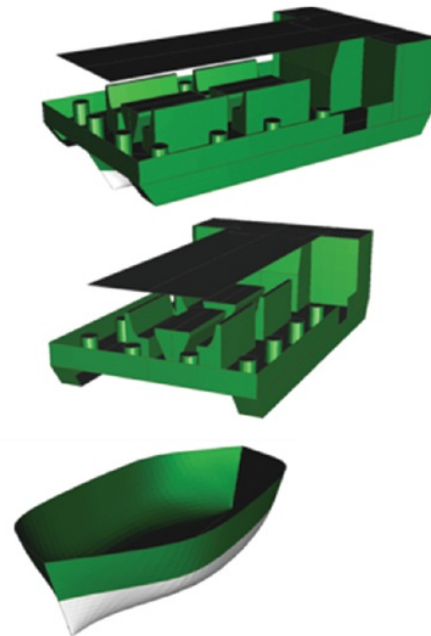


Fig. 2. Leisure boat.



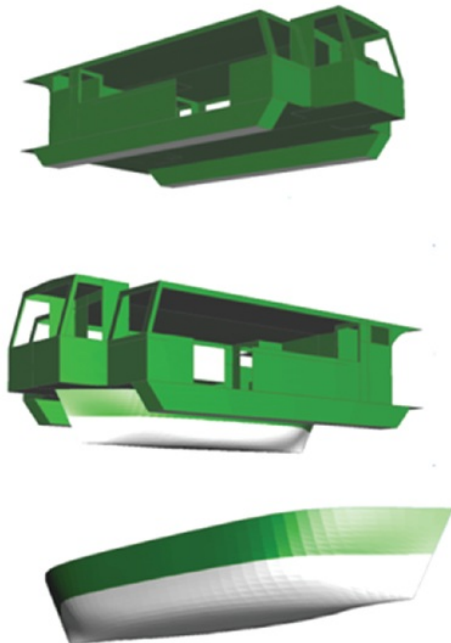


Fig. 3. Tourist fishing boat.

The technical review of the two design models has been carried out by applying the software DelftShip, seakeeping simulation results shows that the boat stability has met "Minimum Design Criteria Applicable to Ship," area under the curve of stability in

the area of  $0^\circ-30^\circ = 4.637 \text{ m}^2 \geq 3.151 \text{ m}^2$ ,  $0^\circ-40^\circ = 6.685 \text{ m}^2 \geq 5.157 \text{ m}^2$ ,  $30^\circ-40^\circ = 2.047 \text{ m}^2 \geq 1.179 \text{ m}^2$  have met the terms IMO,  $GZ \text{ max on slope } >27^\circ = 0.233 \text{ m} \geq 0.200 \text{ m}$  has met the terms IMO, thus the Sopek Boat design modifications to be a travel boat can be applied.

This travel boat design excellence lies on spacious main deck and knock down system of connection between the body and the main deck of the boat and the upper building, thus it is so easy to be repaired, the travel boat is also a multi-functional building when the main deck and the upper building are removed from the body of the boat, then the body of boat can be serving as a fishing boat again, while the deck can be used for tourist services within calm watery (rivers/lakes) by adding buoyancy and stabilizer (ballast). The main Dimensions of Sopek boat  $LOA \times H \times B \times T \times Cb = 7.45 \text{ m} \times 2.6 \text{ m} \times 1.0 \text{ m} \times 0.5 \text{ m} \times 0.68$ , while the size of the main deck of the modified design is  $L \times B = 9 \text{ m} \times 4.6 \text{ m}$ . Figures 3.1–3.5 the following is a General Plan of travel boat-Fishing types.

#### 4. ANALYS OF STATISTIC

Business feasibility Comparison between the Sopek boat that has been developed into a travel boat and the Sopek boat used to catch crabs, was analyzed by: Gain and Loss Calculation, Benefit Cost Ratio, Break Even Point and Pay Back Period.

The results of the sopek-boat-based feasibility calculations summarized and can be explained that, the three types of businesses by using Sopek boat has a value indicator B/C ratio above 1, even business of catching crab has value indicator B/C ratio of 2.46. This phenomenon indicates that the three sopek-boat-based business is very feasible. Based on the Profit and Loss analysis, business of The Travel Boat-Leisure and the Sopek boat used to catch crabs provides similar profit in the range of Rp 22,000,000.00 per year. By applying the Pay Back Period analysis, the total investment amounting to Rp 60,000,000.00 for Travel Boat-Leisure, the Pay Back Period is 2 years and 4 months. While The Sopek boat used to catch crabs with the total investment amounting to Rp 28,000,000.00, The Pay Back period was 1 year 11 months, and 19 days or nearly 2 years.

Conclusions of economic studies, feasibility of catching crab business with Sopek boat still takes the top ranking compared to that of The Travel Boat. However, characteristic of the two business is different, The Travel Boat business depends on the number of tourists who need tourism services, while the number of tourist' visits can be augmented by management engineering, in term of this study, its independent variables are Infrastructure of Marine Tourism, Accessibility of tourist attraction, the number and variety of attractions offered as well as Information and Promotion through printing and electronic media. The crab catching business highly depends on watery resources and climate in fishing watery and an adequate number of fishing gear, for the rest, the fishermen just rely on good fortune alone.

The results of queue computational simulations of 1–5 Leisure travel boat to get the optimum amount based on the total minimum cost is as follows.

Simulation results show that the optimum number of boats based on the minimum total cost is 2 boats. Meanwhile, to anticipate the availability that services are not disrupted because of the tourist peak season and maintenance server, 3 boats should be provided. Simulation of the number calculation of travel

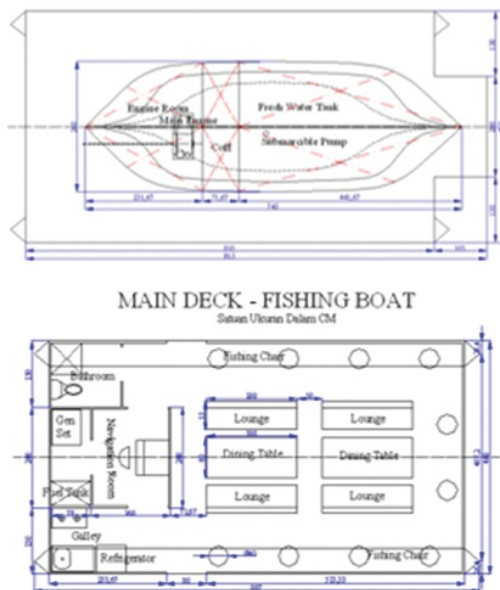


Fig. 4. 1 top view.

boats-Fishing. Simulation of queue to obtain the optimum number of boats based on the minimum total cost is as follows.

Simulation results show that the number of optimum servers (boat) is 2 boats. This condition applies to condition where normal tourist arrival is 7 people/hour, while field conditions show that tourist arrivals rate is almost the same at the same time of between 6 p.m to 8 p.m. This condition requires more servers to cater to tourists.

## 5. CONCLUSION

This study concludes that Sopek boat design development for marine tourism transportation model in the city of Semarang and for crab fishing business is economically feasible to run because it has almost the same profitability rate at the range of Rp 22,000,000.00/year.

The number of travel boats that must be provided to meet the marine tourism demand today is 2 travel boats-Leisure and 2 travel boats-Fishing. To anticipate the peak season and maintenance, 2 reserve boats are required for each type, bringing the total need of the travel boat of 8 units.

Development the fleet management of travel boat for Sopek kind is directed at improving tourist arrivals influenced by: Accessibility, Infrastructures, Attractions, Promotions and Information of tourism sights.

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