Study of Location Selection of Fish Landing Place in Pambangpesisir Village, Bantan Subdistrict, Bengkalis Regency Riau Province

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Abstract. The study was conducted for 6 months from April to October 2018. The survey was conducted on 4 and 5 May and 24 August 2018 in Pambangpesisir Village. The research aims to determine the most appropriate location of the three locations that are determined to be used as a place to build a Fish Landing Place. The results showed that the location II in the Dusun Kembar had better physical, technical, demography and infrastructure compared to the other two locations. Whereas location I in Dusun Permai and location III in Dusun Makmur have better fishery potential value than location II. But overall location II has a better value (249) than the location I (179) and location III (172). So that the best location to build a Fish Landing Place in Pambangpesisir Village is in location II which is located in the Dusun Kembar.

1. Introduction

Pambangpesisir is a fishing village located in the Bantan SubDistrict, Bengkalis Regency, Riau Province. The number of fishermen in the village is 248 people who generally operate the fishing gear kurau nets and mini longlines. In operating their fishing gear they use motorboats 2 GT to 5 GT [1].

Kurau and malong fish are the main target of fishermen catching in this village because these fish have high economic value with the main marketing objective being exported.

Kurau is exported in fresh fish to the aim of marketing the State of Singapore and Malong exported to Malaysia. The malong fish swimming bubbles are exported to Singapore. In addition to export destinations, the fish are also marketed for local consumption.

As an export commodity fish requires good quality which is largely determined by the handling of fish on the ship to the marketing process. The good handling of fish on a ship is largely determined by the ingredients of the sea supplies (ice) brought by fishermen to maintain...
the quality of fish. In the fish season, fishermen generally get a lot of catch while the amount of ice brought is not comparable to what is needed by fishermen because the ice producers in the village are only refrigerators in the stalls of the village with very limited production. So that only certain fishes are given special handling with ice while other fish are only placed in the hold of the ship with improper handling. This makes the price of fish to below because it has decreased quality.

Fishermen in the village of Pambangpesisir often experience obstacles in preparation for fishing. This is caused by the absence of a Fish Landing Place so that the fishing boat fishing activity supplies (fuel, ice, food, cigarettes, and water) are not from one place so that the fishermen suffer losses in terms of time and energy and costs

**Research Purpose**

The research aims to determine the best location for the construction of a Fish Landing Place in Pambangpesisir Village.

2. **Research Methods**

   • **Time and place**

      The study was conducted for 6 months from April to October 2018. Data were collected on 4 and 5 May 2018 and 24 August 2018 in Pambangpesisir Village

   • **Materials and Research Tools/equipment**

      The material used in this study was a questionnaire to collect data on fisheries facilities and activities contained in Pambangpesisir Village. The equipments used in this research are GPS, echosounder, stationery, camera, calculator and computer

   • **Research methods**

      The method used in this study is a survey method that aims to determine the best location of the three prospective locations as the construction place for a Fish Landing place.

   • **Data collection**

      Data collection was done through direct observation and interviews using questionnaires. Interviews were conducted to respondents consisting of village heads, UPTD Bantan Sub District staff, fishermen, traders, and the community.

      The data collected are technical data, fishery potential, demography and infrastructure in the village [2]. Technical data consist of geographic data (location and position of the prospective location), location topography, bathymetry, geology (sedimentation data) and oceanography (tides, currents, water depth, waves) and climatology (wind).

      Fisheries potential data collected are fishing units (ships, fishing gear and fishermen), fishing areas, production (types and quantities) and supporting infrastructure for fisheries
(transportation, electricity, telecommunications, clean water, roads, fuel, fishing halls, cooperatives, Public toilets, markets, and other facilities).

- **Data analysis**

  Data were analyzed descriptively by comparing data from three prospective locations using nonparametric statistics. Three location data are scored and weighted. According to [3] and [4] that the scores at each location studied were determined based on parameter comparison values at the three observation points according to location criteria. While the determination of weights is based on influential data in determining the location of Fish Landing Place. The best location determination is determined using the formula [5]:

  \[ \Sigma \text{value (N)} = \Sigma \text{weight (B) x Score (S)}; \]

  The largest number of values from the three prospective locations is determined as the best location. The research implementation can be seen in the diagram in Figure 1.

![Flow chart of research implementation](image-url)
3. The Result

1. General Conditions of Location

Geographically, Pambangpesisir Village is bordered by the Malacca Strait to the north and east. While in the west and south it is bordered by Pambangbaru Village, Bantan Sub District. This village has relatively flat land with a height of 7 m above sea level. The topsoil in this village is generally peatland.

2. Demographics

In 2018 the population in Pambangpesisir Village was 1407 people consisting of 701 men and 706 women. The number of productive population aged 15 to 54 years is 64.12%. The largest population education level is elementary school/equivalent and did not continue to further education, namely 805 people (71.68%). Most of the population lives around the center of the village.

3. Fisheries Facilities and Infrastructure

Fisheries facilities and infrastructure found in Pambangpesisir Village are SPBUN (Fuel Filling Station for Fishermen) in Kembar Village, a shipyard unit on Dusun Permai beach. Some stalls produce ice using a refrigerator or freezer with a small production capacity, one market unit, a fishing cooperative and 17 units of stalls selling basic foodstuffs and one special stall unit that sells refill drinking water.

4. Fisheries Conditions

The fishing gear operated by fishermen in Pambangpesisir Village is 45 units of mini longline and 33 units of gillnet. Mini longline fishermen use motorboats 2 GT and gillnet fishermen use motorboats 5 GT. The number of Pambangpesisir Village Fishermen is 248 people consisting of 124 mini longline fishermen and 124 gillnet fishermen. Although generally, they live around the village center (Dusun Kembar), their motorboats bases are in Dusun Permai and Dusun Makmur.

The fishing grounds in the Pambang Pesisir Village are located in the eastern and western waters of the Pambang Pesisir Village. The distance from the base to the waters of the eastern region is 1.5 hours, while to the waters of the western region around 1 hour. The furthest location the fishermen catch fish is about 10 miles from the village with a distance of 2 hours. The nearest location is 1 to 4 miles from the village and takes 10 minutes to 1 hour.

The production of fishermen's catches in the village of Pambangpesisir during the fishing season by gillnet ranges from 30 to 300 kg while during the offseason 0 to 75 kg in one fishing trip. Mini longline catches in the fish season range from 10 to 30 kg while during the offseason 0 to 5 kg in one fishing trip.
Fresh fish caught are sold to collectors called tauke and to retailers or the public. Fish sold to tauke will then be distributed to Bengkalis City or other local markets. Certain types and sizes of fish will be exported to Malaysia and Singapore.

5. Condition of Prospective Fish Landing Location

- **Bathymetry**

  The depth of the 2m waters was found at a distance of 200 m from the coast of Pambangpesisir Village. Bathymetric measurements show that at a distance of 200 m from the coast it has a depth of 2.2 m to 13.8 m. Bathymetry conditions in village waters are shown in the following figure.

![Bathymetry of the waters of the Pambangpesisir Village](image)

**Figure 2.** Bathymetry of the waters of the Pambangpesisir Village

- **Topography**

  The topographic measurements of the three prospective locations show that the location in Dusun Permai has land that is relatively tilted to the east. In certain parts, some areas are low
so that they are still submerged in seawater at low tide. This location has a height of between 0 and 4 meters above sea level (Figure 3)

Figure 3. Topography of prospective location I in Dusun Permai

Location 2 in the Dusun Kembar has relatively sloping land but is flatter than location 1 in Dusun Permai. This location has a height of between 1 and 9 meters above sea level. Most of these locations have land heights between 4 and 9 meters above sea level (figure 4).

Figure 4. Topography of location II in the Dusun Kembar

The topography of location 3 in Dusun Makmur has relatively sloping land but in certain parts, there are still low areas. This location has a height of mostly between 0 and 4 meters above sea level while the other part has a height of between 5 and 7 meters (Figure 5)
Figure 5. Topography of location III in Dusun Makmur

- **Tidal**
  
  Tides that occur in Desa Pambangpesisir are semi-diurnal tide types with two upper tide and two low tides a day. Highest tides and lowest tides occur in December. At lowest tide, the sea level is at a distance of approximately 200 m from the coast while at the highest tide most of the locations in Dusun Permai and Dusun Makmur are submerged by seawater. Whereas the location in the Dusun Kembar is not submerged by seawater.

- **Wind**
  
  The monsoon that occurs in Pambangpesisir Village is the east wind, west wind, north wind, and south wind. The strongest winds occur in December, which is the Northwind. At that time fishermen did not catch fish because it was too dangerous for their safety. In this season fishermen tether their motorboats in waters protected from waves in the Dusun Permai and Dusun Makmur. The waters are protected because there is breakwater. However, the breakwater also captures the sediment that accompanies wind and currents so that on the inside the breakwater that leads to land is filled with relatively many sediments. It is this sediment that forms the mainland location in Dusun Permai and Dusun Makmur. At that time wind speeds range from 50 to 60 knots.

6. **Selection of Fish Landing Place Location**

   The data obtained were entered into one assessment matrix by considering scores and weights at each location. These assessments are listed in the following table.
Table 1. Comparative Analysis of prospective Fish Landing Place Location

| No | Data                     | Initial Score | Weighting Factor | Final Score |
|----|--------------------------|---------------|------------------|-------------|
|    |                          | Loc. 1 | Loc. 2 | Loc. 3 | Loc. 1 | Loc. 2 | Loc. 3 |
|----|--------------------------|--------|--------|--------|--------|--------|--------|
| 1  | TECHNICAL PHYSICS        |        |        |        |        |        |        |
|    | a. Geography             |        |        |        |        |        |        |
|    |  1) Position             | 1.5    | 3      | 1.5    | 4      | 6      | 12     |
|    |  2) Location Boundary    | 1.5    | 3      | 1.5    | 4      | 6      | 12     |
|    | b. Topography            |        |        |        |        |        |        |
|    |  1) Beach Conditions     | 1.5    | 3      | 1.5    | 4      | 6      | 12     |
|    |  2) Land area            | 2      | 2      | 2      | 4      | 8      | 8      |
|    | c. Geology               |        |        |        |        |        |        |
|    |  1) Sedimentation        | 1.5    | 1.5    | 3      | 2      | 3      | 3      |
|    |  2) Freshwater Sources   | 1.5    | 3      | 1.5    | 4      | 6      | 12     |
|    | d. Oceanography and      |        |        |        |        |        |        |
|    |  1) Depth                | 2      | 2      | 2      | 2      | 4      | 4      |
|    |  2) Current              | 2      | 2      | 2      | 2      | 4      | 4      |
|    |  3) Wave                 | 2      | 2      | 2      | 2      | 4      | 4      |
|    |  4) Tide                 | 1.5    | 3      | 1.5    | 5      | 7.5    | 15     |
|    |  5) wind                 | 2      | 2      | 2      | 2      | 4      | 4      |
|    |                          |        |        |        |        |        |        |
|    | 58.5                     | 90     | 61.5   |        |        |        |        |
| 2  | FISHERIES POTENTIAL      |        |        |        |        |        |        |
|    | a. Fishing Unit          |        |        |        |        |        |        |
|    |  1) Motor boats          | 3      | 1      | 2      | 4      | 12     | 4      |
|    |  2) Fishing gear         | 3      | 1      | 2      | 3      | 9      | 3      |
|    |  3) Fishermen            | 3      | 1      | 2      | 4      | 12     | 4      |
|    | b. Fish Production       | 3      | 1      | 2      | 4      | 12     | 4      |
|    |                          |        |        |        |        |        |        |
|    |                          |        |        |        |        |        |        |
| 3  | DEMOGRAPHY               |        |        |        |        |        |        |
|    | a. Total population      | 1      | 3      | 2      | 2      | 2      | 6      |
|    | b. Total Productive Age  | 1      | 3      | 2      | 3      | 3      | 9      |
|    |                          |        |        |        |        |        |        |
| 4  | FACILITIES AND           |        |        |        |        |        |        |
|    | INFRASTRUCTURE           |        |        |        |        |        |        |
|    | a. Transportation        | 1      | 3      | 2      | 4      | 4      | 12     |
|    | b. Telecommunication     | 1      | 3      | 2      | 2      | 2      | 6      |
|    | c. State of the Road     | 1.5    | 3      | 1.5    | 5      | 7.5    | 15     |
|    | d. Shipyard              | 3      | 1.5    | 1.5    | 4      | 12     | 6      |
|    | e. Source of ice maker   | 1.5    | 3      | 1.5    | 4      | 6      | 12     |
|    | f. Electricity Source    | 1.5    | 3      | 1.5    | 5      | 7.5    | 15     |
|    | g. Fuel source           | 1.5    | 3      | 1.5    | 5      | 7.5    | 15     |
|    |                          |        |        |        |        |        |        |
The results of the analysis of the three locations show that physical, technical, demographic and infrastructure data show that the Dusun Kembar is superior to Dusun Permai and Dusun Makmur. The Dusun Kembar has a low value of fisheries potential data compared to the Dusun Permai and Dusun Makmur because at the moment most fishermen are based in both hamlets. Overall, the highest scores for Dusun Kembar were followed by Dusun Permai and Dusun Makmur. Thus the Dusun Kembar is the best place to build a Fish Landing Place in Pambangpesisir Village.

4. Conclusion

An assessment of the technical physical data, fishery potential, demographics, facilities and infrastructure detailed in 28 data shows that the Dusun Kembar is the best location to build a Fish Landing Place with a score of 249. While the other two locations namely Dusun Permai and Dusun Makmur get almost the value the same is 179 and 172.

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