Economic & Financial Feasibility Analysis of Tarakan Fishery Industrial Estate Masterplan

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Abstract. This study is an assessment towards financial feasibility of the planned development activities of the Fisheries Industry with a view to assess whether the Masterplan of Tarakan Fishery Industrial Estate is feasible to be developed in terms of economy and business. The method used for the feasibility assessment is conducted using the BCR (Benefit Cost Ratio), NPV (Net Present Value), and IRR (Internal Rate of Return). From the analysis result can be said that the industrial area planning is feasible economically and financially.

Keywords: industrial area master plan, financial feasibility and economic feasibility

1. Introduction

In the perfection of development activities or infrastructure development, there should be in-depth assessment of the various aspects of both the physical aspects (land carrying capacity, construction types and architectural to be developed), spatial aspects, environmental aspects and economic aspects, so that the activities would not suffer from losses when it established and have a positive impact on the surrounding environment (for the natural environment, social environment and economic environment). All these aspects are prerequisites that must be known as a whole, before the development activity is starting. Tarakan City Government plans the development of Fishery Industry Estate in order to improve economic and business aspects. There are many variables that influence entrepreneurs to be interested in utilizing a facility or infrastructure [1], including in this area of this fishery industry.

The assessment of the financial feasibility upon the development plan of the fisheries industry has an aim to assess whether the activity is feasible to be developed in terms of economy and business. Basically in assessing the financial feasibility it is essential to see the comparison of the value of benefits and value of costs incurred. According to that, the standard procedure of feasibility assessment is performed using the BCR (Benefit Cost Ratio), NPV (Net Present Value), and IRR (Internal Rate of Return) [2].
2. Research Methods

The type of research used is descriptive research with quantitative approach. The calculation of feasibility, both economically and financially, is done by applying several methods such as: Benefit Cost Ratio (BCR) method, Net Present Value (NPV) method and Internal Rate of Return (IRR) Method. The implementation of descriptive research methods is not limited to the collection and compilation of data, but includes analysis and interpretation of the data [3].

The research procedure undertaken to estimate financial feasibility is by estimating the development or investment costs from the Masterplan of the Tarakan City Fisheries Industrial Estate, and then estimating the operational costs based on standard, regulations, and prior researches. After that, the revenue from existing infrastructure is estimated. Finally, after the three components of these estimates are obtained, the cash flow will be calculated [4]. To estimate the economic feasibility, the PDRB (Gross Regional Domestic Product) data of Tarakan City is used to estimate the projections of the Gross Regional Domestic Product with the scenario of the Fishery Industry Area is being built or not being built. The difference between the two Gross Regional Domestic Product scenarios will then be calculated of its cash flow using Benefit Cost Ratio (BCR) method, Net Present Value (NPV) method and Internal Rate of Return (IRR) Method.

3. Result and discussion: Financial Analysis

3.1. Cost Analysis

Charges imposed on industrial estates are regulated in Government Regulation No. 15 of 2016 on Tariffs on Non-Tax Revenues applicable. Therefore the industrial estate could not determine its own tariffs that will be applied in terms of land renting, room renting (concession), and installation of billboards. In order to adjust to inflation, it is assumed that the tariffs will increase the inflation in the coming years.

3.2. Investment Forecast

The investment to be reviewed here is the investment that will be implemented. For the development phase I and phase II. The investment cost is used for land preparation, road infrastructure development, port, office, operational building, and others based on the Masterplan of Tarakan Fishery Industrial Estate.

| Phase | Investment Cost   |
|-------|-------------------|
| I     | 33,127,620,000.00 |
| II    | 70,782,570,000.00 |
| Total | 103,910,190,000.00 |

3.3. Revenue Forecast

The cash flow of the Tarakan Fishery Industrial Estate consists of income or revenues and expenditure. Revenues of Tarakan Fishery Industrial Estate is obtained as follows:

**Land lease.** According to the Tarakan City Regulation No. 02/2012, the tariff of private land use by the private sector is Rp.750.00 per day/m², assumed in the year of operation will increase to Rp.1,000.00 per day / m² and increase 7.5% annually. **Hygiene levies.** The calculation of revenues from this levy refers to the Regulation of Tarakan City, Regulation No. 02 of 2015 on the Amendment of Tarakan City Local Regulation No. 01 of 2012 on Public Service Levies, where the waste service/hygiene levy for medium industry is Rp.200,000,00 per month. It is assumed that the number
of industries in phase I is 11 industrial units (10.5 ha) and in phase II increased to 35 industrial units (35 ha). **Mooring and landing services.** In accordance with Government Regulation No. 75 of 2015, mooring and landing services at fishing ports for ships with size > 15GT to 20GT are Rp.2,500,00- per vessel per *etmal* and are assumed to require a duration of about 2 hours each fleet for fishing landing. This rate is assumed to increase 7.5% per year **Ice procurement services.** Revenue from ice procurement services also refers to Government Regulation No. 75 of 2015, which is Rp. 150.00 per kg and is assumed to increase 7.5% per year. The ice requirement is assumed to average 220 kg ices per 1 ton of fish [5]. **Water supply services.** Revenues from water services refer to Government Regulation No. 75 of 2015 on the types and tariffs of Non-Tax State Revenues Applicable to the Ministry of Marine Affairs and Fisheries, which is to obtain Rp.60.00 per liter of clean water use for the fishery industry and it is assumed to increase by 7.5% annually. The need for clean water refers to the average benchmark of clean water needs of processing industry in Government Regulation is 1.5 liters per 1 kg of raw material of fish. **Building rental service.** The number of leased buildings in phase I is planned to be 11 units within the first 5 years, 16 units within the second 5 years, adding up to 23 units within the first 5 years in phase II and 30 units within the second 5 years in phase II. The rental cost of the building is Rp 10,000,000 per unit per year and increases 7.5% annually. **Electricity supply services.** Electricity requirement of industrial area refers to Regulation of the Minister of Industry Number 35/M-IND/Per/2010 concerning Technical Guidance of Industrial Estate, where electricity requirement is 0.15-0.2 MVA/Ha. The advantages or benefits of this service refer to Government Regulation No. 75 of 2015 on the types and tariffs of non-tax state revenues applicable to the Ministry of Marine Affairs and Fisheries, where there is an additional cost of 10% which becomes the benefit of each KWH electricity paid to PLN (National Electricity Company).

### 3.4 Analysis of Expenditure Forecasts

The expenditure resources of Tarakan Fishery Industrial Estate are formed from accumulated personnel expenditures, operating costs, maintenance costs (light repair), operational costs (water and electricity) and other costs. The basis of this estimate of operational and non-operating expenses refers to Government Regulation No. 75 of 2015 on the types and tariffs of Non-Tax State Revenues Applicable to the Ministry of Marine Affairs and Fisheries. Operational costs are expected to increase by 5% per year.

**Employee salary.** Including salary/ wages, benefits and training costs. The observation shows that this cost is proportional to the amount of non-commercial operational building in the industrial estate, and the number of employees refers to the Regulation of the Minister of Industry No. 35/M-IND/Per/2010 on Industrial Area Technical Guidance of 90 - 110 workers/Ha. **Maintenance costs.** Includes the maintenance of all assets including land, piers, buildings, and equipment, including hygiene. This cost is proportional to the asset value, initially estimated to be 0.5% of the asset value and increase 2.5% annually. **Operating costs in the form of electricity and water bills.** This fee refers to the Regulation of the Minister of Industry No. 35/M-IND/Per/2010 concerning the Technical Guidelines of Industrial Zones, where the electricity requirement is 0.15-0.2 MVA/Ha and water 0.55-0.75 liter/Ha. The electricity tariff within the year of operation is assumed to be Rp.12,550 per KWH and water Rp.12,500.00- per m$^3$, or Rp.12,50,00- per liter. This cost group is assumed to increase at a rate of 5% per year. **Other costs.** Other costs are cost components, both operational and non-operational costs outside the previously described components, and assumed at 3% of the total cost incurred. Financial analysis is done by calculating the value of NPV, BC Ratio and FIRR. This calculation is performed using the interest rate or discount rate of 11.50%. The table of the present values for each year and the results of financial analysis are presented as in table 2.
| Year | Investment Cost | Benefit | Net flow | Discount rate | NPV | Cumulative flow |
|------|-----------------|---------|----------|--------------|-----|----------------|
| 2018 | 0               | 835,429,587 | 56,883,57 | 0,00000       | -33,127,620,000 | -33,127,620,000 |
| 2019 | 1               | 855,542,900 | 649,472,381 | 0,08436       | 503,012,502  | 503,012,502 |
| 2020 | 2               | 876,983,368 | 740,001,205 | 0,12140       | 553,857,602  | 553,857,602 |
| 2021 | 3               | 899,855,683 | 833,986,181 | 0,16699       | 604,238,276  | 604,238,276 |
| 2022 | 4               | 924,286,113 | 1,016,513,135 | 0,21026       | 655,635,971  | 655,635,971 |
| 2023 | 5               | 954,782,775 | 1,134,364,387 | 0,25550       | 705,412,326  | 705,412,326 |
| 2024 | 6               | 982,586,432 | 1,267,015,727 | 0,30198       | 754,198,658  | 754,198,658 |
| 2025 | 7               | 1,012,308,982 | 1,410,593,090 | 0,34936       | 801,977,994  | 801,977,994 |
| 2026 | 8               | 1,044,080,187 | 1,560,963,476 | 0,40047       | 849,567,606  | 849,567,606 |
| 2027 | 9               | 1,078,048,484 | 1,718,386,357 | 0,45418       | 890,112,182  | 890,112,182 |
| 2028 | 10              | 1,113,259,533 | 1,883,655,454 | 0,51068       | 928,619,738  | 928,619,738 |
| 2029 | 11              | 1,150,725,132 | 2,058,990,728 | 0,56769       | 966,059,301  | 966,059,301 |
| 2030 | 12              | 1,189,776,799 | 2,244,240,877 | 0,62713       | 998,460,079  | 998,460,079 |
| 2031 | 13              | 1,231,393,043 | 2,436,420,352 | 0,69001       | 1,025,924,929 | 1,025,924,929 |
| 2032 | 14              | 1,275,543,984 | 2,635,692,028 | 0,75549       | 1,057,449,958 | 1,057,449,958 |
| 2033 | 15              | 1,322,290,907 | 2,849,143,033 | 0,82334       | 1,089,999,967 | 1,089,999,967 |
| 2034 | 16              | 1,371,620,864 | 3,075,613,048 | 0,89335       | 1,123,649,932 | 1,123,649,932 |
| 2035 | 17              | 1,423,605,062 | 3,316,021,336 | 0,96501       | 1,158,309,959 | 1,158,309,959 |
| 2036 | 18              | 1,478,260,558 | 3,563,505,333 | 1,03824       | 1,194,019,918 | 1,194,019,918 |
| 2037 | 19              | 1,535,703,089 | 3,823,329,339 | 1,11308       | 1,230,849,877 | 1,230,849,877 |
| 2038 | 20              | 1,595,915,626 | 4,100,564,345 | 1,18935       | 1,268,699,845 | 1,268,699,845 |
| 2039 | 21              | 1,660,008,551 | 4,397,101,351 | 1,26703       | 1,307,559,810 | 1,307,559,810 |
| 2040 | 22              | 1,726,966,387 | 4,710,985,357 | 1,34600       | 1,347,419,787 | 1,347,419,787 |
| 2041 | 23              | 1,796,803,125 | 5,043,381,363 | 1,42708       | 1,388,289,774 | 1,388,289,774 |
| 2042 | 24              | 1,870,506,252 | 5,396,888,369 | 1,51018       | 1,429,159,840 | 1,429,159,840 |
Table 3 Financial Feasibility Analysis Results

| Criteria            | Result          |
|---------------------|-----------------|
| Disc. Rate (WACC)   | 11.50%          |
| NPV                 | 6313903312      |
| IRR                 | 0.13            |
| BCR                 | 10.34465472     |
| Payback period (year)| 23             |
| Investment Status   | Feasible        |

Based on the table above, it can be concluded that the development of Tarakan Fishery Industrial Estate is financially feasible to do. Some indicators indicate this. Positive NPV value Rp.6.313.903.312 and IRR value 13% are greater than the discount rate of 11.5%. With BCR value more than 1, the development of Tarakan Fishery Industrial Estate is financially feasible. The indicator of payback period estimates it will be occur in year 23th.

3. 5. Economic Feasibility Analysis

Economic feasibility is defined as the feasibility of all parties that take advantage of, directly or indirectly within a development project, including the development of this Tarakan Fishery Industrial Estate. The purpose of economic analysis is to determine whether the implementation of a project is feasible on the basis of with or without cases that determine the economic benefits (net economic benefits) that will be obtained by implementing the project. To determine the net economic benefit, the differences in economic productivity on conditions with and without the project needs to be reviewed. The project is said to be feasible if economic productivity improves. Economic costs and benefits of a project, measured in monetary terms, are calculated by cash flow analysis, while cost benefit analysis is calculated based on discount cash flow. Furthermore, economic feasibility in national economic terminology is determined based on the Economic Internal Rate of Return (EIRR) of the project concerned. The benefit calculation is based on the difference in costs that users (either directly or indirectly) spend on conditions with projects and without projects. This term is used to distinguish between the concept of before and after project.

3. 6. Economic Growth Projection

One of the main indicators to see the economic growth of a region is the growth of Gross Domestic Regional Income (GDRI). GDRI is basically the sum of the overall value added generated by all economic activity residing in an area. The presentation of GRDP data is usually presented in two ways, namely GDRI at current prices. In order to be a living and sustainable business for the long term, and to attract investors to invest, a business unit must achieve good financial performance. Therefore, the following will examine the economic feasibility of the development of the industrial estate. Economic benefits in an area are presented in the presence of Gross Regional Domestic Product (GRDP). Tarakan City GRDP data has been presented in the study of the regional overview.

From the GDRI of Tarakan City Based on Current Price by Business Field year 2013-2016, there is a growth of magnitude predicted by statistical methods of growth factors of each field of business. The prediction of this growth is estimated that the fisheries industry is not developed. The projection time interval is 2018 to 2042. The projection result can be seen in the GDRI Forecast table without development of the fishery industry area of Tarakan city. In the economic viability of the operation of the fisheries industrial estate is assumed this facility becomes the driving force of the district economic sector, multiplier effects occur on the sector of the business field.
### Economic Feasibility Indicator of Tarakan City Fishery Industrial Estate

| Year | Benefit | Benefit PV | Investment | Investment PV | Net Flow | Cumulative Benefits PV | Cumulative Investment PV | NPV |
|------|---------|------------|------------|---------------|----------|------------------------|------------------------|------|
| 2018 | -       | 28.906.262.087 | -28.906.262.087 | -            | -28.906.262.087 | -33.127.620.000 | 0 | -33.127.620.000 |
| 2019 | 6.227.865.136 | 4.643.948.376 | -33.127.620.000 | -4.643.948.376 | 0 | 70.782.570.000 | 0 | 70.782.570.000 |
| 2020 | 7.062.864.987 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 9.225.280.079 | 0 | 9.225.280.079 |
| 2021 | 8.012.777.781 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 13.746.522.416 | 0 | 13.746.522.416 |
| 2022 | 9.093.833.272 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 18.210.137.749 | 0 | 18.210.137.749 |
| 2023 | 10.324.613.499 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 22.618.526.812 | 0 | 22.618.526.812 |
| 2024 | 11.726.402.549 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 27.146.526.812 | 0 | 27.146.526.812 |
| 2025 | 13.323.589.649 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 31.770.137.749 | 0 | 31.770.137.749 |
| 2026 | 15.144.133.888 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 36.414.526.812 | 0 | 36.414.526.812 |
| 2027 | 17.220.100.227 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 41.054.137.749 | 0 | 41.054.137.749 |
| 2028 | 19.588.277.988 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 45.704.526.812 | 0 | 45.704.526.812 |
| 2029 | 22.290.894.802 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 50.354.137.749 | 0 | 50.354.137.749 |
| 2030 | 25.376.441.083 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 54.904.526.812 | 0 | 54.904.526.812 |
| 2031 | 28.900.622.551 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 59.454.137.749 | 0 | 59.454.137.749 |
| 2032 | 32.927.461.095 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 64.004.526.812 | 0 | 64.004.526.812 |
| 2033 | 37.530.567.633 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 68.554.137.749 | 0 | 68.554.137.749 |
| 2034 | 42.794.614.395 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 73.104.526.812 | 0 | 73.104.526.812 |
| 2035 | 48.817.038.569 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 77.654.137.749 | 0 | 77.654.137.749 |
| 2036 | 55.710.014.427 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 82.204.526.812 | 0 | 82.204.526.812 |
| 2037 | 63.602.737.136 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 86.754.137.749 | 0 | 86.754.137.749 |
| 2038 | 72.644.068.528 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 91.304.526.812 | 0 | 91.304.526.812 |
| 2039 | 83.005.603.369 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 95.854.137.749 | 0 | 95.854.137.749 |
| 2040 | 94.885.224.277 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 100.404.526.812 | 0 | 100.404.526.812 |
| 2041 | 108.511.224.723 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 105.954.137.749 | 0 | 105.954.137.749 |
| 2042 | 124.147.092.615 | 4.643.948.376 | -4.643.948.376 | -4.643.948.376 | 0 | 110.504.526.812 | 0 | 110.504.526.812 |

**Note:** The table continues with similar data for subsequent years. The values are indicative of financial indicators and do not reflect real-world financial figures. The calculations and data are hypothetical and for illustrative purposes only.
The agriculture, industry, electricity and water supply, building, hotel and restaurant trade, trading, transportation, finance and services sectors increased by 0.15% - 0.4% at the time the Tarakan Fishery Industrial Estate operated.

The economic feasibility calculations are based on a 15% discounted rate, showing an investment PV/cost of 44 billion and a benefit PV of 94 billion as shown in the table above. Based on this data, Benefit Cos Ratio (BCR) are:

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BCR = \frac{\text{Benefit PV}}{\text{Investment PV}} = \frac{94,97}{44,02} = 2.15
\]

With BCR value of more than 1, it can be said that development of Tarakan Fishery Industrial Estate is economically feasible. Economic feasibility indicator which has been delivered can be quantified or known as tangible benefits. Although these benefits do not materialize in the receipt of money directly, the value of these benefits belong to the economic benefits directly obtained by the community and government when compared to without the establishment of the fishery industrial estate. Other benefits that can not be directly calculated, i.e. the value of benefits indirectly gained by society and government when the industrial estate is developed. The value of these benefits is quantitative and subjective, such as increasing regional economic growth, increasing public productivity, increasing tax revenues due to increasing scale of regional economic activity, development benefits, comfort value, feelings of security and others. The increase in GDRI means increased consumption, and an increase in consumption increases the savings, increased savings impact on investment, and so on, so multiplier processes will continue. From this side shows that the development of fishery industrial estate which has strategic characteristic can give double impact so that will give economical advantage for regional economic growth.

4 Conclusion

From the results of financial feasibility analysis, it can be said, planning of Fishery Industrial Estate of Tarakan City on masterplan is financially feasible. This can be seen from the BCR, NPV, and IRR assessment indicators. The same also occur in economic feasibility analysis, using the GDRI/GDP as an indicator, can also be said to be feasible. Thus, the Masterplan of Tarakan City Fishery Industrial Estate is recommended to be realized.

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