

## ANALYSIS OF INVESTMENT SENSITIVITY IN RUSUNAWA TAMBAK WEDI CITY SURABAYA

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### Article History

Received : November 2023

Revised : November 2023

Accepted : November 2023

Published : November 2023

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### Cite This Article:

H. A. Mawardianto, Laksono Djoko Nugroho, and Haris Muhammadun, "ANALYSIS OF INVESTMENT SENSITIVITY IN RUSUNAWA TAMBAK WEDI CITY SURABAYA", IJST, vol. 2, no. 3, pp. 69-78, Nov. 2023.

### DOI:

<https://doi.org/10.56127/ijst.v2i3.1098>

**Abstract:** Based on the Surabaya City RPJMD for 2021-2026, strategic issues in government affairs in the field of housing and residential areas focus on providing Rusunawa capacity which is not proportional to the number of applicants. To overcome this problem, the Surabaya City Government took the initiative to build Rusunawa Tambak Wedi in the City of Surabaya. This research aims to evaluate the amount of investment receipts and determine the acceptance limits, with the aim of minimizing risks in Rusunawa investment activities. The research results show that the Medium Tariff Structure 1, Lower Tariff Structure 1, and Lower Tariff Structure 2 are considered feasible if analyzed based on the Net Present Value (NPV), Internal Rate of Return (IRR), Benefit Cost Ratio (BCR), and Payback Period methods. (PP) but the Medium Tariff Structure 2 and the Upper Tariff Structure were declared unfeasible if analyzed using the same method. Sensitivity analysis shows that each Rusunawa rental rate structure has a different level of sensitivity to changes in variables, such as residential unit rental rates, management fees, and management fee subsidies provided by the Government.

**Keywords:** Sensitivity Analysis, Investment, Subsidies, Rusunawa.

## INTRODUCTION

The city of Surabaya, as one of the capital cities of East Java Province, which has a strategic function in the Indonesian economy, has a variety of infrastructure to support economic activities including trade activities, both inter-island trade and trade between countries. Identification of development problems in the city of Surabaya is carried out in all areas of government administration affairs. The existence of the population is very important in the development process; therefore, the population will become a burden for the region if it is not managed well and conversely will become potential capital if it can be managed well. Based on the Surabaya City RPJMD for 2021-2026 as stated in Surabaya City Regional Regulation Number 4 of 2021 concerning the Medium-Term Regional Development Plan for the City of Surabaya for 2021-2026, one of the regional strategic issues in government affairs in the field of housing and residential areas is the provision of apartment capacity. simple rental (Rusunawa) is not yet proportional to the number of Rusunawa applicants.[1]

Based on data from the Department of Public Housing and Settlement Areas and Land Affairs of the City of Surabaya (DPRKPP Surabaya City) as the manager of Rusunawa in the City of Surabaya, the Surabaya City Government until 2023 has 109 Rusunawa blocks consisting of 5233 residential units. The flats in question are intended for Low Income Communities (MBR) and as of September 2023 the occupancy rate will reach 98.4%. There are 5,354 MBRs who have applied to live in Rusunawa and are on the Rusunawa waiting list until 2022. This has encouraged the Surabaya City Government to provide Rusunawa as an effort to fulfill housing needs for MBR, one of which is the construction of the Tambak Wedi Rusunawa in Tambak Wedi Village, Kenjeran District, Surabaya City.

Rusunawa rental income in Surabaya City in 2022 will only contribute less than 5% of the total Rusunawa management budget. This fact indicates that the Rusunawa rental rates that have been set are not able to cover the management costs, so the Surabaya City Government needs to provide subsidies to meet the needs for management costs of the Rusunawa. The rental rate set for a Rusunawa should be able to cover management costs, but the Surabaya City Government must provide subsidies for the management costs of the Rusunawa because the rental rate that has been set cannot cover management costs.[2]

In this research, an investment sensitivity analysis was carried out at Rusunawa Tambak Wedi. Considering that the cost of investing in Rusunawa requires quite large funds so it is risky if not planned well, a sensitivity

analysis is needed in this investment activity. In this research, the analysis was calculated using investment evaluation methods, namely Net Present Value (NPV), Internal Rate of Return (IRR), Benefit Cost Ratio (BCR), and Payback Period (PP) and then a sensitivity analysis was carried out. The sensitivity analysis was reviewed based on several parameters such as rental rates for Rusunawa residential units, Rusunawa management costs, and management cost subsidies by the Surabaya City Government. This is expected to minimize risks and losses and avoid things that are not profitable in these investment activities. Apart from that, this research aims to determine the number of subsidies provided by the Surabaya City Government for the management costs of Rusunawa Tambak Wedi.

## RESEARCH METHOD

### Research design

This research combines quantitative and qualitative methods by referring to primary data and secondary data. The research location is on Jalan Tambak Wedi Tengah Timur I, Tambak Wedi Village, Kenjeran District, Surabaya City. The research instruments used in this research were interview guides and observation sheets or observation guides as data collection instruments. Based on information from the Surabaya City DPRKPP, the target for the construction of Rusunawa Tambak Wedi in 2024 is 1 Twin Block (2 Blocks) with a 5-story type 24 typology and a total of 96 residential units and 10 business space units.



**Figure 1.** Master Plan Rusunawa Tambak Wedi  
Source: DPRKPP Kota Surabaya (2023)

### Data collection

In this research, the data collection methods used were interviews, observation and documentation.

1. Primary Data.  
The methods used to obtain primary data are interview and observation methods. Interviews were conducted with DPRKPP Surabaya City as the Rusunawa manager to obtain a more in-depth picture of Rusunawa management in Surabaya City. Observations were carried out at the research location and several Rusunawa in the city of Surabaya.
2. Secondary Data.  
Secondary data is used to strengthen findings and complement previously obtained information, for example relevant laws, ministerial regulations, regional regulations, etc.

### Investment Cost Analysis

Analysis of investment costs in Rusunawa Tambak Wedi is carried out by analyzing data on the components that make up investment costs. The investment cost components in question include [3]:

1. Land acquisition costs.
2. Pre-construction costs:
  - a. Licensing fees
  - b. Feasibility study costs.
  - c. Analysis costs and environmental impacts.
  - d. Planning costs.
  - e. Other costs.
3. Construction costs:
  - a. Cost structure

- b. Architectural costs.
- c. Infrastructure and utility costs.
4. Supervision costs.

In conducting investment cost analysis, land acquisition costs are not categorized into the investment cost component because the land used for the construction of Rusunawa Tambak Wedi is an asset of the Surabaya City Government. Licensing costs are also not categorized as an investment cost component because licensing costs are an incentive that must be provided by the government for the provision of flats. This is in accordance with what is mandated in Articles 87 and 88 of the Law of the Republic of Indonesia Number 20 of 2011 concerning Flats.[4]

### Expenditure Analysis

In carrying out expenditure analysis, especially Rusunawa management costs, management costs are calculated based on real needs for operational costs, maintenance costs and maintenance costs [5]. Management cost analysis functions to determine the amount of costs required to manage Rusunawa Tambak Wedi for 1 year.

### Income Analysis

In carrying out income analysis, the income component of Rusunawa is obtained through 2 components, namely rental of Rusunawa residential units and rental of business space [5]. The mechanism for determining rental rates for Rusunawa is as follows:

1. Rusunawa Residential Unit Rental Rates.

When determining Rusunawa rental rates, you can be guided by Surabaya City Regional Regulation Number 2 of 2010 concerning the Use of Flats or Regulation of the Minister of Public Works and Public Housing of the Republic of Indonesia Number 7 of 2022 concerning Implementation of Housing Development Assistance and Provision of Special Housing. The highest rental rate calculation for public flats is 1/3 (one third) of the provincial minimum wage (UMP) [5]. East Java UMP for 2023 is IDR. 2,040,244.30 [6]. Alternative rental rates for Rusunawa residential units are calculated using the following formula:

**Table 1.** Formula for Rental Rates for Residential Units in Rusunawa Tambak Wedi [3][5]

No.	Alternative Rate Sewa	Formula
1	Alternative 1 (Intermediate cost structure 1) [5]	$\frac{\text{Operational Cost}}{\text{Number of residential units}}$
2	Alternative 2 (Intermediate cost structure 2) [5]	$\frac{\text{Maintenance Cost}}{\text{Number of residential units}}$
3	Alternative 3 (Lower Cost Structure 1) [5]	$\frac{\text{Operational Cost} \times 50\%}{\text{Number of residential units}}$
4	Alternative 4 (Lower cost Structure 2) [5]	$\frac{\text{Maintenance Cost} \times 50\%}{\text{Number of residential units}}$
5	Alternative 5 (Upper Cost Structure) [5]	$\frac{\text{Operational Cost} + \text{Maintenance Cost}}{\text{Number of residential units}}$
6	Alternative 6 [3]	$\frac{\text{Maks. } 3\% \times \text{Investment Cost}}{12 \times \text{Number of residential units}}$

1. Business Space Rental Rates.

In determining the rental rate for business space can be through the following mechanism [7]:

- a. The cost of operation and maintenance of business space is known.
- b. The ground floor area in the flat for the placement of business space is known.
- c. The objectives of the business have been directed by policy makers.

2. Rusunawa Management Cost Subsidy.

The calculation of the subsidy of Rusunawa management costs is done by calculating the total income of Rusunawa minus the cost of Rusunawa management. From the results of these calculations will be obtained the amount of subsidy of Rusunawa management costs provided by the Surabaya City Government for the management of Rusunawa Tambak Wedi.

### Investment Evaluation

In conducting investment evaluation, investment evaluation is analyzed using NPV, IRR, BCR, and PP methods. The preparation of cash flow projections at Rusunawa Tambak Wedi needs to be done before conducting an investment evaluation. The projection is prepared from various components related to

Rusunawa investment activities. The components used in the preparation of cash flow projections are as follows:

1. Rusunawa management costs.
2. Rental income of Rusunawa residential units.
3. Business space rental income.
4. Rusunawa management fee subsidy.

The investment cost component of Rusunawa development is not categorized into the components that make up the Rusunawa cash flow projection because the provision of houses for MBR is the responsibility of the government so it is not categorized into the components that make up the cash flow projection. The responsibility for the provision is in the form of allocating funds and/or development costs to support the realization of housing for MBR, facilitating the provision of housing and settlements for the community, especially for MBR." [8][9]

### Sensitivity Analysis

After the investment evaluation was carried out at the previous stage, a sensitivity analysis was carried out by calculating the effect of the investment acceptance limit on changes in each sensitivity parameter. The sensitivity parameters reviewed in this analysis are as follows:

1. Rental rates for Rusunawa residential units.
2. Rusunawa management fee
3. Subsidization of management costs by Surabaya City Government.

## RESULT AND DISCUSSION

### Investment Cost Analysis

The results of the analysis of investment costs at Rusunawa Tambak Wedi are presented in the table below:

**Table 2.** Investment Cost Analysis of Rusunawa Tambak Wedi

No.	Investment Cost Component	Total Cost (Rp.)
1	Pre-Construction Cost (Planning Cost Physical/DED)	949.050.000
2	Physical Construction Cost of Rusunawa	25.221.582.559
3	Supervision Fee (Construction Management Fee)	777.000.000
<b>Total Investment Cost (Rp.)</b>		<b>26.947.632.559</b>

Source: DPRKPP Kota Surabaya, Author's Processing (2023)

### Expenditure Analysis

The results of the expenditure analysis, especially the management costs at Rusunawa Tambak Wedi every year are presented in the table below:

**Table 3.** Analysis of Management Costs of Rusunawa Tambak Wedi

No.	Management Cost Component	Total Cost (Rp.)
1	Operational Cost	332.652.222
2	Maintenance Cost	431.379.310
3	Service Cost	50.994.322
<b>Total Management Cost (Rp.)</b>		<b>815.025.854</b>

Source : Author's Processing (2023)

### Income Analysis

1. Rusunawa Residential Unit Rental Rates.

Based on the formula as mentioned above, the basic rental rate structure of the Tambak Wedi Rusunawa residential unit is presented in the table below:

**Table 4.** Basic RentRate Structure of Tambak Wedi Rusunawa Residential Unit

No.	Alternative Rental Rates	Fee Structure (Rp.)	1/3 UMP Jawa Timur 2023 (Rp.)	Description
1	Alternative 1	288.760,61	680.081,43	Eligible
2	Alternative 2	374.461,21	680.081,43	Eligible
3	Alternative 3	144.380,30	680.081,43	Eligible
4	Alternative 4	187.230,60	680.081,43	Eligible
5	Alternative 5	663.221,82	680.081,43	Eligible
6	Alternative 6	701.761,26	680.081,43	Not Eligible

Based on the results of the calculation of the basic rental rate structure above, Alternative Rental Rate 6 does not meet the requirements as stipulated in the provisions of Article 49 Permen PUPR Number 7 of 2022 because the resulting rate structure is greater than the value of 1/3 of the East Java UMP in 2023. After obtaining the results of the calculation of the basic rental rate structure of the residential unit, the rental rate of the residential unit for each floor in accordance with the rent adjustment factor at Rusunawa Tambak Wedi is presented in the table below:

**Table 5.** Rental Rates for Tambak Wedi Rusunawa Residential Units

Lantai	Rental Rate Per Month (Rp.)				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Lantai 1	399.000	517.000	200.000	259.000	915.000
Lantai 2	359.000	465.000	180.000	233.000	824.000
Lantai 3	319.000	414.000	160.000	207.000	732.000
Lantai 4	259.000	336.000	130.000	168.000	595.000
Lantai 5	180.000	233.000	90.000	117.000	412.000

Source: Author's Processing (2023)

#### 1. Business Space Rental Rates.

Based on the business space rental rates that have been set, the estimated business space rental income of Rusunawa Tambak Wedi is presented in the table below:

**Table 6.** Estimated Rental Income of Tambak Wedi Rusunawa Business Space

Floor	Number of Business Room Units	Rental Rate Per Month (Rp.)	Total Income (Rp.)
Business Space	10	531.000	5.310.000
Estimated Monthly Business Space Rental Income			5.310.000
<b>Estimated Business Space Rental Income Each Year</b>			<b>63.720.000</b>

Source: Author's Processing (2023)

#### 2. Subsidization of Rusunawa Management Costs.

Based on the rental rates of residential units and business space rental rates that have been determined, the total estimated income of Rusunawa Tambak Wedi each year is presented in the table below:

**Table 7.** Total Estimated Revenue of Tambak Wedi Rusunawa

Alternative Rental Rates	Estimated Income (Rp.)		Total Estimated Income (Rp.)
	Residential Unit	Business Space	
Alternative 1	333.192.000	63.720.000	396.912.000
Alternative 2	431.904.000	63.720.000	495.624.000
Alternative 3	167.040.000	63.720.000	230.760.000
Alternative 4	216.264.000	63.720.000	279.984.000
Alternative 5	764.472.000	63.720.000	828.192.000

Source: Author's Processing (2023)

After knowing the total estimated income of Tambak Wedi Rusunawa, the calculation of the Rusunawa management fee subsidy provided by the Surabaya City Government for Rusunawa management costs is carried out. The calculation of the subsidy of Rusunawa management costs is done by calculating the total income of Rusunawa minus the cost of Rusunawa management. The amount of subsidy of Tambak Wedi Rusunawa management costs each year is presented in the table below:

**Table 8.** Subsidy of Tambak Wedi Rusunawa Management Costs

Alternative Rental Rates	Estimated Income (Rp.)	Management Cost (Rp.)	Subsidies (Rp.)
Alternative 1	396.912.000	815.025.854	- 418.113.854
Alternative 2	495.624.000	815.025.854	- 319.401.854
Alternative 3	230.760.000	815.025.854	- 584.265.854
Alternative 4	279.984.000	815.025.854	- 535.041.854
Alternative 5	828.192.000	815.025.854	13.166.146

Source: Author's Processing (2023)

In Alternative Rental Rates 1 to Alternative Rental Rates 4 produces a negative value, which means that the management activities of Tambak Wedi Rusunawa do not provide benefits for the Surabaya City Government so that the Surabaya City Government must subsidize the cost of managing the Rusunawa. In Alternative Rental Rates 5 produces a positive value which means that the management activities of Tambak Wedi Rusunawa provide benefits to the Surabaya City Government of Rp. 13,166,146, - every year.

### Investment Evaluation

In evaluating the Tambak Wedi Rusunawa investment, the calculation of cash flow projections uses the discounted cash flow method with the following assumptions and conditions:

1. Financial projections are estimated over the life of the Rusunawa building plan, which is for 50 years.
2. The occupancy rate is estimated to be 100% (fully occupied Rusunawa residential units and fully rented Rusunawa business space).
3. Rusunawa management costs are estimated to increase by 4.00% annually based on the average inflation of Surabaya City in the last 8 years.
4. Rental rates for Rusunawa residential units are estimated to increase by 5.00% every 2 years based on the average economic growth of Surabaya City in the last 8 years.
5. The rental rate of Rusunawa business/commercial space is estimated to increase by 6.00% every year based on the average increase in East Java UMP in the last 8 years...
6. Rusunawa management fee subsidy is estimated to increase by 5.00% every year based on the average economic growth of Surabaya City in the last 8 years.
7. The interest rate refers to the provisions of Bank Indonesia in 2023 with an average during January-September of 5.75%.

The results of the investment evaluation on each alternative rental rate of Rusunawa Tambak Wedi are presented in the table below:

**Table 9.** Investment Evaluation of Tambak Wedi Rusunawa.

No.	Alternative Rental Rates	Investment Parameters				Result
		NPV (Rp.)	IRR (%)	BCR	PP (Year)	
1	Alternative 1	1.494.443.488	30,83	1,0567	10,79	Feasible
2	Alternative 2	- 88.400.512	4,64	0,9966	52,93	Not Feasible
3	Alternative 3	4.158.685.892		1,1578	1,00	Feasible
4	Alternative 4	3.369.380.508	356,04	1,1278	2,30	Feasible
5	Alternative 5	- 4.895.458.090	137,77	0,8142		Not Feasible

Source: Author's Processing (2023)

Alternative Rental Rate 1, Alternative Rental Rate 3, and Alternative Rental Rate 4 are declared feasible when analyzed based on NPV, IRR, BCR, and PP methods but Alternative Rental Rate 2 and Alternative Rental Rate 5 are declared not feasible. In Alternative Lease Rate 5, the IRR shows an irrational value because there is a large cash inflow at the beginning of the investment while a larger cash outflow occurs later on. The PP does not perform as there is a continuous decrease in cash inflows after the end of the payback period while on the contrary the cash outflows continue to increase.

### Sensitivity Analysis

1. Sensitivity to Rental Rates of Rusunawa Residential Units.

Sensitivity analysis of the rental rate of the Tambak Wedi Rusunawa residential unit is presented in the table below:

**Table 10.** Sensitivity Analysis of Rental Rates for Rusunawa Tambak Wedi Residential Units

Condition	Investment Parameters				Result
	NPV (Rp.)	IRR	BCR	PP (Year)	
<b>Alternative 1 (Decrease) :</b>					
18,75%	1.939.843	5,758%	1,0000	49,97 Year	Feasible
18,76%	1.143.842	5,755%	1,0000	49,98 Year	Feasible
18,77%	347.840	5,751%	1,0000	49,99 Year	Feasible
18,78%	-448.162	5,748%	0,9999	> 50 Year	Not Feasible
18,79%	-1.244.164	5,745%	0,9999	> 50 Year	Not Feasible
18,80%	-2.040.166	5,742%	0,9999	> 50 Year	Not Feasible
<b>Alternative 2 (Increase) :</b>					
0,83%	-2.758.890	5,712%	0,9998	> 50 Year	Not Feasible

Condition	Investment Parameters				Result
	NPV (Rp.)	IRR	BCR	PP (Year)	
0,84%	-1.727.063	209,05%	0,9999	> 50 Year	Not Feasible
0,85%	-695.237	205,25%	0,9999	> 50 Year	Not Feasible
0,86%	336.590	201,55%	1,0000	49,99 Year	Feasible
0,87%	1.368.417	5,769%	1,0000	49,95 Year	Feasible
0,88%	2.400.244	194,43%	1,0000	49,91 Year	Feasible
<b>Alternative 3 (Decrease) :</b>					
104,19%	862.080	5,752%	1,0000	49,99 Year	Feasible
104,20%	463.018	5,751%	1,0000	50,00 Year	Feasible
104,21%	63.956	5,750%	1,0000	50,00 Year	Feasible
104,22%	-335.106	5,749%	0,9999	> 50 Year	Not Feasible
104,23%	-734.167	5,749%	0,9999	> 50 Year	Not Feasible
104,24%	-1.133.229	5,748%	0,9999	> 50 Year	Not Feasible
<b>Alternative 4 (Increase) :</b>					
65,19%	1.282.076	5,753%	1,0000	49,99 Year	Feasible
65,20%	765.417	5,752%	1,0000	49,99 Year	Feasible
65,21%	248.758	5,751%	1,0000	50,00 Year	Feasible
65,22%	-267.901	5,749%	0,9999	> 50 Year	Not Feasible
65,23%	-784.559	5,748%	0,9999	> 50 Year	Not Feasible
65,24%	-1.301.218	5,747%	0,9999	> 50 Year	Not Feasible
<b>Alternative 5 (Increase) :</b>					
26,78%	-4.525.031	5,759%	0,9998		Not Feasible
26,79%	-2.698.693	5,755%	0,9998		Not Feasible
26,80%	-872.355	5,752%	0,9999		Not Feasible
26,81%	953.983	5,748%	1,0000	1,00 Year	Feasible
26,82%	2.780.321	5,745%	1,0001	1,00 Year	Feasible
26,83%	4.606.659	5,741%	1,0001	1,00 Year	Feasible

Source: Author`s Processing (2023)

## 2. Sensitivity to Management Fee Rusunawa.

Sensitivity analysis of the management costs of Tambak Wedi Rusunawa is presented in the table below:

**Table 11.** Sensitivity Analysis of the Management Cost of Tambak Wedi Rusunawa

Condition	Investment Parameters				Result
	NPV (Rp.)	IRR	BCR	PP (Year)	
<b>Alternative 1 (Increase) :</b>					
5,65%	5.505.218	5,776%	1,0001	49,90 Year	Feasible
5,66%	2.869.929	5,764%	1,0001	49,95 Year	Feasible
5,67%	234.640	5,751%	1,0000	50,00 Year	Feasible
5,68%	-2.400.649	5,739%	0,9999	> 50 Year	Not Feasible
5,69%	-5.035.938	5,726%	0,9998	> 50 Year	Not Feasible
5,70%	-7.671.227	5,714%	0,9997	> 50 Year	Not Feasible
<b>Alternative 2 (Decrease) :</b>					
0,31%	-6.706.553	5,660%	0,9997	> 50 Year	Not Feasible
0,32%	-4.071.264	5,695%	0,9998	> 50 Year	Not Feasible
0,33%	-1.435.975	320,67%	0,9999	> 50 Year	Not Feasible
0,34%	1.199.314	5,766%	1,0000	49,96 Year	Feasible
0,35%	3.834.602	5,802%	1,0001	49,86 Year	Feasible
0,36%	6.469.891	5,838%	1,0002	49,76 Year	Feasible
<b>Alternative 3 (Increase) :</b>					
15,76%	5.470.470	5,762%	1,0001	49,94 Year	Feasible
15,77%	2.835.181	5,756%	1,0000	49,97 Year	Feasible
15,78%	199.892	5,750%	1,0000	50,00 Year	Feasible
15,79%	-2.435.397	5,744%	0,9999	> 50 Year	Not Feasible
15,80%	-5.070.686	5,739%	0,9998	> 50 Year	Not Feasible
15,81%	-7.705.975	5,733%	0,9997	> 50 Year	Not Feasible

Condition	Investment Parameters				Result
	NPV (Rp.)	IRR	BCR	PP (Year)	
<b>Alternative 4 (Increase) :</b>					
12,76%	6.751.778	5,768%	1,0002	49,92 Year	Feasible
12,77%	4.116.489	5,761%	1,0001	49,95 Year	Feasible
12,78%	1.481.200	5,754%	1,0000	49,98 Year	Feasible
12,79%	-1.154.089	5,747%	0,9999	> 50 Year	Not Feasible
12,80%	-3.789.378	5,740%	0,9998	> 50 Year	Not Feasible
12,81%	-6.424.667	5,733%	0,9997	> 50 Year	Not Feasible
<b>Alternative 5 (Decrease) :</b>					
18,55%	-6.997.045	5,769%	0,9996		Not Feasible
18,56%	-4.361.756	5,762%	0,9997		Not Feasible
18,57%	-1.726.467	5,755%	0,9999		Not Feasible
18,58%	908.822	5,748%	1,0000	1,00 Year	Feasible
18,59%	3.544.111	5,741%	1,0001	1,00 Year	Feasible
18,60%	6.179.400	5,734%	1,0002	1,00 Year	Feasible

Source: Author`s Processing (2023)

### 3. Sensitivity to Subsidization of Rusunawa Management Costs.

Sensitivity analysis of subsidized management costs of Tambak Wedi Rusunawa is presented in the table below:

**Table 12.** Sensitivity Analysis of Subsidized Management Costs of Tambak Wedi Rusunawa

Condition	Investment Parameters				Result
	NPV (Rp.)	IRR	BCR	PP (Year)	
<b>Alternative 1 (Penurunan) :</b>					
8,93%	3.735.213	5,770%	1,0001	49,92 Year	Feasible
8,94%	2.065.887	5,761%	1,0000	49,96 Year	Feasible
8,95%	396.561	5,752%	1,0000	49,99 Year	Feasible
8,96%	-1.272.765	5,743%	0,9999	> 50 Year	Not Feasible
8,97%	-2.942.091	5,734%	0,9998	> 50 Year	Not Feasible
8,98%	-4.611.417	5,725%	0,9998	> 50 Year	Not Feasible
<b>Alternative 2 (Increase) :</b>					
0,67%	-2.960.976	5,711%	0,9998	> 50 Year	Not Feasible
0,68%	-1.685.759	5,728%	0,9999	> 50 Year	Not Feasible
0,69%	-410.542	5,745%	0,9999	> 50 Year	Not Feasible
0,70%	864.675	5,761%	1,0000	49,97 Year	Feasible
0,71%	2.139.892	5,778%	1,0000	49,92 Year	Feasible
0,72%	3.415.109	5,795%	1,0001	49,87 Year	Feasible
<b>Alternative 3 (Decrease) :</b>					
17,81%	4.765.381	5,763%	1,0001	49,94 Year	Feasible
17,82%	2.432.691	5,757%	1,0000	49,97 Year	Feasible
17,83%	100.000	5,750%	1,0000	50,00 Year	Feasible
17,84%	-2.232.691	5,744%	0,9999	> 50 Year	Not Feasible
17,85%	-4.565.381	5,737%	0,9998	> 50 Year	Not Feasible
17,86%	-6.898.072	5,731%	0,9997	> 50 Year	Not Feasible
<b>Alternative 4 (Decrease) :</b>					
15,75%	4.923.682	5,766%	1,0001	49,93 Year	Feasible
15,76%	2.787.519	5,759%	1,0001	49,96 Year	Feasible
15,77%	651.356	5,752%	1,0000	49,99 Year	Feasible
15,78%	-1.484.807	5,745%	0,9999	> 50 Year	Not Feasible
15,79%	-3.620.970	5,738%	0,9998	> 50 Year	Not Feasible
15,80%	-5.757.134	5,731%	0,9997	> 50 Year	Not Feasible

Source: Author`s Processing (2023)

## CONCLUSION

- The feasibility of investing in Rusunawa Tambak Wedi if analyzed using the Net Present Value (NPV), Internal Rate of Return (IRR), Benefit Cost Ratio (BCR) and Payback Period (PP) methods is as follows:



- a. Alternative Rental Rates 1 (Medium Rate Structure 1) produces an NPV value of Rp. 1,494,443,488,- IRR of 30.83%, BCR of 1.0567, and PP of 10.79 Year so it is declared Feasible.
  - b. Alternative Rental Rate 2 (Medium rate structure 2) produces an NPV value of -Rp. 88,400,512,-, IRR of 4.64%, BCR of 0.9966, and PP of 52.93 Year so it was declared Not Feasible.
  - c. Alternative Rental Rate 3 (Lower rate structure 1) produces an NPV value of Rp. 4,158,685,892,-, IRR does not show results, BCR is 1.1578, and PP is 1.00 Year so it is declared Feasible.
  - d. Alternative Rental Rate 4 (Lower rate structure 2) produces an NPV value of Rp. 3,369,380,508,-, IRR of 356.04%, BCR of 1.1278, and PP of 2.30 Year so it is declared Feasible.
  - e. Alternative Rental Rate 5 (Upper rate structure) produces an NPV value of -Rp. 4,895,458,090,-, IRR of 137.77%, BCR of 0.8142, and PP did not show results so it was declared Not Feasible. IRR shows an irrational value because there is a large cash inflow at the beginning of the investment while a larger cash outflow occurs at a later date. This condition causes the IRR to have a high value but the NPV to be negative. This situation is triggered by rapid cash inflows and the time value of larger cash outflows. PP does not show results because there is a continuous decline in cash inflow after the end of the capital payback period while on the contrary cash outflow continues to increase.
2. The investment sensitivity level of Rusunawa Tambak Wedi is as follows:
- a. Alternative Rental Rate 1 (Medium Rate Structure 1) is declared Feasible and quite sensitive if there is a decrease in the rental rate for Rusunawa residential units by  $\leq 18.77\%$  or an increase in Rusunawa management costs by  $\leq 5.67\%$  or a decrease in subsidies for Rusunawa management costs by  $\leq 8, 95\%$ .
  - b. Alternative Rental Rate 2 (Medium Rate Structure 2) is declared Feasible and quite sensitive if there is an increase in the rental rate for Rusunawa residential units of  $\geq 0.86\%$  or a decrease in Rusunawa management costs of  $\geq 0.34\%$  or an increase in subsidies for Rusunawa management costs of  $\geq 0, 70\%$ .
  - c. Alternative Rental Rate 3 (Lower Rate Structure 1) is declared Feasible and quite sensitive if there is a decrease in the rental rate for Rusunawa residential units by  $\leq 104.21\%$  or an increase in Rusunawa management costs by  $\leq 15.78\%$  or a decrease in subsidies for Rusunawa management costs by  $\leq 17, 83\%$ .
  - d. Alternative Rental Rate 4 (Lower Rate Structure 2) is declared Feasible and quite sensitive if there is a decrease in the rental rate for Rusunawa residential units by  $\leq 65.21\%$  or an increase in Rusunawa management costs by  $\leq 12.78\%$  or a decrease in subsidies for Rusunawa management costs by  $\leq 15, 77\%$ .
  - e. Alternative Rental Rate 5 (Upper Rate Structure) is declared Feasible and quite sensitive if there is an increase in the rental rate for Rusunawa residential units by  $\geq 26.81\%$  or a decrease in Rusunawa management costs by  $\geq 18.58\%$ .
3. The amount of subsidy provided by the Surabaya City Government for the management costs of Rusunawa Tambak Wedi is as follows:
- a. Alternative Rental Rate 1 (Medium Rate Structure 1) is IDR. 418,113,854,- every year.
  - b. Alternative Rental Rate 2 (Medium Rate Structure 2) is IDR. 319,401,854,- every year.
  - c. Alternative Rental Rate 3 (Lower Rate Structure 1) is IDR. 584,265,854,- every year.
  - d. Alternative Rental Rate 4 (Lower Rate Structure 2) is IDR. 535,041,854,- every year.

## REFERENCES

- [1] Pemerintah Kota Surabaya, *Peraturan Daerah Kota Surabaya Nomor 4 Year 2021 tentang Rencana Pembangunan Jangka Menengah Daerah Kota Surabaya Year 2021-2026*.
- [2] H. A. Mawardianto, B. Zaman, and T. T. Putranto, "Penetapan Rate Sewa Rumah Susun pada Rumah Susun Sederhana Sewa Dukuh Menanggal Kota Surabaya," *JPII*, vol. 1, no. 5, pp. 150–155, 2023.
- [3] Pemerintah Kota Surabaya, *Peraturan Daerah Kota Surabaya Nomor 2 Year 2010 tentang Pemakaian Rumah Susun*.
- [4] Pemerintah Republik Indonesia, *Undang-Undang Republik Indonesia Nomor 20 Year 2011 tentang Rumah Susun*.
- [5] Kementerian Pekerjaan Umum dan Perumahan Rakyat Republik Indonesia, *Peraturan Menteri Pekerjaan Umum dan Perumahan Rakyat Republik Indonesia Nomor 7 Year 2022 tentang Pelaksanaan Bantuan Pembangunan Perumahan dan Penyediaan Rumah Khusus*.
- [6] Pemerintah Provinsi Jawa Timur, *Keputusan Gubernur Jawa Timur Nomor 188/860/KPTS/013/2022 tentang Upah Minimum Provinsi Jawa Timur Year 2023*.

- [7] E. R. Marsadi, *Modul Administrasi dan Keuangan dalam Penghunian dan Pengelolaan Rumah Susun*. Bandung: Pusdiklat Jalan, Perumahan, Permukiman, dan Pengembangan Infrastruktur Wilayah Badan Pengembangan Sumber Daya Manusia Kementerian Pekerjaan Umum dan Perumahan Rakyat, 2019.
- [8] Pemerintah Republik Indonesia, *Undang-Undang Republik Indonesia Nomor 1 Year 2011 tentang Perumahan dan Kawasan Permukiman*.
- [9] Pemerintah Republik Indonesia, *Undang-Undang Republik Indonesia Nomor 23 Year 2014 tentang Pemerintahan Daerah*.