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# Analysis of the Feasibility of Investment in Damai Permai Housing in Tangerang Regency

**Tuti Rahmawati[1], Ida Ayu Ari Angreni[2]**
[1]*Masters Program of Civil Engineering, Gunadarma University, Jakarta, Indonesia*
[2]*Lecturer of Civil Engineering Study Program, Gunadarma University, Jakarta, Indonesia*
*tutyrahmawaty95@gmail.com*

**Abstract**

*Housing is one option that is intended to satisfy the community's housing requirements. This provides business opportunities for developers to build residential property as a fulfillment of community needs. Housing projects must be based on a fairly in-depth evaluation of investment feasibility. In this study, the housing project under study was the Damai Permai housing project built in Tangerang Regency. This study aim to determine the financial feasibility of an investment proposal for the development of Damai Permai Housing in the Tangerang Regency of Indonesia. This study uses a Net Present Value (NPV) value approach, Benefit Cost Ratio (BCR), Break Event Point (BEP), and Payback Period (PP). Based on these values it will be known whether the Damai Permai housing project in Tangerang Regency is feasible or not and how long the payback period is.*

Keywords
*capital budgeting; damai permai housing; tangerang regency; investment feasibility analysis*

## I. Introduction

The need for a place to live is one of the community's demands that must always be addressed. This corresponds to a community's economic development and population increase (Edy, 2016). The higher the community's economic level and the number of residents in an area, the greater the impact on the sector of housing or house necessities in the area (Munawir, 2012). One method to address the need for this house is the existence of a housing project. Further, this housing project will offer new commercial and business chances for those in the real estate industry.

Likewise, whoever is interested in this community housing project wants to know if the funds he has entrusted for house building will return and make returns for him (Priyo, 2012). Since this is a commercial enterprise, every investment must pass a thorough and in-depth investment feasibility analysis (Wiranata, 2012). Because capital investment in the property or infrastructure industries has particular consequences that are different from other industries, this must be ensured from the beginning of capital budgeting (Wibowo, 2008).

The housing project analyzed in this study was the Damai Permai housing project in Tangerang Regency. This study aims to assess the financial feasibility of the proposed investment project to build Damai Permai Housing in Tangerang Regency. This study uses a value approach of (1) Net Present Value (NPV), (2) Benefit Cost Ratio (BCR), (3) Break Event Point (BEP), and (4) Payback Period (PP). The feasibility of the Damai Permai housing project in Tangerang Regency, as well as the length of the payback time for investors, will be determined based on the findings of the four analyses. The study has limitations, such as not carrying structural analysis and only assessing the financial feasibility assessment of the Damai Permai housing project in Tangerang Regency and analyzing the calculations using the Capital Budgeting method.

## II. Review of Literature

Capital budgeting is one method of analyzing and determining the feasibility of a long-term project or capital investment that aims to generate profits in the future (Peterson & Fabozzi, 2002). This paper employs the Capital budgeting method with financial statements as the source documents for its analysis. Meanwhile, this study focuses primarily on case studies, which are in-depth investigations of a particular object carried over a specific period of time.

### 2.1 Net Present Value (NPV)

Net Present Value (NPV) is defined as the result of subtracting the Present Value of the benefit component minus the Present Value of the cost component. The NPV value will give consideration to the time value of money, and is a widely used capital budgeting technique. NPV is the total present value of all cash inflows collected by the project (using the discount rate on credit interest paid by investors) minus the amount of investment (initial cash outflow). According to Iman Suharto (in (Nastiti et al., 2020)), this can be written with the following systematic formula;

$$NPV = \sum_{t=0}^{n} \frac{(B(t)}{(1+i)^t} - \sum_{t=0}^{n} \frac{(C(t)}{(1+i)^t} \quad (1)$$

Description:
B (t) = The total amount of the project benefit component in t period (IDR)
C (t) = The total amount of the cost component in t period (IDR)
i = Interest rate calculated (%)
t = Period of years (years)

The benefit of the NPV method as a tool for assessing the feasibility of a capital investment plan is the use of the time-money value to determine the current value of future cash flows (Nisa & Juliprijanto, 2022). Thereby, a more accurate reflection of the profitability of housing projects can be obtained. The discount factor, which is the incorrect interest rate on loans borrowed by investors to finance projects, is also considered as another advantage. Consequently, the flexibility of this method is increased since it can be adapted to the fluctuating discount factor. Using this method, an investment is accepted if the NPV value is positive, and it is rejected if the NPV value is negative.

**Table 1**. Conclusion of NPV Method

| If | Note |
|---|---|
| NPV > 0 | Project should be accepted |
| NPV < 0 | Project should be rejected |
| NPV = 0 | There is no difference in accepting or rejecting the project |

*Source : Peterson dan Fabozi (2002)*

### 2.2 Benefit Cost Ratio (BCR)

The Benefit Cost Ratio (BCR) method emphasizes the importance of comparing the expected benefits to the expected costs and losses of an investment. For calculating the BCR, the following formula is employed:

$$BCR = \frac{(PV)B}{(PV)C} \quad (2)$$

Description:
*BCR* = Benefit Cost of Ratio
(PV) B = Present value of benefits
(PV) C = Present value of cost

## 2.3. Break Even Point

Break Even Point represents that a production has earned the same amount of revenue as it has spent on production costs. According to Munawir (2012), the break even point is defined as a situation where in its operations, a company does not make a profit and does not suffer a loss (total income = total costs).

It is possible to identify the BEP in the figure, particularly at the intersection of the sales revenue and total cost lines. If we draw a straight vertical line from that point to the X axis, we can see the value of the break even in units. Meanwhile, the value of the break even will be shown in rupiah if the point is drawn straight horizontally to the side up to the Y axis.

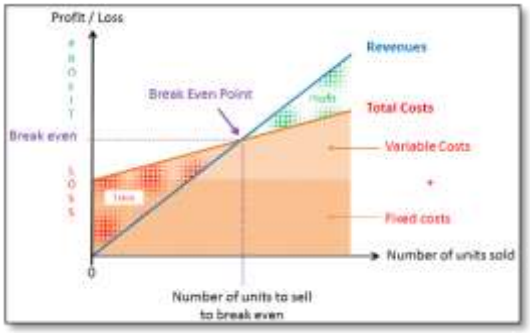


***Figure 1***. *Break Even Point*

If we assume that the price of sales will remain the same (constant), we can calculate it as follows:

$$Qi = \frac{FC}{P - VC} \quad (3)$$

Description:
Qi = Break-even point
FC = Fixed Cost
VC = Variable Cost
P = Income

The BEP analysis will be useful if it is able to satisfy some fundamental assumptions such as the following:

a) Grouped costs that have come out in the form of variable costs and fixed costs.
b) By the total amount of variable costs can vary in proportion to the volume of production or sales. This means that the variable cost per unit is fixed.
c) The size Fixed costs in total do not change despite changes in the volume of production or sales. This means that the fixed costs per unit fluctuate due to changes in the volume of activity
d) Amount units of product sold is equal to the number of units of product produced.
e) Price selling products per unit does not change in a certain period.

f) Company only produces one type of product, if more than one type of composition of each type of product is considered constant (fixed).

### 2.4 Payback Period (PP)

The payback period is defined as "the number of periods (years) required to cover investment expenditures made." According to Yulia Widhianti (2011), investment proposals are estimated to generate the same amount of cash flow each year. As a result, this process can be formalized by simply dividing the initial investment outlay by the total inflows.

According to Situmorang & Dilham (2007), the payback period method that neglects the time value of money. Therefore, an effort is made to improve the method by presenting the value of cash inflows from the investment plan, which is then used to calculate the payback period. The cash flows employed are discounted cash flows based on opportunity costs.

The payback period can be calculated by dividing total cash outflow (net cash outflow) by net cash inflow. Nevertheless, Payback Period ignores the time value of money, as well as free cash flow does not return to the present. This method overlooks all cash flows that occur after the payback period since it is more focused on the short term, as such long-term variables are commonly neglected. This method does not account for other variables that arise when selecting an alternative investment, such as the rate of return on capital market investments, deposits, and others (Aminah, 2021).

Furthermore, the following formula is employed in the process of calculating the Payback Period:

$$\text{Payback Period} = n + \frac{a-b}{c-b} x\ 1\ Period \qquad (4)$$

Description:

n = The last period in which the amount of cash flow still cannot cover the initial investment

a = Amount of initial investment

b = Cumulative amount of cash flows in n period

c = Cumulative amount of cash flows in period of n+1

## III. Research Method

According to Umar (2005), there are several things in the investment feasibility analysis stage, including:

### 3.1 Idea discovery

The need for the market and the type of product or service offered by the business must be investigated so that the product or hope to be produced has the potential to be profitable and sold. Research on the type of product can be performed using the criterion that a product or service is created to meet market needs that have not yet been met, as well as human needs, even though the product or service does not currently exist.

### 3.2 Research stage

Following the selection of project ideas, in-depth research is done using the scientific method. The scientific method is the first step in the procedure, which include Collecting data, Processing data by incorporating relevant theories, as well as Analyze and interpret the results of data processing

a) Evaluation stage

There are three types of project evaluation, namely:

1) Evaluating the proposed project to be established;
2) Projects in operation; and
3) Evaluating recently completed projects

### 3.3 Appropriate proposal ordering stage

If more than one project proposal is deemed feasible and there are limitations on the management's capacity to achieve all of these projects, it is necessary to select the project that is deemed the most important. Basically, this prioritized project has the highest score among other proposed projects based on predetermined evaluation criteria.

### 3.4 Implementation plan stage

After a project proposal is selected for implementation, it is necessary to create a work plan for the project's actual development. Beginning with the determination of the type of work, the number and qualifications of implementing personnel, the availability of funds and other resources, and the preparedness of management, among other considerations.

### 3.5 Implementation stage

After all necessary preparations have been completed, the project implementation phase commences. All project implementers, from leaders to the thirteen lowest levels, must collaborate as effectively as possible in accordance with the implemented plans. This study is a Capital budgeting method study utilizing financial report documents as sources. On the other hand, this research focuses more on problem research, which is an in-depth study of a specific object conducted over a period of time with a relatively uniform depth and distribution. The stages of completion for this research will be depicted in the figure below.

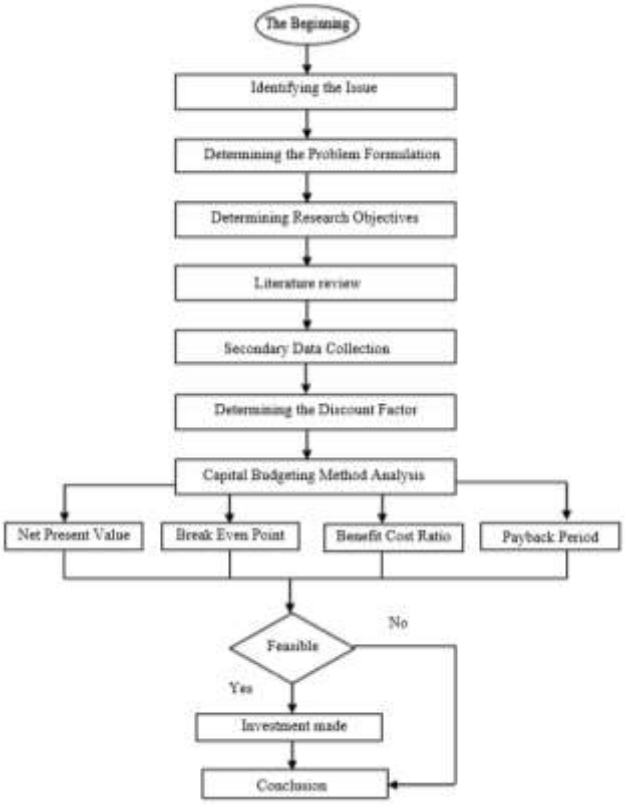

***Figure 2**. Project Financial Feasibility Analysis Study Research Diagram*

## IV. Result and Discussion

### 4.1 Calculation of Net Present Value (NPV)

The calculated cash flow planning is 2 years and 2 months or for 26 months with a discount factor of 11.5%. The discount factor is obtained from the average BI rate sourced from Bank Indonesia.

**Table 2**. PV Cash Out Calculation

| The month of | Cash Out (IDR) | Discount Factor | PV Cash Out (IDR) |
|---|---|---|---|
| 1 | 1.021.500.000 | 0,8969 | 916.143.498 |
| 2 | 1.031.625.000 | 0,8044 | 829.797.502 |
| 3 | 3.374.900.000 | 0,7214 | 2.434.648.711 |
| 4 | 3.021.625.000 | 0,6470 | 1.954.974.493 |
| 5 | 424.924.500 | 0,5803 | 246.568.410 |
| 6 | 501.875.000 | 0,5204 | 261.183.873 |
| 7 | 981.125.000 | 0,4667 | 457.931.238 |
| 8 | 466.729.167 | 0,4186 | 195.373.656 |
| 9 | 466.729.167 | 0,3754 | 175.223.009 |
| 10 | 650.395.833 | 0,3367 | 218.992.417 |
| 11 | 463.395.833 | 0,3020 | 139.935.719 |
| 12 | 613.395.833 | 0,2708 | 166.127.838 |
| 13 | 513.395.833 | 0,2429 | 124.703.621 |
| 14 | 450.645.833 | 0,2178 | 98.171.905 |
| 15 | 240.645.833 | 0,1954 | 47.017.046 |
| 16 | 217.416.667 | 0,1752 | 38.097.366 |
| 17 | 499.016.667 | 0,1572 | 78.422.793 |
| 18 | 217.416.667 | 0,1409 | 30.643.984 |
| 19 | 58.750.000 | 0,1264 | 7.426.521 |
| 20 | 58.750.000 | 0,1134 | 6.660.557 |
| 21 | 58.750.000 | 0,1017 | 5.973.593 |
| 22 | 58.750.000 | 0,0912 | 5.357.483 |
| 23 | 52.750.000 | 0,0818 | 4.314.202 |
| 24 | 52.750.000 | 0,0734 | 3.869.240 |
| 25 | 52.750.000 | 0,0658 | 3.470.170 |
| 26 | 52.750.000 | 0,0590 | 3.112.260 |

| The month of | Cash Out (IDR) | Discount Factor | PV Cash Out (IDR) |
|---|---|---|---|
| | **15.602.757.833** | | **8.454.141.105** |

**Table 3**. Calculation of PV Cash In

| The month of | Cash In (IDR) | Discount Factor | PV Cash In (IDR) |
|---|---|---|---|
| 1 | 13.500.000.000 | 0,8969 | 12.107.623.318 |
| 2 | - | 0,8044 | - |
| 3 | 250.000.000 | 0,7214 | 180.349.693 |
| 4 | - | 0,6470 | - |
| 5 | - | 0,5803 | - |
| 6 | - | 0,5204 | - |
| 7 | - | 0,4667 | - |
| 8 | - | 0,4186 | - |
| 9 | - | 0,3754 | - |
| 10 | - | 0,3367 | - |
| 11 | 608.902.022 | 0,3020 | 183.875.503 |
| 12 | 608.902.022 | 0,2708 | 164.910.765 |
| 13 | 608.902.022 | 0,2429 | 147.902.032 |
| 14 | 736.187.100 | 0,2178 | 160.376.252 |
| 15 | 736.187.100 | 0,1954 | 143.835.204 |
| 16 | 736.187.100 | 0,1752 | 129.000.183 |
| 17 | 1.420.771.384 | 0,1572 | 223.280.839 |
| 18 | 1.420.771.384 | 0,1409 | 200.251.874 |
| 19 | 2.008.184.918 | 0,1264 | 253.852.369 |
| 20 | 2.305.183.435 | 0,1134 | 261.341.357 |
| 21 | 2.305.183.435 | 0,1017 | 234.386.868 |
| 22 | 1.717.769.901 | 0,0912 | 156.645.494 |
| 23 | - | 0,0818 | - |
| 24 | 524.562.703 | 0,0734 | 38.476.946 |
| 25 | 524.562.703 | 0,0658 | 34.508.472 |
| 26 | 524.562.703 | 0,0590 | 30.949.302 |
| | **30.536.819.933** | | **14.651.566.470** |

It is possible to draw the following conclusions from the calculations above.

PV Cash In = IDR 14.651.566.470
PV Cash Out = IDR 8.454.141.105
NPV = IDR 6.197.425.365

Hence, the Damai Permai Housing Project is feasible since it has a positive net present value (NPV).

### 4.2. Calculation of Benefit Cost Ratio (BCR)

(PV) B = IDR 14.651.566.470
(PV) C = IDR 8.454.141.105

$$BCR = \frac{\text{IDR } 14.651.566.470}{\text{IDR } 8.454.141.105} = 1{,}73$$

BCR = 1.73 > 1, then the Damai Permai Housing Project is said to be feasible.

### 4.3. Calculation of Break Event Point (BEP)

The following calculation of Break Even Point for housing type 36/72 is as follows;

FC = IDR 2.820.939.291
VC = IDR 155.243.534
P = IDR 507.418.351

$$Qi = \frac{\text{IDR } 2.820.939.291}{\text{IDR } 507.418.351 - \text{IDR } 155.243.534}$$

$$= 8$$

Thus, the break-even point (BEP) for type 36/72 is 8 units. The following is a BEP chart for type 36/72.

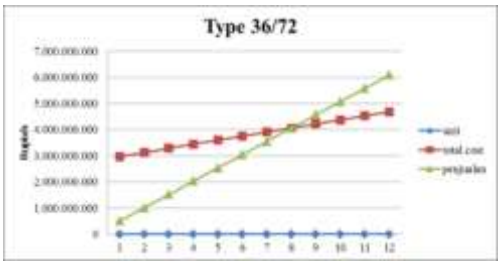


***Figure 3**. BEP for Type 36/72*

The following calculation of Break Even Point for housing type 45/84 is as follows.

FC = IDR 3.291.095.840
VC = IDR 194.054.418
P = IDR 613.489.250

$$Qi = \frac{\text{IDR } 3,291,095,840}{\text{IDR } 613.489.250 – \text{IDR } 194.054.418}$$

$$= 8$$

Therefore, the break-even point (BEP) for type 45/84 is 8 units. The following is a BEP chart for type 45/84.

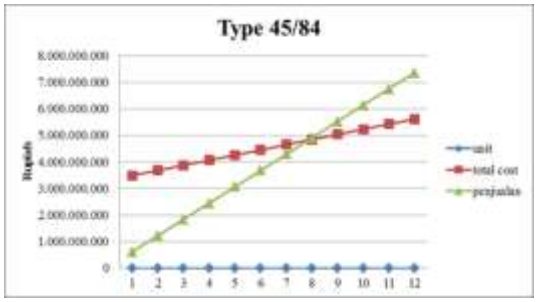


***Figure 4**. BEP for Type 45/84*

The following calculation of Break Even Point for housing type 72/90 is as follows.

FC = IDR 1.763.087.057
VC = IDR 310.487.069
P = IDR 979.022.557
Qi = IDR 1.763.087.057
IDR 979.022.557 - IDR 310.487.069
= 3

Hence, the break-even point (BEP) for type 72/90 is 3 units. The following is a BEP chart for type 72/90.

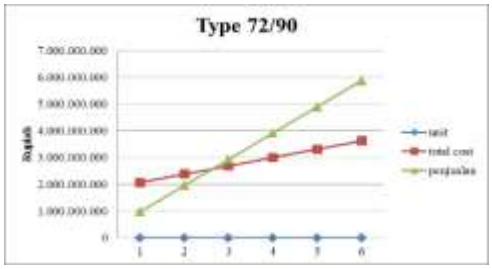


***Figure 5**. BEP for Type 72/90*

### 4.4. Calculation of Payback Period (PP)

Calculation in the period of time required to return the capital of an investment, which is calculated from net cash flows.

**Table 4**. Annual Cash Flow with Variable Amount

| The month of | Cash Out (IDR) | Cash In (IDR) | Cumulative net cash flow (IDR) |
|---|---|---|---|
| 1 | 1.021.500.000 | 13.500.000.000 | 12.478.500.000 |
| 2 | 1.031.625.000 | | 11.446.875.000 |
| 3 | 3.374.900.000 | 250.000.000 | 8.321.975.000 |
| 4 | 3.021.625.000 | | 5.300.350.000 |
| 5 | 424.924.500 | | 4.875.425.500 |
| 6 | 501.875.000 | | 4.373.550.500 |
| 7 | 981.125.000 | | 3.392.425.500 |
| 8 | 466.729.167 | | 2.925.696.333 |

| The month of | Cash Out (IDR) | Cash In (IDR) | Cumulative net cash flow (IDR) |
|---|---|---|---|
| 9 | 466.729.167 | | 2.458.967.167 |
| 10 | 650.395.833 | | 1.808.571.333 |
| 11 | 463.395.833 | 608.902.022 | 1.954.077.522 |
| 12 | 613.395.833 | 608.902.022 | 1.949.583.710 |
| 13 | 513.395.833 | 608.902.022 | 2.045.089.898 |
| 14 | 450.645.833 | 736.187.100 | 2.330.631.165 |
| 15 | 240.645.833 | 736.187.100 | 2.826.172.432 |
| 16 | 217.416.667 | 736.187.100 | 3.344.942.866 |
| 17 | 499.016.667 | 1.420.771.384 | 4.266.697.583 |
| 18 | 217.416.667 | 1.420.771.384 | 5.470.052.300 |
| 19 | 58.750.000 | 2.008.184.918 | 7.419.487.219 |
| 20 | 58.750.000 | 2.305.183.435 | 9.665.920.654 |
| 21 | 58.750.000 | 2.305.183.435 | 11.912.354.089 |
| 22 | 58.750.000 | 1.717.769.901 | 13.571.373.989 |
| 23 | 52.750.000 | - | 13.518.623.989 |
| 24 | 52.750.000 | 524.562.703 | 13.990.436.693 |
| 25 | 52.750.000 | 524.562.703 | 14.462.249.396 |
| 26 | 52.750.000 | 524.562.703 | 14.934.062.100 |

Payback Period = $n + \frac{a-b}{c-b} x\ 1\ Period$ (5)

n = 24
a = IDR 13.750.000.000
b = IDR. 14.462.249.396
c = IDR. 14.934.062.100

The calculation is as follows :

24 + (IDR 13.750.000.000 – IDR. 13.990.436.693) / (IDR. 14.462.249.396 – IDR. 13.990.436.693) x 1 Period (year)
= 23,490

Therefore, it can be concluded that the return on investment occurs in the 23rd month over 15 days.

## V. Conclusion

According to previous analyses, the Damai Permai Housing Project in Tangerang Regency is financially feasible. This is demonstrated by the calculation of a variety of methods, such as:

1. NPV (Net Present Value) the results obtained are positive in the amount of IDR.

6.197.425.365 which means that if the NPV value is positive, then the project is financially feasible.

2. In the Benefit Cost Ratio (BCR) method the results obtained are 1.73 where the value is > 1, then the project is financially feasible.
3. Break Even Point (BEP) value is obtained from the sale of housing units with 8 units of type 36/72, 8 units of type 45/84, and 3 units of type 72/90.
4. Payback Period (PP) or return on investment occurs in the 23rd month over 15 days.

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