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# Feasibility Study And Investment Analysis Of Mix Use Sentraland Semarang

**Soedarsono, Kartono Wibowo**
Lecturer Sultan Agung Islamic University, Departmen of Civil Engineering
Jl. Raya Kaligawe Km.04, Semarang, Jawa Tengah, Indonesia

**Pramodya**
Sultan Agung Islamic University, Departemen of Civil Engineering
Jl. Raya Kaligawe Km.04, Semarang, Jawa Tengah, Indonesia
pramidgar@gmail.com

***Abstract*** - The construction of high-rise buildings is being done in urban areas, especially vertical buildings due to the low availability of land. The longer development of the building leads to more complex functions resulting from the fulfillment of needs for the surrounding community so that the development of the building that can accommodate all the needs of the community is the mix use building. Building with this combined function certainly has a more complex influence both in terms of economic and environmental. Required detailed economic calculations in order to obtain maximum results from the building, especially for investors who have invested for the construction of the building, for that needed a feasibility study and investment analysis. So before the project is carried out can be taken whether the project is feasible to do or not according to the results obtained calculations. The results of this study show that the feasibility study and investment analysis of mix use building that has been done can give a clear picture about the profit or loss of the project implementation for the owner who will invest or the building manager later.

**Keyword:** *Feasibility study, Investment analysis, Mix use building, Economic engineering*

## 1. Introduction

### 1.1. Background of the study

In big cities like Semarang which is the capital of Central Java province, land is very expensive. Given the difficulty in finding land and the expensive land to build a house then the construction of housing is a difficult thing done in big cities like Semarang. Sentraland is a mixed-use project which means that in one area or building it can be used for various purposes. The objective of this project is to meet the needs of the upper and lower middle class in urban areas in full, given the busyness and time density of middle and upper class in urban areas so that convenience is their highest priority. Sentraland itself consists of several building functions such as hotels, condotels, apartments, offices, shopping centers and others.

In accordance with the above description, the development of the central project has the following project background:

a. The greater the needs of the community, especially the middle class and above will be a place to live as well as work and relax so it takes the construction of building use.
b. The higher the price of land and the difficulty of finding a strategic land for the construction of the house so that the apartment is the right choice for middle and upper class.

c. Congestion is a major problem for urban communities, so the development of centralized mix use can help certain groups to facilitate their needs in one area.
d. Following the property business that has developed rapidly in the area of Jakarta, So built centralized projects semarang.

### 1.2. Statements of The Problem

The formulation of the problem of this research are:

1. What is the value of investments incurred for the construction of a central project?
2. What is the return on investment invested in the central project?
3. Whether the Sentraland mix-up project is worth reviewing using the Benefit Cost Rato (BCR), Net Present Value (NPV), and Internal Rate of Return (IRR) analyzes?

## 2. Significances Of The Study

### 2.1. Project Feasibility Study

Understanding the feasibility study by Husein Amir, Business Feasibility Study Edition - 2 (p. 8 yr, 2003) is a study of business plans that not only analyze whether or not a business is built, but also when operationalized regularly in order to achieve maximum profit for the time which is not specified. So the Project feasibility study is largely a study of whether a project (usually an investment project) can be carried out successfully (as expected).

### 2.2. Definition of Investment

Based on economic theory, investment means the purchase (and production) of capital goods that are not consumed but used for future production (production goods). For example building a railroad or factory. Investment is a component of GDP with the formula GDP = C + I + G + (X-M). The investment function in that aspect is divided into non-residential investment (such as factory and machinery) and residential investment (new house). Investment is a function of income and interest rate, seen with the relation I = (Y, i). An increase in income will encourage greater investment, where higher interest rates will lower interest for investment as it will be more expensive than borrowing money. Although if another company chooses to use its own funds for investment, the interest rate represents an opportunity cost of investing the fund rather than lending to get interest.

### 2.3. Economic Feasibility

1. **BCR Method**

   Benefit Cost Ratio is one method of investment feasibility. Basically the calculation of this investment feasibility method is more emphasis on the benefits (benefits) and perngorbanan (cost / cost) of an investment, can be a business, or project. In general, the type of invetation that is often used is government projects where the benefits of the type of direct benefit, the benefits will be felt directly on the community a lot.

   Benefit cost ratio analysis is mathematically a comparison of the equivalent value of all benefits to the equivalent value of all costs. Equivalence calculations can use one of several analyzes. Example :

   B / C = PWbenefit / (PW cost) = FWbenefit / FWcost = AWbenefit / AWcost

   For decision-making criteria for a single alternative is to look at the value of B / C whether the magnitude of equal to one or a small of one.

-If B / C ≥ 1, then an investment alternative or feasible project is accepted
-If B / C <1, then the alternative investment or project is not feasible (not feasible).

**2. NPV Method**

NPV is the difference between disbursement and discounted income by using the social opportunity cost of capital as a discount factor, or in other words, the estimated future cash flows which are currently discounted. To calculate the NPV data is required on the estimated investment cost , operating costs, and maintenance as well as estimated benefit / benefit of the planned project. The time value of money formula present value is to know the current value of money. Since the money will be accepted in the future, we must know what it is worth if we accept it now.

Net Present Value of investment can be obtained by using the following formula:

NPV = PWB - PWC

$$PWB = \sum_{t=0}^{n} Ccb\ (FPB)$$

$$PWC = \sum_{t=0}^{n} Cct\ (FPB)$$

explanation :

NPV = Net Presen Value
PWB = Present Worth of Benefit
PWC = Present Worth of Cost
FPB = interest factor (%)
Ccb = Cash Flow Benefit
Ccc = Cash Flow
n = age of investment
t = time period

Or

$$NPV = -value\ of\ project + \frac{Cash\ inflow\ n}{(1+i)n} + \frac{Cash\ inflow\ n}{(1+i)n}$$

-If NPV ≥ 1, then an investment alternative or feasible project is accepted
-If NPV <1, then the alternative investment or project is not feasible (not feasible).

**3. IRR Method**

This way to make an assessment by using an appropriate rate of return on investment that discounts the flow of incoming currents, with the actual price equal to the discount rate made by NPV equal to zero.

The purpose of IRR calculation is to know the percentage of profit from a project each year. In addition, IRR is also a measuring tool. On IRR size shows the interest rate that yields NPV equal to Zero. Thus to look for IRR we have to raise the discount factor (DF) so that the NPV is equal to zero.

To get the value of IRR used interpolation formula :

$$IRR = I_1 + \frac{NPV^{(+)}}{NPV^{(+)} - NPV^{(-)}}(I_2 - I_1)$$

explanation :

I1 = first Discount Factor in which a positive NPV is obtained.
I2 = Discount Factor (interest rate) first where NPV is negative.

The IRR calculation results are then compared with the prevailing bank interest rate, if the IRR is calculated> the prevailing bank interest then the project or the business idea is feasible to cultivate. Obtain negative NPV.

**4. Payback period**

Payback period analyze method is purpose to find out how long (periode) investment will giving back when break even-point is happen (the calculate cash flow income equals with cash flow outcome). Payback period methods follows:

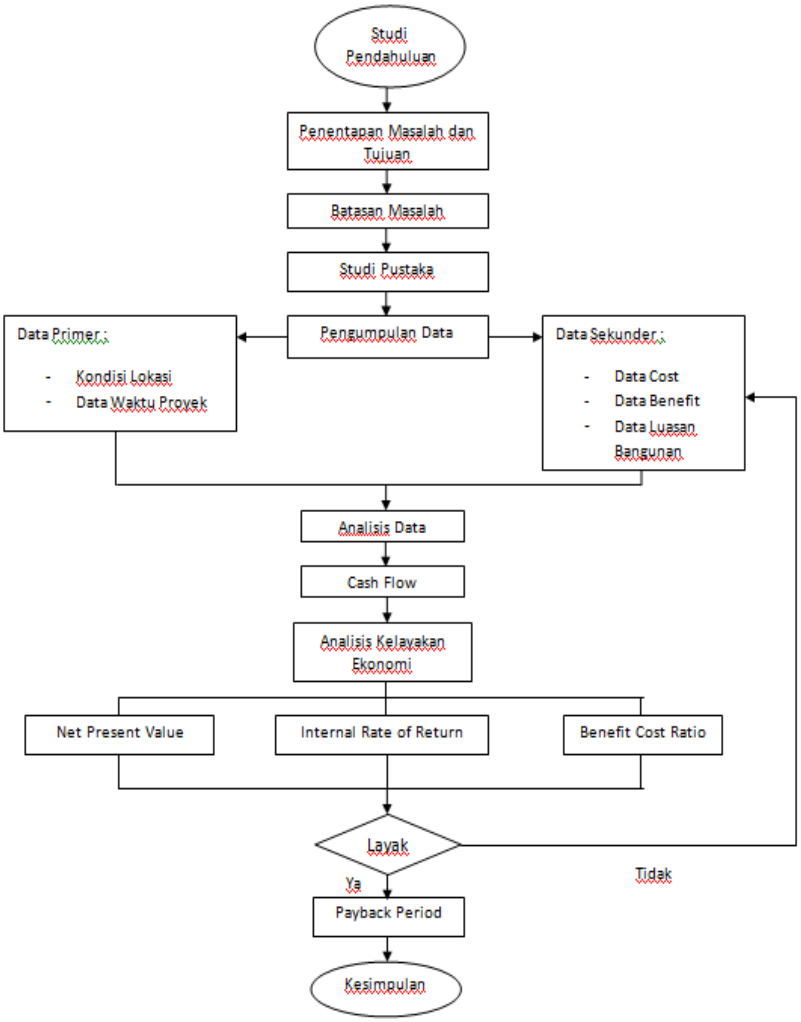
payback period = $\frac{Nilai\ investasi}{prosceed}$

## 3. Research Methodology

### 3.1. Steps of the research

There are some steps of the research such as:

1. First is statements of the problems
2. Next is collect the bibliography of the study
3. After that discuss the economic feasibility method
4. Then, analyze the data
5. The last is conclude the result and suggestion




**Picture 1.** Research Flow

## 4. Research Findings And Discussion

### 4.1. Initial Investment

Details of Construction Project Cost Plan Sentraland Semarang, Jl.Kimangunsarkoro, No.36 Semarang below:

**Table 1. Detail Of Initial Cost Plan**

| No | Tipe Of Work | Nilai Kontrak |
|---|---|---|
| I | Preparatory | |
| 1 | DED | Rp. 2.577.000.000 |
| 2 | Site Legal Permit | Rp. 4.639.217.000 |
| II | Struktur | |
| 1 | Sub struktur | Rp. 35.258.467.000 |
| 2 | Upper struktur | Rp. 135.358.062.000 |
| III | Arsitektur | Rp. 40.742.000.000 |
| IV | MEP | Rp. 59.858.261.000 |
| V | Interior | Rp. 21.772.597.000 |
| VI | Other Fasilitas | Rp. 25.899.581.000 |
| | Total | Rp. 289.437.385.000 |
| | PPN (10 %) | Rp. 28.943.738.500 |
| | **Grand Summary** | **Rp. 318.381.123.500** |

*Source : Data of Sentraland Semarang*

### 4.2. Benefit

The revenue plan from Semarang Central Project, Jl.Kimangunsarkoro, No.36 Semarang below:

**Table 2. Detail of benefit**

| No | Item | QTY | Unit | Price | Total |
|---|---|---|---|---|---|
| I | Sells | | | | |
| 1 | Unit Appartment / Condotel type 28 m2 | 170 | Unit | Rp. 550.000.000 | Rp. 93.500.000.000 |
| 2 | Unit Appartmen / Condotel type 42 m2 | 120 | Unit | Rp. 750.000.000 | Rp. 90.000.000.000 |
| 3 | Unit Appartmen / Condotel type 54 | 80 | Unit | Rp. 1.250.000.000 | Rp. 100.000.000.000 |
| 4 | Unit Hotel | 128 | Unit | Rp. 380.000.000 | Rp. 48.640.000.000 |
| 5 | Office | 3800 | M2 | Rp. 6.000.000 | Rp.22.800.000.000 |
| 6 | Retail / Commersial | 7000 | M2 | Rp. 3.000.000 | Rp.21.000.000.000 |
| 7 | Food Court | 800 | M2 | Rp. 3.500.000 | Rp.2.800.000.000 |
| 8 | Motorcycle parking | 3000 | M2 | Rp. 4.000.000 | Rp. 12.000.000.000 |
| 9 | Cars parking | 3000 | M2 | Rp. 7.500.000 | Rp.22.500.000.000 |
| Total | | | | | Rp.413.240.000.000 |
| PPN (10 %) | | | | | Rp.41.324.000.000 |
| **Grand Summary** | | | | | **Rp.372.000.000.000** |

*Source : Data of Sentraland Semarang*

### 4.3. Cost

1. Detail of building maintenance fee

   Maintenance bilding sentraland semarang, Jl. Kimangunsarkoro, No.36 Semarang is planned 5% per year from the project budget plan. With the formula = grand summary RAB project x 5% = Rp. 318.381.123.500 x 5% = Rp. 15919.056.180

2. Details of Building Operational Costs
   Operational Cost of Central Building Building Semarang, Jl. Kimangunsarkoro, No.36 Semarang is planned 15% of Building Maintenance Cost per year. In this study the planned Maintenance Cost Building for 10 years.

**Table 3. Detail Of Building Operasional Costs**

| year | Number of year | Cost | i = 10 % d = 1 / (1+0,1)^n | Present Worth |
|---|---|---|---|---|
| 2017 | 0 | 0 | 0 | 0 |
| 2018 | 1 | Rp795.952.809 | 0,9090909091 | Rp 723.593.463 |
| 2019 | 2 | Rp915.345.730 | 0,8264462810 | Rp 756.484.075 |
| 2020 | 3 | Rp1.052.647.590 | 0,7513148009 | Rp 790.869.714 |
| 2021 | 4 | Rp1.210.544.728 | 0,6830134554 | Rp 826.818.338 |
| 2022 | 5 | Rp1.392.126.438 | 0,6209213231 | Rp 864.400.990 |
| 2023 | 6 | Rp1.600.945.403 | 0,5644739301 | Rp 903.691.944 |
| 2024 | 7 | Rp1.841.087.214 | 0,5131581182 | Rp 944.768.850 |
| 2025 | 8 | Rp2.117.250.296 | 0,4665073802 | Rp 987.712.889 |
| 2026 | 9 | Rp2.434.837.840 | 0,4240976184 | Rp 1.032.608.929 |
| 2027 | 10 | Rp2.800.063.516 | 0,3855432894 | Rp 1.079.545.699 |
| Operasional cost for 10 years | | | | Rp 8.910.494.889 |

*Source : Data of Sentraland Semarang*

### 4.3. Analysis

1. BCR Analysis
   The BCR analysis, can be calculated by the following formula:
   BCR = (Σ benefit) / (Σ cost)
   BCR = 372.000.000.000/327.291.618.389 = 1.04
   Value BCR = 1.14 so the construction of Sentraland building Semarang worth to be implemented.
2. NPV Analysis
   The NPV analysis, can be calculated by the following formula:
   NPV = Benefit – Cost
   NPV = 372.000.000.000 – 327.291.618.389
   NPV = Rp.44.624.381.611 so the construction of Sentraland building Semarang worth to be implemented.
3. IRR Analysis
   The feasibility of building construction can be determined after we calculate the IRR value. IRR calculation using trial & error. By using present method worth a try with interest rate i = 1% and i = 10%
   Used Factor = 1%

## 5. Conclusion And Suggestion

### 5.1. Conclusion

Based on the results of research conducted, project work is positive for investors, here is the result:

1. After calculating, it can be known that the total costs of sentraland's project is Rp. 372.000.000.000
2. OP costs of sentraland semarang total is Rp. 8.910.494.889
3. The economic feasibility BCR value = 1,14

4. Based on analysis, project can be said that is feasible.

**5.2 Suggestion**

As the result of this study could be suggest as follows:

1. More results can be obtained if the building can be managed directly
2. Expected for further research to analyze sensitivity studies

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