

## INVESTMENT FEASIBILITY ANALYSIS OF RESORT X DEVELOPMENT PROJECT IN LABUAN BAJO USING DISCOUNTED CASH FLOW AND MONTE CARLO METHOD

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### ABSTRACT

*Labuan Bajo is being the focus of infrastructure development by the Indonesian government which is one of the super priority tourism destinations. In general, tourist destinations in Labuan Bajo are synonymous with Komodo National Park. This is the background for the developer to invest in the construction of resort X in Labuan Bajo. It is hoped that the resort X area can become an attraction for tourists in Labuan Bajo. In this study, a financial feasibility analysis was carried out to find out whether or not the investment to be made was feasible. The methods used are discounted cash flow (DCF) and Monte Carlo. The X resort construction project is built on an area of 113,396 m<sup>2</sup> and is planned to build 263 units of shop houses and 1 unit of 4-star hotels as well as supporting buildings such as back of house (BOH) buildings, public toilets, floating libraries, arrival pavilions. The results of the analysis using the DCF method show a positive NPV value of Rp 87,895,000,000 and an IRR value of 17.66% greater than the Minimum Attractive Rate of Return (MARR) value of 10%, so that the project can be declared feasible to be implemented, as well as the Monte Carlo method which shows a positive NPV value of Rp 35,423,000,000 and an IRR value of 12.82% greater than the MARR value. Therefore, based on the results of the analysis of these two methods, the resort X project in Labuan Bajo can be declared feasible to be implemented.*

**KEYWORDS** Discounted Cash Flow; Monte Carlo; Feasibility Analysis; Trinomial Lattice; Labuan Bajo



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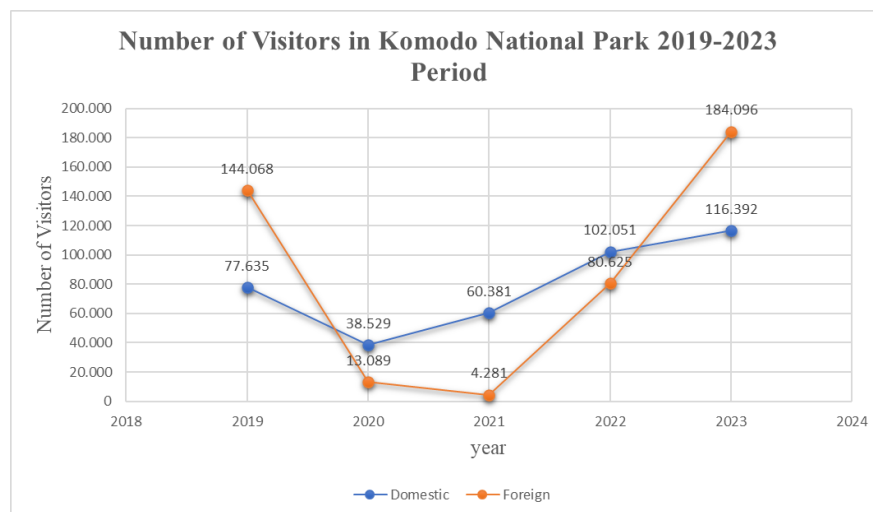
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## INTRODUCTION

The Eastern Region of Indonesia (KTI) is the focus of infrastructure development of the Ministry of Public Works and Public Housing (PUPR). This is a form of implementation of *nawacita*, namely building from the periphery. The construction of this KTI aims to reduce the development gap with the western region of Indonesia. Based on the Ministry of PUPR (2017), the Labuan Bajo area is designated as one of the super priority tourism destinations (Giatman, 2011). In 2023, Labuan Bajo will be the location for the 42nd ASEAN Summit (KTT ASEAN) (Kwak & Ingall, 2009; Rochaety & Tresnati, 2022).

Based on the Central Statistics Agency of West Manggarai Regency (2024), West Manggarai Regency has a land area of approximately 3141.47 km<sup>2</sup> consisting of the mainland of Flores and several large islands such as Komodo Island, Rinca, Longos and several other small islands. The city of Labuan Bajo itself has a land area of approximately 813.53 km<sup>2</sup>. The tourist destination for tourists in Labuan Bajo is Komodo National Park (Purwadinata & Ridolof, 2020). In Figure 1, a recapitulation of the trend of the number of visitors in Komodo National Park consisting of foreign and domestic visitors in the 2019-2023 period will be displayed (Bouayed, 2016; Stevens, 2022).



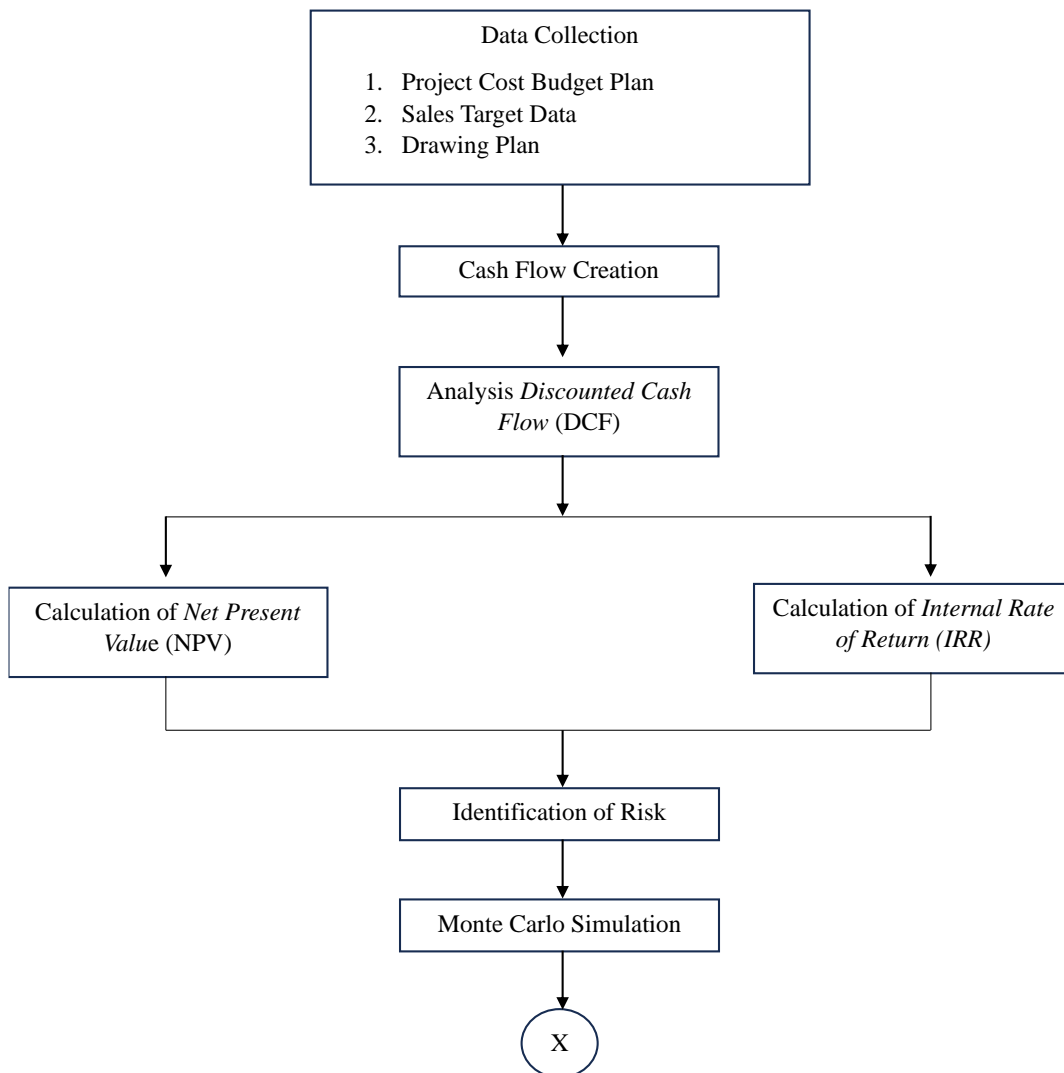
**Figure 1.** Number of Visitors to Komodo National Park 2019-2023

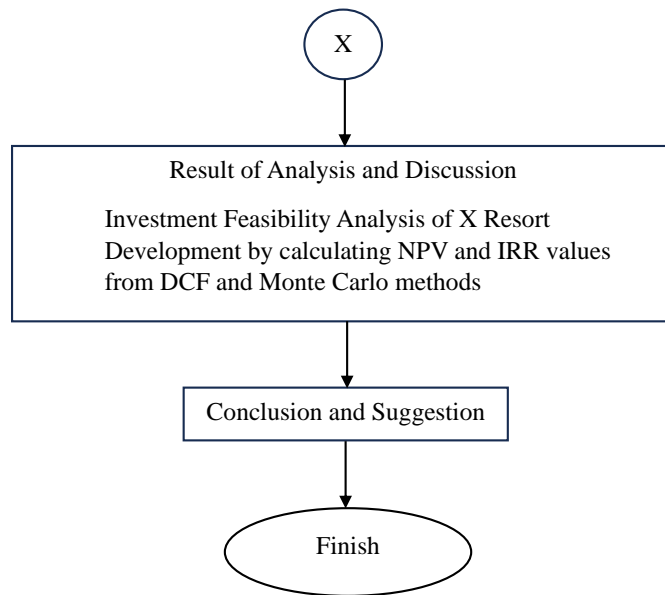
PT. XYZ as the developer plans to invest in the Labuan Bajo area. As a developer, he sees the potential for resort development to be one of the attractive investments to make in Labuan Bajo by taking advantage of natural beauty such as hills and the beauty of the sea. Labuan Bajo is also the only access for tourists aiming to Komodo Island. This is also strengthened by the data of hotel visitors in West Manggarai Regency which recorded an upward trend per year. Mill (2012) state that *Resort* is a place where people go for recreation. The resort X development project is built on an area of 113,396 m<sup>2</sup> and is planned to build 263 units of shop houses and 1 unit of 4-star hotel buildings as well as supporting buildings such as back of house (BOH) building, public toilet, floating libraries and arrival pavilion

(Soeharto, 2001; Trigeorgis, 2003). With a large area and a large number of construction activities to be carried out, this study is intended to evaluate the feasibility of an investment planned by developers (Metropolis, 1949). By conducting a financial feasibility analysis on resort X, it is hoped that it will be known whether or not it is feasible to invest in the construction project of resort X in Labuan Bajo.

## RESEARCH METHOD

This study was conducted in the West Manggarai area, Labuan Bajo City, East Nusa Tenggara (Sa'adah, 2021). The determination of this location is believed to be a tourist attraction in the city of Labuan Bajo in addition to Komodo Island (Juliandi & Manurung, 2014).





**Figure 2.** Research Flow Diagram

## RESULT AND DISCUSSION

### Discounted Cash Flow (DCF) Analysis

Before conducting a DCF analysis, it is necessary to create a *cash flow* on the project to be implemented. The cash flow recapitulation can be seen in Table 1. Based on the results of the calculation in Table 1, the *present value* each year can be calculated based on the *net cash flow* that has been discounted. It is known that the NPV value is Rp 87895 (in million rupiah) > 0 and an IRR value of 17.66% > a *Minimum Attractive Rate of Return (MARR)* of 10%. Based on the *calculation of discounted cash flow*, resort X project can be declared feasible.

**Table 1. Project Cash Flow Recapitulation**

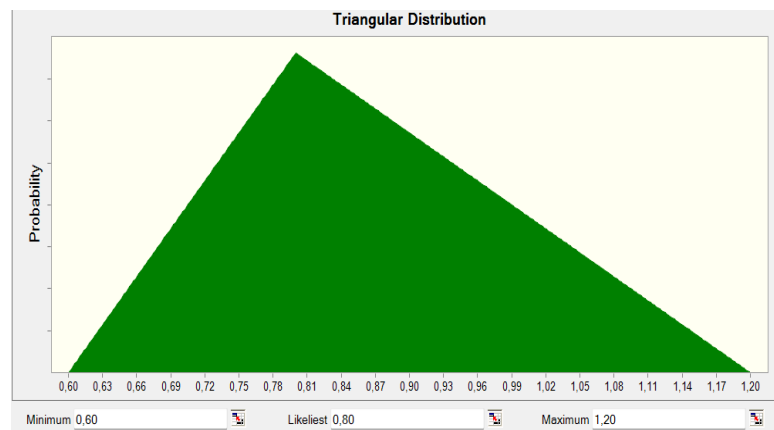
Year	Cash In		Cash out		Net Cash Flow		DCF
2024	Rp	-	Rp	16.427	(-Rp	16.427 )	(-Rp 16.427 )
2025	Rp	25.722	Rp	186.241	(-Rp	160.518 )	(-Rp 151.329 )
2026	Rp	72.092	Rp	184.157	(-Rp	112.065 )	(-Rp 97.363 )
2027	Rp	175.659	Rp	184.157	(-Rp	8.499 )	Rp 34.630
2028	Rp	175.659	Rp	130.443	Rp	45.215	Rp 112.931
2029	Rp	207.466	Rp	43.709	Rp	163.757	Rp 108.583
2030	Rp	171.420	Rp	43.709	Rp	127.711	Rp 73.890
2031	Rp	87.155	Rp	43.709	Rp	43.446	Rp 22.980
					NPV		<b>Rp87.895</b>
					IRR		<b>17,66%</b>

**Monte Carlo Simulation**

After obtaining the NPV and IRR values, in this part a Monte Carlo simulation was carried out using the help of the Crystall Ball program which helped calculate the risk factors by providing random values that were assumed to affect the NPV and IRR values of an investment. This study will focus on 3 risk variables, namely the results of the shophouse sales target, the increase in the price value of construction buildings, and the occupancy rate of hotel room rentals.

**Determination of Distribution of Shophouse Sales Target Results**

Based on the condition of Labuan Bajo which is still developing, it is assumed that the sales of shophouses can decrease by 40% as the minimum sales results, the estimate of likeliest is assumed that the sales results can be reduced to 80%, and the maximum estimate is assumed to be 120% of the sales results. The following is presented the triangular distribution which can be seen in Figure 3.



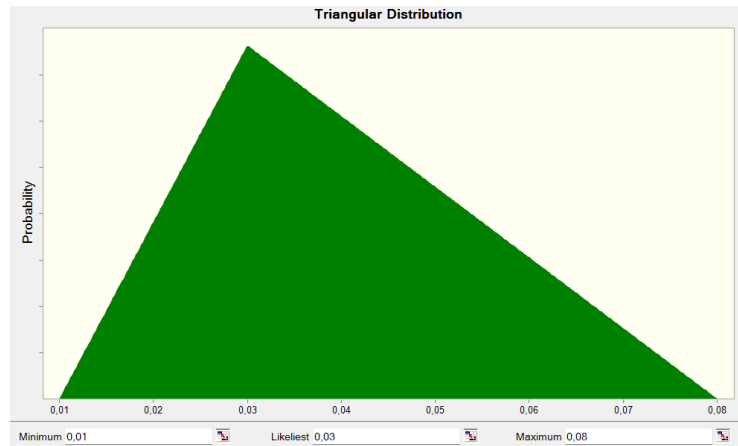
**Figure 3.** Triangular distribution for the target of shophouse sales

**Determination of Distribution of Increase in the Price Value of Construction Building Materials**

Based on BPS for the period 2015 to 2019, the price value of construction building materials increased by around 3.04% from 2015 to 2019. The highest increase occurred in 2019 at around 8.77%. So it is assumed that the minimum construction building price value will increase by 1%, the estimated likeliest will increase by 3.04% and the maximum will increase by around 8.77%. Table 2 shows the Construction Cost Index (CCI) as a reference in determining the increase in construction building prices. The following triangular distribution can be seen in Figure 4.

**Table 2. Percentage of Volatility in Building Material Prices Based on CCI**

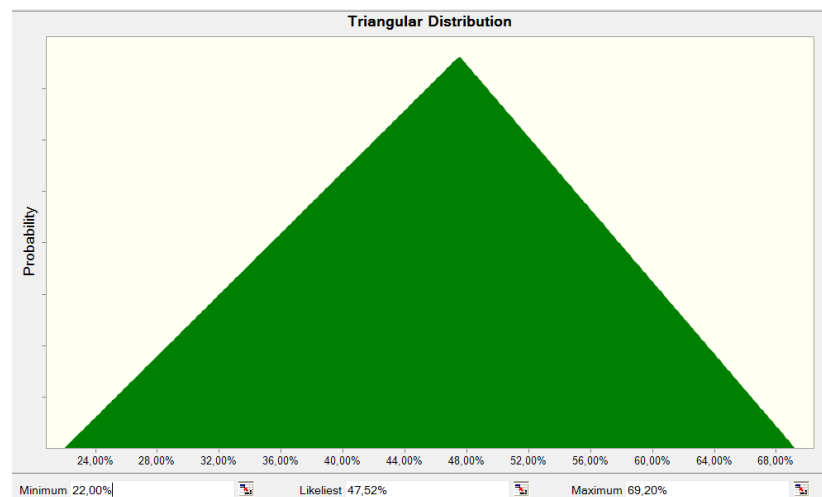
Construction Cost	2015	2016	2017	2018	2019	Average
Index (CCI)	88,87	95,82	91,57	91,57	99,6	
Percentage						
Volatility (%)	-	7,82	-4,44	0,00	8,77	3,04



**Figure 4.** Distribution of Probability of Percentage Increase in Construction Prices/year

### Occupancy Rate Percentage of Room Rental in Star-rated Hotels

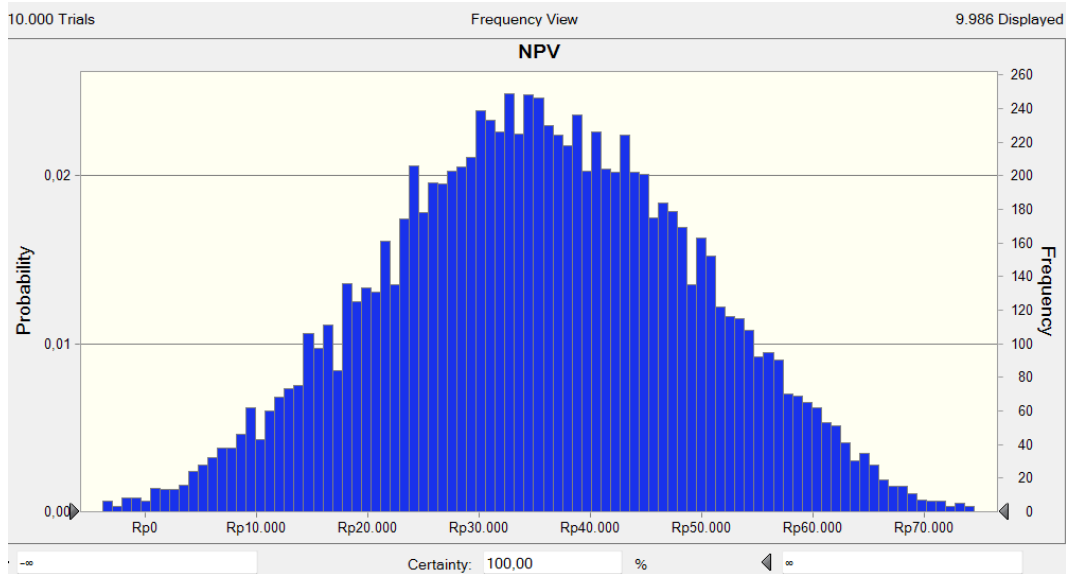
Based on data from BPS West Manggarai in 2023, the average occupancy rate of star-rated hotels was 47.52%. The minimum occupancy rate that occurs is 22.31% and the maximum occupancy rate of room rent is 69.20% in August which is the high season for people on vacation. The following is presented the triangular distribution which can be seen in Figure 5.



**Figure 5.** Probability Distribution Percentage Occupancy rate hotel room rental

### Discussion of Monte Carlo's Results on NPV

Based on the results of the Monte Carlo simulation that has been carried out for 10,000 iterations, the NPV results and the recapitulation of the forecast value results can be seen in Figure 6 and Figure 7.



**Figure 6.** Results of Monte Carlo Simulated Frequency on NPV

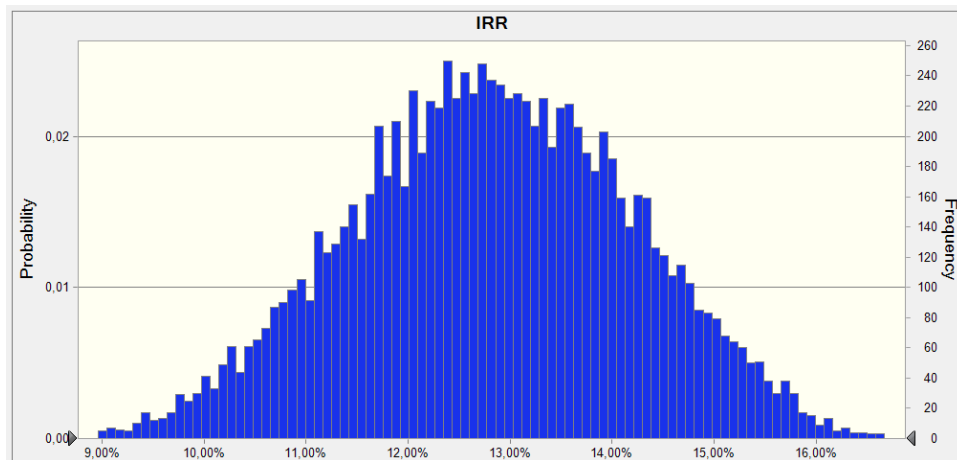
Statistic	Forecast values
Trials	10.000
Base Case	Rp87.895
Mean	Rp35.338
Median	Rp35.274
Mode	---
Standard Deviation	Rp13.983
Variance	Rp195.536.244
Skewness	-0,0368
Kurtosis	2,65
Coeff. of Variation	0,3957
Minimum	(Rp11.534)
Maximum	Rp82.500
Mean Std. Error	Rp140

**Figure 7.** Monte Carlo simulation results on NPV (in millions of rupiah)

Based on Figure 6 and Figure 7 above, it can be concluded that the average NPV value is IDR 35,338 (in million rupiah) with a standard deviation of IDR 13,983 (in million rupiah). It can be seen that the NPV value with the Monte Carlo simulation has a lower NPV result of Rp 52,557 compared to NPV using the DCF method.

### Discussion of Monte Carlo Results on IRR

Based on the results of the Monte Carlo simulation that has been carried out 10,000 iterations, the results of the IRR and the recapitulation of the forecast value results can be seen in Figure 8 and Figure 9.



**Figure 8.** Monte Carlo Simulated Frequency Results against IRR (per year)

Statistic	Forecast values
Trials	10.000
Base Case	17,66%
Mean	12,82%
Median	12,82%
Mode	---
Standard Deviation	1,38%
Variance	0,02%
Skewness	-0,0638
Kurtosis	2,66
Coeff. of Variation	0,1075
Minimum	8,12%
Maximum	17,42%
Mean Std. Error	0,01%

**Figure 9.** Monte Carlo simulation results against IRR (per year)

Based on Figure 8 and Figure 9 above, an average IRR value of 12.82% per year is obtained with a standard deviation of 1.38%. The maximum value of IRR reaches 17.42% per year. It can be seen that the IRR value with the Monte Carlo simulation has a lower NPV result of 4.84% compared to NPV using the DCF method.

### CONCLUSION

In this study, an investment feasibility analysis has been calculated which can be concluded as follows: Based on the discounted cash flow analysis, it resulted in a positive NPV value of Rp 87,895,000,000 and an IRR value of 17.66% per year, higher than the predetermined MARR value of 10%. So the investment in the construction of resort X can be declared feasible to be implemented.

Meanwhile, the results of the Monte Carlo simulation, which has considered risk factors, obtained a positive average NPV value of IDR 35,423,000,000 with a standard deviation of IDR 14,067,000,000 and an average IRR value of 12.82% per year with a standard deviation of 1.39% higher than the MARR value. So the investment in the construction of resort X can be declared feasible to be implemented. The identified risks such as the sales of shophouses, hotel room rental



income, and the increase in building material prices have a reduction factor of 59.6% to the NPV value of the project using the DCF method.

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