Financial Feasibility Analysis of Terminal Construction Project at Motaain Checkpoint Crossing in Belu Regency

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Abstract—*One of the borders of Indonesia is located in Belu Regency, East Nusa Tenggara Province where the checkpoint crossing is located in which it borders the Democratic Republic of Timor-Leste; i.e. the Motaain Checkpoint Crossing. Previously, the existence of its terminal did not have complete facilities that were fully adequate as a A-type terminal and did not have supporting facilities to become a commercial area. Currently, the terminal construction project is being carried out to provide convenience for its users and gain income. It is planned to have several places that will be leased. By having the terminal construction project in the checkpoint crossing, we can review the performance of A-type terminal, economic feasibility for the government, and benefits for the community. To analyze the financial feasibility of the checkpoint crossing's terminal construction project, the indicators used to calculate financial feasibility include Net Present Value (NPV), Benefit Cost Ratio (BCR), Internal Rate of Return (IRR), and return on capital to break even using the Payback Period (PBP) method. Based on the calculation of economic analysis using several indicators, it was found that the Net Present Value (NPV) is IDR 44,503,687,056, Benefit Cost Ratio (BCR) is 1,49, the value of BCR > 1, Internal of Return (IRR) > 12%; that is 19%, and Payback Period (PBP) in 2024 or the 8th year is IDR 5,871,957,983. Based on these findings, the construction project of the Motaain Checkpoint Crossing is feasible considered to be feasible.*

Keywords—*Benefit Cost Ratio, Internal Rate of Return, Net Present Value, Payback Period, Sensitivity.*

I. INTRODUCTION

The border region in Indonesia consists of land, sea, and air. However, the borders that are visible include land and sea boundaries. The border area is an area that is geographically bordered directly by neighboring countries and which is directly dealing with other countries [1]. The border areas in Indonesia include 3 countries; the land boundary area includes Malaysia, Democratic Republic of Timor-Leste, and Papua New Guinea. In addition, Indonesia's State sea boundary borders 10 neighboring countries including India, Malaysia, Singapore, Thailand, Vietnam, the Philippines, Democratic Republic of Timor-Leste, Papua New Guinea, Australia and Palau.

Terminals are places where transportation can stop and load or dismantle goods [2]. According to Law Number 22 of 2009, the terminal is a base of public motorized vehicles used to regulate arrivals and departures, pick and drop goods/people as well as transfer of modes of transportation. The terminal division based on the type of transport includes the passenger terminal and goods terminal. Passenger terminal is road transportation infrastructure for the purpose of picking and dropping the passengers, intra-movement or between modes of transportation and regulating the arrival and departure of public transport [3]. The goods terminal is a road transportation infrastructure that aims to dismantle and load goods as well as intra- or inter-mode transportation [4].

The position of the Indonesian land borders makes the movement of people and goods increasingly high and causes the increasing need for transportation services. The need for transportation services is increasing since the access to human and goods movements is also increasing every year.

Cooperation between countries in several commodities makes transportation needs continue to grow. This increasing movement makes the function of checkpoint crossing increasingly expanded and maintained. Some of the country's border areas are sometimes synonymous with remote, poor infrastructure, and poor areas. The existence of a land route that connects between 2 (two) countries is one of the opportunities to obtain a large economic income. As a boundary line, it is not only the country's economy that will improve but the local economy is also expected to have an impact on economic improvement.

One of the borders of Indonesia is located in Belu Regency, East Nusa Tenggara Province where the checkpoint crossing is located in which it borders the Democratic Republic of Timor-Leste; i.e. the Motaain Checkpoint Crossing. Previously, the existence of its terminal did not have complete facilities that were fully adequate as an A-type terminal and did not have supporting facilities which can be rented to become economic income. In other words, the terminal itself does not have commercial area. However, the current construction continues to increase due to the increasing needs. Thus, further construction and improvement of some facilities are needed. Recently, the terminal is making changes and expansion for the convenience of its users and aiming to have additional income since in the construction plan will build several places which can then rented. Those rented places are expected to be used properly since it spent many costs. Similar to other border areas, some places around the border are still lacking in infrastructure and are commonly consisting of poor families. By the existence of the checkpoint crossing, it is desirable to see the performance of the A-type terminal and the financial feasibility of the construction

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project for the government and the direct benefits experienced by the community; by the construction of the Motaain checkpoint crossing.

A. Research Problems

The formulation of the research problems to be discussed in this research are:
1. How is financially the feasibility of the Motaain checkpoint crossing terminal?
2. How many years has the project been implemented to break even value?
3. What is the sensitivity of the project to rising interest rates and rising material prices?

B. Research Objectives

The objectives of this research include:
1. Analyzing the financial feasibility of the Motaain checkpoint crossing terminal.
2. Analyzing the project to break even value.
3. Analyze project sensitivity to rising interest rates and rising material prices.

II. RESEARCH METHOD

A. Planning

At this stage, preparations are made in the form of providing equipment that will be needed in conducting the survey. The things that need to be prepared are design surveys, literature reviews, and other related journals. Those information sources are used to compile a theoretical review in scientific research.

B. Survey Method

Primary data survey is an activity aiming to obtain field data directly by observing the condition of the research setting [5]. Primary data are in the form of observation results regarding the information on the availability of terminal facilities and information on terminal facility's needs. The observation results were obtained by using documentary study and observation. This research used structured observation technique in which the observers use observation guidelines in carrying out the observation [6].

In this case, the availability and types of facilities are in the form of absolute main facilities in the terminal such as arrival and departure areas, passenger parking spaces, public transportation waiting areas, crossroads, office buildings, shopping areas, watch towers, signs, parking lots and counters. In addition, it also provides supporting facilities such as toilets, prayer rooms, treatment rooms, information rooms, public phones and parks.

From the results of the observations, the facilities used and the available facilities were calculated. The basis of the observation technique is expected to answer the research objectives.

C. Documentation

The data collection was carried out by recording events or situations in the research location in the form of pictures (photographs) to support the research. Taking the pictures will be carried out in several parts of the location in the terminal and the available facilities to facilitate the research identification stage. Pictures (photographs) are taken from, for example, waiting areas, arrival areas, departure areas, office management buildings, and all terminal areas.

D. Secondary Data Survey

Secondary data were obtained through literature related to the research topic. This literature study consists of theoretical reviews and data collection from relevant agencies. Theoretical review is a data collection activity conducted by studying the theories of expert's opinion of related to the discussion of the research. Meanwhile, the data from some agencies are required to support the discussion. The required data comes from the Transportation Agency of Belu Regency and the terminal management agency.

E. Research Setting

The research was conducted at the Motaain Checkpoint Crossing terminal, on the border of the Republic of Indonesia and Timor Leste which is located in Silawan Village, Belu Regency, East Nusa Tenggara Province. The observation of the research setting will be carried out inside the terminal and the area around the border crossing terminal with a radius of 200 meters.

F. Regional Potential Analysis Stage

This activity aims to find out and record the physical potential, population, and activities that occur in the research setting so that it obtains information relating to the construction of the terminal at the checkpoint crossing. This stage consists of determining the potential number of outbreaks that will occur in the future, determining the type of needs based on the activities occurred, and determining the types of needs and transportation of goods.

G. Performance and Feasibility Analysis Stage

This stage will discuss the level of terminal performance and economic feasibility in the Motaain checkpoint crossing. This terminal performance can be seen from the indicators: A-type terminal requirements and the suitability of existing facilities with terminal facilities. To calculate economic feasibility, it is reviewed from: project feasibility analysis, project sensitivity analysis of tariff increases, socio-economic community.

III. RESEARCH FINDINGS

A. Terminal Perfomance

Based on the definition, the terminal is a node from various means (modes) of transportation that has a function as a point of transfer of passengers from one means of transportation to other means of transportation and also a starting point and end point of a person's journey on a particular trip. Another definition of a terminal is a process tool from the transportation system and is the point where passengers and goods go in and out of the system.

The development of checkpoint crossing is occurring along with the ever-increasing number of crossers which supports the economic activities of the community both in Indonesia and the RDTL (Democratic Republic of Timor-Leste). The development of the border area is aimed at realizing the border area as a competitive and safe front yard of the country so that

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the development of the border region is built with a security, prosperity and environmental approach. The development carried out at the border line is also in accordance with the current government program, i.e. the 3rd NAWA CITA; developing Indonesia by strengthening peripheral regions and villages within the framework of a unitary state, one of which is to accelerate the development of the country's border areas. The development of this border area is also supported by road facilities and utilities such as water and electricity networks.

The development of checkpoint crossing serves crossers who enter and leave Indonesia. In addition to serving crossers, this crossing also has a function to serve access of public transportation between cities in the province and cross-border transportation, parking that travels to serve passers-by who enter Indonesia and city transportation. Therefore, by looking at the service function, this crossing is also used as an A-type terminal.

Currently, the national boundary between Indonesia and RDTL which is located in Belu Regency has a checkpoint crossing which is a crossing center called the Motaain checkpoint crossing. Motaain itself is a node of land transportation facilities that connects Indonesia and RDTL, both passengers and goods.

TABLE 1. Terminal Terms and Functions

Indicators of A-Type Terminal		Existing Motaain Checkpoint Crossing
Location Requirements	It lies in the inter-provincial route network and/or national border traffic	√
	It is located on an arterial road that has the road class of at least Class IIIA.	√
	The distance between the two A-type terminals (in one trajectory) is at least 20 km on Java Island, 30 km on Sumatra Island, and 50 km on other islands.	√
	The available land area is at least 5 Ha for terminals in Java and Sumatra Islands and 3 Ha on other islands (the building area is adjusted to needs)	√
	It has access to the entrance or exit to and from the terminal with a minimum distance of 100 meters on the Java Island and 50 meters on other islands; calculated from the road to the terminal exit or entrance.	√
Service Area Functions	It aims to serve public transportation for checkpoint crossing transportation, inter-city transportation between provinces, inter-city transport within the province, city transportation and rural transportation.	√

Reviewing from the existing conditions in the field and some definitions of the terminal, currently the Motaain checkpoint crossing is considered to be a terminal; a part of the transportation system which is the starting and ending point for the entry and exit of passengers and goods. In the literature review, the Motaain checkpoint crossing is already referred to in an A-type terminal which is in line with the terms and functions based on the terminal service area can be seen in Table 1.

The facilities provided in the checkpoint crossing zone that function as this terminal are also adequate as the passenger terminal. The facilities available are also quite convenient for the user and is provided as an absolute facility that must be owned in a terminal. The availability of these facilities can be seen in Table 2.

TABLE 2. The Availability of the Facility

Type	Facilities	The Existing Motaain Checkpoint Crossing
Main Facilities	Departure Path	√
	Arrival Path	√
	Waiting Area for Public Transport	√
	Waiting Area for Passenger	√
	Track Path	√
	Official Building	√
	Rest Area for Vehicles	√
	Watch Tower	-
	Ticket Sales Counter	-
	Signs and Information Boards	√
	Parking area for delivery transport and taxi	√
Supporting Facilities	Toilet	√
	Prayer Room	√
	Treatment Room	-
	Information Room	√
	Public Payphone	-
	Park	√

The existing conditions indicate that most of the facilities have been provided and have also been used. However, some facilities that are not available at the main facilities include the watchtower and ticket sales counters and at supporting facilities including the treatment room, public payphone and prayer room to be built in the second stage.

B. Financial Feasibility Analysis

The feasibility analysis in this research aims to determine the financial feasibility of construction project of Motaain Checkpoint Crossing, which is reviewed using the methods of Net Present Value (NPV), Benefit Cost Ratio (BCR), Internal Rate Of Return (IRR), break-even analysis or Break Even Point (BEP) which aims to determine the age of the project to the break even value with the Payback Period (PBP) method and sensitivity analysis to see the project feasibility level during the price changes.

C. Planning Analysis

The construction of the Checkpoint Crossing, which also functions as a terminal, consists of 2 stages of construction. The first stage covers the main zone and the second stage includes the construction of supporting zones; the implementation time starts in 2016-2019. The completion phase is described as follows:

- First Stage: border gate building, guard house, arrival and departure gate building, main office building, customs service office building, weigh bridge building, X-Tray and warehouse.
- Second Stage: development of supporting zones, i.e. employee mess, Indonesian homestead, checkpoint market, church, rest area, sports field, military post, police post.

The construction of the second stage is on-going. In addition, the construction of the main zone in the first stage of

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construction has begun to be operated although it is not yet optimal. The first stage calculates the estimated budget needs to its realization based on each type of building.

D. Economic Aspect

The review of an economic feasibility is inseparable from economic aspects defined through the values of money or costs. Economic feasibility is assessed by direct and indirect benefits for various parties. In relation to feasibility, the value of benefits obtained must also be greater than the costs incurred. Discussions on economic aspects include:

1. Expenditure Cost Analysis

Expenditure cost analysis, such as total construction and operational costs, includes employee salaries, office administration, electricity costs and others. The expenses are analyzed as follows:

a. Construction Costs

-	Construction Cost	=	IDR 82,280,082,000
-	VAT Cost 10%	=	IDR 8,228,008,200
	Total	=	IDR 90,508,090,200

b. Operational Costs

Operational costs are calculated since the terminal is fully operational. However, the terminal at this Motaain checkpoint crossing has not fully operated because the construction of stage 2 will only begin, so that the ongoing activities are the crossing activities. Some activities are still funded by the central government, but some expenditures can be assumed based on local conditions. In addition, expenditure is also assumed to increase up to 3%. These operational costs include:

c. Employee Salary

There are many related agencies in this construction project one of which is the border manager who is also the temporary terminal manager, in which the manager is required to employ workers from the local community, in this case, the Silawan Village community to help the community economy. The workforce consists of:

- Team Leader of Cleaning Service

There are 3 workers with a salary of IDR 1,500,000 / month.

- Technicians of Motaain Checkpoint Crossing

There are 4 workers with a salary of IDR 1,500,000 / month

- Security Officer

There are 10 workers with a salary of IDR 1,500,000 / month

- Janitor

There are 18 workers with a salary of IDR 1,250,000 / month

TABLE 3. Estimated Recapitulation of Employee Salary Needs

Jobs	Workers	Salary (IDR)	Total
Team Leader of Cleaning Service	3	IDR 1,500,000	IDR 4,500,000
Technicians of Checkpoint Crossing	4	IDR 1,500,000	IDR 6,000,000
Security Officer	10	IDR 1,500,000	IDR 15,000,000
Janitor	18	IDR 1,250,000	IDR 22,500,000
Total			IDR 48,000,000

The total cost incurred for the 1-month employee salary at the Motaain Checkpoint Crossing is IDR 48,000,000.

d. Insurance Cost

Insurance costs are assumed to be as much as 3% of the total construction costs of the Motaain Checkpoint Crossing project as follows:

TABLE 4. Estimated Insurance Costs

Description	Rate (%)	Value (IDR)	Insurance Costs
Construction Costs of Motaain Checkpoint Crossing in Belu Regency	3	90,508,090,200	2,715,242,706

e. Electricity Cost

Electricity needs in the Motaain Checkpoint Crossing area are quite large because there are several electronic uses that help the crossing check like metal detector at each arrival and departure gate, as well as the interests of each work unit within the scope of the Checkpoint Crossing. Therefore, within 1 month, it can cost IDR 50,000,000. The prediction of planned expenditure costs in the terminal area of Checkpoint Crossing from 2019-2028 (10 years) is assumed to increase by 3% every 3 years.

2. Income Cost Analysis

The income cost is considered to be a direct benefit value, which is the direct benefit of A-type terminal in the Checkpoint Crossing in Belu Regency is obtained from the supporting zone, i.e. rental or sale booth at the checkpoint market, Indonesian guesthouse and vehicle or transportation levy entering and leaving the terminal. The supporting zone in this case is currently under construction. Based on the time of project implementation, this zone will be completed and start to operate in 2019.

a. State Passers

The checkpoint crossers are always crowded. Every day there are passers who will cross the border area in various interests, both economic and personal interests. Politically, the State of Indonesia, especially Belu Regency and Democratic Republic of East Timor (RDTL) has been separated, but the ties between ethnic groups and cultural cultures are still very close so that the indigenous people will cross the border for personal and economic interests every day, i.e. shopping in traditional markets because it is cheaper to shop in Indonesia for some necessity. Communities around the border who are directly across from RDTL are provided with cross-border pass for personal or family interests issued by Immigration agency and according to the provisions, it is free of charge for the people who manage the checkpoint.

TABLE 5. Number of Checkpoint Crossers Passing through the Motaain Checkpoint Crossing

Types of Crosser	Number of Crossers	Administration Cost (IDR)	Total Cost (IDR/month)
Citizen	2000	435,000	870,000,000
Vehicle	1200	435,000	522,000,000
Total Income			1,392,000,000

Crossers are also divided into 2 types, i.e. humans and vehicles, each of which must pay $ 30 (USD) once crossing with a specified time period. According to data obtained from border managers, the number of passers passing through Motaain checkpoint can be seen in Table 5, but this number increases every month especially on certain holidays so that

the income earned from crossing the country is assumed to increase by 1% every year.

b. Export-Import Activities

The export and import activities between Indonesia and the Democratic Republic of Timor Leste keep on-going because most of their basic needs are still from Indonesia, from basic necessities until daily necessities such as matches were still imported from Indonesia. Other income that can be obtained by the state is from this import and export activities. Based on the latest data on Customs and Excise in July 2018, the amount of export and import income can be seen in Table 6.

TABLE 6. Total of Export-Import Income

Export	$ 14,864,597
Import	IDR 4,326.474,777

Source: Atambua Customs

The amount of export and import income is converted into rupiah value and it is assumed that each of them has input into the country amounting to 10% of total income. However, every month it experiences an increase in the number of export-import activities, the total obtained is estimated in 2019, calculated from the total operation of the terminal is IDR 24,136,910,577. With the increase and addition of basic needs every month, it is assumed that the income increases every year is 1%.

c. Checkpoint Market

The checkpoint market is built for long-term use that sells Indonesian specialties and specifically East Nusa Tenggara which is provided for the general public. It also aims to build or increase the economy of the local community, especially the people of Silawan Village. It is assumed that it will be built as many as 30 stalls that will be leased for sale and purchase activities with estimated rental prices based on Belu Regency Regional Regulation No.15 of 2004 concerning Market Levies can be seen in Table 7.

TABLE 7. Levy Prices of Belu Regency Market

	I-Class Market (IDR/m^2/month)	II-Class Market (IDR/m^2/month)
Permanent Kiosk	7,500	7,500
Permanent Los	5,000	5,000
Semi-Permanent Los	-	2,500
Court	1,000	1,000

The rented stalls are assumed to have different areas if it is viewed from the location of the stalls and the stall area of 2500 m^2 and 6000 m^2. There are also permanent booth types. The cost of income from the market stall rental can be seen in table 4.10. Based on the total cost of entering the checkpoint market, it is assumed that there is an increase of 3% every 3 years which is calculated from the date of full operation in 2019.

TABLE 8. Market Income Costs

Stall Area (m²)	Number of Unit	Rental Price (IDR)	Total Cost (IDR)
2500	30	7,500	562,500,000
6000	15		675,000,000
Permanent Los	12	5,000	60,000
Total Income			**1,237,560,000**

Source: Analysis Results

d. Indonesian Guesthouse

Indonesian Guesthouse is built in the second stage of the construction project that is still underway and is a supporting facility in the Motaain Checkpoint Crossing area. The price offer from the guesthouse is assumed to come from the standards of several inns, hotels and home stays in Belu Regency which range from IDR 275,000. This guesthouse is considered as one of the incomes that can be generated by the state and is also a place of employment that can generate the economy of the community around the border area. It was assumed that the tariff from this guesthouse, based on the choice of rooms offered, is IDR 24,250,000. It can be seen in table 9 in which it starts operating in 2019 and will experience a 3-year increase of 1%.

TABLE 9. Income Income of Indonesian Guesthouse

Room Type	Number of Unit	Rental Price (IDR)	Total Cost (IDR)
Standard	30	275,000	8,250,000
Double	20	350,000	7,000,000
Twins Room	20	450,000	9,000,000
Total Income			**24,250,000**

e. Employee Mess

Mess is provided for employees who are within the scope of the Motaain Checkpoint Crossing who do not have a place to live and come from outside the Belu Regency. The Mess provided is assumed to be 30 units. Mess is considered as an official house facility given to the employees. The monthly rental fee comes from the withdrawal of the employee's salary and it returns to the non-tax state revenue which is in accordance with the applicable government regulation, namely Government Regulation No.47 of 2010 and there is no increase in the amount of rent price for the mess every year. Classes of mess and the price of rent mess are assumed in Table 10.

TABLE 10. State Income from the Employee Mess

Mess Type	Number of Unit	Rental Price (IDR)	Total Cost (IDR/month)
1-Class Mess	20	50,000	1,000,000
2-Class Mess	10	75,000	750,000
Total Income			**1,750,000**

f. Retribution of the Vehicle Entry

Vehicle retribution that enter the terminal area are types of transportation such as Mini Bus, Travel Car, Online Transportation which are used by border crossers as a means of transportation. After fully operating in 2019 it is assumed in Table 11.

TABLE 11. Retribution of Vehicle Entry

Vehicle Types	Number of Vehicle Entry	Retribution Cost (IDR/Day/Mode)	Total Cost (IDR/month)
Rural Transportation	10	5,000	1,500,000
Mini Bus	20	10,000	6,000,000
Travel Car	18	10,000	5,400,000
Online Transportation	30	2,000	1,800,000
Total Income			**1,900,000**

The retribution is considered valid from the operation in 2019 and retribution price is drawn in accordance with the

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provisions of the Regulation of Belu Regency that apply to Belu Regency terminals according to the terminal class. The retribution is considered to increase every 3 years with an increase of 3%.

E. Feasibility Analysis

The feasibility study is a comprehensive study and highlights all aspects of the feasibility of a project or investment. The feasibility study presents the results of a quantitative analysis of the benefits to be obtained. Eligibility criteria are closely related to success. In a project, the emphasis of success lies in the financial and economic aspects, whereas from the governance aspect the success criteria are

broader, namely economic growth, improving the welfare of the community, and encouraging private initiatives.

Assessment of feasibility analysis is carried out with several criteria commonly used and evaluations are also made. Feasibility analysis of the construction project for the Motaain Checkpoint Crossing terminal in Belu Regency uses several indicators, including:
1. Net Present Value;
2. Benefit Cost Ratio;
3. Internal Rate of Return; and
4. Payback Period.

TABLE 12. Calculation of Net Present Value (NPV)

Year (n)	Net in Flow (IDR)	Net Out Flow (IDR)	Discount Factory (12%) (P/F,12%, n)	Present Value	
				Inflow (IDR)	Outflow (IDR)
0		90,508,090,200	1.000		90,508,090,200
1	22,792,521,477		0.8929	20,351,442,427	
2	23,035,046,128		0.7972	18,363,538,773	
3	23,435,553,033		0.7118	16,681,426,649	
4	23,682,952,429		0.6355	15,050,516,268	
5	23,932,825,819		0.5674	13,579,485,370	
6	24,385,390,241		0.5066	12,353,638,696	
7	24,640,286,086		0.4523	11,144,801,397	
8	24,897,730,890		0.4039	10,056,193,506	
9	25,411,911,381		0.3606	9,163,535,244	
10	25,674,530,825		0.3220	8,267,198,926	
Sub Total			Outflow		90,508,090,200
			Inflow	135,011,777,256	
Net Present Value				44,503,687,056	

TABLE 13. Calculation of Net Present Value i (12%) and i (20%)

Year (n)	Cash Flow	i (12%)		i (20%)	
		(P/F,12%, n)	PV	(P/F,20%, n)	PV
0	-90,508,090,200	1.000	-90,508,090,200	1.000	-90,508,090,200
1	22,792,521,477	0.8929	20,351,442,427	0.8333	18,993,008,147
2	23,035,046,128	0.7972	18,363,538,773	0.6945	15,997,839,536
3	23,435,553,033	0.7118	16,681,426,649	0.5787	13,562,154,540
4	23,682,952,429	0.6355	15,050,516,268	0.4823	11,422,287,956
5	23,932,825,819	0.5674	13,579,485,370	0.4019	9,618,602,697
6	24,385,390,241	0.5066	12,353,638,696	0.3349	8,166,667,192
7	24,640,286,086	0.4523	11,144,801,397	0.2791	6,877,103,847
8	24,897,730,890	0.4039	10,056,193,506	0.2326	5,791,212,205
9	25,411,911,381	0.3606	9,163,535,244	0.1938	4,924,828,426
10	25,674,530,825	0.3220	8,267,198,926	0.1615	4,146,436,728
NPV		44,503,687,056		8,992,051,073	

TABLE 14. Calculation of Investment Return (Payback Period)

Year	Cash Flow (IDR)	Cash Flow Accumulation (IDR)
0	90,508,090,200	-90,508,090,200
1	20,351,442,427	-70,156,647,773
2	18,363,538,773	-51,793,109,000
3	16,681,426,649	-35,111,682,351
4	15,050,516,268	-20.061,166,082
5	13,579,485,370	-6,481,680,713
6	**12,353,638,696**	**5,871,957,983**
7	11,144,801,397	17,016,759,380
8	10,056,193,506	27,072,952,886
9	9,163,535,244	36,236,488,130
10	8,267,198,926	44,503,687,056

F. Sensitivity Analysis

The feasibility study is a comprehensive study and highlights all aspects of the feasibility of a project or investment. The feasibility study presents the results of a

quantitative analysis of the benefits to be obtained. Eligibility criteria are closely related to success. In a project, the emphasis of success lies in the financial and economic aspects, whereas from the governance aspect the success criteria are broader, namely economic growth, improving the welfare of the community, and encouraging private initiatives.

In the Checkpoint Crossing terminal, this analysis is assumed to have a tariff increase of 1% per year. The calculation is carried out using Net Present Value (NPV), Benefit Cost Ratio (BCR), Internal Rate of Return (IRR) and Payback Period indicators. The following is the calculation of sensitivity analysis:

a. Net Present Value (NPV)

In this indicator, with a rate increase of 1%, the PV_{inflow} value is IDR 133,519,831,944 and $P_{Voutflow}$ is IDR 90,508,090,200. Hence, the NPV value is IDR

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43,011,741,744. It results in a positive value. Thus, the construction project of Checkpoint Crossing terminal is still feasible.

b. Benefit Cost Ratio (BCR)

In the calculation using this indicator, if the results of BCR > 1 then the construction project is considered to be feasible, with the following equation:

$$BCR = \frac{PV\ inflow}{PV\ outflow}$$

$$BCR = \frac{133,519,831,944}{90,508,090,200} = 1.475225382$$

It was found that the BCR result is > 1, so this project is still considered to be feasible to be conducted.

c. Internal Rate of Return (IRR)

This indicator is the average value of the internal return flow of the NPV value, in which the cash in value is the same with the cash out value. IRR calculation results can be seen in table 4.21 and the interpolation calculation of the IRR is as the following:

$$\frac{20 - IRR}{IDR\ 8,063,213,725} = \frac{20 + 12}{IDR\ 43,011,741,744 + IDR\ 8,063,213,725}$$

$$\frac{(20 - IRR) \times IDR\ 51,074,955,469}{} = 8 \times IDR\ 8,063,213,725$$

$$IDR\ 1,021,499,109,380 - IDR\ 51,074,955,469\ IRR = IDR\ 64,505,709,800$$

$$IRR = \frac{IDR\ 1,021,499,109,380 - IDR\ 64,505,709,800}{IDR\ 51,074,955,469}$$

$$= 18.73703835 \sim 19\%$$

From these results, it is found that the value is > 12% so the project is still considered to be feasible.

TABLE 15. Calculation of Net Present Value i (12%) and i (20%) (Increase of 1% Per Year)

Year (n)	Cash Flow	i (12%)		i (20%)	
		(P/F,12%, n)	PV	(P/F,20%, n)	PV
0	-90,508,090,200	1.000	-90,508,090,200	1.000	-90,508,090,200
1	22,792,521,477	0.8929	20,351,442,427	0.8333	18,993,008,147
2	23,047,172,498	0.7972	18,373,205,915	0.6945	16,006,261,300
3	23,224,192,611	0.7118	16,530,980,301	0.5787	13,439,840,264
4	23,483,962,117	0.6355	14,924,057,926	0.4823	11,326,314,929
5	23,746,329,319	0.5674	13,473,667,255	0.4019	9,543,649,753
6	23,928,737,452	0.5066	12,122,298,393	0.3349	8,013,734,173
7	24,196,378,234	0.4523	10,944,021,875	0.2791	6,753,209,165
8	24,466,695,423	0.4039	9,882,098,282	0.2326	5,690,953,355
9	24,654,655,563	0.3606	8,890,468,796	0.1938	4,778,072,248
10	24,930,406,128	0.3220	8,027,590,773	0.1615	4,026,260,590
NPV		43,011,741,744		8,063,213,725	

d. Payback Period (PBP)

Payback period is a calculation that calculates the effective time period for the payback period. In this construction project of checkpoint crossing terminal, it is found that PBP in the 6th year is IDR 5,267,562,018. It can be seen in Table 16.

TABLE 16. Calculation of Payback Period (Tariff Increase of 1% Per Year)

Year	Cash Flow (IDR	Accumulation of Cash Flow (IDR)
0	-90,508,090,200	-90,508,090,200
1	20,351,442,427	-70,156,647,773
2	18,373,205,915	-51,783,441,857
3	16,530,980,301	-35,252,461,557
4	14,924,057,926	-20,328,403,631
5	13,473,667,255	-6,854,736,376
6	**12,122,298,393**	**5,267,562,018**
7	10,944,021,875	16,211,583,893
8	9,882,098,282	26,093,682,174
9	8,890,468,796	34,984,150,970
10	8,027,590,773	43,011,741,744

G. Socio-Economic Impact for the Community

The impacts arising from the construction project activities of the checkpoint crossing terminal are the employment of workers in the community around the border area, transportation traverses that cross along the border area, the economic added value of the community through trading activities (traditional markets), and regional income. The checkpoint crossing is currently under the supervision of the National Border Management Agency, which has employed workers from the area around the Motaain Checkpoint Crossing which obliges to employ the residents from Silawan Village with the aim of continuing the activities in the Checkpoint Crossing. The current workforce is employed in several parts including administrative staff, cleaning staff, security officers and technicians. With the construction of the second stage project underway and the building of supporting facilities within the Checkpoint Crossing area, it will automatically increase the employment of workers which will improve the welfare of the community in terms of improving the economy in the border area.

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