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ANALYSIS OF GOVERNMENT AND NON-GOVERNMENT INVESTMENT IN TPASR PROBOLINGGO DEVELOPMENT

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Abstract

Waste management is a pressing issue in Probolinggo Regency and City, necessitating swift action to mitigate environmental impacts. The construction of the Probolinggo Regional Waste Landfill (TPA) aims to address this challenge through cross-regional sanitation services. Proper financing is crucial for successful infrastructure development, and this study compares government budget (APBN/APBD) and non-government (regional loans) financing schemes. Utilizing a quantitative approach with primary and secondary data, the analysis indicates the viability of both financing options. Government-sourced investment shows an NPV of Rp 431,148,007,790, IRR 40.55%, BCR 1.07, and a 3-year payback period. Meanwhile, non-government or regional loans exhibit an NPV of Rp 110,115,495,905, IRR 9.03%, BCR 1.3, and a 9-year payback period. The decision-making process, weighing financial and non-financial criteria, favors regional loans/loans as the preferred financing scheme for the Probolinggo TPASR project. This research emphasizes the importance of a well-selected financing scheme to ensure the success and sustainability of the Probolinggo Regional Waste Landfill infrastructure.

Keywords: *Infrastructure Financing, Financing Schemes, Regional Waste*

1. INTRODUCTION

As a developing country with rapid economic growth and a growing population, Indonesia is faced with serious challenges in managing waste effectively and sustainably. The Sustainable Development Goals (SDGs) target until 2030 is to ensure the availability and sustainable management of clean water and sanitation including waste(Darmawan, 2018).

Probolinggo City is one of the cities in the northern part of East Java Province which has an area of about 5,667 Ha with a population of ± 235,211 people. Based on data from the Environmental Service (DLH) of Probolinggo City, the Probolinggo City Final Processing Site (TPA), namely Bestari Landfill, is located in Sukabumi Village, Mayangan District, Probolinggo City, has a land area of 4 Ha. Currently Bestari Landfill has three cells where the first cell is overloaded and the second cell has almost reached full capacity. Through the Regional Regulation of East Java Province Number 5 of 2012 concerning the Provincial Spatial Plan for 2011-2031, an Environmental Management Infrastructure System Plan has been established in article 48 paragraph (6) point h, namely the Regional Landfill Development Plan, namely Probolinggo, which serves Probolinggo City and Probolinggo Regency.

The limited government budget in financing infrastructure development currently causes a funding gap of 63% or 4,060 trillion rupiah. To overcome the funding gap, the government needs alternative non-government funding sources.

In this study, an analysis of government and non-government investment in the development of the Probolinggo TPASR was conducted. The investment feasibility analysis conducted is based on financial aspects. This research aims to explore alternative financing schemes for the Probolinggo TPASR infrastructure. The schemes analyzed in this study consist of government financing schemes (APBN/APBD) and non-government financing schemes, namely Regional Loans/Loan. The method used is Life Cycle Cost (LCC) Analysis by comparing the NPV value of each financing scheme.

2. LITERATURE REVIEW

2.1. Investment Evaluation Methods

Investment activities are important activities that require large costs and have a long-term impact on business continuity. Therefore, a systematic and rational analysis is needed before the activity is realized. According to Kuswadi in Zainuri (2021), there are various methods of evaluating investment feasibility and one of them is the Discounted Cash Flow (DCF) method, using indicators:

a. Net Present Value (NPV).
b. Internal Rate of Return (lRR).
c. Benefit Cost Ratio (BCR).
d. Payback Period (PP).

2.2. Regional Loan Financing Scheme

Regional Loans are all transactions that result in the Region receiving a sum of money or receiving benefits that are worth money from other parties so that the Region is burdened with the obligation to repay. According to PP No. 54 of 2005 and PP No. 30 of 2011, in principle, it is derived from Law No. 33 of 2004 concerning Financial Balance between Central and Regional Governments which explains that there are alternative sources of financing for local governments to accelerate regional economic growth and improve services to the community(Artiningsih et al., 2019).

2.3. Regional Waste Disposal Sites (TPASR)

According to Law No.18 of 2008, waste management is a systematic, comprehensive and sustainable activity that includes waste reduction and handling. The final stage of waste management is disposal which is carried out in landfills. According to Law No. 18 of 2008, TPA (Final Processing Site) is a place to process and return waste to environmental media safely for humans and the environment. Meanwhile, the Regional Landfill is a place to process and return waste to the environmental media which is jointly managed by two or more regencies / cities in one province. According to Law No. 23 Year 2014, the development of regional waste systems and management is the authority of the provincial government(Fuller & Petersen, 1995). By building a Regional Waste Landfill, the Regional Government saves more on operation and maintenance costs because it is managed together.

2.4. Previous Research

Research by Z.A Fanani, Year (2021) with the title "Benefit Cost Analysis in the Construction of Penjaringan Flats with NPV, IRR, PP, BCR Methods Using Investment Evaluation Software". This study analyzes the financial aspects of running a business / project that the costs used are feasible or not feasible. This financial aspect has several calculations with Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period (PP), Benefit Cost Ratio (BCR).

Research by Arlina Phelia and Enri Damanhuri (2019) with the title "Review of Landfill Evaluation and Benefit Cost Analysis of Waste Management Systems in Landfills (Case Study of Bakung Landfill, Bandar Lampung City)". (Mahyudin, 2017)This study evaluates the waste management system at Bakung Landfill using the ARRPET method, followed by scenario planning for the development of the waste management system in the landfill through the Cost Benefit Analysis (CBA) approach so that efficiency in terms of economic costs and service areas for Bandar Lampung City and its future development can be made better attention to planning in the waste sector.

Research by Berawi, M.A., 2021 with the title "An Infrastructure Financing Scheme for Industrial Development". (Ferza et al., 2019)This research provides a simulation of a partnership infrastructure financing scheme between the government and the private sector both at the initial cost, O&M Cost, Initial & OM Cost sharing, Initial & OM Cost and Revenue Sharing stages. The optimal cost-sharing scenario of the PPP financing scheme for industrial infrastructure development in six economic corridors in Indonesia.

3. RESEARCH METHODS

The research location is TPSAR Probolinggo which is located in Purut Village, Lumbang District, Probolinggo Regency. The data used in this research are primary and secondary data. The primary data used in this study are the results of interviews conducted with expert sources to identify alternative financing schemes for the Probolinggo Regional Waste Landfill. Secondary data in this study is data obtained from other sources such as Ministerial regulations, SNI, waste technical guidelines, scientific journals/publications and so on. Secondary data is also needed in calculating the amount of costs for investment, operations and maintenance to projected revenues from the construction of the Probolinggo Regional Waste Landfill. After obtaining the data as mentioned above, an investment feasibility analysis is carried out.

3.1. Identification of Investment Costs and Annual Cash Flow of Probolinggo Regional Waste Landfill Development

This stage identifies the possible costs associated with the construction, operation and maintenance of the Probolinggo TPASR obtained from valid secondary data from relevant agencies and other technical guidelines. The cost components identified include the following components of development investment costs, operational and maintenance costs of the TPASR from related SKPDs:

Table 1. Secondary Data Sources from Related Agencies

No	Data Source	Data
1	Office of Public Housing, Settlement Areas and Human Settlements of East Java Province	Study/assessment data related to landfill development
2	Bappeda of East Java Province	
3	Public Works and Housing Office of Probolinggo District and City	Study/assessment data related to existing landfill construction, daily waste generation, etc. related to analysis
4	Environmental Agency of Probolinggo District and City	

3.2. Financing Scheme Analysis

Analysis of the financing scheme is used to identify the financing scheme for the construction of the Probolinggo Regional Waste Landfill. The financing scheme used as a comparison in the study is financing sourced from the government budget and financing sourced from non-government sources. In table 3.2 below is a government financing scheme sourced from the APBN and APBD budgets. In this scheme, land acquisition and construction costs are fully sourced from collaboration between the APBN, APBD 1 (East Java Province) and APBD 2 (Probolinggo Regency / City). While all operational and maintenance costs will be the responsibility of APBD 1 (East Java Provincial Government).

Table 2. Government Financing Scheme (APBN & APBD)

		Central Government	Provincial Government	District/City Government
Investment	Phase 1 Land Acquisition			
	Phase 1 Construction Cost (2025)			
	Land Acquisition Phase 2			
	Phase 2 Construction Cost (2035)			
Cost	Fixed Cost Administration and General			
	Fixed Cost Operasional			
	Fixed Cost Maintenance			

The second scheme is a financing scheme derived from regional loans (Loan). In this scheme, the initial land acquisition financing is the responsibility of the East Java Provincial Government. The loan will then be used to finance the entire cost of construction and land acquisition of phase 2. In this scheme, the East Java Provincial Government will manage all operational and maintenance costs of the Probolinggo TPASR. The loan financing scheme can be seen in table 3.3 below:

Table 3. Regional Loan Financing Scheme

REGIONAL LOAN SCHEME			
		APBD Prov	**LOAN**
Investment	Phase 1 Land Acquisition		
	Phase 1 Construction Cost (2025)		
	Land Acquisition Phase 2		
	Phase 2 Construction Cost (2035)		
Cost	Fixed Cost Administration and General		
	Fixed Cost Operasional		
	Fixed Cost Maintenance		

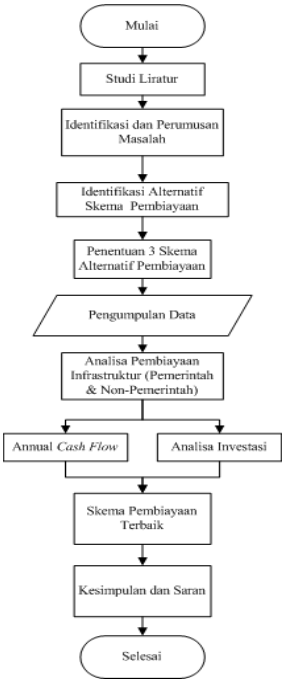
3.3. Annual Cashflow Analysis of each Alternative Financing Scheme for Probolinggo TPASR Infrastructure

The next step is to analyze the cash flow of the Probolinggo TPASR development financing scheme, both through government and non-government financing schemes. Cash flow provides an overview of the amount of funds available to meet operational needs including investment costs for the construction of TPASR and its supporting infrastructure, such as access roads, guard posts, waste transportation fleets and others.

Life Cycle Cost (LCC) is defined as "the total discounted cost of owning, operating, maintaining, and disposing of a building or building system over a specified period of time(Purnamasari, 2022)." (Zainuri, 2021)Life Cycle Cost Analysis (LCCA) is an economic evaluation technique that determines the total cost of owning and operating a facility over a specified period of time. LCC is the cost required by a building over its planned life, including planning and construction costs, maintenance costs (routine maintenance and repair costs), and the cost of demolition and repair of unused materials.

In conducting a financial feasibility analysis, calculations are also carried out on cost components which include expenditure costs and revenue costs. Furthermore, a cash flow analysis is carried out to generate net cash value and is used to evaluate the investment using the following methods:

a. Net Present Value (NPV).
b. Internal Rate of Return (IRR).
c. Benefit Cost Ratio (BCR).
d. Payback Period (PP).



Source: Author's Processed Data (2023)

Figure 1. Research Flow Chart.

4. RESULTS AND DISCUSSION

4.1. Overview of Probolinggo Regional Waste Landfill Project

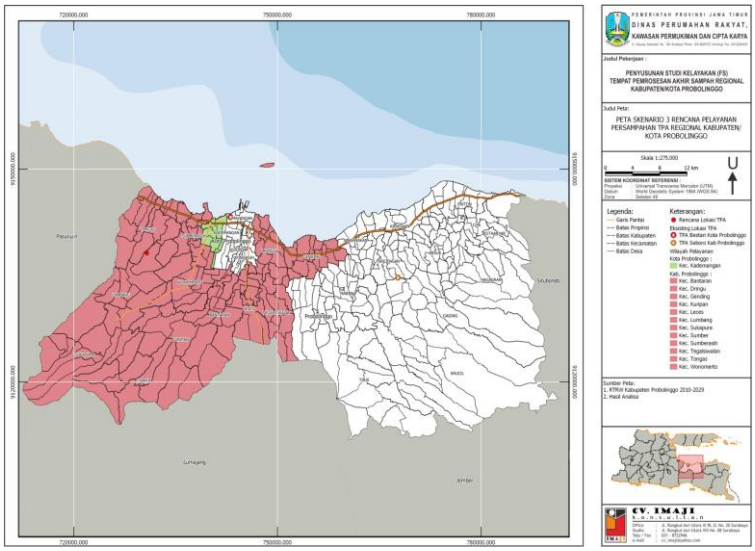
Based on the Regional Waste Landfill land selection mapping study conducted by the East Java Provincial Environmental Service in 2019, it was found that the candidate location of the Regional Landfill was in Lumbang District, Probolinggo Regency. After going through the results of the study, the candidate location for the Probolinggo Regional Landfill development plan was determined to be in Purut Village, Lumbang District. Purut Village has a lot of moorland, recorded the amount of moorland in Purut village is 683 Ha. The coordinate position of Purut Village location is at 7°47'30.00" LS and 113°5'32.60" East. The land used for the development of the new landfill in Probolinggo Regency/City is about 20 hectares. The land condition is flat land with a slope of about 2-8%. The study site is mostly moorland. To get to the landfill candidate land uses the main road access, namely Jl. Purut-Lumbang with moderate traffic levels. The distance to the nearest settlement is ± 100 m with low density. The following is documentation of the location in Purut Village.

Source: Survey results, 2020

Figure 2. Location Documentation of Purut Village, Lumbang District

4.2. Service Area Plan

The service area plan of TPASR Probolinggo covers Probolinggo Regency (urban and rural) in the western region and Kademangan Sub-district of Probolinggo City. The sub-districts that receive services are as follows:



Source: Probolinggo District/City Government

Figure 3. Map of the service area

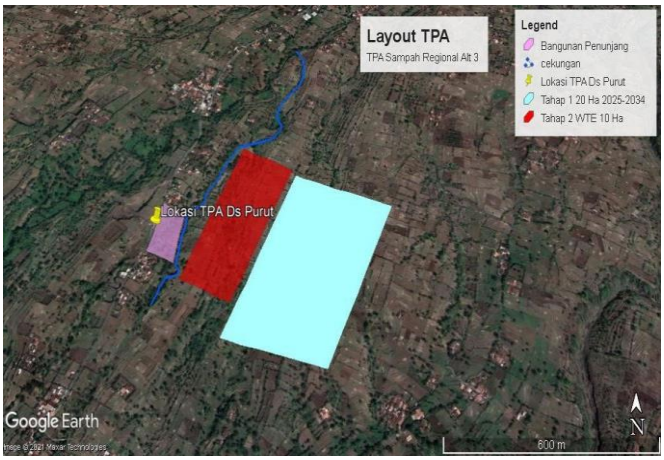
Table 4. Service Area Plan

No	Kecamatan	Kecamatan
	Kabupaten Probolinggo	**Kota Probolinggo**
1	Kecamatan Sukapura	Kecamatan Kademangan
2	Kecamatan Sumber	

No	Kecamatan	Kecamatan
3	Kecamatan Kuripan	
4	Kecamatan Leces	
5	Kecamatan Tegalsiwalan	
6	Kecamatan Banyuanyar	
7	Kecamatan Gending	
8	Kecamatan Dringu	
9	Kecamatan Wonomerto	
10	Kecamatan Lumbang	
11	Kecamatan Tongas	
12	Kecamatan Sumberasih	

The solid waste service area serves urban and rural areas of Probolinggo West District and Kademangan Sub-district of Probolinggo City. The service period of TPASR Probolinggo is divided into two stages in 2025-2034 and the second stage 2035-2045.

4.3. Landfill Facility Plan Concept



Source: Survey results, 2020

Figure 4. Regional Waste Landfill Lay Out Probolinggo District/City

Landfill facilities and infrastructure based on the Regulation of the Minister of Public Works of the Republic of Indonesia Number 03/PRT/M/2013 concerning the Implementation of Waste Infrastructure and Facilities in Handling Household Waste and Waste Similar to Household Waste are as follows(Pemerintah Indonesia, 2013):

1. Public facilities (entrance road, office/guard post, drainage channel and fence)
2. Environmental protection facilities (impermeable layer, leachate collector, leachate treatment, gas ventilation, buffer zone, soil cover.
3. Support facilities (weighbridge, water supply, electricity, workshop and hangar).(Pemerintah Indonesia, 2015)
4. Operational facilities (large equipment and soil transportation trucks).

5. Water source comes from borehole wells
6. Electricity source is from the State Electricity Company (PLN) 6.

4.4. Life Cycle Cost Proyek TPA Sampah Regional Probolinggo

The identification of Life Cycle Cost in the Probolinggo Regional Waste Landfill development project consists of development investment costs (capital expenditure) which are divided into construction and land acquisition stages. While the operational and maintenance costs of the Probolinggo Regional Waste Landfill every year are assumed according to the percentage that has been identified in chapter 3. Projected revenues sourced from gate fees (tipping fees) are calculated based on the projected volume of waste entering the landfill every day. All of this cost identification data was obtained from the results of the Probolinggo TPASR feasibility study conducted in 2020 and supported by other data both from interviews with related SKPDs and other studies. The following sub-chapters each explain the identification of costs in the construction of the Probolinggo Regional Waste Landfill.

1. Investment Costs.

Investment costs in the Probolinggo TPASR development project consist of land acquisition costs and construction stages that will be carried out in 2 stages, namely in 2025 and 2035. The following are the results of the identification of investment costs for the Probolinggo TPASR with a sanitary landfill system.

Table 5. Investment Cost of Probolinggo TPASR

ITEM	FEES
Phase 1 Land Acquisition	68.655.457.143
Phase 1 Construction Cost and Equipment (2025)	98.294.959.267
Land Acquisition Phase 2	88.863.421.429
Phase 2 Construction Cost (2035)	84.108.174.753
Total	**339.922.012.591**

Source: Author's Analysis, 2023

2. Revenue Analysis.

The projected revenue is derived from the value of tipping fees paid by the Probolinggo Regency and City Governments as service recipients of the Probolinggo TPASR. In addition to the source of revenue from gate fees, the Probolinggo Regional TPSAR also optimizes the source of revenue from processed waste. The following is the result of the forecast projection value of TPASR Probolinggo's tipping fee and processed waste revenues.

Table 6. Revenue projection for the Management of TPASR Probolinggo

YEAR	Revenue		
	Treated Waste Revenue	Tiping Fee	Total Revenue

2025	Rp	17.793.750.000,00	Rp	18.980.000.000,00	Rp	36.773.750.000,00
2026	Rp	17.909.409.375,00	Rp	19.467.786.000,00	Rp	37.377.195.375,00
2026	Rp	18.025.820.535,94	Rp	19.968.108.100,20	Rp	37.993.928.636,14
2027	Rp	18.142.988.369,42	Rp	20.481.288.478,38	Rp	38.624.276.847,80
2027	Rp	18.260.917.793,82	Rp	21.007.657.592,27	Rp	39.268.575.386,09
2028	Rp	18.379.613.759,48	Rp	21.547.554.392,39	Rp	39.927.168.151,87
2028	Rp	18.499.081.248,92	Rp	22.101.326.540,28	Rp	40.600.407.789,19
2029	Rp	18.619.325.277,04	Rp	22.669.330.632,36	Rp	41.288.655.909,40
2029	Rp	18.740.350.891,34	Rp	23.251.932.429,61	Rp	41.992.283.320,95
2030	Rp	18.862.163.172,13	Rp	23.849.507.093,05	Rp	42.711.670.265,18
2030	Rp	18.984.767.232,75	Rp	24.462.439.425,34	Rp	43.447.206.658,09
2031	Rp	19.108.168.219,76	Rp	25.091.124.118,58	Rp	44.199.292.338,34
2031	Rp	19.232.371.313,19	Rp	25.735.966.008,42	Rp	44.968.337.321,61
2032	Rp	19.357.381.726,73	Rp	26.397.380.334,84	Rp	45.754.762.061,57
2032	Rp	19.483.204.707,95	Rp	27.075.793.009,45	Rp	46.558.997.717,40
2033	Rp	19.609.845.538,55	Rp	27.771.640.889,79	Rp	47.381.486.428,34
2033	Rp	19.737.309.534,55	Rp	28.485.372.060,66	Rp	48.222.681.595,2
2034	Rp	19.865.602.046,53	Rp	29.217.446.122,61	Rp	49.083.048.169,14
2034	Rp	19.994.728.459,83	Rp	29.968.334.487,97	Rp	49.963.062.947,80
2035	Rp	20.124.694.194,82	Rp	30.738.520.684,31	Rp	50.863.214.879,13
					Rp	**867.000.001.798,24**

Source: Author's Analysis, 2023

3. Analysis of Operational and Maintenance Costs of Probolinggo Regional TPASR

The operational and maintenance costs of the Probolinggo Regional Waste Landfill for each year are calculated with the percentage assumptions described in Chapter 3. The operational and maintenance costs of the Probolinggo TPASR can be seen in the following table:

Table 7. Operational and Maintenance Costs TPASR Probolinggo

Year		Spending						Total Expenses	
		Fixed Cost Administrasi		Fixed Cost Operasional		Fixed Cost Pemeliharaan			
	To	and General							
2024	0							Rp	-
2025	1	Rp	649.006.600,00	Rp	6.107.591.104,00	Rp	91.425.000,00	Rp	6.848.022.704,00
2026	2	Rp	713.907.260,00	Rp	6.718.350.214,40	Rp	100.567.500,00	Rp	7.532.824.974,40
2027	3	Rp	785.297.986,00	Rp	7.390.185.235,84	Rp	110.624.250,00	Rp	8.286.107.471,84
2028	4	Rp	863.827.784,60	Rp	8.129.203.759,42	Rp	121.686.675,00	Rp	9.114.718.219,02
2029	5	Rp	950.210.563,06	Rp	8.942.124.135,37	Rp	133.855.342,50	Rp	10.026.190.040,93

Year		Spending						Total Expenses	
		Fixed Cost Administrasi		Fixed Cost Operasional		Fixed Cost Pemeliharaan			
	To	and General							
2030	6	Rp	1.045.231.619,37	Rp	9.836.336.548,90	Rp	147.240.876,75	Rp	11.028.809.045,02
2031	7	Rp	1.149.754.781,30	Rp	10.819.970.203,79	Rp	161.964.964,43	Rp	12.131.689.949,52
2032	8	Rp	1.264.730.259,43	Rp	11.901.967.224,17	Rp	178.161.460,87	Rp	13.344.858.944,47
2033	9	Rp	1.391.203.285,38	Rp	13.092.163.946,59	Rp	195.977.606,95	Rp	14.679.344.838,92
2034	10	Rp	1.530.323.613,91	Rp	14.401.380.341,25	Rp	215.575.367,65	Rp	16.147.279.322,81
2035	11	Rp	1.683.355.975,31	Rp	15.841.518.375,37	Rp	237.132.904,41	Rp	17.762.007.255,09
2036	12	Rp	1.851.691.572,84	Rp	17.425.670.212,91	Rp	260.846.194,86	Rp	19.538.207.980,61
2037	13	Rp	2.036.860.730,12	Rp	19.168.237.234,20	Rp	286.930.814,34	Rp	21.492.028.778,66
2038	14	Rp	2.240.546.803,13	Rp	21.085.060.957,62	Rp	315.623.895,78	Rp	23.641.231.656,53
2039	15	Rp	2.464.601.483,44	Rp	23.193.567.053,38	Rp	347.186.285,35	Rp	26.005.354.822,17
2040	16	Rp	2.711.061.631,79	Rp	25.512.923.758,72	Rp	381.904.913,89	Rp	28.605.890.304,40
2041	17	Rp	2.982.167.794,97	Rp	28.064.216.134,60	Rp	420.095.405,28	Rp	31.466.479.334,85
2042	18	Rp	3.280.384.574,46	Rp	30.870.637.748,06	Rp	462.104.945,81	Rp	34.613.127.268,33
2043	19	Rp	3.608.423.031,91	Rp	33.957.701.522,86	Rp	508.315.440,39	Rp	38.074.439.995,16
2044	20	Rp	3.969.265.335,10	Rp	37.353.471.675,15	Rp	559.146.984,42	Rp	41.881.883.994,67
Jumlah								**Rp**	**392.220.496.901,42**

Source: Author's Analysis, 2023

4.5. Cash Flow Analysis of Financing Scheme

The following describes the cash flow analysis of each financing scheme of the Probolinggo TPASR development assessed from the perspective of the Provincial Government as the PJPK of the Probolinggo TPASR project.

1. Cash Flow Analysis of Government Budget Financing Scheme (APBN/APBD)

Funding sources originating from the APBN, Provincial APBD and Regency and City APBD. The division of roles in this financing scheme sourced from the Government budget can be seen in table 4.5(irman, 2013). The APBN plays a role in financing stage 1 construction. The Provincial APBD plays a role in financing stage 1 land acquisition, stage 2 land acquisition and stage 2 construction as well as operational financing and financing of TPASR Probolinggo during TPASR operations. Meanwhile, the Regency/City APBD plays a role in stage 2 construction. The division of roles in the stage 2 construction stage is that the APBN bears 70% of the construction costs amounting to Rp. 58,875,722,327, 00, the Provincial APBD bears 20% of the stage 2 construction costs amounting to Rp. 16,821,634,951, 00 and the Regency / City APBD bears 10% of the stage 2 construction costs amounting to Rp. 8,410,817,475, 00.

Table 8. Role Sharing of Government Financing Scheme (APBN APBD)

APBN APBD SCHEME (SCHEME 1)					
		Central Government	Provincial Government	District/City Government	Rp.
Investment	Phase 1 Land Acquisition		68.655.457.143		68.655.457.143
	Phase 1 Construction Cost (2025)	98.294.959.267			98.294.959.267
	Land Acquisition Phase 2		88.863.421.429		88.863.421.429
	Phase 2 Construction Cost (2035)	58.875.722.327	16.821.634.951	8.410.817.475	84.108.174.753
Biaya	Fixed Cost Administrasi dan Umum		37.171.852.686		37.171.852.686
	Fixed Cost Operasional		349.812.277.387		349.812.277.387
	Fixed Cost Maintenance		5.236.366.829		5.236.366.829

Source: Author's Analysis, 2023

2. Cash Flow Analysis of Regional Loan Financing Scheme

Cash flow analysis of regional loan financing comes from APBD I (Provincial APBD) and regional loans. The financing scheme sourced from this local government loan can be seen in table 4.6. The financing scheme with this regional loan is sourced from the Provincial APBD budget for land acquisition costs, operational costs and TPASR maintenance. While the regional loan is used to finance the entire cost of landfill construction which consists of 2 (three) stages of development.

Table 9. Division of Roles of Regional Loan Financing Scheme (Loan)

SKEMA PINJAMAN LUAR DAERAH (LOAN)				
		APBD Prov	LOAN	Rp
Investasi	Pembebasan Lahan Tahap 1	68.655.457.143		68.655.457.143
	Biaya Kontruksi Tahap 1 (2025)		110.090.354.379	110.090.354.379
	Pembebasan Lahan Tahap 2		88.863.421.429	88.863.421.429
	Biaya Kontruksi Tahap 2 (2035)		94.201.155.724	94.201.155.724
Biaya	Fixed Cost Administrasi dan Umum	37.171.852.686		37.171.852.686
	Fixed Cost Operasional	349.812.277.387		349.812.277.387
	Fixed Cost Pemeliharaan	5.236.366.829		5.236.366.829

Source: Author's Analysis, 2023

4.6. Results of Cash Flow Analysis of Financing Scheme

The results of investment evaluation on each alternative financing scheme of Probolinggo TPASR can be seen in the table below:

Table 10. Probolinggo TPASR Investment Feasibility Analysis.

No.	Alternative Financing Schemes	Investment Parameters				Results
		NPV (Rp.)	IRR (%)	BCR	PP (Year)	
1	Government Financing Scheme (APBN/APBD)	431.148.007.790	40.55%	1,07	3	Worth
2	Non-Governmental Financing Scheme -Local Loan	110.115.495.905	9.03%	1.30	9	Worth

Source: Author's Processed Data (2023).

From the results of Cash Flow Analysis of government and non-government financing schemes in the Probolinggo TPASR development plan, it was found that both schemes were feasible. In the government financing scheme through APBN / APBD, the NPV value of Rp 431,148,007,790, IRR 40.55%, BCR 1.07 and Payback Period in year 3 were obtained. While the results of investment analysis with a budget sourced from non-government or regional loans/loans show an NPV value of Rp 110,115,495,905, IRR 9.03%, BCR 1.3 and payback period in year 9.

4.7. Decision Making on the Selection of the Best Financing Scheme for Probolinggo TPASR Project

The decision to select the best financing scheme for the Probolingo TPASR project was carried out through the weighting of financial and non-financial criteria, the results of which were then validated through an FGD (Focus Group Discussion) process involving 3 (three) expert resource persons.

Table 11. Scheme Decision Making

No	Decision Criteria	Scheme I (APBN&APBD)	Skema II (Loan)
1.	Financial Feasibility (NPV)	√ 431.148.007.790	110.115.495.905
2.	Capital Expenditure (Pemprov)	174.340.513.522	√ 68.655.457.143
3.	Availability of Funds	Minimal availability	√ Greater availability
4.	Technical Implementation	Medium technical process (subject to RKA preparation)	√ Process tends to be shorter

Source: author's analysis with validation of expert resource FGDs, 2023

5. CONCLUSION

From the results of the financial analysis of each infrastructure financing scheme of the Probolinggo Regional Waste Landfill development project with the selected government and non-government budgets(Putri & Putri, 2020), it shows that all schemes provide positive value or are feasible to do. The resume of the results of financial analysis on infrastructure financing schemes in the development of regional waste management in probolinggo district and city as follows:

a. In the government budget financing scheme (APBN APBD), shows the highest NPV value of Rp. 431,148,007,790, - with IRR 40.55%, BCR 1.07 and Payback Period in year 3.
b. In the non-government financing scheme (Regional Loan/Loan), the NPV value is Rp. 110,115,495,905, - with an IRR of 9.03% BCR 1.30 and Payback Period in year 9.

Based on the results of weighting with 4 (four) financial and non-financial criteria, which infrastructure financing scheme is the best and feasible to implement in the construction of the Probolinggo Regional Waste Landfill is sorted as follows:

a. Alternative I: Non-Government Financing Scheme with Regional Loan/Loan,
b. Alternative II: Government Financing Scheme of APBN and APBD

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