FEASIBILITY OF INVESTMENT DEVELOPMENT SYUKURAN AMINUDDIN AMIR AIRPORT LUWUK

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ABSTRACT

Air transport in the town of Luwuk Banggai has increased significantly, this can be seen with increasing volume flight Syukuran Aminuddin Amir Airport average of 17.59% per year to various regions in the country and has the infrastructure facilities that can accommodate as many as 219261 average passengers/year with a percentage of 17.67% per year. The results of the research can be used to determine the feasibility of investing in the development of an airport by using economic calculation engineering and value advantage of the extension of the runway to 3000 m complete with other facilities with competing methods will be applied as follows: Net Present Value (NPV), Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR), and payback period. From the results of investment appraisal using the NPV method results obtained IDR.79,002,433,592.00 with methods derived into 36.142% IRR greater than 15% and Profitability Index (PI) has a value of 1.126 that is greater than 1 and analysis Payback Period (PP) was obtained within 15 years to reach the Break-Even Point.

Keywords: investment, development, airport

ABSTRAK

Transportasi udara di kota Luwuk Banggai telah meningkat secara signifikan, hal ini dapat dilihat dengan meningkatnya volume penerbangan Bandara Syukuran Aminuddin Amir rata-rata 17.59% per tahun ke berbagai daerah di tanah air dan memiliki fasilitas infrastruktur yang dapat menampung rata-rata sebanyak 219261 penumpang/tahun dengan persentase 17.67% per tahun. Hasil penelitian dapat digunakan untuk menentukan kelayakan investasi dalam pengembangan bandara dengan menggunakan teknik perhitungan ekonomi dan nilai keuntungan dari perluasan landasan pacu hingga 3000 m lengkap dengan fasilitas lain dengan metode bersaing akan diterapkan sebagai berikut: Net Present Value (NPV), Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR), dan periode pengembalian. Dari hasil penilaian investasi dengan menggunakan metode NPV diperoleh hasil Rp.79,002,433,592.00 dengan metode IRR yang didapat menjadi 36.142% lebih besar dari 15% dan Profitability Index (PI) memiliki nilai 1.126 yang lebih besar dari 1 dan analisis Payback Period (PP) adalah diperoleh dalam waktu 15 tahun untuk mencapai Break-Even Point.

Kata kunci: investasi, pengembangan, bandara

1 INTRODUCTION

The airport was a means of organizing flights in supporting the activities of the region. In addition to having the primary function in supporting inter-regional connectivity, the airport is expected to boost the economic growth of a region. In Indonesia, the construction of airports has a strategic role as a gateway to economic activity, the activity over the mode of transportation, driver of industrial activity and trade, the opening of isolated areas and infrastructure to strengthen the archipelago insight and sovereignty

Luwuk Banggai with a wealth of natural resources such as oil and gas which has managed to attract investors to conduct their business activities in Luwuk Banggai. Contents condition affecting almost all economic and social activity Banggai, particularly airports, which is one mode of transportation that has been chosen by the investor as a mode of transport that promises security, speed and convenience.

Air transport in the town of Luwuk Banggai has increased significantly, this can be seen with increasing volume Aminudin flight on Thanksgiving service Luwuk Amir average of 17.59% per year to various regions in the country and has the infrastructure facilities that can accommodate as many as 219 261 average passengers/year with a percentage of 17.67% per year. The existence of Syukuran Aminuddin Amir Airport in Banggai has contributed significantly to the economic development of both regional and national territory. The development of the airport facility is considered a strategic transport infrastructure in order to improve the local economy, especially in providing ease of mobility for economic actors and the public.

One of the facilities to be developed is the airside facilities is one of which is an aircraft runway (runway). The expanded facility can be considered an efficient means of mobilization to accommodate service users who steadily. Thanksgiving service with state A. Amir Luwuk long runway is currently not considered to meet safety standards with the correction ARFL long runway for the aircraft type Boeing 737-900, the plans to develop the airport's organizational system airside facilities by increasing the length of the runway from 2250 meters to 3000 meters to be able to serve a larger aircraft type.

Figure 1. Map Syukuran Aminuddin Amir Airport Luwuk

2 LITERATURE REVIEW

2.1 Net Present Value (NPV)

NPV method is used to determine the value of the project based on the project's cash flow. Thus the NPV is calculated as the difference between cash flows incurred by the project cash flows received by the project. NPV is reckoned to be the present value using a certain interest rate. Total NPV projects are planned can be calculated with the following formula:

$$NPV = \sum_{t=0}^{n} \frac{CFt}{(1+K)} \text{.........................} (1)$$

CFt = cash flow per year in the period t

K = the interest rate

t = year-t

n = life of the project

The rate of capital or the rate of return is very closely related to the level of eligibility for a project whether it will be accepted or rejected. The loss or absence of an investment in a particular project can be seen in the net present value or net present value of the project.

2.2 Benefit-Cost Ratio (B/C Ratio)

B/C Ratio is comparing the benefits (benefits) obtained at the cost (cost) that have been issued, if the value of the benefits compared to its costs, > 1 then the economies that have been run, viable, but if the value <1, then economics was run less profitable. If obtained is equal to = 1 means the economics of the run, said marginal (no loss and no profitable), with the following formula:

$$B/C \text{ ratio} = \frac{Benefit}{Cost} > 1 \text{................} (2)$$

2.3 Payback Period (PBP)

PBP is an investment project appraisal based on the repayment of the investment cost of the project or the achievement of the net periodic benefit obtained is equal to the level of investment costs already incurred. PBP is determined by calculating the time it takes for the accumulated cash flow changes from a negative value into a positive value, and benefit from much-needed investments have been equal to the investment cost is formulated as follows:

$$PBP = \frac{\% \text{ Total Investasi } (100\%)}{ROI} \text{........ (3)}$$

2.4 Internal Rate of Return (IRR)

IRR is the interest rate that can make the size of the project NPV equal to zero, or to create B / CR equal to 1. If IRR <of the interest rate banks can be said that the business is not profitable, and if IRR> of interest can be said that the commodity business is feasible to be developed and can provide benefits, formulated as follows:

$$IRR \to \sum_{t=1}^{n} \frac{Bt-Ct}{(1+IRR)} = 0 \text{............... (4)}$$

Bt = benefit of all t

Ct = cost of all t

t = year

n = life of the project

2.5 Airport

The airport is the node for flights which serve the activities of passenger traffic and aircraft, which are used as places of landing and takeoff of aircraft, ups, and downs of passengers, loading and unloading goods, the movement of intermodal transport, which is equipped with safety facilities and aviation security, as well as basic facilities and other supporting facilities. The airport is a particular area of the ground or water (including any buildings, installations, and equipment) intended to be used whole or in part for landing, departure and aircraft movement on the surface. The Aerodrome (airport) can be divided into two parts based on the usefulness of the amenities, airside and the landside. Facilities included in the air is the runway, grounding circuit (taxi's way), and apron.

Aerodrome's airside facilities serve not only as the aircraft took off, but in the air transportation system includes the extensive activities in which there are flows of passengers and goods, including the components included in the system Runway. By its program of infrastructure development, especially the development of the airport runway constituted by observing the movement of air traffic flow for 10 (ten) years.

Calculation of actual runway length and a power calculation runway closely related to the safety of flight operations and air traffic services are to prevent overrun at the time of landing and prevent failed to take off as well as its relationship to service of air traffic is to limit MTOW (Maximum takeoff Weight) and MLW (maximum Landing Weight) to prevent damage to the runway at the airport when ACN (aircraft Classification Number) maximum required by the aircraft does not comply with the PCN (Pavement Classification Number).

2.6 Airport Infrastructure

The airport construction is a job that requires the availability of large amounts of capital and is complex. Is a capital intensive as the construction of airports require an investment of construction and installation are quite large, on the other hand, the construction of the airport is a very complex because it requires the integration of a variety of occupations and areas of expertise, including the integration intra-modal and inter-modal integration transport within the coverage area served. Therefore, the construction and development of an airport require careful planning so that investment can be efficient and effective.

The airport is a transport service which is transport or moves a passenger activity (human) and cargo (goods) from airports of origin to destination by plane. Air infrastructure is the main supporter of the functions of the social system and the economic system in people's daily lives and is a physical asset that is designed to provide public services of the transportation services sector. Infrastructure needs (domestic and inter-island) and improve linkages with the international community.

3 METHODS

Research variables used in determining the feasibility analysis are non-tax revenues (Revenues Non-tax) as a source of revenue to operate and maintain this activity. The financial aspects were is calculated using investment criteria include Net Present Value (NPV); Benefit-Cost Ratio (BCR); Internal Rate of Return (IRR) and Payback Period (PP).

4 RESULT AND DISCUSSION
4.1 Air Transport Growth Rate

To predict the volume growth of air transport will use Syukuran Aminuddin Amir Airport until the age of projects implemented are the factors influencing that growth factors the number of aircraft that arrive and depart, the number of

passengers who arrive and depart, the quantity of cargo unloaded and loaded, and the amount of luggage were unloaded and loaded. To that end, air transport growth predictions based on historical data, namely the existence of statistical data. Table 1 shows the statistical data growth of air transport in the last 10 years Syukuran Aminuddin Amir Airport (2009-2018).

Analysis of the rate of growth of air transport modeling using geometric models, exponential models, and arithmetic models more are presented in Table 2. The geometric growth model assumes that the same growth rate annually. The exponential growth model is directly continuous growth (continuous) which is influenced by several factors, for example in the calculation of their population growth as a result of factors influence birth and death. The arithmetic growth model provides projections of growth under the assumption that the amount of growth in the future will increase by the same amount each year, this model is used if only the amount of total growth he wants to know.

The results of the analysis predicted good growth of air transport aircraft, passengers, baggage and cargo in Syukuran Aminuddin Amir Airport in from 2019 up to the year 2038 using the geometric method can be seen in Table 3.

Table 1. Growth of Air Transport Departing and Arriving The Syukuran Aminuddin Amir Airport

Year	Plane		Passenger		Luggage (kg)		Freight (kg)	
	Unloading	Loading	Unloading	Loading	Unloading	Loading	Unloading	Loading
2009	545	544	30157	31056	332473	291505	57163	85856
2010	537	536	43466	44341	401814	202053	141146	558
2011	1051	1051	52257	55148	483635	137654	199388	-
2012	1158	1158	74787	73408	635470	252629	331433	-
2013	1135	1134	76722	78244	638459	483185	368301	-
2014	1627	1628	98936	95099	875544	740333	510375	262318
2015	1877	1877	112594	119355	1018867	860310	712397	157541
2016	2854	2859	166438	166291	1182101	1601366	235913	537796
2017	2872	2870	173292	182417	1391411	1183682	447588	593203
2018	3420	3421	198583	202538	1738313	1510085	562811	597100

Table 2. Growth Model Air Transport Departing and Arriving The Syukuran Aminuddin Amir Airport

Description Type Air Transport	Air Transport Growth Model					
	Geometric (%)		Exponential (%)		Arithmetic (%)	
	Coming/ Unloading	Departing/ Load	Coming/ Unloading	Departing/ Load	Coming/ Unloading	Departing/ Load
Aircraft	20.16	20.19	18.37	18.39	52.75	52.89
Passenger	20.74	20.62	18.85	18.75	55.85	55.22
Luggage	17.99	17.88	16.54	16.45	42.28	41.80
Freight	25.70	21.40	22.87	19.39	88.46	59.55

Table 3. Predicted Air Transport

Year	Air Transport Type							
	Plane		Passenger		Luggage (kg)		Freight (kg)	
	Unloading	Loading	Unloading	Loading	Unloading	Loading	Unloading	Loading
2017	2872	2870	173292	182417	1391411	1183682	447588	593203
2018	3420	3421	198583	202538	1738313	1510085	562811	597100
Prediction Airport Start Year New								
2019	4110	4102	239771	244318	2050998	1780069	707436	724894
2020	4818	4942	289900	294899	2419827	2098324	819236	880040
2021	5934	5999	349549	355480	2855219	2475478	1117730	1068390
2022	7130	7138	422050	438796	3368811	2915705	1404952	1297053
2023	8567	8579	509588	517234	3974786	3416996	1865982	1574655
2024	10294	10301	615282	623912	4609768	4051489	2219789	1910670
2025	12370	12392	742899	752590	5533349	4715804	2790283	2320825
2026	14864	14893	896985	907611	6128678	5629726	3507201	2817528
2027	17860	17900	1081450	1095044	7701045	6616227	4406443	3420549
2028	21463	21503	1307663	1320893	9088854	7822702	5541281	4125632
2029	25788	25856	1578888	1583322	10723904	9211304	6965121	5041400
2030	30987	30975	1906368	1921940	12661428	10868994	8355001	6120185
2031	37234	37349	2301771	2318333	14928324	12813371	11004857	7430301
2032	44743	44888	2719186	2796488	17611600	15504242	13832770	9020572
2033	53360	53949	3315623	3473246	20781906	17804692	17381571	10951200
2034	64606	54840	4051617	4068967	24520117	20987949	21855996	13295031
2035	77624	77928	4891978	4908177	28930758	24740333	27471567	16140500
2036	93274	93699	5906622	5930472	34134760	29563597	34530923	19194971
2037	112079	112566	7131724	7141549	40274857	34377685	43404529	23768785
2038	134674	135289	8670923	8684469	47529424	40529987	54557907	28880181

4.2 Revenue Cost Estimation Airport

4.2.1 Aeronautical revenue

The estimated cost of revenue aeronautics Syukuran Aminuddin Amir Airport is based on rates set by the Government Regulation (PP) No. 15 of 2016 regarding Type and Tariff on Non-Tax Revenue in force at the National Institute of Aeronautics and Space the magnitude Rates Services Landing, Placement and Storage Aircraft (PJP4U), services tariff revenue from Passenger Aircraft services (PJP2U).

4.2.2 Non-Aeronautical Revenues

Cost of revenue non-aeronautical services warehouse is assumed to be as much as 20% of revenue aeronautics consisting of interest income from the rental of space and land, concessions, interest income from the use of electricity, water and telephone debtor (tenant), service installation of billboards, service usage lounge area domestic, revenue fitting/port, cargo handling.

4.3 Construction Costs

According to Aminuddin Amir Masterplan Thanksgiving Luwuk Airport, this airport will undergo expansion by increasing the length of the runway from 2250 meters to 3000 meters to be able to serve a larger aircraft type. Details of the Budget Plan can be seen in Table 4.

Table 4. Estimated Construction Cost

Type of Work	Stages	
	Phase I (IDR)	Phase II (IDR)
Preparatory work	1,150,190,580.00	1,150,190,580.00
Earthworks	100,000,000,000.00	100,000,000,000.00
Civil works airside	56,714,981,688.00	70,843,659,591.00
Civil works landside	-	2,023,122,901.00
Drainage civil works	-	3,244,026,180.00
Building work	81,140,000,000.00	101,092,300,000.00
Total real cost	239,005,172,268.00	278,353,299,252.00
Contingencies (10%)	23,900,517,226.80	27,835,329,925.20
Number of 1	262,905,689,494.80	306,188,629,177.20
Vat 10%	26,290,568,949.48	30,618,862,917.72
Total	289,196,258,444.28	336,807,492,094.92
Be rounded	289,196,258,000.00	336,807,492,000.00
	Grand Total	626,003,750,000.00

4.4 Investment Feasibility Analysis

Investment feasibility analysis conducted with a view to evaluating the financial feasibility of the project. The method used is the Net Present Value (NPV), internal rate of return (IRR), and Profitability Index (PI), Payback Period (PP), Break-Even Point (BEP) and sensitivity analysis (SA). The amount of Net Present Value (NPV) is the assessment of the feasibility of investment is determined by using the calculation proceeds Present Value multiplied by the interest rate applicable to the parties who will give loans. Development Syukuran Aminuddin Amir Airport will be financed by the state budget Pure assuming a low-interest rate of 15% per year. Thus the NPV is calculated as follows:

Table 5. The amount of the Net Present Value 15% Syukuran Aminuddin Amir Airport

Year	Proceed's (IDR)	DF (15%)	PV from Proceed's (IDR)
2019	7,830,065	0870	6,808,752
2020	9,916,676	0756	7,498,432
2021	13,403,603	0658	8,813,086
2022	18,043,646	0572	10,316,513
2023	24,204,036	0497	12,033,683
2024	32,366,098	0432	13,992,758
2025	43,160,117	0376	16,225,487
2026	57,410,117	0327	18,767,668
2027	76,196,003	0284	21,659,660
2028	100,924,345	0247	24,946,954
2029	133,434,487	0215	28,680,839
2030	176,125,557	0187	32,919,126
2031	232,126,164	0163	37,726,991
2032	305,514,196	0141	43,177,911
2033	401,602,467	0123	49,354,728
2034	527,309,909	0107	56,350,852
2035	691,643,856	0093	64,271,619
2036	906,326,617	0081	73,235,830
2037	1,186,609,465	0070	83,377,495
2038	1,552,330,058	0061	94,847,800
Total PV Cash Flow			705,006,183,592
PV Investment			626,003,750,000
Difference			79,002,433,592

With a discount factor of capital required by the owner of 15% of the proceeds proposal, which is greater than the present value of the expenditure Investment Development Syukuran Aminuddin Amir Airport, so the NPV is positive or IDR.79,002,433,592.00, then it can be said investment profitable or feasible.

The internal rate of return calculation is defined as the interest rate that will make the value of the proceeds is expected to be received (the PV of future proceeds) basically to be sought by means of "trial and error" with all-round attempts. Differences between the DF or the interest held a positive NPV with DF which produce negative cultivated exceeding 5% difference of greater than 5% more to contain the possibility of error compared to the 5% or smaller, so in this case, the author uses interest rate 15% as required by the investor and 30%.

Table 6. The amount of the Net Present Value 15% Syukuran Aminuddin Amir Airport

Year	Proceed's (IDR)	DF (15%)	PV from Proceed's (IDR)
2019	7,830,065	0769	6,023,127
2020	9,916,676	0592	5,867,855
2021	13,403,603	0455	6,100,866
2022	18,043,646	0350	6,317,582
2023	24,204,036	0269	6,518,851
2024	32,366,098	0207	6,705,486
2025	43,160,117	0159	6,878,269
2026	57,410,117	0123	7,037,951
2027	76,196,003	0094	7,185,252
2028	100,924,345	0073	7,320,865
2029	133,434,487	0056	7,445,455
2030	176,125,557	0043	7,559,658
2031	232,126,164	0033	7,664,089
2032	305,514,196	0025	7,759,334
2033	401,602,467	0020	7,845,960
2034	527,309,909	0015	7,924,508
2035	691,643,856	0012	7,995,498
2036	906,326,617	0009	8,059,431
2037	1,186,609,465	0007	8,116,786
2038	1,552,330,058	0005	8,168,024
Total PV Cash Flow			144,494,847,191
PV Investment			626,003,750,000
Difference			(481,508,902,809)

Based on the results of the internal rate of return calculation using Equation 4, then the IRR> DF or 36 142%> 15%, it can be said Investment Development Syukuran Aminuddin Amir Airport feasible.

By the use of the two B/C ratio obtained the value of B/C Ratio = 1.126. Therefore B/C ratio > 1, it can be said that the development of Syukuran Aminuddin Amir Airport feasible.
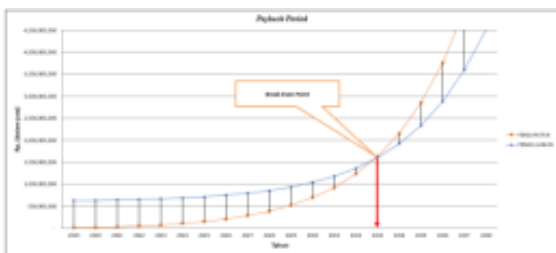

Figure 2. Break-Even Point (BEP) Investment Development Syukuran Aminuddin Amir Airport

From the analysis of Break-Even Point (BEP) Investment Development Syukuran Aminuddin Amir Airport Year 2019 to 2038 was in 2033 or occurred in the 15th year.

5 CONCLUSION

From the results of investment appraisal using the Net Present Value (NPV), the obtained results of IDR.79.002.433.592.00, which means that the investment is feasible. Results of investment appraisal methods Internal Rate Of Return (IRR), it can be seen that the IRR> DF which is equal to 36.142% of> 15%, it can be said that this investment is feasible. The result of the assessment B / C ratio is greater than 1 (one) or PI = 1,126> 1. Calculation of Payback Period (PP) together with the results of the calculation of Break-Even Point (BEP) that is for 15 years, with an interest rate of 15% is still considered safe in terms of the initial cost. it can be concluded that the economic analysis, development of Syukuran Aminuddin Amir Airport is feasible and can cover investment and operating costs of the airport.

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