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FEASIBILITY ANALYSIS AIRSTRIP DEVELOPMENT IN JAYAPURA REGENCY AND SURROUNDINGS

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Abstract

Jayapura Regency and surroundings in Papua Province is separated by very complex geographical conditions, including wilderness, rivers, and mountains. Judging from this condition, the need for an Airport (Airstrip) is very necessary as a means of transporting people or goods. The selection of the airport is very appropriate considering the lack of availability of land transportation facilities, namely roads that connect one area to another. Judging from this condition, the need for airports (airstrip) is very necessary as a means of transportation of people or goods. In general, the construction of airstrip aims for the flight of social and humanitarian missions. This airstrip is widely available in Indonesia, especially in Papua Province In the planning of an airport, an approach and methodology are needed taking into account various aspects, including regional development strategies, technical, economical, aviation operations safety, environment and defense and security so that the investment invested can be useful (efficient) and successful (effective) considering the development of the airport is a capital-intensive and high-tech job. The result of this research shows Jayapura regency and surrounding areas in Papua Province are in dire need of connecting media that can reach isolated areas. An air grip can not only be relied upon as a means of mobilization but can also be an opening for access to various information. Criteria for determining airstrips in Jayapura Regency and surrounding areas in Papua Province that can be upgraded to airport based on 3 indicators.

INTRODUCTION

An airstrip is a place where airplanes take off and land without normal airport facilities (KP 216 of 2017). In general, the construction of an airstrip is intended for social and humanitarian mission flights. There are many airstrips in Indonesia, especially in remote and isolated areas.

Jayapura Regency and surroundings in Papua Province is separated by very complex geographical conditions, including wilderness, rivers, and mountains. Judging from this condition, the need for an Airport (Airstrip) is very necessary as a means of transporting people or goods. The selection of the airport is very appropriate considering the lack of availability of land transportation facilities, namely roads that connect one area to another.

Due to the condition of the airstrips whose foundations are still gravel and grass, as well as very complex geographical conditions, making these airstrips unable to serve aircraft with a large carrying capacity, even though their role as the entrance to the region is very much needed in order to carry out the function of the airport as a air bridge for remote areas.

In an effort to take advantage of the potential of existing airstrips in Jayapura Regency and surroundings, Papua Province, it is deemed necessary to arrange an airport which will later receive a recommendation to be developed into an airport, with the hope that it will open up the isolation of surrounding areas which are currently difficult to reach by land transportation. The length of roads in Jayapura Regency in 2020 is 618.68 km. The road conditions include 237.36 km in good condition, 31.35 km in moderate condition, 142.45 in light damage and 207.52 km in severe damage (Jayapura Regency in Figure, 2021: 166).

The approach carried out in the work of the *Airstrip* Development Study to Airport Status in Jayapura Regency and surroundings is to conduct an *airstrip* feasibility study to be developed into an airport taking into account technical, operational, air transport business, regional development policy and national transportation development, defense and security and environmental sustainability aspects. The purposes of this study are:

1. Determining the criteria for determining *airstrips* in Jayapura Regency and surroundings of Papua Province that can be upgraded to the minimum standard status of the airport;
2. Determine the priority of the airstrip which can be upgraded to the minimum standard status of the airport in accordance with applicable provisions;
3. Draw up a *roadmap* for the development of*airstrips* that will be the minimum standard status of the airport to support the mobility of the people of Jayapura Regency and surrounding areas.

The scope of activities to be carried out in this study is as follows:

1. Inventory of airstrip data, status and environmental/ natural conditions in Jayapura Regency and surroundings;

2. Selection of the location of the *airstrips* in Jayapura Regency and surrounding areas that can be upgraded to the standard status of the airport;

3. Determining the criteria for *determining airstrips* in Jayapura Regency and surrounding areas that can be upgraded to the standard status of the airport;

4. Determine *the airstrip* that can be upgraded to airport standards in accordance with applicable provisions;

A review of the literature used in the Study of Increasing Airstip to standard Airport status in Jayapura Regency and its surroundings is as follows.

The technical term of airport used in the Feasibility Analysis *Airstrip* Development in Jayapura Regency and Surroundings refers to Law No. 1 of 2009 on aviation, which is as follows.

1. Airport is everything related to the implementation of airports and other activities in carrying out the functions of safety, security, smooth and order of the flow of aircraft traffic, passengers, cargo and/or posts, intra and/or intermodal displacement and increasing national and regional economic growth.
2. Airport is an area on land and / or waters with certain boundaries that are used as a place where aircraft land or take off, up and down passengers, loading and unloading goods and intra- and intermodal transportation, equipped with safety and security facilities, the environment, as well as supporting facilities and other public facilities.
3. A public airport is an airport used to serve the public interest.
4. Special Airport is an airport that is only used to serve its own interests to support its basic business activities.
5. Air freight is any activity by using an aircraft to transport passengers, cargo, and/or post for one or more trip from one airport to another airport or multiple airports.
6. Pioneer Air Freight is a domestic commercial air freight activity that serves networks and flight routes to connect remote and disadvantaged areas or areas that have not been served by other modes of transportation and are commercially unprofitable.
7. Flight Route is the trajectory of an aircraft from the original airport to the destination airport through a predetermined flight path.
8. Cargo is any goods transported by aircraft including animals and plants other than the post, aircraft goods during flight, luggage, or no-man's goods.
9. Aviation Safety is a state of meeting safety requirements in the utilization of airspace, aircraft, airports, air transportation, flight navigation, as well as supporting facilities and other public facilities.
10. Aviation Security is a situation that provides protection to aviation from unlawful action through the integration of human resource utilization, facilities, and procedures.
11. The National Municipal Order is a national municipal system that describes airport planning based on spatial plans, economic growth, comparative advantage ofregions, natural conditions and geography, intra- and intermodal integration of transportation, environmental sustainability, aviation safety and security, and integration with other development sectors.

    Based on the Regulation of the Minister of Transportation No. 69 of 2013 on the National Municipal Order, the Airport Hierarchy consists of a collecting airport *(Hub)* and Feeder Airport *(spoke).*

1. *A* hub is an airport that has a wide service coverage of various airports that serve passengers and/or cargo in large quantities and affect economic development nationally or various provinces that are distinguished into:

a. The collecting airport with the scale of primary service is the airport as one of the infrastructures supporting the National Activity Center (PKN) service that serves passengers with a number greater or equal to 5,000,000 (five million) people per year;

b. The collecting airport with a secondary service scale is an airport as one of the infrastructures supporting the National Activity Center (PKN) service that serves passengers with a number greater than or equal to 1,000,000 (one million) and smaller than 5,000,000 (five million) people per year;

c. The collection airport with tertiary service scale is the airport as one of the supporting infrastructures of the National Activity Center (PKN) and the nearest Regional Activity Center (PKW) serving passengers with numbers greater than or equal to 500,000 (five hundred thousand) and smaller than 1,000,000 (one million) people per year.

2. Feeder Airport (spoke) is an airport that has service coverage and affects limited economic development which is:

a. Airports that have service coverage and affect the local economy;

b. Destination airport or supporting airport from the collecting airport, and

c. Airport as one of the infrastructures supporting local activities.

The classification of airports consists of several classes of airports that are determined based on the service capacity and operational activities of the airport. Service capacity is the airport's ability to serve the largest types of aircraft and the number of passengers / goods that include:

a. **Code number** is the calculation *of* runway length based on aeroplane reference field length (ARFL).

b. **Code letter** is a calculation according to the wingspan and width / distance of the outermost wheel of the aircraft.

Table1

Airport Reference Code

Code Number	Aeroplane Reference Field Length (ARFL) (m)	Code Letter	Wing Span (WS) (m)	Outer Mean Gear (OMG) (m)
1	ARFL < 800	A	WS < 15	OMG < 4.5
2	800 ≤ ARFL <1200	B	15 ≤ WS < 24	4.5 m ≤ OMG < 6
3	1200 ARFL ≤ < 1800	C	24 ≤ WS < 36	6 m ≤ OMG < 9
4	1800 ≤ ARFL	D	36 ≤ WS < 52	9 m ≤ OMG < 14
		E	52 WS ≤ < 56	9 m ≤ OMG < 14
		F	56 ≤ WS < 80	14 m ≤ OMG < 16

Source: KP 326 (2019)

Table 2.

Criteria and Sub-criteria

No.	Criterion		Sub-kriteria
I	Feasibility of Regional Development	1	Suitability of District and/or Provincial RTRW
		2	Suitability of Tatrawil and/or Tatralok
		3	Policies on Disaster-Prone Areas
II	Economic and Financial Viability	1	Net Present Value (NPV)
		2	Benefit Cost Ratio (BCR)
III	Technical Feasibility of Development	1	Airstrip Location Land Conditions
		2	Ground Surface Flow / Drainage System
		3	Accessibility Conditions
IV	Operational Feasibility	1	Air Space Conditions
		2	Wind Direction Conditions
		3	Landing and Takeoff Procedures
V	Air Freight Eligibility	1	Service Coverage
		2	Potential passengers
		3	Cargo Potential
VI	Environmental Feasibility	1	Natural Environment
		2	Land Allocation
VII	Social Qualifications	1	Harmony and Cultural Balance
		2	Impact of Airports on The Community

Source: PM 20 (2014) Procedures for Airport Location Determination

RESEARCH METHODS

In the planning of an airport, an approach and methodology are needed taking into account various aspects, including regional development strategies, technical, economical, aviation operations safety, environment and defense and security so that the investment invested can be useful (efficient) and successful (effective) considering the development of the airport is a capital-intensive and high-tech job.

Based on the above thought patterns, in the *Airstrip* Development Study to Airport Status in Jayapura Regency and surrounding areas, the following steps are needed to implement the work:

1. Conducting preliminary surveys, in the form of interviews with *stake holders*, especially regulators, visual observation surveys of several locations and collecting related secondary data to describe the existing conditions of locations, road transportation systems and aspirations and visions of *stakeholders* in the future;

2. Conducting valuasi on the condition of the existing airfield in the region and some study results related to spatial planning and transportation systems in papua province and surrounding areas, as well as concepts / policies and related regulations / regulations;

3. Conduct primary and secondary data collection in the field, among others:

a. Regional Development Policies and Strategies related to government programs in order to realize the National Transportation System (SISTRANAS), Tatrawil and Tatralok, are intended to obtain a socially organized transportation order within the scope of national, provincial, district /kabupaten areas that include highway transportation and air transportation which each consists of mutually organized facilities and facilities. Erinteraksi forms aneffective transportation jas servicesystem.

b. The policy of the regional transportation system contained in the documents of the Provincial Transportation Level (Tatrawil) and the Local Transportation Tataran (Tatralok) Regency.

c. Existing Land Use and Infrastructure Plans of the Area, including:

- Regional Spatial Plan (RTRW) provinces and regencies;
- Airport Area Spatial Detail Plan (if it already exists);
- Transportation infrastructure network and its development plan (if it already exists);
- The utility network and its development plan (if it already exists).

d. Socio-Economic Data of the Region, including:

- Population;
- Gross Regional Domestic Product (PDRB);
- Profile of Investment Potential in the Region;
- Tourism Potential;
- Cultural data;
- Socio-Economic Conditions of the local community;
- Potential / Source of Building Materials and the price of materials / wages.

e. Physiography, Topography, and Meteorology

- Land conditions in the location and area of the airstrip;
- Soil conditions in the airstriparea;
- Data on the status and price of land at the airstriplocation;
- Meteorological and climatologicaldata.

Determination of the increase of *airstrip* to airport is done with 2 (two) *stages*, namely the initial study of airstrip selection conducted based on secondary data (administrative map, land use, etc.) and field survey to review the *airstrip* to be used as an airport.
For this stage is carried out based on the criteria that have been established *by* assessing each criterion so that the final result of each alternative airstrip is most technically qualified both technically, the safety and potential of passengers and / or cargo with the weighted average method.
Airstrip's selection methodology is based on the following indicators and criteria:
1) Technical Indicators of *Airstrip* Development, with the following criteria:

a. Ownership and allocation of land;

b. Availability of development land;

c. Topographic conditions;

d. Ground level conditions;

e. The length of the existing Airstrip;

f. Accessibility to airstrip locations.

2) Flight Operational Safety Indicators, with the following criteria:

a. Existence of obstacles;

b. Safety takes off and landing;

c. Elevation of *airstrip;*

d. Weather conditions.

3) Indicators of Air Transport Potential, with the following criteria:

a. Number of District/District Residents

b. Gross Regional Domestic Product (PDRB)

c. Air freight routes

For each airstrip will be assigned a value of 1 to 5 for each of the above criteria. With a score of 1 very bad and a score of 5 very good.

RESULTS AND DISCUSSIONS

Jayapura Regency and its surroundings in Papua Province are in dire need of liaison media that can reach isolated areas. Air transportation can not only be relied upon as a means of mobilization but can also be used as a means of opening access to communication and information.

4.1. Condition of study area

Jayapura Regency is one of the regencies in the province of Papua, Indonesia. The district capital is located in Sentani, 33 km from Jayapura City. Jayapura Regency with an area of 17,516.6 Km2 which is divided into 19 districts, 139 villages and 5 sub-districts located between 139° - 140° east longitude and 2° north latitude and 3° south latitude.

The topography and slopes are generally relatively steep with a slope of 5% - 30% and have an actual height of 0.5 m above sea level - 1500 m above sea level. The northern coastal area is a undulating lowland with a slope of 0% - 10% which is covered with alluvial deposits. Physically, apart from land, it also consists of swamps (13,700 ha). Most areas of Jayapura Regency (72.09%) are on a slope above 41%, while those with a slope of 0 - 15% range from 23.74%.

The minimum average air temperature ranges between 21.2° – 36.7° Celsius. Air humidity averages at 74 and 77 percent. The highest rainfall occurred in November 258.1 mm and the lowest in June 62.6 mm.

4.2. Airstrip Lereh in Kaureh District

Kaureh district with 5 villages is located in mountainous and valley areas, therefore the transportation used is two-wheeled vehicles, namely motorcycle taxis (two-wheeled public transportation) due to very minimal road infrastructure in this case the road is still dirt or gravel. Usually people charter vehicles with four or more wheels at a fairly high cost to transport their agricultural products out of the Kaureh District.

Accessibility to Kaureh District and Lereh Airstrip can be reached by land with a travel time of ± 7 hours from Sentani. The journey to Airstrip Lereh must use a type 4 WD car, because the condition of the road to Airstrip Lereh is still not good. The following is the condition of roads and bridges to Kaureh District and Lereh Airstrip.

The population of Kaureh District in 2020 is 9,517 people. The number of Play Group is 3 units, while for TK there are 3 units. There are 8 public elementary schools, 2 junior high schools.

Figure 1.

Road Conditions to Airstrip Lereh - Kaureh

The production of food crop commodities includes Corn, peanuts, sweet potatoes and sweet potatoes. Of these comuditas, the most produced is sweet potatoes of 79 tons, while the least is peanuts, which is 6 tons. The production of vegetable commodities includes red pepper, mustard, chickpeas, tomat, long beans, barplant, kale and spinach. From the vegetable commodity kale is the commodity with the most production which is about 32 tons, whilethe commodity with the least production is chickpeas sekitar 4 tons.

Airtstrip Lereh, which is located in Kaureh District, is no longer active. Previously, the Lereh Airstrip was opened by missionary flights with dimensions of 600 meters x 20 meters. The direction of the runway is 12 - 30. At the end of runway 12 - 13 is a bush. The Lereh Airstrip is at an elevation of 29 meters MSL. Airstrip Lereh last operated in 1995 with land ownership over the Church (customary land). Around the location of the Airstrip there are houses of residents.

Figure 2.

Location of Airstrip Lereh-District Kaureh

4.3. Airstrip Pagai in Airu District

Airu District with its capital in Pagai has 6 (five) villages, namely: Pagai, Hulu Atas, Aurina, Maura Nawa, Kamikaru, Naira. Airu District has an area of 591.5 km². Kampung Pagai is the largest area which is 183.06 km².

Airstrip Pagai is located in the village of Pagai Airu District. Accessibility to Kampung Pagai can be reached through Jayapura-Wamena road which is taken for 4 Hours by double garden car to Elelim and 6 hours drive to Wamena, besides that it can also be accessed via Baliem river to Naira port for 1 Hour, from Naira to Jayapura can be reached by road for 12 hours.

The population of Airu District is 1,104. Educational facilities in Airu District 5 Elementary School (SD) which is divided into State Elementary and Private Elementary School. State Elementary School is located in five villages, namely, Pagai, Upper Hulu, Muaranawa, Kamikaru and Naira, each of which has 1 elementary school unit, while Private Elementary School there is 1 unit in Aurina village. For high school only 1 unit in Airu district precisely in the village of Aurina.

The production of food crop commodities was the highest in Airu District, namely yam crops as much as 78 tons, then sweet potatoes as much as 44 tons and corn as much as 18 tons. The production of vegetable commodities is tomatoes as much as 18 tons, long beans as much as 6 tons, kale as much as 3 tons, red pepper as much as 3 tons and spinach as much as 1 ton.

The production of local specific commodities is taro as much as 26 tons, keladi as much as 34 tons, shafu as much as 14 tons, kiha as much as 5 tons, wax vegetables as much as 8 tons, gedi vegetables as much as 3 tons, ginger as much as 2 kg, galangal as much as 15 kg and turmeric as much as 32 kg.

Airstrip Pagai is located in Kampung Pagai located at coordinates 3° 32' 25" S - 139° 46' 49" E to 3° 32' 00" S 139° 47' 02" E. Airstrip Pagai is opened by missionary flights with land status is customary land. Airstrip Pagai length is875 meters x 20 meters with runway direction 02 - 20. At the end of runway 20 are tall trees, and at the end of runway 02 is the Baliem river. Pagai airstrip pavement is still in the form of sand and stone.

Airstrip is located at an altitude of 68 meters above sea level (MSL), with a relatively flat contour of land and quite far from the mountains. The distance of Airstrip Pagai to the surrounding major airports is as follows:

1. The distance of Pagai airstrip to Bandar Udara Sentani is 134 km.
2. The distance of pagai airstrip to Bandar Udara Wamena is 111 km.
3. The distance of Pagai airstrip to Bandar Udara Nop Goliath Dekai is 149 km.

Airstrip Pagai is a collection area for hospital patients around Kampung Pagai, which will be flown to Jayapura. Around the location of Airstrip Pagai there are still many people's homes. Residents around airstrip do daily activities by farming.

At the airstrip location there is lighting / electricity using a solar-powered generator set. Here is the condition of Airtsrip Pagai:

Figure 3.

Location of Airstrip Pagai – Airu District

4.4. Airstrip Waris in Waris District

Waris Districtisbetween 3º 14' 36" Lintang Selatan and 140º 58' 0.9" Longitude Timur.

Waris District area consists of 8 villages with an area of ±911.94 km² and is at a height of ±150-200 meters above sea level The area that has the largest area in Waris District is Kampung Banda with an area of 189.79 km^2 or 20.81 percent of the total area of Waris District.

Airstrip Waris is located in Pund Village. Airstrip coordinates are located at 3° 14' 00" S 140° 58' 00" E. Around the Airstrip location there are people's homes, places of worship and health facilities. Transportation facilities to Waris District and Airstrip Waris can be taken by road with travel time of ±7 Hours from Jayapura. The journey to Airstrip Waris must use a type 4 WD car, because the road conditions to Airtsrip Waris are still not good there are many hollow roads and some bridges to Airstrip Waris are still in the form of wooden bridges. Here are the conditions of the road, and the bridge to the Waris district and Airstrip Waris:

Figure 4.

Road Conditions to Airstrip Waris Location

The population of Waris District is 3,425 people. Most of the population is men, which is 52.18 percent, while the female population amounted to 47.82 percent of the entire population in Waris District. With an area of ± 911.94 km2 means that the population density only reaches 3.88 people per km2. This means that every 1 km is only inhabited by 4 people.

Preschool institution in Waris District there are 4 private kindergartens, elementary school as many as 5 units, junior high school there are 2 units, high school there is 1 unit. The number of elementary students amounted to 750 students, junior high school students numbered 97, high school students numbered 76. The number of teachers in Waris District amounted to 65 people consisting of 38 elementary teachers, 17 junior high teachers, and 10 high school teachers.

Airstrip Waris located is located at coordinates 3°14'00" S 140°58'00" E. Airstrip Warisi is opened by missionary flights with the status of land is customary land. Airstrip Waris condition when surveyed is no longer operational.

Airstrip Waris last operated in 1978. Airstrip Waris dimensions are 700 meters x 18 meters long with runway direction 07 - 26. Airstrip is located at an altitude of 487.23 meters above sea surface (MSL), with a relatively flat land contour and quite far from the mountains.

Around the location of airstrip Waris there are many settlements. And at the end of the airstrip there is the office of Waris District and Puskesmas Waris District. This airstrip is still maintained by the surrounding community.

Figure 5.

Road Conditions to Airstrip Waris Location

4.5. Airstrip Ubrub in Web District

The Web district is set between 2º 53' 49.13" Lintang Selatan and 140º 46' 03.97" Longitude Timur.

The Web District has an area of 714.43 km²· Kampung Umuaf is the largest campong with an area of 375.57 km² or an area of more than 50 percent of the total area of Web Subdistrict.

Airstrip Ubrub is located in the village of Umuaf. Accessibility to Kampung Umuaf can be reached by road by *double gardan (4 WD)* from Sentani taken for ± 8 hours. The condition of the road to Airtsrip Ubrub is still not good there are many potholes and some bridges to Airstrip Ubrub are still wooden bridges. Here is a documentation of public facilities, road conditions, and bridges leading to the Web and Airstrip Ubrub districts.

Figure 6.

Road Conditions to Airstrip Ubrub Location

The population of Web District is 1,813 people. Most of the population is men, which is 1,018 people or 56.15 percent, while the female population is 795 people or 43.85 percent of the entire population in the Web District.

Quantity of education tool in District We there are 1 private kindergarten in Kampung Umuaf and SD as many as 3 units. For SLTP there is 1 unit. Until now, The Web District does not have an SLTA school.

Airtsrip Ubrub is located in kampung Umuaf District Web. This airstrip is located at coordinates 3°40'00" S 140°51'00" E. Airstrip is no longer active. Airstrip Ubrub was opened by missionary flights with dimensions of 750 meters x 20 meters with runway directions 18 - 36. The end of runways 18 - 36 is a thicket. Airstrip Ubrub is at an elevation of 450 meters above sea level (MSL), with land ownership of customary land.

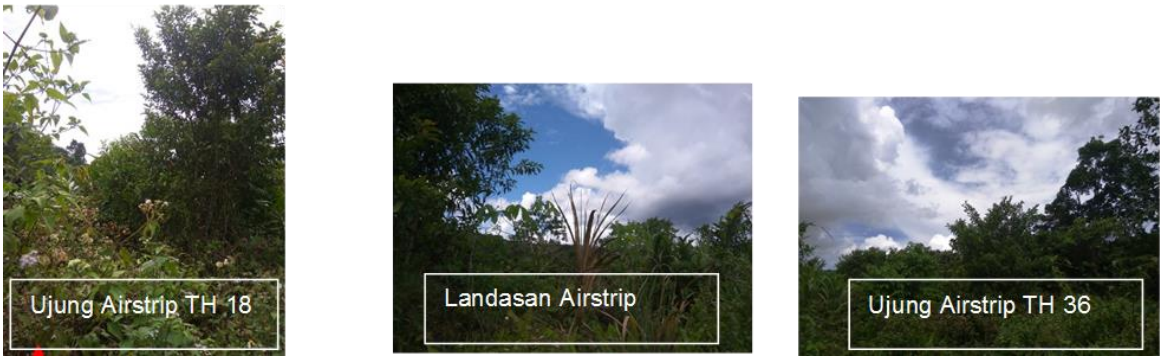

Figure 7.

Location of airstrip Ubrub – Web District

4.6. Airstrip Assessment Analysis

Airstrip assessment based on indicators and criteria for each airstrip can be seen in the airstrip column in question for each criterion.

NO	PARAMETER	CRITERIA	SCORE	WEIGHT	AIRSTRIP LOCATION			
					Lereh	Pagai	Waris	Ubrub
I		**LAND OWNERSHIP AND USE**		5				
		a. Land for the location of the airstrip (company/private property)	1					
		b. Land for the location of the airstrip (owned by TNI)	2					
		c. Land for the location of the airstrip (owned by the community)	3		15	15	15	15
		d. Land for the location of the airstrip (owned by local government)	4					
		e. Land for the location of the pioneer airport (owned by MOT)	5					
		AVAILABILITY OF DEVELOPMENT LAND		6				
		a. No development land available	1					
		b. Available but in the form of paddy field and/or swamp	2					
		c. Available but in the form of garden land	3				18	
		d. There is land available in the form of grassland but it is limited	4		24			
		e. The land available in the form of grassland is very wide	5			30		30
	AIRSTRIP	**TOPOGRAPHIC CONDITIONS**		5				
	DEVELOPMENT	a. Very Wavy	1					
	TECHNICAL	b. Wavy	2					
		c. Relatively Flat	3					
		d Flat	4					20
		e Very Flat	5		25	25	25	
		SOIL SURFACE CONDITIONS		5				
		a. Swamp and/or peat	1					
		b. Rice fields and/or soft land	2					
		c. Rice Fields and Gardens	3					
		d. Garden	4					20
		e. Grasslands and/or small shrubs	5		25	25	25	
		LENGTH OF EXISTING AIRSTRIP		5				
		a. Length : L < 450 m	1					
		b. Length : 450 m ≤ L < 550 m	2					
		c. Length : 550 m ≤ L < 650 m	3					
		d. Length : 650 m ≤ L < 750 m	4				20	
		e. Length : L ≥ 750 m	5		25	25		25
		ACCESSIBILITY		4				
		a. No other modes of transportation available	5					
		b. There is a path that cannot be developed	4					
		c. Available but need to make a connecting road	3		12	12	12	12
		d. Available and there is no need for connecting roads	2					
		e. There is already a connecting road around the airstrip	1					
II		**OBSTACLE EXISTENCE**		12				
		a. There are obstacles in the take-off area, right & left there are hills	1					
		b. There is an obstacle in the take-off area	2					
		c. There are obstacles on the right & left areas of the runway	3		36		36	
		d. There are obstacles on the right or left of the runway	4					48
		e. No Obstacle (clear)	5			60		
	AVIATION	**SAFETY TAKE OFF AND LANDING**		12				
	OPERATION	a. Both ends of the runway have ravines or hills, a distance ≤ 30 m	1					
	SAFETY	b. Both ends of the runway have ravines or hills, a distance ≤ 60 m	2					
		c. One end of the runway there is a cliff or hill, a distance ≤ 30 m	3					
		d. One end of the runway there is a cliff or hill, a distance ≤ 60 m	4			48	48	
		e. There are no ravines or hills at both ends of the runway	5		60			60
		AIRSTRIP ELEVATION		9				
		a. Elevation : E < 50 m	5		45			
		b. Elevation : 50 m ≤ E < 500 m	4			36	36	36
		c. Elevation : 500 m ≤ E < 1000 m	3					
		d. Elevation : 1000 m ≤ E < 2000 m	2					
		e. Elevation : E ≥ 2000 m	1					
		WEATHER CONDITIONS		9				
		a. Sunny weather conditions ≤ 2 jam	1					
		b. Sunny weather conditions ≤ 3 jam	2					
		c. Sunny weather conditions ≤ 4 jam	3					
		d. Sunny weather conditions ≤ 5 jam	4				36	36
		e. Sunny weather conditions > 5 jam	5		45	45		
III		**NUMBER OF POPULATION AROUND THE AIRSTRIP**		10				
		a. Total population < 2.000	1			10		10
		b. Total population ≥ 2.000	2					
		c. Total population ≥ 3.000	3				30	
	AIR	d. Total population ≥ 4.000	4					
	TRANSPORT	e. Total population ≥ 5.000	5		50			
	POTENTIAL							
		GROSS REGIONAL DOMESTIC PRODUCT (GRDP)		8				
		a. District GRDP < 10 Triliun rupiah	1				8	8
		b. District GRDP ≥ 10 Triliun rupiah	2		16	16		
		c. District GRDP ≥ 30 Triliun rupiah	3					
		d. District GRDP ≥ 40 Triliun rupiah	4					
		e. District GRDP ≥ 50 Triliun rupiah	5					
		AIR TRANSPORT ROUTE		10				
		a. Airstrip is not active	1		10		10	10
		b. Airstrip is active but no air freight route	2			20		
		c. There is an air transport route with a frequency of 2 times a week	3					
		d. There is an air transport route with a frequency of 1 time a week	4					
		e. There are air freight routes more than 2 times a week	5					
				TOTAL	388	367	319	330

CONCLUSIONS

Based on the results of research and discussions that have been carried out, it can be concluded that there are 4 Airstrips that can be developed to meet airport standards so that larger aircraft can be landed based on an assessment of multi criteria, with development

priority being Airstrip Lereh, Pagai, Ubrub and Waris. Furthermore, further studies need to be conducted with the following *Roadmap*.

Henceforth, it is necessary to carry out further studies with the following Roadmap :

1) Feasibility Study,
2) Master Plan Study,
3) Detail Engineering Design,
4) Development Implementation.

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Jayapura Regency in Figure, 2021