

## A Perspective of Transportation Development for Bintuni Regency in West Papua-Indonesia

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**Abstract:-** Bintuni Regency in West Papua Province, can be accessed by sea and air transportation from Manokwari, Sorong and it's a road transport from Manokwari. The study aims to analyze regional resources of Bintuni Regency which is supported by transportation, availability of infrastructure and transportation services, to support development. The method used was interview with questionnaires and secondary data collection from relevant institute. Regional potency and availability of infrastructure and transportation services were analyze by descriptive and the transportation performance obtained using Importance Performance Analysis and Customer Satisfaction Index method, population trip pattern used origin destination matrix (O-D matrix), while perspective transportation development derived from SWOT analysis. The availability of infrastructure and transportation services to support regional development is still relatively limited, are transportation services at very poor level, and internal population trip pattern centered on Bintuni Regency. Perspective transportation development focused on road transportation networks development, ferry and water, sea transportation in Bintuni and babo Regency, and air transportation in Bintuni, Babo and Merdey Regency.

**Keywords:-** Regional Resources, transportation performance, infrastructure, development strategies

### I. INTRODUCTION

Development of a region can not be separated from the role of the transport sector. [1], the transport acts as a driving force for the development of remote or underdeveloped areas, aims to open isolated areas, increase inter-regional trade, improve mobility, reduce disparities between regions, and improve the efficiency of administrative governance and creating stability in regional. [2], the system transportation will change over time, grow over the development and changes in social and economic activities of man. [3], states that the availability of transport infrastructure networks extensively to various areas of social and economic benefits.

In developing regions, the transport system is to bridge the socio-economic activities of the functional linkages between regions, so that the transport system development policies geared to 1) support the development of activity centers that are the vertices of regional activities, 2) strengthen the network path to the major transportation nodes in the development of an integrated regional transportation system (multimodal) and 3) enhance the growth across regions in order to evolve harmoniously together in the surrounding region and between regions [4].

The availability of transportation infrastructure is one of the important factors in the development of the region. The level of availability of transportation facilities and infrastructure can increase the accessibility of the area, the opposite is likely [5] that the area is isolated, so that the growth and development of the region to be slow. Transportation Service System aims to create an effective organization of transport within the meaning of safe, high accessibility, integrated, sufficient capacity, orderly, smooth and fast, easy, timely, convenient, affordable rates, orderly, safe, low pollution and efficient.

In Master Plan Acceleration and Expantion of Indonesia Eoconomic Development (MP3EI), West Papua province is included in the corridor VI Papua and Maluku Islands [6]. The distribution of the population of West Papua Province has not been evenly distributed, mostly concentrated in urban areas of Manokwari, Sorong and Sorong Regency. The Factor that affect them: 1) the level of activity and service system regions, including urban and rural areas of activity; 2) physical conditions do not allow the inhabited land and most of the forest area, 3) accessibility and the level of achievement of each different region, some areas isolated, so it requires a fairly large transportation costs, and 4) the area of each Regency varies.



Figure 1. Location of Bintuni Regency

Bintuni Regency (Figure 1), is the largest of the 11 regency in the province of West Papua, i.e. 20,840.83 km<sup>2</sup> (21.5% province wide), the population density of 52.422 souls and 3 people / km<sup>2</sup> is relatively low [7], when this consist of 24 Regencys, 115 villages and two urban villages with an area of 18 637 km<sup>2</sup>, [8].

The potential of natural resources in Bintuni Regency is the sector of mining (coal and liquefied gas) and forestry (forest production and sago) [9], management of natural resources are managed by the private sector, government involvement and local residents are still limited, management of liquid gas in the Babo Regency to give effect to the formation of new settlements result in increased population movements in the Gulf of Bintuni Regency.

Transportation services are made possible by the Gulf of Bintuni Regency conditions ranging from ground transportation to the internal movement of the city, river and sea transportation for the movement as well as the internal and external air transportation for the movement of external and regional level, where there is a ground transportation nodes, streams and waterways as well as but the air is still very limited. The entire movement of passengers, either directly from the villages and Regencys of the capital Regency only has access out through the Gulf of Bintuni Regency and Babo, necessitating the development of transportation networks exist. To support the movement in the Gulf of Bintuni Regency in internal and external scope in optimizing the potential that is, the study analyzes the potential of the Gulf of Bintuni Regency supported availability of network infrastructure and services to support the development of transportation in the region.

### **Data Analysis**

The study was conducted in Regency in West Papua Province which is divided administratively into 24 Regencys, using a descriptive study with qualitative and quantitative analysis. The population is divided into five categories, namely 1) the population as a transportation demand movement activity, 2) employees of government agencies related to the development of transport 3) transport operators, 4) public figures, and 5) academics.

### **Data Collection Techniques**

The Data collection in the form of a physical condition, the potential of the region, the existing network infrastructure and transportation services.

The potential population of Bintuni as transportation demand used analysis population projections (compound interest method). For transportation performance is analyzed qualitatively and using Importance Performance Analysis and Customer Satisfaction Index uses 14 indicators of the National Transportation System, to analyze movement patterns antarzona used an Origin Destination (OD) and to analyze the perspective of the development of transport used SWOT analysis.

## II. RESULT

Bintuni Regency is the Regency capital Bintuni with area 421.75 km<sup>2</sup> or about 2.26% of the area of the Regency. The potential for disaster is there between the other ground movement, floods, forest fires, earthquakes, and tsunamis. The population is approximately 56.167 inhabitants with density of 103.36 people / km<sup>2</sup>. The highest population density is in the Bintuni Regency is 49.28 people / km<sup>2</sup> followed Manimeri Regency is 16.99 people / km<sup>2</sup> and the lowest was the West Regency Moskona is 0.49 people/km<sup>2</sup>. The manufacturing sector dominates the economy, is 92.44%.

The average population growth in the Gulf of Bintuni Regency of year 2006-2012 decreased due to the division of the Regency territory, so the distribution of the population of the Regency spread to other Regencys. However, overall the total population of the gulf of Bintuni Regency grew quite low, of 0.02% per year, projected to 2020 as many as 62.839 people.

The gulf of Bintuni Regency commodities have the potential mining and quarrying. Almost the entire area contains a liquefied natural gas (LNG), other mining products such as coal and mica. Mining area is on site Bintuni, Tembuni, and Merdey. Reserve liquid gas (LNG) held an estimated 23.7 trillion cubic feet (TCF). The content of petroleum in the Regency is estimated 45 million tons. Sentra utilization of LNG in Kampung Tanah Merah, Babo Regency, while making the concentration of oil in the Regency of South Moskona.

In general, the condition of roads in the Bintuni Regency is in poor condition. The main road to the national road status contained in Manokwari Regency of West Papua is Trans linking the regency of Manokwari and Bintuni Regency, while connecting with South Sorong Regency is a primary arterial road primer. Network primary systems that have so far are the regional traffic from the direction toward Manokwari to Bintuni Regency leads to Mayado Regency. Provincial and Regency roads are strategic roads in the Bintuni Regency with a total length of 824.95 km<sup>2</sup> road, consists of 13 strategic roads. Provincial and Regency road is a land-road along the 296.7 km<sup>2</sup> and 350 km<sup>2</sup> is still forested. The road that connects the Bintuni City with surrounding villages is a land-road embankment and compacted land-road.

Bintuni River with a length of 123 km and a width of 50-175 meters is one of the rivers that are empowered to gas management activities in the gulf of Berau, both for distribution logistics for workers as well as for mobility. There is a river port which has a capacity of 1,500 DWT, with concrete and wood construction has a size of 8 x 70 meters and a depth of 10.5 meters. Local navigation channel internally Regency consists of Bintuni - Babo and Bintuni - other activity centers in the Bintuni Regency. Bintuni harbor ships owned by private, pioneer, speed boat, and cruise ships goods archipelago.

Bintuni Airport is the airport of fourth grade, is 151.25 miles from the capital of the province of West Papua, Manokwari operators DASH-6, DHC-6 and hierarchical as feeder airports. Babo Airport is 199.21 km from Manokwari, hierarchical as feeder airports with airline operators type ATR-72 but not the center of the spread of the airport, but has a special function for strong services of LNG in the Babo Regency.

Population movements that occurred are not only in the sphere of inter-Regency Bintuni, but there are also external movement to Sorong and Manokwari. From the results of the MAT that the internal movement of 216 people / day, an external movement to Sorong of 19 people / day and to Manokwari of 30 people / day. Trip generation and internal is greatest Bintuni Regency, Manimeri Regency second is a distance of approximately 15 km from the Bintuni Regency also serves as the population of migrants from Java.

Overall performance of transport by land, water and air are at very poor level of <64%. Based on the acquired land transportation IPA quadrant 5 indicators that perform well are efficient, regularity, convenient, safety and orderly, the other needs to be improved. Transportation waters 5 indicators that performs well is the capacity, accessibility, affordable rates, efficient order and the other needs to be improved while on air transport was obtained 4 indicators were performing well that is efficient, regularity, capacity and comfortable, the other needs to be improved.

The results of subsequent identification of the SWOT analysis should be weighted internal factors and external factors (Table 1). Based on the total weight value obtained W-O strategy is to develop road transport network, namely the opening of roads in isolated areas through cooperation with private investors and the government prioritizing the development of road network in the North and South regions further provides transportation services through the provision of road transport pioneers.

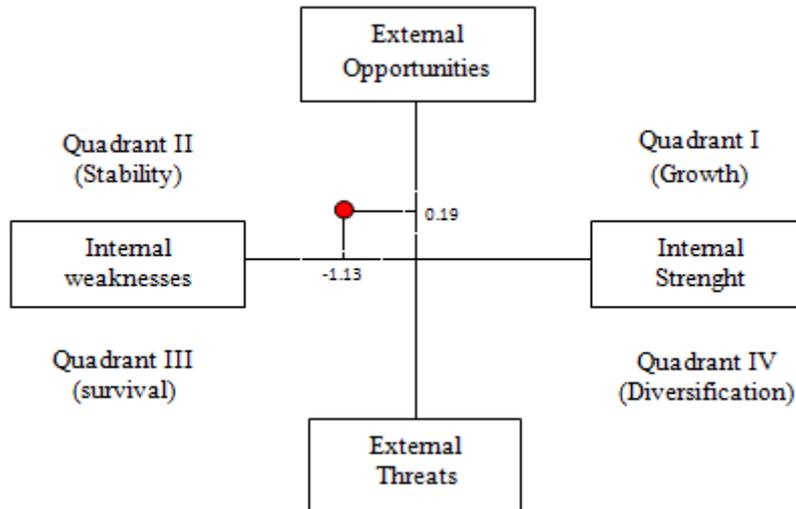


Figure 2. Policies Position (O-W) for Transport Development

### III. DISCUSSION

This study shows that the potential of the Bintuni Regency is natural resources spread across several Regencys are mapped based on the geographical characteristics influence the mode of transport used to facilitate accessibility. Geographical conditions affect the type of transportation mode being used in the Bintuni Regency. When viewed from the condition of the area can be divided into: 1) the mountainous region: Regency Tuhiba, placenta, South Moskona, Moskona West, East Moskona, North Moskona, Merdey, Meyado, Masyeta, Dataran Beimes and Biscoop; and 2) coastal area: Weriagar Regency, Wamewsa, Tomu, Sumuri, Manimeri, Kuri, Kamundan, Kaitaro, Fafurwar, Bintuni, Babo, Aroba and Aranday. Mountainous region dominated by air and road transport modes (which are still very limited conditions), while coastal areas dominated by river transport, sea and land.

Problems faced in improving the road from the ground into the pavement or asphalt is difficult stone materials in the gulf of Bintuni Regency, due to be brought from Manokwari or Sorong. Transportation in the mountainous region to the accessibility to the city center is very low both central to the achievement of the activity and mode of transportation available. Generally ground transportation services are still very limited, yet there is a regular route serving the movement between regions. Residents who move, generally still walk or use a motorcycle, there are no terminals and mass public transport services do not exist, just use double axle chartered transportation capacity of 7-10 passengers.

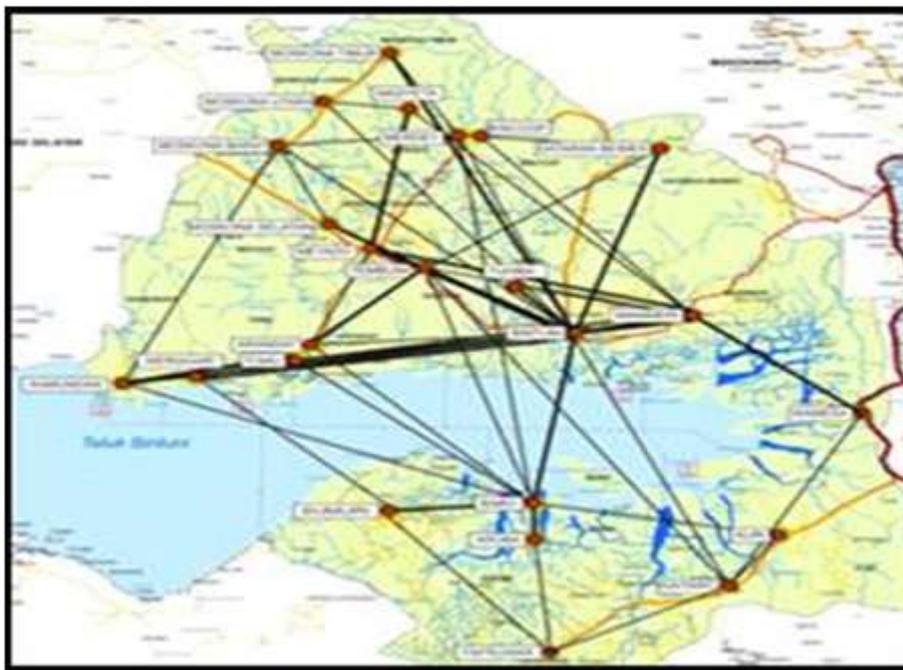


Figure 3. Desire Line Origin-Destination (O-D) Transport Development

In generally of movement occurs only within the scope of the internal and surrounding Bintuni Regency as its capital. Movement by using inter-Regency road network is still poor because the road network is still much that is lost and not integrated. It is, causing the operating mode of transport is also very minimal, so dominated by private transport and motorcycles as a primary means of connecting in close quarters. In the Bintuni Regency there are node movements such as ports and airports that connect with regions outside the Regency. In addition, the existing road networks in part a national strategic road that directly connects to the town of Manokwari, while other Regencys have not developed because there are isolated so that the economic development of the region is also difficult to develop.

The movement of Bintuni Regency to Manimeri as migrants and regional government and the central office and the Regency became the second movement is often a regular movement. Relatively close distance between the Regencys, connected by a road network with moderate conditions and partly still a land of pavement. The amount of movement in the Regency are located in mountainous areas the amount is the lowest, because of the limited supporting infrastructure, such as roads were cut off and there is no regular transportation that serve the movement of passengers, local residents who do a lot more movement on foot in groups.

One of the things that hinder the development of the Regency around Bintuni City is the region of topography is surrounded by hills and swamps, protected forest areas are also located along the river in Weriarag Regency, Aranday and Bintuni, while in the protected forest falls within the area of potential natural gas fields and some nodes river port used residents to switch from road to water transport. In addition, the threat of earthquakes in some Regency is also inhibit the development of the region.

#### **IV. CONCLUSIONS AND RECOMMENDATIONS**

The potential resources that need to be supported modes of transportation are primarily located in the plantation commodity production centers in the Babo Regency and Bintuni. Commodity coastal fisheries contained in Bintuni whose role is the transportation mode of transport streams, and marine waters. Excellent potential liquefied natural gas (LNG) and oil and gas, but mobility is managed by the Company of Gas Tangguh.

Network infrastructure and transportation services is limited, largely paved roads, even still road, some roads cut off / not functioning. Transport streams and waterways that connect the port collector served long boat and a speed boat. Internal and external transportation use passenger ships. For air transport is at the airport Stengkool Bintuni route flight to Sorong, Manokwari and Babo, both scheduled and unscheduled nature. Perspective transport development is focused on the development of road transport networks, transport streams and waterways in Bintuni Regency, sea transportation in the Bintuni Regency and Babo and air transportation in the Bintuni Regency, Babo and Merdey.

Local governments should increase the intensity of counseling, supervision and coaching actors' plantation and fisheries sectors, as well as the production of liquefied natural gas (LNG) and oil. It should be a priority of development and improvement of road networks that can integrate transport streams in a number of Regencys are located on the coast, the sea port in Bintuni, Babo and Aranday and airport Bintuni and financing synergies of the National Budget and Local Budget and provide ease of to the private sector investing.

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Attachment

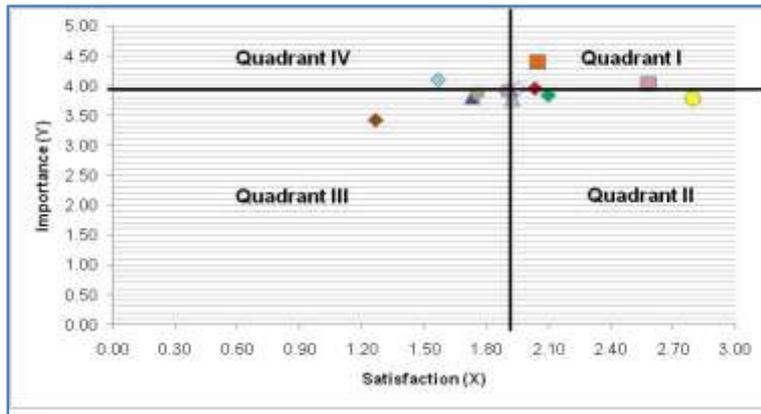


Figure 4. The performance of Road Transport

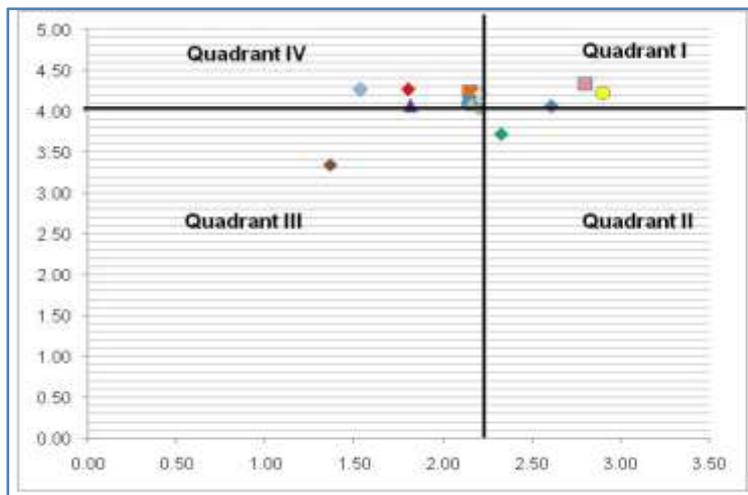
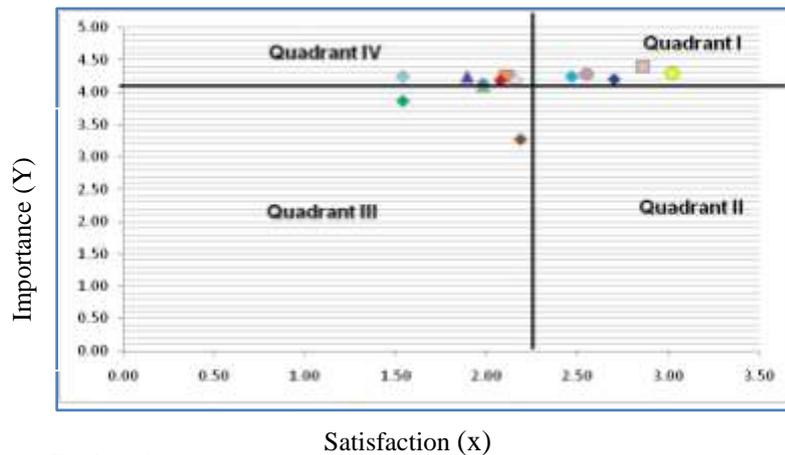


Figure 5. The Performance of Air Transport



Explanation:

- Safety
- Accessibility
- Capacity
- Regularly
- Low Pollution
- Integrity
- Efficient
- Affordable Tariff
- Secure
- On time
- Easy
- Orderly
- Comfortable
- Swift and fast

Figure 6. The Performance of Sea Transport

**Table 1. The weighting**

No.	The factors assessed	Urgency	The weight of the support	Weights linkages	Weight value
	<i>Strengths</i>				
1	The potential of natural resources in the form of excavated coal mines, forest production and liquefied gas (LNG)	5	0.37	0.36	0.73
2	Potential major watersheds in the Gulf region as an alternative river transportation	5	0.46	0.30	0.76
3	Potential areas of mangrove forest and natural reserve	3	0.17	0.20	0.36
4	Interaction with the provincial capital quite closely linked with national strategic road	4	0.30	0.25	0.55
5	Capacity transport services pioneer boats and PT. PELNI is sufficient	4	0.30	0.23	0.53
6	Services Bintuni airport lounge facilities are adequate	3	0.17	0.11	0.28
	<b>Total</b>	<b>24</b>			<b>3.22</b>
	<b>Weaknesses</b>				
8	Population growth is low and not evenly spreading	3	0.22	0.20	0.42
9	Accessibility is still low	5	0.46	0.40	0.86
10	The road network is still minimal and very limited public transport services and the movement of the population is also not evenly distributed.	5	0.46	0.36	0.82
11	High fuel prices and transport costs are relatively high so	4	0.30	0.23	0.53
12	There have been no land transportation terminals as regular public transportation is not available.	3	0.17	0.15	0.31
13	The road construction is limited to the distribution of material from the outside.	3	0.22	0.19	0.41
14	Condition of the river dock is still limited and there are no regular services between Regencys of river transport.	3	0.22	0.18	0.40
15	These flights and airlines serving still lacking.	4	0.37	0.22	0.59
	<b>Total</b>	<b>30</b>			<b>4.35</b>
	<b>Opportunities</b>				
16	The issue of the development of the national strategic road network of Bintuni to South Sorong, Fak-Fak and Mombay.	4	0.67	0.38	1.05
17	The issue of splitting the northern and southern regions Bintuni Regency.	4	0.53	0.52	1.05
18	Potential as a source of income for the province of West Papua, namely as the largest producer of liquefied gas.	3	0.40	0.36	0.75
19	With the chance of LNG mega projects on the development of infrastructure, particularly transport.	4	0.53	0.59	1.12
	<b>Total</b>	<b>15</b>			<b>3.98</b>
	<b>Threats</b>				
23	Prone to natural disasters such as earthquakes, floods and forest fires.	5	0.50	0.24	0.76
24	The social condition of the local residents who live in groups and still obey the chiefs thus hampers the development of the region.	4	0.40	0.34	0.484
25	The slow pace of infrastructure development due to difficulties in land acquisition, local residents consider the existing land as customary land.	4	0.67	0.58	0.484
26	Activities of exploitation of natural resources in the area of nature reserves and controlled by foreign investors while the minimal involvement of the local population.	5	0.67	0.39	0.76
	<b>Total</b>	<b>18</b>			<b>3.79</b>

Source: Results of Analysis, 2014