

Connectivity Model of Sea Transportation in Economic Corridor of Papua Maluku Islands in Indonesia (A Study Interconnection System of Regional Transportation In West Papua)

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Abstract:- The challenge for Indonesia is the provision of transport infrastructure in support of economic activities that encourage inter-regional connectivity in accelerating and expanding economic development. *The Master Plan for Acceleration and Expansion of Indonesia Economic Development (MP3EI)* will put Indonesia as a developed country by the year 2025, income of between USD 14,250-USD 15,500 per capita. National Transportation Systems expected to produce transportation services effectively and efficiently. Sea freight services, air and ferry pioneering currently support the activities of government, economic and social. Availability of the network infrastructure and regional transportation needs to be improved to accelerate the development of Trans Papua region connecting the nodes with the integration of transport modes, thus creating an interaction between the regional district and the provincial capital of the island of Papua.

Keywords:- Connectivity, Infrastructure, Network Services and Mode of transport.

I. INTRODUCTION

The MP3EI [1] is a master plan for the acceleration and expansion of Indonesia's economic development for the period 2011-2025, he was planning documents and implementation of the National Long Term Development Plan 2005-2025. The existence of Indonesia in the global economic center of gravity between the East and Southeast Asian region, with about 50 percent of the world's population, and an opportunity for Indonesia to accelerate the realization of a developed country with the outcome of development and prosperity that can be enjoyed by society.

Aligned with the national development vision of the Law No. 17 in year 2007 on National Long Term Development Plan 2005-2025, The MP3EI's vision of "Creating an Indonesia Community, Stand Alone, Forward Looking, Equitable and Prosperous". The MP3EI's realization will put Indonesia as a developed country by the year 2025, income of between USD 14,250-USD 15,500 per capita. To make it happen, the necessary economic growth, at 6.4 to 7.5 per cent in the period 2011-2025 was accompanied by a reduction of 6.5% in the period 2011-2014 to 3.0% in 2025.[2]

National Transportation Systems [3] is a concept of systemic approach to transport development, integrate resources to facilitate the achievement of national objectives, functional and sustainable network infrastructure and strengthen linkages in the organization of transport services both at national and at regional and local level. Sistranas implementation of services is expected to generate an effective and efficient transportation.

II. CONCEPTION OF TRANSPORTATION NETWORK

The challenge for Indonesia is the provision of infrastructure to support economic activity. Transport infrastructure has a broad spectrum, and should be a major concern, so as to encourage inter-regional connectivity in accelerating and expanding economic development. Availability of infrastructure and good transport services can encourage connectivity impact on the cost of transport and logistics in order to improve the competitiveness of national products [2, 4].

Development of economic corridors in Indonesia is based on the potential advantages of each region, as well as considering the potential and the strategic role of each of the islands (according to the geographic

location and the position of each island). Conception MP3EI set of six economic corridors, including the Economic Corridor Papua-Maluku Islands with theme development as "Development Center of Food, Fisheries and the National Mining" as in Figure 1 [1,2]

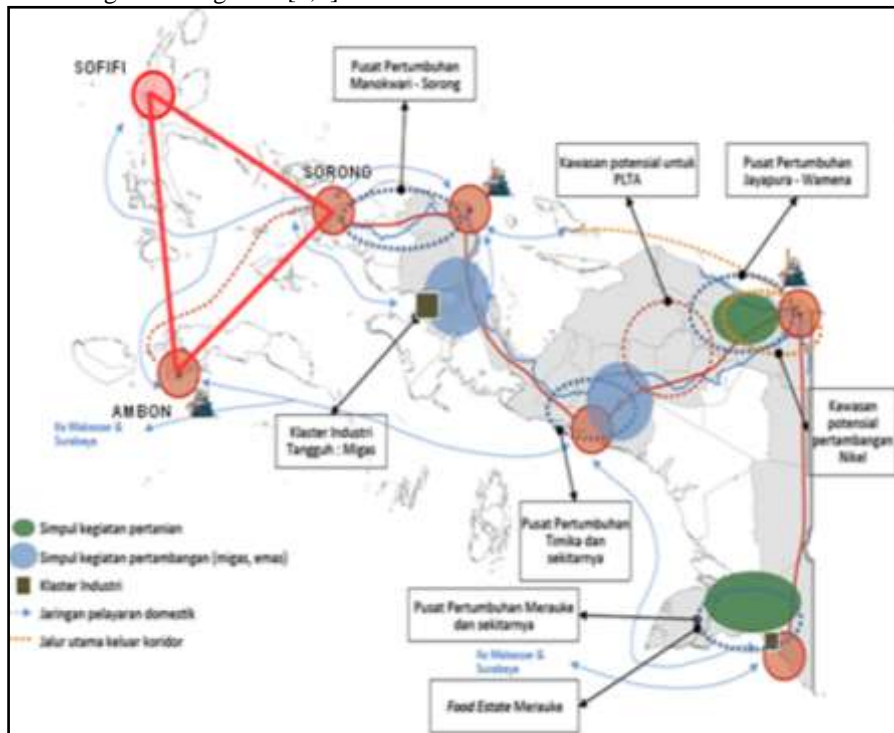


Figure 1. Economic Corridor for Papua Maluku Islands

As stipulated by Article 34 of Law no. 21 Year 2001 on Special Autonomy of Papua island, transport infrastructure development to the attention of the government to develop an integrated network infrastructure throughout the County and City. Infrastructure development is a priority that is intended to improve the welfare of the people of Papua Island. Development of transport networks starting from the structure and patterns of space utilization Spatial or Spatial Planning and Policy MP3EI [1,2,5] as the flow of thought Figure 2.

The level of regional transportation embodiment done to improve transportation services, from the aspects of reliability, feasibility of transportation infrastructure, as well as integration between transport and intramoda. Development adjusted with the economic development, the level of technological advancement, environmental and spatial policies, changes in regulation and legislation related to transportation, thereby supporting the acceleration and expansion of economic development especially in the economic corridor VI Papua-Maluku Islands.

Gap Analysis and policy

The results of analysis of the current state and the future, the problems need to be identified, namely those relating to development and transportation network node. Synchronization problems Spatial Planning island or province and transport performance. Identify the effect of operational improvements to the transportation needs, policies, strategies and efforts are expected to increase in network infrastructure and services. Conceived as a strategic policy measures to be taken in achieving the objectives of transport in the province as defined previously. Concrete efforts to the elaboration of each of a predetermined strategy.

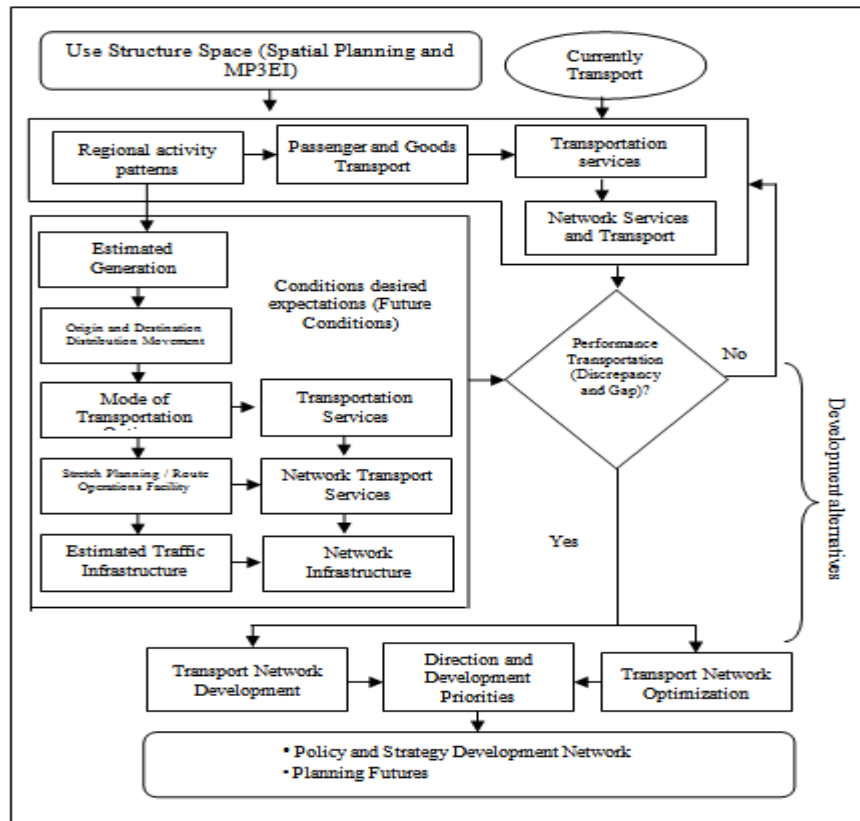


Figure 2 Basic Model of Transport Network [6,7]

Interconnection of Transport Network

Transport Network, covering the development direction of transport networks using the principles of hierarchical, geographical, economical, and support the development of the region. Regional Transport Network Development process has two functions, namely the service function occurs in areas that have been developed while the promotional function for undeveloped areas. For areas that have been developed can be performed to determine the projection of future conditions. As for the undeveloped areas of analysis not only projections but also should be combined with scenario analysis is done through several stages.

Development of Transport Networks, covering network development direction analysis phase in the development process include the regional transportation network analysis Provincial Spatial Plan, the structure and pattern of spatial planning and structuring of the city. Passenger transport analysis, trip generation estimates and origin destination trip, the selection of modes of transportation, planning the route / routes operating facilities, as well as the analysis of freight. Estimated traffic generation tool is calculated based on the analysis of passengers and goods, origin of goods or passengers, as well as alternative modes of transportation with the transformation of the number of passenger and freight demand obtained a number of infrastructure and transportation needs.

Trip Generation

Potential trip generation of destination West Papua province to province, South Sulawesi province to the highest (16.60%), to 5.94% of Central Java, Bali (5.44%), and Gorontalo as much as 5.11%, to Papua province of only 114 761 people (4.3%). Internal movement (inter-county/city) as much as 219 638 people, the movement from the city of Sorong 40.15% and shoves that led to as many as 87 313 people (39.75%), trip generation in Sorong (23, 98%). Trip generation in Manokwari is (7.02%) and the pull of the movement of (6.99%). Predictions based on data generation and pull are according to the National Transportation Origin-Destination (NTOD) ATTN 2006 and ATTN 2011 with moderate conditions as in Figure 1.

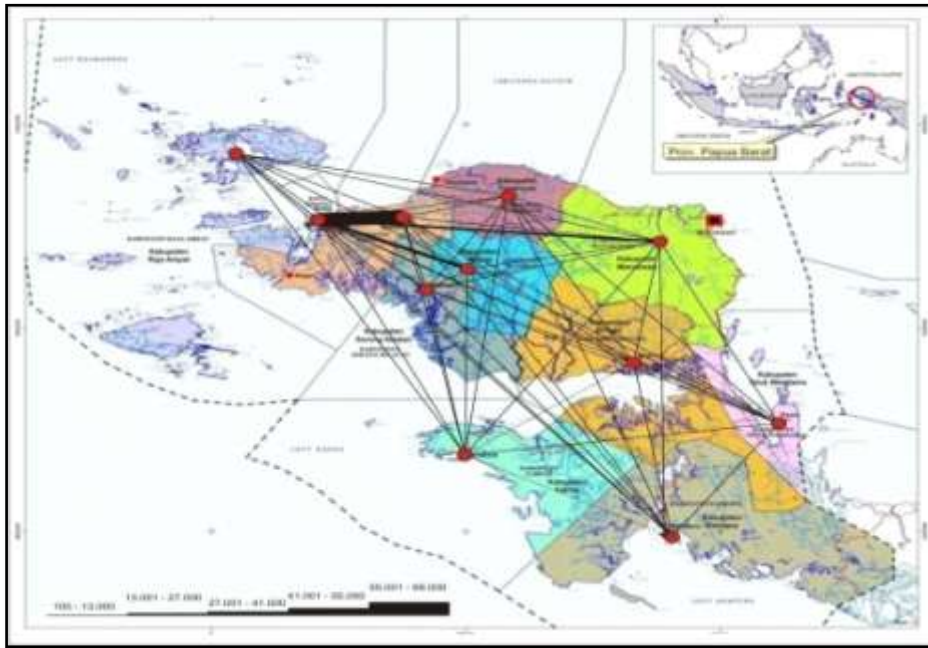


Figure 3 Desire Line Cargo Movement [2,8]

ATTN based survey in 2011 [8] showed that the amount of movement of goods from the West Papua province reached 3,776,944 tons with the aim of moving most to this area as much as 16.70% of South Sulawesi Province, North Sulawesi province as much as 9.99%, East Java Province as much as 7.98%, province of Central Java and Bali as much as 5.88% as much as 5.44%. Meanwhile, from the province of Papua was only 4.61%. Movement of goods origin destination of West Papua which most comes from the province as much as 16.30% of East Java, Central Java and South Sulawesi, respectively 15.90% and 12.80%. Meanwhile, from the province of West Papua with a total of 1.81% and the smallest region of Central Kalimantan movement is as much or 0.18%.

Seen that the rise and pull movement in West Papua province is dominated by the movement of goods from/to the province of East Java and South Sulawesi. The two regions, a region of inter-island trade distribution center, have access intensity of being closer to the West Papua Province.

Movement of goods occurred in the province of West Papua or movement between the district / city is as much as 268 819 tonnes. Origin of most goods movement is as much as 28.03% Sorong, Sorong as much as 27.89%. In contrast, the movement of most goods destination is as much as 46.29% Sorong, Sorong regency as much as 17.44% and origin-destination Tambrauw has the smallest movement of goods.

Network Infrastructure and Services of Road Transport

Development of road infrastructure network based on the level of service and interconnectivity between regions, in supporting the development of the region based on its potential, the development focused on the range of services in the border areas, remote or isolated.

The most fundamental problems in West Papua province today is the lack of road network and most of the districts / cities do not have adequate road network. One of the triggers for the lack of service delivery for transportation is the unavailability of an adequate road network, which connects the centers of socio-economic activities of the region.

Future transportation conditions in the province of West Papua will increase quite rapidly, in line with the demands of current users of transportation services. It is, seen from West Papua's Gross Regional Domestic Product (GRDP) growth over the last 5 years average of 12.16% / per year [2]. This situation shows that the economy in West Papua rise in line with oil and gas exploration in Sorong and Bintuni Nickel mining in Raja Ampat, and a major contribution to the sector in the Gross Regional Domestic Product (GRDP).

Priority development of future road network is a network that connects the causeway Sorong Papua - Manokwari - Nabire - Wamena - Jayapura. Arterial road network is expected quickly built road network that connects the entire Capital District, namely Sorong, Manokwari, Teminabuan, Bintuni, Wasior, Fakfak, and Kaimana. Raja Ampat district in need of development, an integrated network of national roads such as on the island of Waisai-Kabaré Waigeo down Mayalibit Bay, at the western end of the island Misol connect Waigama-Lenmalas on the north coast and Fafanlap in the East end. Salawati Island consists of two (2) administrative

regions namely Sorong and Raja Ampat so expect a road network that connects Kalobo-Samate and Sailolof [3], see Figure 4.

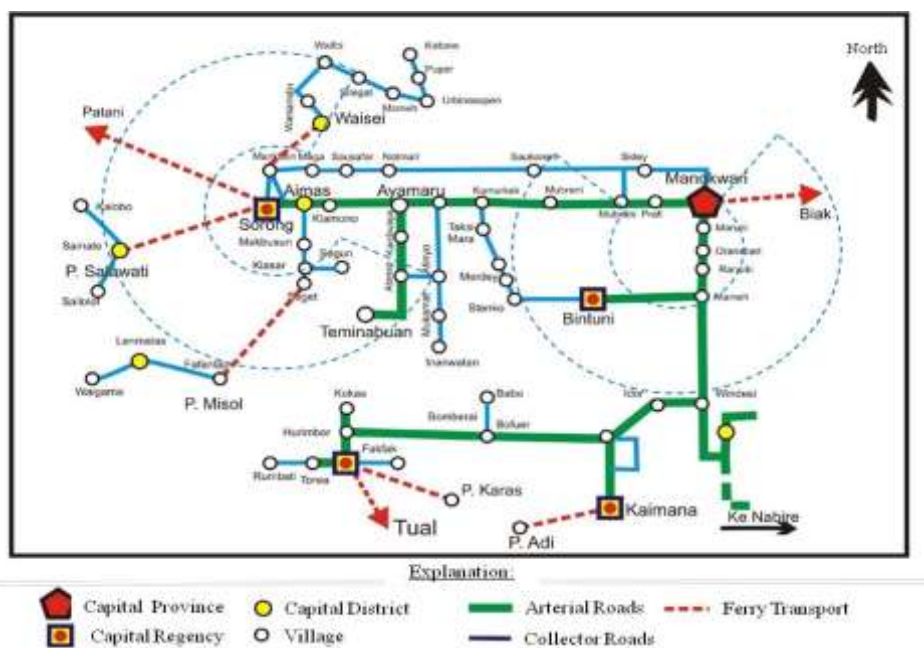


Figure 4. Roads and Ferry Transportation Network

Ferry Transport

Development of Ferry Transport potentially quite large at bay Bintuni and Raja Ampat as a national attraction Marine transportation infrastructure such as piers ferry ports, based on the interaction between regions to support the tourism potential of the District and the Raja Ampat Islands in the Tangguh LNG mining potential as well as potential Manokwari.

The connected crossing of Ferry Transport intern islands on the inter-provincial cross, Manokwari-Mokmer/Biak (Papua), Klademak (Sorong)-Patani (North Maluku), Waigama (Misol) Wahai (Maluku), Fakfak-Tual/Dobo (Maluku) ,-Noemfoor Manokwari (Papua), Klademak (Sorong)-Wahai (Maluku).

See Transportation Network

Development of sea transport network infrastructure in ports of transit priority Pioneers ship dock facility but is not yet available, or the islands have a population. Development of road network in the area of Raja Ampat in coastal North Coast to be anticipated, when the road network is materialized, the existence of the port is estimated as optimum performance, unless the rear area that has the potential trade in commodities and foreign. Development of sea transport infrastructure networks can be seen in Table 1.

Table 1. Port in the province of West Papua [2]

No	Port	Pier (m)	Status	Regency
1	Sorong	580 x 12	afforded	Sorong
2	Manokwari	313 x 12	afforded	Manokwari
3	Fakfak	200 x 12	afforded	Fakfak
4	Babo	250 x 10	Kanpel	The Gulf Bintuni
5	Wasior	170 x 12	Kanpel	The Gulf Wondama
6	Waisai	150 x 10	Kanpel	The Chief of Ampat
7	Kaimana	150 x 8	Kanpel	Kaimana
8	Inanwatan	140 x 10	Kanpel	South Sorong
9	Kokas	140 x 8	Kanpel	Fakfak
10	Arar	200 x 12	Pemda Sorong Kawasan Industri	Sorong
11	Babo	200 x 12	Pelabuhan LNG	The Gulf Bintuni

No	Port	Pier (m)	Status	Regency
			Tanggung	
12	P. Manurang	200 x 12	Pelabuhan PT. Anugerah Surya	The Chief of Ampat
13	Kapadiri	200 x 12	Pelabuhan PT. Guri Delta Meaning	The Chief of Raja Ampat
14	Warwanai	200 x 12	Pelabuhan PT. Kaunia Alam Waigeo	The Chief of Raja Ampat

Note: The results of the analysis, to support maritime transport connectivity to the hinterland region and serves as a local transport, there are many commonly sized dock port with a length of 50 m, 70 m, 100 m, and 120 m with a width of 8 m, there is a majority in as many districts Raja Ampat 13 port, in port and at Fakfak 2 ports and in the Gulf Wondama, Manokwari and Kaimana each of the ports..

Increasing competition in the intermodal maritime transport, the strategy of PT. PELNI needs to be developed with the direct route system with port to port services such as KM. Labobar with Route Makassar - Sorong, for it is necessary to develop direct route Sorong - Timika, Manokwari - Jayapura, Sorong - Bitung / Manado and Sorong - Babo. Pelayanan sea transport pilot based in Manokwari and Sorong maintained, but the average service system average of the voyage reached 11-17 days, a reduction is necessary to increase the number of days sailing and voyage, the port number layover limited to no more than 10 ports.

Harbor pilot takes ocean freight service is the pioneer of the North Coast of West Papua and the islands of Raja Ampat. For the South Coast, and the Gulf Bintuni Wondama, as well as several ports that can be used as a port because it is supported by the distribution of the road network of the district, such as for the South Coast there Teminabuan port that serves as a distribution center, there is a port in the Bay and in Bintuni there Wondama Manokwari bay harbor or Wasior.

c. Multi-Mode Connection

Featured modes based policy analysis of National, Regional, sector potential, economics and geography, topography and demography, the use of alternative modes of transportation were the most efficient and effective in a region need to be considered, when the potential of the region as well as network support infrastructure is available. Transportation service target is the creation of a multimodal transportation system connecting services between the district and provincial capital. Development superior current transportation modes for inter-provincial transportation are served by sea and air, and the future will be in synergy with other modes of Taransportasi Sea, air and crossings, as in Table 2.

Table 2. Multimodal services between the District and Provincial Capital

Manokwari to	Alternatif of Transport Mode			
	Road	Crossing	Sea	Air
Teminabuan	Bintuni	-	Bintuni-Teminabuan	-
Fakfak	Bintuni	-	Bintuni-Kokdas	-
Waisoi	-	Sorong-Waisai	Sorong-Waisai	Sorong
Teminabuan	Klamono	-	-	-
Sorong-Teminabuan	Sorong-Klamono	-	-	-

Source: Result of analysis

III. CONCLUSION

Sea freight services and air crossings pioneering improve the economic and social activities, as well as supporting the wheels of government. Availability of transport infrastructure network needs to be improved to enhance the connectivity between districts / cities and districts to create an integrated land transport (and road crossings) and the sea. The road to the hinterland transport network port services should reach up to the production centers. Today, the only visible road transport network connecting between regions, alternative modes of transportation that role is sea and air transportation.

Necessary efforts to accelerate the construction of the causeway that connects Papua strategic road network to create a regional intraksi between districts and provincial capitals. Develop a network of transportation infrastructure Klademak ferry ports, Manokwari, Sorong sea port, Manokwari, Fakfak, Kaimana,

Babo, and the port Pioneers in the Raja Ampat islands are bright prospects for the future of national and international travel.

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