

Ferry Transport Of Trans Maluku Interislands Cluster In Indonesia

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Abstract-- Geography with a dominance of marine areas are scattered in small islands (island group), resulting in high transportation costs, the level of isolation, poor accessibility, lack of infrastructure and transportation affect to economic growth in the region Province of Maluku. These study are policy and case study, using the method of gap analysis, descriptive qualitative to find out how people's satisfaction with the performance, characteristics of transportation development priorities and strategies. In general, transport services is still far from adequate, although subsidies from the government, especially in the islands group in the East and South. Required system integration between modes of air transport services and water transport (pioneering sea transport, cruise people, and Ferry transportation).

Index Term-- Service Performance, Inter-islands Cluster, Regional Transport, Ferry Ship

INTRODUCTION

Maluku province in Geogarfis lies between $2^{\circ} 30' - 9^{\circ}$ south latitude and $124^{\circ} - 136^{\circ}$ east longitude, with administrative boundaries as follows:

- North side adjacent to the North Maluku Province
- Southern border with East Timor and Australia
- To the East to West Papua Province
- Next to the western border with the Province of Southeast Sulawesi and Central Sulawesi

The total area of the whole is 712.479.69 km², an area of 92.40% and 7.60% is water the land area. Maluku province is a region of islands, has 1340 islands, so the role of water transportation is very important as the infrastructure and facilities supporting community activities and development of the region.

Distance of the small islands in the archipelago province vary widely, from nearest to farthest or outermost

so that air and sea transportation accessibility is necessary even though the frequency of service to the tiny island-peulau very limited, requiring a relatively long travel time and cost. The role of local government in an effort to facilitate transport between the districts of small islands is not maximized. The lack of transportation infrastructure, leading to high transport costs and slow economic growth in communities in Maluku province, so we need a concept of how the development of infrastructure and facilities between modes of transportation combined sea / ferry and land. This study classified cases and policy research that is studying the transportation system Trans Maluku island group as a product of public service policies to find out how people's satisfaction with the performance and characteristics of transportation.

OBSERVATION OF THEORY

1. Islands Regional Development Model

Development areas on the islands or island group basically aims to:

- Equal distribution of growth rates between regions
- Enhance the public welfare
- Reduce the level of inequality (economic and social) between regions
- Efforts to balance national and regional economic structure.

Islands can be developed with models of regional development in areas that have not been or are being developed, states that there are several models of the development of the islands [1] are as follows:

- a. Growth Center Model
- b. Model Transito
- c. Sea Border Region Model

Development area or areas is closely associated with the transportation system. There are 3 (three) main elements of regional development are:

- 1). Nodal Center
- 2). Effect of region or service area
- 3). Transport network.

These elements are the same as the nodal center where transportation nodes, or the influence of the service area associated with the movement of the flow of people and goods from origin node to destination node of transportation or transportation networks. Thus, the activity is in line with regional development and transportation activities are the building blocks of economic growth.

1. Transport and Regional Economy

In the process of regional development, transport is one element forming region of space structures directly supporting the functional relationship between the distribution and orientation of service nodes, both internal and external areas can affect economic growth directly, as in figure 1.

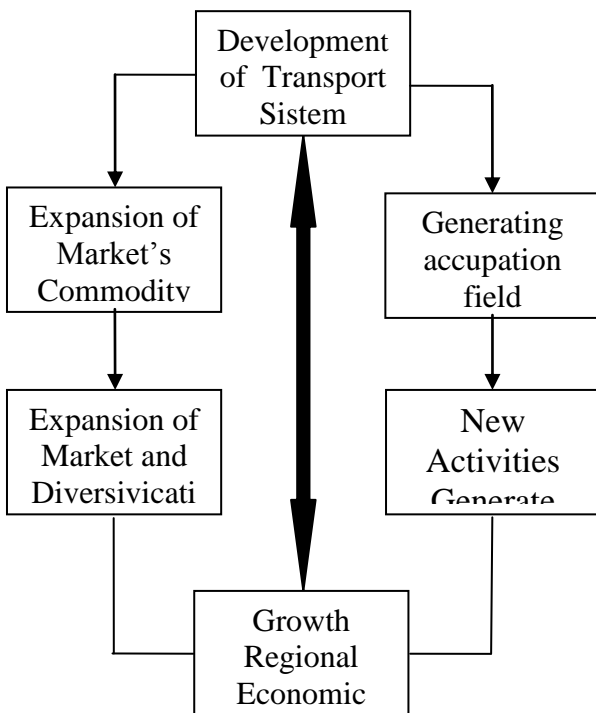


Fig. 1. Transportation development and economic growth
Sources: <http://www.irishspatialstrategy.ie/docs/pdf>

Furthermore, according to its role as the lifeblood of economic, social, cultural, political, security and defense, transportation modes has a multiplier function as a supporting element (servicing sector) and as the driving element (promoting sector).

As a supporting element, serves to provide transportation service effective and efficient transportation to meet the needs of other sectors as well as anticipated, they serve to move the dynamics of development. As the

driving element, mode of transportation to work provide effective transportation services to open up isolated areas, serving areas or remote islands, stimulate the growth of the back area, behind the village and is able to suppress poverty in remote areas [2,3,4].

Explaining that there are 4 (four) main benefits of transport infrastructure for the community, namely:

- 1) Opening the isolation region and the region.
- 2) Increasing economic activity and support the smooth region.
- 3) Facilitate access to technology and utilization of social facilities,
- 4) Increased mobility and social contact between residents.

The transport sector is one sector of the economy is very skelter in supporting the economy of a region or country. One of the main functions of this sector is to distribute the production of goods-producing sectors, like agriculture, mining and quarrying, industrial, to the end consumer is using. Another function is to carry out the mobility of people from place to place, also suggested that the presence of transport cost reduction is the movement of goods, production of a region will give usability point (place utility) and time utility so that it becomes a large value of the goods with lower transport costs [5,6,7].

Efficient and effective transport defined by the chain of connectivity or node that serves as composition, conection, interchange and Decomposition, particularly in intermodal transport [8,9,10]

RESEARCH METHODS

Research location in the province of Maluku, as in Figure 2. Scop research includes the combined transport between road and ferry transport. However in this discussion is limited to the transport system include the movement Ferry, Transportation Network, and Service performance.



Fig. 2. Research Location Map

Maluku provincial spatial structure consists of twelve groups of islands, each island group has development centers that serve the region or city orientation for other cities are less stratified hierarchy. Though not entirely, generally these service centers are the district capital. Based on the analysis of patterns of population movements, and goods, internal transportation service network Maluku

TABLE I
Fleet of Ferry Transport Trans Maluku

Route and Distance	Name of Ship	Ship Capacity		Speed (knot)
		Person	Vehicle	
Poka – Galala (0,5 mil)	Gabus	100	10	7
	Tenggiri	340	12	9
Galala – Namlea (85 mil)	Temi	214	21	
Hunimua – Waipirit (12 mil)	Gurita	300	12	10
	Iniloko	400	12	10
	Terubuk	350	9	12
Tual-Kur-Larat-Tayandu (295 mil)	Karmo-Malin	450	21	12
Adaut–Letwurung-Larat–Yaru-Saumlaki–Seira–Wunlah- Yaru – Momar (132 mil)	Ergon	197	7	

Sources: Department of Transportation Maluku Province, 2012

TABLE II
Productivity of Ferry Transport

The Ferry Line	Trip per day	Passengers Per Day	Vehicles Per Day		Goods (tons) /day	Passenger Vehicle Unit (PVU)
			Motorcycles	Vehicle *		
Galala- Poka	77	3077	1969	338	-	660-700
Hunimua- Waipirit	14	1181	351	168	115	260-300
Galala- Namlea	1	241	26	10	2	18-25
Tulehu – Kailolo - Umeh Putih – Wailey	4	52	20	3	6	15-20
Tulehu – Umeputih - Nahalia – Amahai	2	30	7	2	5	10-15
Galala-Ambalauw - Wamsisi - Namrole – Leksula	2	101	6	2	1	10-15

Source: Analysis results 2012

a. Distance Line Ferry

Line ferry is very distance varies, the line of the most widely served ferry is less than 30 nautical miles by 44% and nationally this track as much as 39%.

b. Boat speed and capacity

Characteristics of speed ferry nationally ranked five clusters, namely, less than 7 knots speed is very low, the speed of 8 to 9 knots speed, 10 to 13 knots have high speed, between 13 to 16 knots boat speed and in above 16 knots in the grade is very high speed, as shown in the following grafikl.

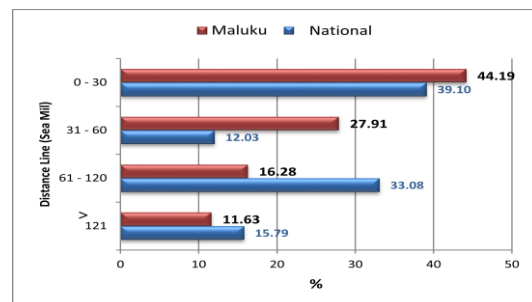


Fig. 6. Distance Line Ferry

TABLE III
Distribution of Ship Speed

Cluster	Speed		Number of Ship	Distribution (%)	Cluster Distribution
	Knot	km/hour			
Very low	< 7	12,97	7	3,27	3,27
Low	8	14,82	10	4,67	12,15
	9	16,68	16	7,48	
Fair	10	18,53	56	26,17	64,02
	11	20,38	50	23,36	
	12	22,24	31	14,49	
High	13	24,09	13	6,07	13,55
	14	25,94	11	5,14	
	15	27,80	5	2,34	
Very High	< 16	29,65	15	7,01	7,01
Amount			214	100	100,00

The line of the ship's speed between 10 to 12 knots, or about 18 to 22 kilometers per hour as many as 137 units (64%), speed over 16 knots, there are around 7%. For cruise crossing trans Maluku island group there are two low-speed boats (6 to 7 knots), a low-speed boats and speed boats were 9 (10 to 12 knots).

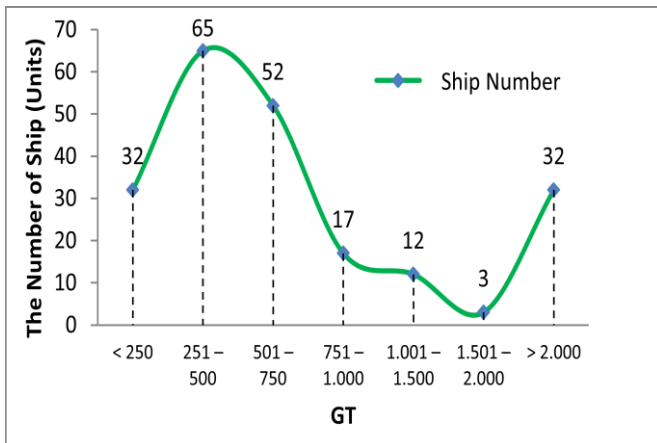


Fig. 7. Characteristics Ship Capacity

Tonnage (GT) which operate nationwide ferry is very diverse. However, almost 50% of the vessel with a capacity between 251-500 GT.

b. Ferry Transport Tariff

Line within a short ferry of less than 12 miles are already commercialized and semi-commercial are within up to 30 miles. Line within the upper 40 miles are heavily subsidized or pionir transport, except for the track-Namlea Galala within 85 miles is a commercial status. Trails are generally more commercial prospect in the northern cluster of transport ferry appeal cluster operating in East and South. It is associated with economic growth and population density.

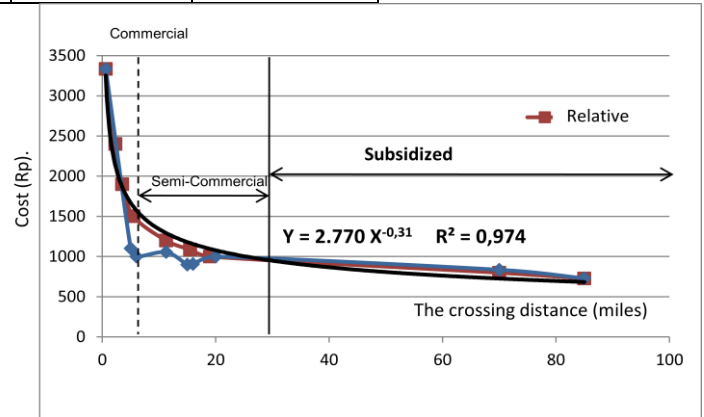


Fig. 8. Ferry Transport Tariff

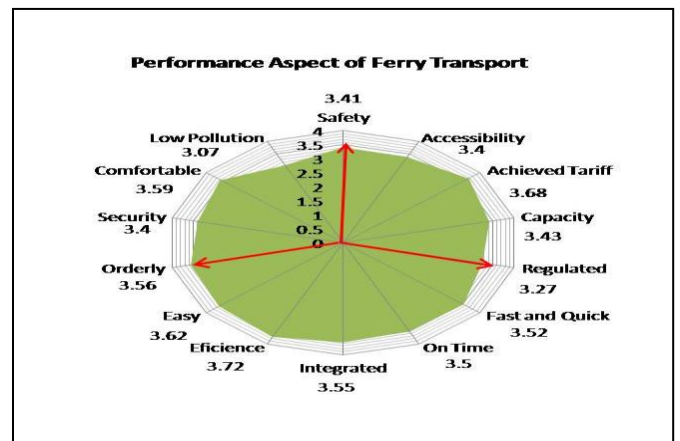


Fig. 9. Performance of ferry transport

4. Performance of Ferry Transport Services

Some of the indicators that need attention is the regularity of transport services and water pollution in the harbor. Neither of the aspects of safety and security as well as aspects of the port hinterland to region access Ferry transport. In general, the indicators related to economic rather than social and environmental aspect performance.

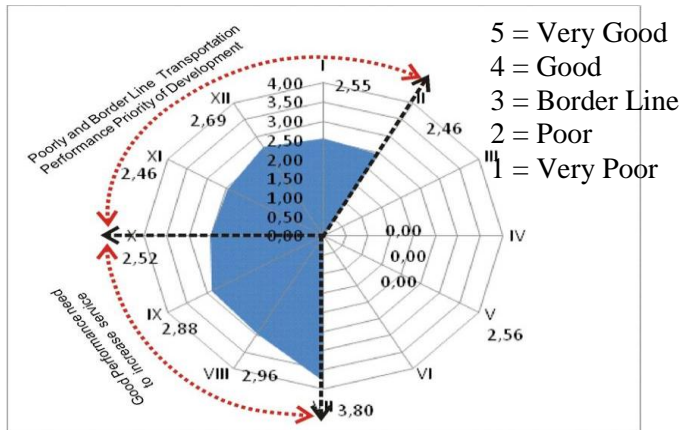


Fig. 10. Performance of Island Groups Ferry transport

Network accessibility of transport services do not reach the broadest possible group of islands in the region to support social activities, especially on the accessibility of transport node achievement of the production centers and settlements. The situation is seen from the comparison of indicators between the length and capacity of transport networks in the service area.

A pretty good indicator is the indicator of the ability efficient maximum benefit with certain sacrifices borne by the government, operators, public or the environment or provide certain benefits with minimum sacrifice. This situation can be measured based on the comparison of benefits with the costs incurred. While capacity utilization is the use of the transport system is expressed by the indicator factor loading of passengers, goods, and the use of facilities and infrastructure.

Capacity ferry vessel to carry passengers, goods and vehicles can be loaded by a ship and the availability of infrastructure and transportation capacity to meet demand for service users. Performance is measured by indicators of the capacity ratio of the number of means of transport with a population of users of transportation, the facilities and infrastructure, including passenger-miles or ton-miles with available capacity.

Pollution caused by the operation of means of transport, particularly on water conditions in the harbor ferry is measured partly by the comparison between the level of pollution that occurred against pollution threshold set, rated apprehensively (cause for concern). Safety performance of the ferry transport is rated unpleasantly, related to the waters condition or seawave and ferry seaworthiness as a treatment to the accident in ocean. It needs to be attended and obeying the rule of IMO (International Maritime Organization), so it can increase the safety at sea.

CONCLUSION

1. The movement of goods between inter island groups to follow the movement of passengers, movement of the density of movement share a triangular connection between Ambon, Piru and Bula. Masohi is a major node

of the three. Intraction cluster north towards the east and south is still very weak, nor the interaction between the island groups in the east and south region.

2. Transportation network of the ferry transport has a commercial statute is in line of Poka – Gala and Gala – Namlea, Hunimua – Waipirit. Trajectory of the ferry at East Cluster and South are majority still subsidized. There was 42% trajectory of the ferry had distance about 30 mil and 28% distance amount 31-60 mil. Capacity of the ship Ro-Ro was operating about 250-500 GRT and the speed between 7 to 12 knot.
3. Service performance of ferry transportation is still unsatisfactory the consumer/adequacy. Performance indicator is rated low and the effect on social and environmental aspects are convenience, pollution, safety, accessibility, and frequency order. The island group with a development center Ambon, Tual, Dobo and Saumlaki relatively good transport services, although it still needs improvement.
4. This research can be developed to study the Transport Integration modeling between road and Ferry Transport as a whole to join intermodal transportation. Further research could also be developed for the prediction of ship capacities related to variables Average Daily Traffic (ADT), Distance of Ferry Lines, and Speed of Ferry Ship.

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