



PRIORITY ANALYSIS OF DISTRICT ROAD DEVELOPMENT IN SOUTH NIAS REGENCY DEVELOPMENT

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ABSTRACT

This study aims to analyze the priority scale determination for road handling in the sub-district of Teluk Dalam, South Nias Regency. Study on the analysis of district road development priorities in the regional development of the South Nias Regency was carried out in the South Nias Regency, North Sumatra Province. In this study, the method of analysis is descriptive, using 8 key informants. The results showed that the main priority for road improvement was the Walo-Jalan Yos Sudarso road. This is based on field observations that the section of the road is in damaged condition and the construction is late in handling, although its function is very significant in moving community activities.

KEYWORDS: Road Network, Teluk Dalam Sub-district, Road Handling Priority

1. INTRODUCTION

South Nias Regency is one of the regencies in North Sumatra Province and one of the expansion areas in the Nias Islands. One of the efforts to develop the South Nias Regency is by providing impulse transportation infrastructure as the best entry-point for the growth of economic activity in this region.

District road construction based on South Nias Regent Decree No. 140 of 2012 concerning the Establishment of the Status of the Road Network as a Road in South Nias Regency and Decree of the South Nias Regent No. 04.3.27 of 2018 concerning the Establishment of the Status of the Road Network as District roads in the South Nias Regency.



Table. 1
South Nias District road Infrastructure Development Budget

No.	Fiscal year	Budget Ceiling	Description
1	2017	47.965.491.885,-	Regional Revenue and Expenditure Budget, and Review
2	2018	71.835.279.119,-	Regional Revenue and Expenditure Budget, and Review
3	2019	72.122.548.142,55	Regional Revenue and Expenditure Budget, and Review
4	2020	61.007.332.037,-	Regional Revenue and Expenditure Budget, and Review

The rationale for the study on road improvement in the South Nias Regency is:

1. Regional development imbalances in South Nias Regency as identified by: a). The concentration of productive economic activities b). Population concentration c). Availability of special road network infrastructure d). Availability of service facilities on a regional scale
2. To improve the South Nias Regency region through policies and development of productive economic activities, in particular economic activities that take advantage of the South Nias Regency's potential;
3. To simplify and accelerate the collection-distribution between operation nodes, in particular between production centers and related markets, efforts to increase road segments to accelerate economic development in the South Nias Regency.

2. RESEARCH METHODOLOGY

This research, with a qualitative approach, is descriptive. The study was conducted in the sub-district of Teluk Dalam, with the research objective being to examine the priorities of road construction in regional development in the South Nias Regency. The collection of respondents was carried out by purposive with expert sampling, where a survey of individuals considered to have knowledge or skills in a specific field, is the approach used. This sample is also known as a panel of experts. This study used eight respondents, where these people are at the level of decision-makers, and part of the organizational structure of 2 (two) Regional Apparatus Organizations (OPD) and the others are community leaders, namely: (1) Head of the Regional Development Planning Agency (BAPPEDA), (2) Head of Public Works and Spatial Planning (PUPR) Office, (3) Secretary of the PUPR Office, (4) Head of the Highways Division of the PUPR Office, (5) Head

of the Facilities and Infrastructure Division of the BAPPEDA, (6) 3 (three) community leaders.

3. LITERATURE REVIEW

Planning is essentially a conscious, organized and continuous effort to choose the best alternatives from some alternatives to achieve certain goals (Conyers in Safi'i, 2007). According to Safi'i (2007) planning is a process to prepare systematically with an awareness of the use of limited resources but oriented to achieve goals effectively and efficiently, where to achieve goals requires accurate policy formulation.

The concept of planning prioritizing the future, especially in a plan, is wellbeing, social justice, equity (Rasyid, 2015). Etzioni in Safi'i (2007) in planning theory, there are several typologies, including the rational planning model; incremental planning model; and strategic planning model.

Tarigan (2006) defines regional planning as planning the use of regional space and planning activities in the area's space. Sirojuzilam and Mahalli (2010) state that regional planning involves two main aspects, namely something related to space and activities above that space.

Generally, transportation can be seen as a system with three main components that influence each other. The three components are:

- 1) Land use subsystem. This subsystem observes the use of land where community activities are carried out, such as the type, structure, and size of the intensity of social and economic activities (in the form of population, labor, industrial output).
- 2) Supply transportation subsystem. This subsystem is the provision of a physical link between land use and human actors in the community. This provision covers various modes of transportation such as roads, railways, bus routes, and states the operational characteristics of these modes,

such as travel time, cost, frequency of service.

- 3) Traffic is a direct result of the interaction between land use and supply transportation

in the form of the movement of goods and services.

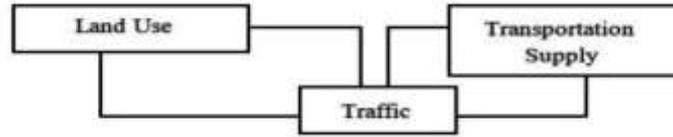


Figure 1. Land Use Interaction - Transportation

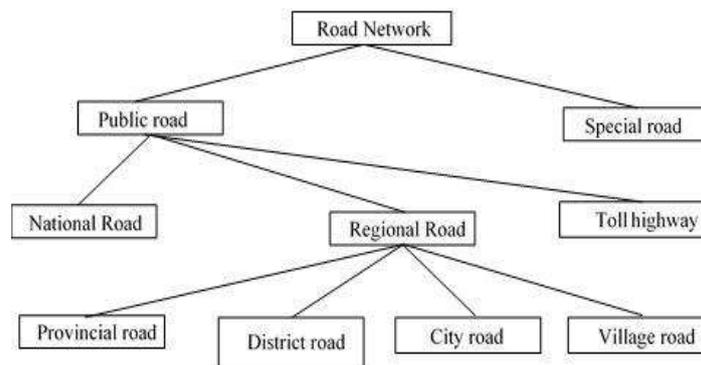
Farahani, et al, (2013) that in community activities, transportation is very important. The population is growing, so transportation demand is also rising. The extent of urbanization has an effect on growing population density, which directly or indirectly decreases regional transport competition (Susantoro and Parikesit, 2004).

Article 1 paragraph 3 of the Government Regulation of the Republic of Indonesia Number 34 of 2006 concerning Road states that roads are land transportation infrastructure covering all parts of the road, including complementary buildings and equipment intended for traffic, which are on the ground level, above the ground surface, below ground level and/or water, as well as above water level, except railroad, lorry, and cable road. Regulation of the Minister of Transportation No: KM 14 of 2006 concerning the Management and Engineering of Traffic on the Road, has determined

the Service Level Standards for Secondary Arterial Roads and Secondary Collectors.

According to Asariansyah, et al (2013) there are several main benefits of road infrastructure for the community, such as (1) opening up the isolation of regions and regions, (2) Increasing activities and supporting the smooth running and wheels of the regional economy, (3) Gaining access to technology and utilization social facilities, such as education, health, the government plans to relocate the regency capital and others.

Foly in Jayadinata (1992) states that urban planning can be done with two approaches, namely (1) unitary approach is to make a picture of the physical environment pattern aimed at a community and to promote development and to ensure that society will be able to develop in the future. , (2) adaptive approach is a complex interweaving of various functionally dependent parts.



Sumber: PP No. 34 Tahun 2006 Tentang Jalan

Figure 2. Pengelompokan Jalan, Pelimpahan dan Penyerahan Kewenangan

Regency/Municipal Roads: namely roads which, based on their level of importance, are assigned the authority to guide them to the City / Regency Government. Roads that fall into this classification are (1) Primary Collector Roads that are not included in either national roads or provincial roads, (2) Primary Local Roads, (3) Secondary roads that are not included in either national roads or roads

province, (4) Other roads that have strategic value towards the interests of the city or regency

Based on studies that have been carried out in improving road segments and under the conditions of the study area in South Nias Regency, several criteria are often used to determine priority for road improvement, namely: (a) Capacity criteria, namely volume capacity ratio (VCR), (b) Generation and

attraction criteria, (c) Speed criteria, (d) Population density criteria

Regions have natural and human resources as well as a geographical position that can be managed and utilized efficiently and effectively through comprehensive planning (Miraza, 2005). Regional development means an increase in the value of the benefits of the area for the people of a certain area being able to accommodate more residents, with an average level of community welfare that has a lot of facilities / infrastructure, goods or services available and increased community business activities, both in meaning of type, intensity, service and quality (Sirojuzilam, 2005). Mulyanto (2008) defines regional development as any government action that will be carried out together with the actors to achieve

a goal that is beneficial for the region itself and for the administrative unit in which the area is part of it.

4. RESULT

Overview of South Nias Regency

The administrative area of South Nias Regency is currently divided into Sub-districts and 459 Villages, and 2 Kelurahan. Geographically, South Nias Regency has an area of 6,902,505 Km², with details of a land area of 2,452,100 Km² and an area of sea / waters 4,450,405 Km². The boundaries of South Nias Regency are in the north, it is bordered by Nias Regency and West Nias Regency. To the south is bordered by the Indonesian Ocean and the Mentawai Islands of West Sumatra. In the east is bordered by the Indonesian Ocean, Mursala Island, Central Tapanuli Regency and Mandailing Natal Regency. The west is bordered by the Indian Ocean.

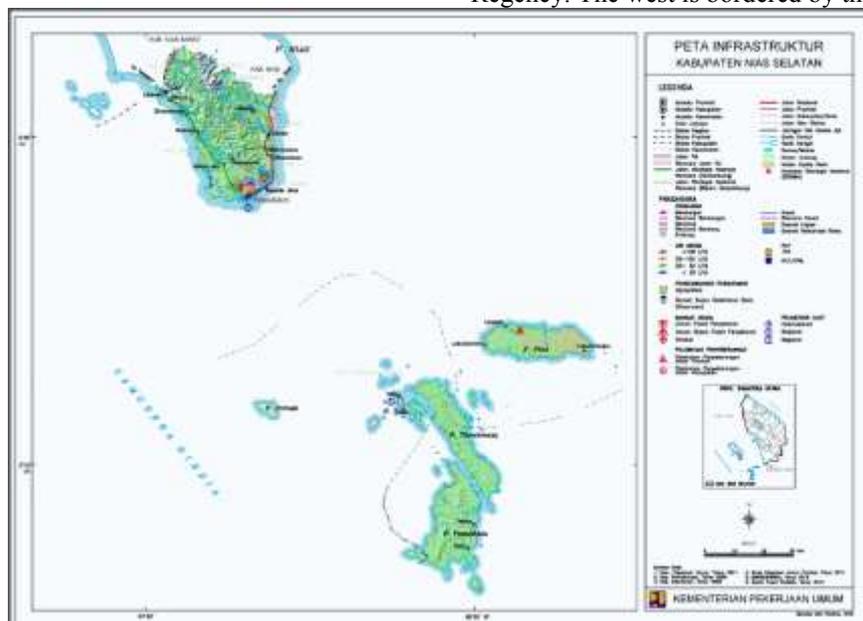


Figure 3. Infrastructure Map of South Nias Regency

Astronomically, Nias Selatan Regency is located at 0 ° 33 '25 "south latitude - 1 ° 4' 5" north latitude and 97 ° 25 '59 "- 98 ° 48' 29" east longitude. The geographic location of South Nias Regency is in the

west of Sumatra Island with a distance of ± 92 nautical miles from Sibolga City or Central Tapanuli Regency to Teluk Dalam.

Table 2
 Selection Parameter

Criteria	Very important	Important	Not important	Total Score	Total Questionnaire	Mean Score
VCR (Volume, Capacity, and Ratio)	3	4	1	18	8	2.25
Generation of traction	4	3	1	19	8	2,38
Speed	3	4	1	18	8	2.25
Population density	1	2	5	12	8	1,50

Source: Primary data, processed (2020)



The density must be excluded from the model parameters from the results of the cut-off value since the mean score is less than two and the density parameter is considered to be less

influential in deciding the priority of road development in Teluk Dalam Sub-district, South Nias Regency, so that the model criteria are capacity (VCR), speed, traction generation

Table 3
Teluk Dalam Subdistrict, South Nias District road Conditions Require Repair

Section Name	Criteria	Lane Width in meter	Roadside Width in meter	Pavement Type	Pavement Conditions	Side Barriers	Road Segment Function
Hilimondre geraya Street	Pendidikan – Desa Hilimondregeraya Roads	3	1	Macadam Penetration Layer (LAPEN)	Heavy Damage	- Slow driving - To enter or exit a driveway, vehicle drive on a sidewalk	Public service
DI Panjaitan Street	Kueni Road – Yos Sudarso Road	4	1	Hotmix	Heavy Damage	- Vehicle parking/stop - Vehicle drive on a sidewalk - Slow driving - Pedestrian - Slow driving	City Road
Siwa Sanuwu Sihono Street	Walo Road –Yos Sudarso Road	8	1	Hotmix	Not finished	- Slow driving	City Road
Lower ring road	Nasional Street Km 3 – Ikhuhele	6	1	LAPEM	Not finished	- Pedestrian - Slow driving	City Road
Pasir Putih Street	Nasional street – Pantai Walo	3	1	Hotmix	Heavy Damage and Not finished	- Pedestrian - Vehicle parking/stop - Vehicle drive on a sidewalk - Slow driving - Pedestrian - Slow driving	City Road
Inner lower ring road	Lower ring road– Lower ring road	10	1	LAPEM	Not finished	- Pedestrian - Slow driving	Tourism
Hilifusi Street	Nasional street Km2 – Pantai Hilifusi	4	1	LAPEM	Not finished	- Pedestrian - Slow driving	Tourism
Kawasan Terpadu Street	Kawasan Terpadu street – Kawasan Terpadu	10	1,5	LAPEM	Not finished	- Pedestrian - Slow driving	City road

Source: Public Works Office of South Nias Regency

Table 4
Description of Priority Roads for Development in Teluk Dalam Sub-district, South Nias Regency

No.	Section Name	Road Condition Data			Road Category
		Length of road (km)	Realization Handled	Not handled	
1	Pendidikan – Desa Hilimondregeraya Roads	17,624	3,830	14,794	Asphalt/micro rough surface/terrain
2	Kueni Road – Yos Sudarso Road	0,281	0,180	0,101	Asphalt/micro rough surface/terrain
3	Walo Road –Yos Sudarso Road	5,000	1,050	3,950	Concrete/Asphalt/micro rough surface/terrain
4	Nasional Street Km 3 – Ikhuhele	8,406	3,800	5,606	Asphalt/micro rough surface/terrain
5	Nasional street – Pantai Walo	0,923	0,440	0,483	Asphalt/micro rough surface/terrain
6	Lower ring road– Lower ring road	0,558	0,304	0,254	Asphalt/micro rough surface/terrain
7	Nasional street Km2 – Pantai Hilifusi	1,054	0,500	0,554	Asphalt/micro rough surface/terrain
8	Kawasan Terpadu street – Kawasan Terpadu	4,597	0,536	4,061	Asphalt/micro rough surface/telford/terrain

Source: Public Works Office of South Nias Regency

The length of Regency roads in South Nias Regency in 2018 reached 743,621 km while Teluk Dalam Sub-district reached 73,822 KM with 43 roads. The condition of roads in Teluk Dalam Subdistrict, South Nias Regency, generally has a traffic lane width of 3-10 M, the type of alignment of hills and mountains, the type of asphalt pavement is flexible and has low side barriers. Many road conditions in Teluk Dalam Subdistrict, South Nias Regency use LAPEM and hot-mix pavement types but the conditions are slightly damaged, moderate and severely damaged and some are incomplete, so it is necessary to carry out maintenance and continuation/improvement (Table 3 and Table 4)

Table 5
Traffic Volume in Teluk Dalam Sub-district, South Nias Regency

Section	Criteria	Light vehicle	Medium Heavy Vehicles	Big Bus	Truck	Motorbike	Total
Hilimondregeraya Street	Pendidikan road– Desa Hilimondregeraya	44	10	0	3	55	112
DI Panjaitan Street	Kueni road– Yos Sudarso Street	37	12	0	3	43	95
Siwa Sanuwu Sihono Street	Walo road – Yos Sudarso Street	16	4	0	0	32	52
Lingkar Bawah Street	Nasional road km 3 – Ikhuhele	22	5	0	0	16	43
Pasir Putih Street	Nasional road– Pantai Walo	24	7	0	0	37	68
Inner lower ring road	Lower ring road– Lower ring road	28	12	0	1	41	82
Hilifusi Street	Nasional road km2 – Pantai Hilifusi	35	11	0	1	74	121
Kawasan Terpadu Street	Kawasan Terpadu road– Kawasan Terpadu	37	10	0	0	48	95

Source: Survey Results



In Teluk Dalam Subdistrict, South Nias Regency, the number of vehicles passing through the roads is normally light vehicles and motorbikes. From the road conditions that look empty, this can be seen clearly. Due to the simultaneous activities at colleges, classes, and workplaces, the number of vehicles is shown to be heavy only about 06.30 to 07.30 in the morning. Then there is a weekend

market (Pekan) that typically happens in each district once a week. At this time the volume of vehicles can be high enough that it can cause congestion around the city or the weekend market. In addition, the volume of vehicles will return to being quiet. Several heavy vehicles such as heavy trucks pass by where these vehicles transport agricultural products, BGGC and other goods from outside the area.

Table 6
VCR analysis results on roads in Teluk Dalam Subdistrict, South Nias Regency

Section	Criteria	VCR
Hilimondregeraya street	Pendidikan road- Desa Hilimondregeraya	0.16
DI Panjaitan street	Kueni road- Yos Sudarso street	0.05
Siwa Sanuwu Sihono street	Walo road - Yos Sudarso street	0.08
Lower ring road	Nasional road km 3 - Ikhuhele	0.12
Pasir Putih street	Nasional road-Pantai Walo	0.16
Inner lower ring road	Lower ring road- Lower ring road	0.04
Hilifusi street	Nasional road km2 - Pantai Hilifusi	0.29
Kawasan Terpadu street	Kawasan Terpadu road- Kawasan Terpadu	0.04

From table 6 it is known that the road segment with the highest VCR is Nasional road km2 - Pantai Hilifusi, while the lowest VCR values are Lower Ring Road - Lower Ring Road and Kawasan terpadu Road - Kawasan terpadu. In general from the results

of the VCR Analysis, the road sections surveyed are still quite good in accommodating the volume of traffic passing through it with Level of service (LOS) A.

Table 7
Average Travel Time on roads in Teluk Dalam Subdistrict, South Nias Regency

Criteria	Distance in km	Average Travel Time in minute
Pendidikan road- Desa Hilimondregeraya	17,624	18
Kueni road- Yos Sudarso street	0,281	10
Walo road - Yos Sudarso street	5,000	29
Nasional road km 3 - Ikhuhele	8,406	28
Nasional road-Pantai Walo	0,923	17
Lower ringroad- Lower ringroad	0,558	26
Nasional road km2 - Pantai Hilifusi	1,054	27
Kawasan Terpadu road- Kawasan Terpadu	4,597	36

Table 8
Average speed on roads in Teluk Dalam Subdistrict, South Nias Regency

Criteria	Distance in km	Average time (km/ menit)
Pendidikan road- Desa Hilimondregeraya	17,624	0.982
Kueni road- Yos Sudarso street	0,281	0.029
Walo road - Yos Sudarso street	5,000	0.174
Nasional road km 3 - Ikhuhele	8,406	0.302
Nasional road-Pantai Walo	0,923	0.056
Lower ring road- Lower ringroad	0,558	0.021



Nasional road km2 – Pantai Hilifusi	1,054	0.039
Kawasan Terpadu road– Kawasan Terpadu	4,597	0.127

From table 8 above, it is known that the road segment that has the highest average speed is on the Pendidikan Road – Desa Hilimondregeraya, while the lowest average speed is the Lower Ring Road - Lower Ring Road section so several things need to be considered based on the survey conducted, namely: a). The width of the road is still narrow and b). Not too much vehicle volume

Trip Generation Model

The model developed in this study was obtained from the generation and attraction of the OD study results in South Nias Regency (Public Works Agency, 2012, Development of a Road Management System Master Plan for South Nias Regency) which is linked to land use, social characteristics. the economy. The model made is for the trip generation and attraction of passengers and goods in the study area with a constant price GRDP (X) and the number of the trip generation (Y) where the unit trip generation of passengers (people per year) and movement of goods (tons per year) are as follows:
 Trip generation for passenger $Y = 1,38208E-05X$
 Trip generation for goods: $Y = 6,12509E-06X$
 Trip attraction for passenger: $Y = 1,18849E-05X$
 Trip attraction for goods: $Y = 4,78960E-05X$
 The results of the trip generation and attraction model for passengers and goods can be calculated by looking at the GRDP of South Nias Regency per District.

5. CONCLUSION

The results of the road improvement priority analysis show that the Kueni road - Yos Sudarso road is the main road improvement priority. The order of priority for road improvement in Teluk Dalam Subdistrict, South Nias Regency is as follows:

1. Walo road – Yos Sudarso street
2. Kueni road– Yos Sudarso street
3. Nasional road km 3 – Ikhuhele
4. Pendidikan road– Hilimondregeraya Village
5. Kawasan Terpadu road– Kawasan Terpadu
6. Lower ring road– Lower ringroad
7. Nasional road km 2 – Pantai Hilifusi
8. Nasional road–Pantai Walo

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