

# Road Network Handling Strategies in Katingan District

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**Abstract**— Road has a very important role in the development of a region. That managing develop the road network needs to be carried out continuously. This study aims to formulate a government strategy in manage road networks, but because of limited funding, in handling the road needs to formulate priorities, where is the (SWOT) analysis method to formulate a road network handling strategy and priority assessment can be done using the method of analytic hierarchy process (AHP). From the results of the (SWOT) method analysis, it is known that the position of Katingan District is at (Quadrant I) with x axis = 1.152 and y = 1.222, it was found that the type of strategy was aggressive (S-O), meaning that Katingan District is in prime and steady condition. Based on the analysis, the strategy that can be implemented is (1) The local government in Katingan District propose an increase in the allocation of funds for handling road networks to the Central Government. (2) Strengthening promotional activities potential of natural resources. (3) Building partnerships with private parties 'cost sharing'. (4) Accelerating Infrastructure Development in isolated areas that have the potential to increase regional income. And the priority of development based on the results of the analysis is the priority of the road network Hampangen–Mendawai, Dehes–Baraoi, Tumbang Sanamang–Kiham Batang, Kereng Pakahi–Pagatan and Telangkah–Tumbang Samba. Based on benefit criteria, Benefits obtained from handling the network, the main thing is ease of accessibility between regions, and travel time saving.

**Keywords**— Road Network, SWOT, AHP.

## I. INTRODUCTION

Road infrastructure is a public good whose existence must be felt by all levels of society, then as a consequence the right to control and authority to procure road infrastructure is generally carried out by the government. And it is expected that each region can develop the system services that are more accommodating to the needs of the local community.

Problems in Katingan District until now there are still many roads that are still damaged. Based on the data there is 30% steadiness, the meaning 70 % still not steady, compared with National road data that District road steadiness is still below it. In addition, the main problem faced in Katingan District is the problem connectivity, out of thirteen sub-districts there are five sub-districts whose territory has not yet been reached by land transportation and funding availability.

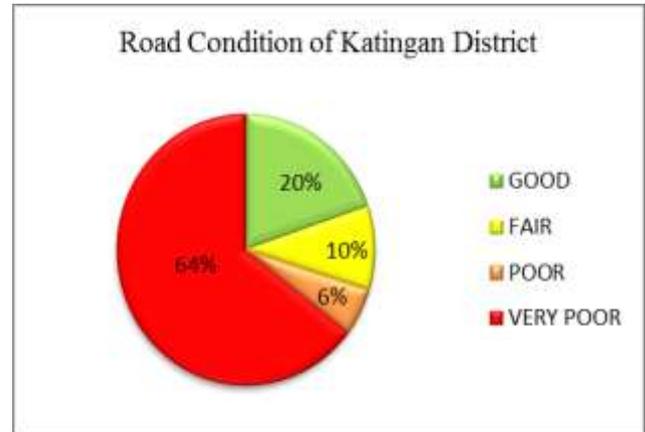


Figure 1.1. Road Condition of Katingan District

In the picture below it can be seen good and fair conditions on a National road of 68 %:



Figure 1.2. National Road Conditions

There are still areas that cannot be reached by land transportation. 5 sub-districts from 13 sub-districts.

Table 1.1. Region data that cannot be passed by 4-wheeled vehicles

No	Sub-district	Area (km <sup>2</sup> )	% of the area of Katingan	Number of villages
1	Katingan Kuala	1.440	8,09	16
2	Mendawai	1.826	10,26	7
3	Katingan Tengah	1.089	6,12	16
4	Katingan Hulu	1.775	9,97	23
5	Bukit Raya	829	4,66	11
Total		6.596	39,1	73
<b>Katingan District</b>		<b>17.800</b>		

Source: Katingan District Public Works Office, 2017

District governments face the problem of limited funding allocations. But on the other hand Katingan District has some great potential.

Table 1.2. Realization of Regional Revenues

Type of Acceptance	2016	2017
Region Income	46.280.722,19	52.991.818,46
Balancing found	918.845.149,2	920.151.106,52
Other Legal Revenue	159.785.055,18	189.465.870,15

Source: Central Bureau of Statistics 2017

Table 1.3. Natural resources in the plantation sector

No	Plantation	Land area/hectare	Ton Production / year
1	Rattan	325.000	99,4
2	Rubber	19.193	2.647
3	Palm oil	144.408	11.307
4	Coconut	491	166,32
5	Coffee	16	0.31

Source: Central Bureau of Statistics 2017

Table 1.4 Fishing and aquaculture production in Katingan District (Ton)

Marine Fisheries		Public waters		Cultivation	
2016	2017	2016	2017	2016	2017
2.521	2.253	-	-	474	403
-	-	406	856	151	141
-	-	1.627	1.003	328	488
-	-	854	603	288	350
-	-	895	539	1.785	1.943
-	-	81	271	184	228
-	-	162	190	225	216
-	-	40	151	276	280
-	-	-	120	15	12,22
-	-	-	-	-	-
-	-	-	-	2,94	-
2.521	2.253	4.069	3.736	3.732	4.064

Source: Central Bureau of Statistics 2017

Table 1.5. Land area that has been processed /opened starting in 2016

No	Mining	Land area/ hectare
1	Coal	165.081
3	Quartz sand	7.630
4	Zirkon	21.290
5	Batu Mulia	-
6	Gold	55.291
7	Precious stones	1.688
8	Iron and Copper	17.658

Source: Central Bureau of Statistics 2017

Idhie (1999) concluded that the emergence of demands for regional autonomy in the point contains the desire to align development between regions and regions because in fact there have been many gaps and inequalities, especially between the West Indonesia region and the East Indonesia region. Therefore, it is necessary to plan with a regionalization or regional approach that is based on an integration analysis by considering the conditions, potentials, problems, and opportunities possessed in a region. Planning with this regionalization approach is one of the right alternatives to reduce or eliminate gaps and lameness which in turn spur balanced economic growth between regions and regions.

Soesilo (2002), in determining the policy strategy that will be implemented, an organization must maximize strengths and opportunities, while minimizing existing weaknesses and

threats, resulting in a balance between internal and external conditions. conditions can be achieved. By using a SWOT analysis, it is expected that this research can reveal internal factors and external factors that are considered important in achieving goals, namely by identifying strengths, weaknesses, opportunities, and threats.

Wheelen and Hunger, (2000) Situation analysis is the beginning of the process of formulating a strategy. It was further stated that situation analysis requires strategic management to find a strategic match between external opportunities and internal strength, in addition to paying attention to external threats and internal weaknesses.

Wedagama (2012) in determining priorities for handling subjective road decisions including experts often produces uncertain relationships between criteria and alternatives. Analytic Hierarchy Process (AHP) will be difficult to deal with unusual multi-factors, so it cannot be fully practiced. Therefore, it is important to establish an appropriate system to identify and find the importance of the criteria for prioritizing road handling relatively.

Pamoto (2004) The results showed that using AHP, priority ranking was obtained in handling intercity roads in the urban areas of North Sumatra in sequence as follows: the first priority was the Rantau Prapat ring road, the second priority was Panyabungan Bypass Road, the third priority was Bypass road Pancur Batu, the fourth priority is Aek Nabara Bypass, the fifth priority is the Sei Rampah road, the sixth priority is the Perbaungan Bypass road, and the seventh priority is the Padang Sidempuan Bypass road. From the above description of gaps in the condition of road steadiness between national roads and District roads, connectivity problems in several sub-districts and limited funds require strategies to resolve, therefore we need a study related to this problem.

## II. LITERATURE REVIEW

### 2.1 SWOT (strengths, weaknesses, opportunities, and threats).

Kutz (2008), SWOT analysis is an important strategic planning tool to help plan to compare the organization's internal strengths and weaknesses with opportunities and threats from external. Whereas according to David, (1996), SWOT analysis is a strategy planning method that serves to evaluate the strengths, weaknesses, opportunities and threats.

Rangkuti (2008), SWOT analysis is a systematic identification of various factors to formulate a strategy. This analysis is based on logic that can maximize strength and opportunity, but can simultaneously minimize weaknesses and threats.

Ardianto (2009), From the formulation of strategies using SWOT analysis obtained 11 strategy formulations. Then prioritizing the strategy is done using QSPM analysis, so the priority of the Regional Government Policy strategy is in the construction of road infrastructure to get an increase in the allocation of funds for road infrastructure development from the Central Government. To obtain the program formulation from the road development strategy carried out by interviewing a number of individuals and regional officials related to road infrastructure development, the program

formulation was obtained as follows: Prioritizing Development / increasing road length and road conditions in West Lampung Regency, Preparing RPJM construction of the road in West Lampung Regency, Making Engineering Design Details of road construction in West Lampung Regency, Conducting studies and evaluating the feasibility of building new road segments on the economic conditions of surrounding communities.

Rahmat (2010). Road Network Development Supports Regional Growth in Parigi Moutong District. The goal achieved is to determine the strategy of developing a road network in supporting regional growth and development in the Parigi Region, Kab. Parigi Moutong. urban and find a strategy for developing road networks with the SWOT method to support the distribution of production in the urban areas of West Muna Regency. Hamonangan (Study of priority strategies for development and improvement of road infrastructure in shaded cities Analysis of strategies using SWOT (Structural, Weakness, Opportunity and Thread) produced several strategies, namely improvement of collector roads, construction of new roads in the form of inner ring road to the east of Sorong City and the policy of developing a road network in accordance with the City Spatial Plan with the support of the community.

The strategy to improve road network performance was formulated with the SWOT method (Strength Weakness Opportunities Threats), it was found that the strategy was aggressive. An aggressive strategy that can be applied is to increase the road network for roads with severe damage, to pave the road to the ground level and to widen the road for the narrow road sections. (Akbar et al. 2018)

Muh (2018). Analyzing the government's strategy in the realization of the national food barn and formulating priority directions for the development of road networks to support the creation of a national food barn in Merauke Regency. The results of the research show that the road network performance improvement strategy is aggressive, namely improving the performance of road networks in order to meet community expectations and network improvement priorities the road for the smooth distribution of food logistics and supporting the realization of the national food barn is located on the Tanah Miring - Salor road, Semangga - Tanah Miring road, Kuprik - Semangga road, Kurik - Kumbe road section. Next as a supporter is the Salor - Kurik and Wendu - Kumbe road sections.

### 2.2 AHP (Analytical Hierarchy Process)

Analytical Hierarchy Process is a method intended to be able to organize information and various decisions rationally. (judgement) in order to choose the most preferred alternative. This method is intended to help solve complex qualitative problems using quantitative calculations. This method has certain advantages because it can help simplify complex problems into structured problems, thus encouraging the acceleration of the related decision making process. (Luki, 2008).

Sibali (2004) Determination of Road Handling Priorities in Mandonga Kendari City with AHP Method. Based on the

evaluation of several criteria considered by the respondents, the abeli dalam terminal road segment is a road that is proposed to get the highest priority in handling roads in the Mandonga sub-district.

Ronting (2009) Strategy and Priority of Road Infrastructure Development in Order to Support Seram Kapet using AHP Analysis. The results of the analysis of the order of priority of road handling on Seram Island to support spooky Kapet show that the Kairatu-Amahai section with a total weight of 0.6870 is in the first order and North Amanai-Seram with a total weight of 0.6857 which is the second order.

Mashuda (2010) Priority of Road Network Development in Bacan Island Region, South Halmahera Regency using AHP Analysis. Roads are a priority in the development of road networks from the results of the analysis is priority I road (Labuha-Babang), then priority II road (Babang-Songa-Songa Wayaua), priority to III road (Labuha-Sawadai).

### III. RESEARCH METHOD

This study uses the SWOT method (Strength Weaknesses Opportunities Threats), and Analytical Hierarchy Process (AHP). By using primary data from interviews and questionnaires to respondents/stakeholders related to handling the road network in Katingan District.

The flow chart of the research is presented in Figure 3.1:

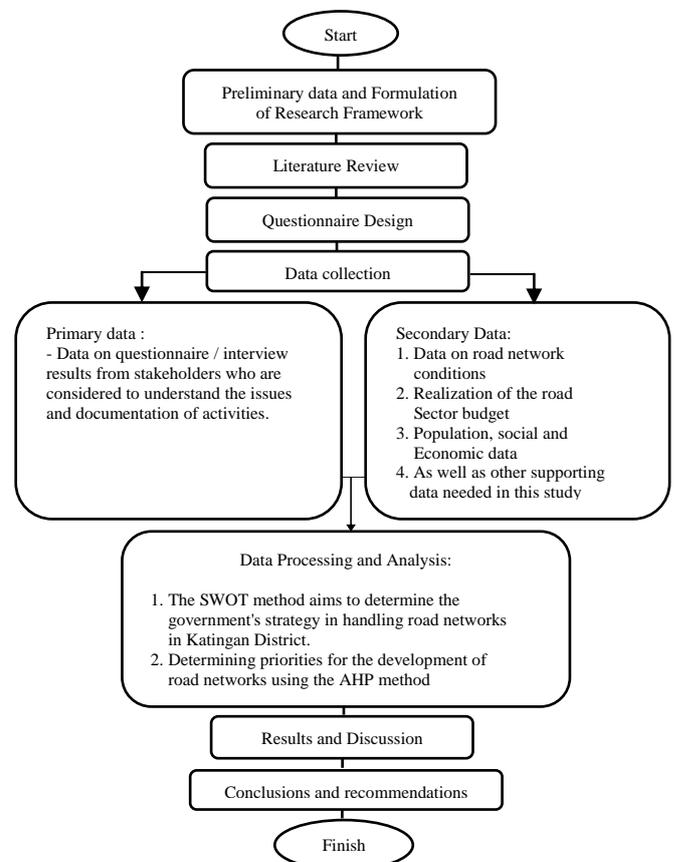


Figure 3.1. Flowchart of research

### 3.1 Data Collection Phase

The method of data collection is done by collecting secondary data and primary data. The data collection methods are as follows:

Secondary data:

- Was obtained from relevant agencies such as the Central Statistics Agency (BPS).
- The Regional Development Planning Agency (Bappeda) of Katingan District.
- The Public Works Agency (Highways) of Katingan District
- And other library resources relevant to the research topic.

Primary data :

- Obtained by conducting interviews and distributing questionnaires to the respondents.

#### 3.1.1 Data analysis method

Based on the data that has been collected, the next step is to do data processing. The steps are as follows:

- This the SWOT method is used to determine the strategy for handling road networks.
- Determine the priority of road network development in Katingan District then carried out by the AHP method.

#### 3.1.2 SWOT analysis

The stages in carrying out a SWOT analysis are carried out as follows:

- *Identification of Internal and External Factors.*

The first stage in the SWOT analysis is to identify internal and external factors that are considered to have a positive or negative effect in formulating a road network management strategy. This stage is very important because the results of this identification will be the basis for subsequent analysis activities. The identification of internal and external factors is done by studying documents, reviewing the literature, and conducting a preliminary survey within the local government of Katingan District.

- *Questionnaire design*

After internal and external factors are identified, the questionnaire is compiled as a means to get an assessment from respondents about the factors that have been formulated. The identified factor assessment is divided into 2 parts, namely :

- Internal factors (strengths and opportunities).
- External factors (weaknesses and threats).

The following questions are contained in the form of internal and external factor questionnaires in the Katingan district, described below :

#### 3.1.3 Internal Factors

Internal factors are factors in the form of driving forces which include strengths and weaknesses in attracting the superiority of Katingan District. Analysis of internal factors which include strengths and weaknesses was carried out to determine the condition of the area.

##### A. Strength

The strength factor of Katingan District which can be identified as follows:

- Land and geographical potential of Katingan District
- Medium-term development plan in Katingan District.

- Potential of natural resources.
- Strong commitment from the government in accelerating the construction of the road network in Katingan District.
- Availability of national fishing ports as a distribution lane for natural resources.
- Potential tourism area of Katingan District.
- Requests for investors to invest in Katingan District.

##### B. Weakness

The weaknesses of Katingan District that can be identified are as follows:

- Quality of human resources in Katingan District.
- The authority in drafting legislation to optimize the potential of the region.
- Regional financial capability.
- Road condition is damaged.
- Limited road network in several regions.
- Scale of development priorities.

#### 3.1.4 External Factors

External factors are factors that include opportunities and threats to determine the position of the area in the face of its external environment.

##### A. Opportunity

Opportunities are the main situation that is advantageous in an area's environment, opportunity factors can be identified as follows:

- Law No. 34 of 2004 concerning roads.
- Road network development refers to the District Spatial Plan.
- Conditions of Social Politics.
- Law No. 33 of 2004 concerning central and regional finance.

##### B. Threat

Threats are the main unfavorable situation in a company's environment, threat factors can be identified as follows:

- Large area autonomy.
- The existence of regional egos.
- Environmental degradation issues.
- Economic globalization.

#### 3.1.5 Determination of Respondents

After the questionnaire has been compiled, the next step is determining the respondents who will fill out the questionnaire. Determination of respondents is done by considering the expertise and relevance of prospective respondents to the problems to be studied.

The selection of respondents is determined purposively, or set directly Based on knowledge and has a strong relationship about the problems being studied. The respondents who were asked to assess internal and external factors in the SWOT questionnaire were described as follows:

- Regional Development Agency 5 respondents.
  - Assembly at regional, Commission C (Development) 8 respondents.
  - Academic 2 respondents.
  - Public Works Agency 5 respondents.
- Amount of Value from stakeholders, Value of factors, Weight, Rating and Score are as follows :
- Amount of Value from Stakeholders (1)
- $$\text{Total PU} = \text{PU1} + \text{PU2} + \text{PU3} + \text{PU4} + \text{PU5}$$

$$\begin{aligned} \text{Total BP} &= \text{PU1}+\text{PU2}+\text{PU3}+\text{PU4}+\text{PU5} \\ \text{Total AK} &= \text{AK1}+\text{AK2} \\ \text{Total DP} &= \text{DP1}+\text{DP2}+\text{DP3}+\text{DP4}+\text{DP5} \\ &\quad +\text{DP6}+\text{DP7}+\text{DP8} \end{aligned}$$

Where:

- PU : Public Works Agency (Highways)
- BP : Regional Development Agency
- AK : Academic
- DP : Assembly at regional

- Calculate factor value (2)

$$\text{Factor Value} = \frac{\text{Amount of value from Stakeholders}}{\text{Respondents}}$$

- Calculating Weight Value (3)

$$\text{Weight} = \frac{\text{Factor value}}{\text{Total strength factor} + \text{Total weakness factors}}$$

- Determine the ranking value (4)

Rating values are obtained by giving values to internal and external factors with rating scales ranging from 4 to based on the influence of these factors on the location of the study.

1. Factors (strengths and opportunities)

- a. Value 1 is not strong
- b. Value 2 is not strong enough
- c. Value of 3 is strong
- d. Value 4 is very strong

2. Factors (weaknesses and threats)

- a. Value 1 is not good
- b. Value 2 is not good
- c. Value 3 is good
- d. Value 4 is very good

- Calculating Score (5)

$$\text{Score} = \text{Weight} \times \text{Rating}$$

### 3.1.5 Strategy formulation

At the decision making stage, this SWOT matrix produces the position of Katingan District so that the most appropriate combination of strategies can be identified. Based on the results of the SWOT analysis, the handling strategy was then formulated.

### 3.2 Priority of road network handling

The general form of the AHP model used in this study is AHP for benefit ratio analysis. Benefit ratio analysis is done by comparing the priority benefits as a whole (Mulyono Sri, 1996). The results of this comparison of the overall benefits priority are then used to determine the priority ranking of road handling.

Because in this study using the benefit ratio analysis technique, maka in this study a be formed 1 (one) hierarchy model. is a hierarchy that deals with evaluating bene-fits from selected roads in accordance with the criteria used later, the benefit criteria used to determine the priority of road development in Katingan District consist of 4 (four) criteria, namely:

- Ease of accessibility between regions (KAD)
- Enhancement relations between regions (PHD)
- Smoothness transportation of goods and people (KTBO)
- travel time savings (PWT)

The stages of data analysis in this study are as follows:

- Analyzed so that it can determine the criteria of the hierarchy model with purpose (focus) is determining the priority of road handling in Katingan District which is useful for knowing the sequences of data to be assessed. This stage is a stage Decomposition Process,
- Get assessment scores on selected road segments for each criterion, questionnaire was distributed to expert respondents. the respondent must choose from the answers that are available. Questionnaire distributed to 17 (seventeen).
- Next is to make a paired comparison matrix (pairwise comparison matrix) for all criteria with numbers obtained from respondents' data.
- Next is the synthesis process, where each paired comparison matrix for each level is searched for the eigen vector to get the local priority and finally the overall priority percentage is obtained.
- Next is the consistency test which is the result of each local priority for each criterion tested in the following way: a) Multiplying the comparison matrix in pairs with the preference vector (local priority) for each criterion so that a column matrix is obtained, b) search for  $\lambda$  max, that is, from dividing the results of the column matrix with the local priority column matrix for each criterion, then add up and look for the average, c) Then look for the Consistency Index (Consistency index, CI).

which is calculated by the formula as follows:

$$\text{CI} = \frac{\lambda \max - n}{n - 1} \tag{6}$$

Where:

n: number of items compared

- Then search Consistency Ratio (CR) by formula:

$$\text{CR} = \frac{\text{CI}}{\text{Random Consistency Index (RI)}} \tag{7}$$

CR = the price cannot be more than 10 %, if necessary, the matrix must be revised. This stage is logical Consistency Process.

- Group priority road segments that are related to each of the highest criteria and priorities. Then each line of road is added to get the overall priority sequence of all road segments.

From the calculation of the weighting criteria of all respondents, we can know the weight the average criteria of all respondents. The weight of the average criteria is calculated by the formula as follows:

$$\text{BK} = \frac{(\text{R1}+\text{R2}+\text{R3}+\text{R4}+\text{R5}+\text{R6}+\text{R7}+\text{R8}+\text{R9}+\text{R10}+\text{R11}+\text{R12}+\text{R13}+\text{R14}+\text{R15}+\text{R16}+\text{R17})}{(n)} \tag{8}$$

Where : BK : Weight of Criteria

R1 s/d R17 : Number of criteria weights Stakeholders

n : Number of stakeholders

## IV. RESULTS AND DISCUSSION

### 4.1 Strategy

This SWOT analysis aims to identify internal and external factors. Internal factors include strengths and weaknesses while external factors include opportunities and threats. The

data collection stage is used to determine the factors that become strengths, weaknesses, opportunities and threats carried out by interviewing experts or quantitative analysis. The SWOT matrix clearly illustrates how the opportunities and threats faced can be adjusted to the strengths and weaknesses, so that strategic steps can be formulated in handling the road network.

From the SWOT weighting matrix it can be seen that the internal and external positions of Katingan District are located at coordinates X: 1.152 and Y: 1.222 can be seen in Figure 4.1:

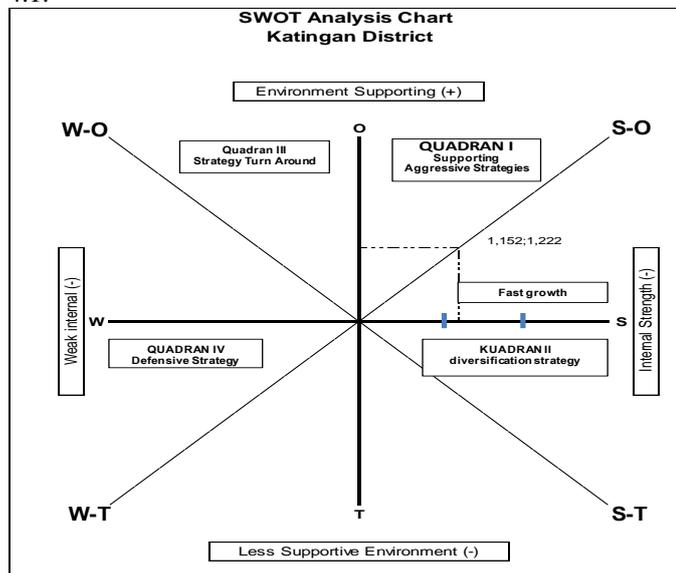


Figure 4.1. SWOT Analysis Diagram

It is known that the Katingan District is in Quadrant I (positive, positive), this position proves a strong and potential situation. The recommended tactic is Aggressive, meaning in prime condition and stable. So it is really possible to continue to expand, increase growth and achieve maximum progress. Based on the analysis, the strategy used is the S-O strategy, namely a strategy that aims to use Strength and take advantage of opportunities.

4.2 Discussion

The next stage is the preparation of a road network handling strategy with the SWOT matrix technique. This SWOT analysis combines internal factors (weaknesses and strengths) with external factors (opportunities and threats). This is intended to determine the appropriate strategy in handling road networks in Katingan District. From the results of the SWOT analysis there were 4 alternative strategies in handling road networks in Katingan District.

The S-O Strategy is a combination of internal factors of strength and opportunities external factors by exploiting opportunities by using strength. This strategy is also referred to as an aggressive strategy. The S-O strategy in handling this road network is as follows :

- 1) Local government policies in handling road networks in Katingan District to get an increase in the allocation of

funds for handling the road network from the Central Government.

The alternative strategy is formulated considering the geographical position of Katingan District and as a conservation District that has important values for environmental sustainability in Central Kalimantan Province and nationally. Land management in Katingan District must not exceed 40% (Regional Regulation Number 4 of 2016) from all regions. Thus the ability of regions to exploit financial resources from the financial capacity of their own regions is increasingly limited. On the one hand, the development of road infrastructure as one of the supporting capital of economic growth and the interests of community mobility continues to be urgent. Investment needs for handling this road network require very large funds.

This strategy was formulated using the element of strength The geographical position of Katingan District, Potential of natural resources, Strong commitment from the government in accelerating the construction of road networks in Katingan District by taking advantage of the opportunities for Law No. 38 of 2004. Regarding roads and Government Regulation No. 34 of 2004 concerning roads. In the Law and Government Regulations mandating the Central Government to participate in funding the construction of road infrastructure in regions that are unable to finance the construction of roads by 20% of the total Local government budget.

- 2) Strengthening the promotion of natural resource potential. Strengthening the promotion of natural resource potential in Katingan District aims to attract investors to invest in Katingan District, especially in the tourism sector. It is expected that with investment in tourism from the private sector can be a means of cooperation in the construction of road infrastructure especially District roads to go to tourist sites. In the National Spatial Plan, Katingan District is one of the nature conservation areas which has a diversity of ecosystems that must be conserved. In addition, the existence of protected forests in Bukit Raya National Park and Sebangau National Park is one of the lungs of the world.. This advantage can be used as an international ecotourism and nature reserve research center.

The alternative strategy was formulated using the policy strength of the Katingan District Regional Government. natural resource potential by utilizing opportunities for District spatial plan and Laws and Government Regulations on roads.

- 3) Building partnerships with private parties 'cost sharing'. Construction / maintenance of road infrastructure requires high investment costs while regional financial capacity is very limited. Of the total area that can be exploited for economic purposes, there is land that can be exploited for economic purposes, there is land that has been used for oil palm plantations, rubber plantations of rattan plantations and others for industrial raw materials outside of Katingan District. Some of the roads to large-scale plantations are part of the District road network where the construction and maintenance are borne by the Katingan District budget. Therefore, an assessment by the Katingan District Government is needed to conduct cost sharing with the private sector (plantations) or

(mining) to help finance the maintenance of the District roads that are carried out by the plantation and mining products..

Alternative strategies are formulated to minimize the weaknesses of regional financial capacity, to take advantage of opportunities for socio-political conditions and the existence of District spatial plan.

4) Accelerating Infrastructure Development in isolated areas that have the potential to increase regional income.

By accelerating and equitable distribution of infrastructure development in Katingan District, especially isolated areas that have very potential resources but are still constrained by inadequate road infrastructure to maximize the potential of existing natural resources. Seperti Katingan Kuala District and Mendawai District which function as a sea port city as well as a center for trade and services, large scale industries, tourism, ecotourism, aquaculture and capture fisheries, wetland agriculture. Whereas Katingan Hulu has regional potential in the mining, plantation and forestry sectors and Bukit Raya has the potential of the region in the tourism sector.

This alternative strategy was formulated using the strength of strength commitment from the Katingan District government, the existence of a National Fisheries port, investors' request to invest, natural resource potential, tourism potential by utilizing opportunities for district spatial plan, Law No.33 on central and regional finance, socio-political conditions.

### 4.3 Priority Analysis

The general form of the AHP model used in this study is AHP for Benefit Analysis. Based on the Benefit Analysis, the road network that will be made the priority of handling is as follow:

- 1) Telangkah–Tumbang Samba
- 2) Hampangen–Mendawai
- 3) Kereng Pakahi–Pagatan
- 4) Tumbang Sanamang–Kiham Batang
- 5) Dehes–Baraoi

#### 4.3.1 Weighting criteria priority

The weight of the criteria is the result of the respondent's assessment in this case is the decision maker (stakeholder) towards the priority criteria for handling the proposed road. By using 4 criteria then a questionnaire is made and distributed to 17 stakeholders who are considered to have interests and competencies related to prioritizing the handling of road networks in Katingan District, namely : Commission C Assembly at regional 7 people, Public Works Service 5 people, Regional Planning and Development Agency 5 people. The results of filling out the questionnaire were translated into the form of pairwise comparison matrices.

From Figure 4.2, it can be seen that the criteria chosen by respondents (R1) from the highest to the lowest are ease of goods and people transportation of 43.94%, travel time savings of 37.58%, ease of accessibility between regions 10.46% and improved relations between regions 8.03%.

From the calculation of the weighting criteria of all respondents, we can know the weight of the average criteria of all respondents.

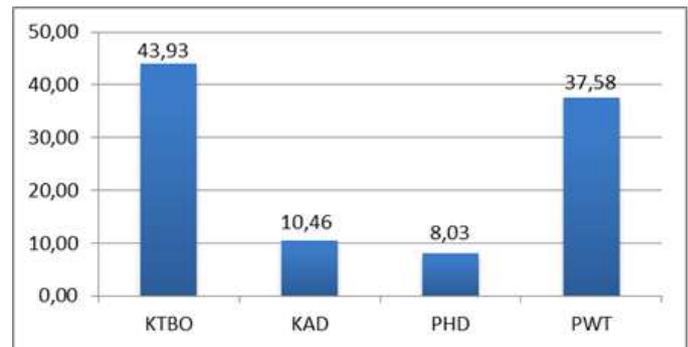


Figure 4.2. Respondent Criteria Weighting Diagram (R1)

Table 4.1. Criteria for the Overall Benefits of Roads

Road Network	Benefit Criteria			
	KAD	PHD	KTBO	PWT
Telangkah – Tumbang Samba	0,4318	0,0814	0,0791	0,1801
Hampangen – Mendawai	0,4797	0,0819	0,0796	0,1867
Kereng Pakahi – Pagatan	0,4412	0,0809	0,0795	0,1741
Tumbang Sanamang – Kiham Batang	0,4626	0,0758	0,0747	0,1596
Dehes – Baraoi	0,4351	0,0755	0,0851	0,1996

Source: Analysis Results, 2019

#### 4.3.2. Priority of Road Network Handling Based on Benefit Criteria

After evaluating the benefits using the AHP method the results obtained are presented in Figure 4.3:

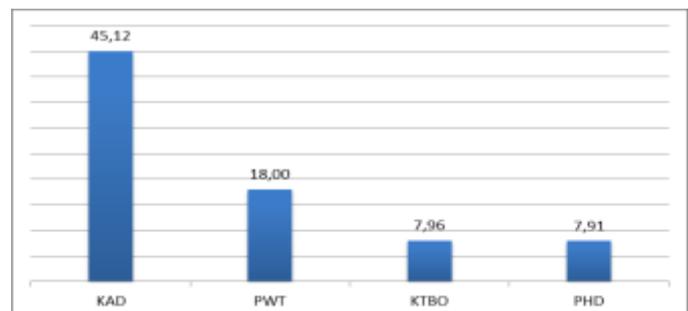


Figure 4.3. Priority Based on Criteria Benefit

The results of the assessment scores above indicate that the highest priority is ease of accessibility between regions, namely 45.12%. This shows that by handling the road network, the benefits will be significant for ease of accessibility between regions in the region around handling road networks.

#### 4.3.3. Road Handling Priority

Next is to classify the priority of the road segment with respect to each of the highest criteria and priorities. Then the number of each road line is added to get the overall priority sequence of all roads. Results obtained as in Table 4.2.

Table 4.2. Average Benefit Criteria Score for each Road Network.

CRITERIA	TELANGKAH	KERENG PAKAHI	HAMPANGEN	T. SANAMAN	DEHES
KAD	0,4318	0,4412	0,4797	0,4682	0,4351
PHD	0,0814	0,0809	0,0819	0,0758	0,0755
KTBO	0,0791	0,0795	0,0796	0,0747	0,0851
PWT	0,1801	0,1741	0,1867	0,1596	0,1996
TOTAL	0,1931	0,1939	0,2070	0,1946	0,1988

Source: Analysis Results, 2019

From the assessment score above, it can be seen that the highest benefit criteria score is the Hampangen - Mendawai road network, which is equal to 20.70%. Based on the benefits criteria, the Hampangen - Mendawai road network is a road network that has the highest priority to be handled compared to other road networks.



Figure 4.3. Priority Based on Criteria Benefits

### V. CONCLUSION

Based on the results of research on evaluating the local management system towards the application of kaizen to increase productivity in the precast production process, the following can be concluded:

1. The results of the analysis of the SWOT method, Katingan District are in Quadrant I, found the clarity of aggressive type strategies which means that Katingan District is in prime condition and stable. Based on the analysis, the strategy used is strategy (S-O), which is a strategy that aims to use force and take advantage of opportunities. The strategies are as follows:
  - a. Local government policies in handling road networks in Katingan District to get an increase in the allocation of funds for handling the road network from the Central Government.
  - b. Strengthening the promotion of natural resource potential.
  - c. Building partnerships with private parties 'cost sharing'.
  - d. Accelerating Infrastructure Development in isolated areas that have the potential to increase regional income.
2. Based on the benefit analysis it can be concluded that ease of accessibility between regions is the most important variable in determining the priority of road network handling, based on the overall benefit ratio analysis of 5

(five) road networks in Katingan District, the priority of development can be stated in the following order:

- a. The first priority is the Hampangen - Mendawai road network.
- b. The time The second priority is the Dehes - Baraol road network.
- c. The third priority is the Tumbang Sanamang - Kiham Batang road network.
- d. The fifth priority of the Telangkah- Tumbang Samba road network

### VI. SUGGESTION

From the results of the research, the suggestions that can be conveyed by researchers are as follows:

1. Public infrastructure development programs should not be carried out sporadically or centrally in accordance with the taste of leadership because it is contrary to the principles of justice and legal certainty (except for disaster emergency conditions).
2. To support the successful development of the road network in Katingan District, strong commitment is needed from the parties involved in policy issues, as well as careful planning in the field of transportation starting from generalplanning, management and control of infrastructure and transportation facilities.

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