

LAND CAPABILITY ANALYSIS OF SOUTH NIAS DISTRICT

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Abstract

For optimal land use planning, an in-depth analysis of the land to be planned is needed so that the appropriate function can be determined. One of the analyses that needs to be done is the Land Capability Unit (SKL) analysis, which is a structured analysis that considers various physical aspects of the environment in determining land capability. Land Capability Unit (SKL) analysis must be applied in every preparation of a spatial utilization plan so that the utilization plan is not risky for both planning and nature. Land Capability Unit Analysis is carried out using the superimpose/Overlay method which utilizes the ArcGis application. South Nias Regency is a regency area that is divided into many islands with diverse surface morphologies, ranging from very steep to flat surfaces. So in planning land use in South Nias Regency, a structured physical analysis must be carried out so that a land use plan can be determined based on its land capability which is determined based on several aspects considered in the Land Capability Unit analysis process in South Nias Regency. From the results of the analysis that has been carried out, it was found that in South Nias Regency there is land with high capacity covering an area of 44,280.1 Ha or around 17.5 percent and land with very high capacity covering an area of 134,769.8 or around 53.2 percent of the total area of South Nias Regency.

Keywords: *South Nias, Land Capability Unit, Superimpose, Land Use*

I. INTRODUCTION

Optimal land use planning requires an in-depth analysis of the potential and constraints of available land resources. This evaluation aims to ensure that land use is in accordance with its physical and ecological characteristics, so as to minimize negative impacts on the environment. Improper land use, without considering the natural capabilities of the soil, can cause land degradation, such as faster erosion due to the loss of vegetation protection and decreased ability of the soil to absorb water. In addition, changes in land use, such as converting forests to agricultural land or settlements, can reduce the ability of the soil to maintain ecosystem balance, such as reducing biodiversity, damaging the water cycle, and increasing the potential for natural disasters. Therefore, it is important to consider factors such as soil type, topography, climate, and sustainable land use so that development goals can be achieved without sacrificing ecosystem health and soil quality in the long term. The erosion that occurs will result in decreased land productivity (Rusneni Ruslan, et. al, 2021).

According to the Regulation of the Minister of State for the Environment No. 17 of 2009 concerning Guidelines for Determining Environmental Carrying Capacity in Regional Spatial Planning, land capability refers to land characteristics that include soil properties, topography, drainage, and other environmental conditions that support life or activities in a particular area. These characteristics are very important in determining whether a land can be used optimally without causing negative impacts on the environment. Therefore, a careful assessment of land capability is the first step in sustainable development planning. According to Notohadiprawiro (1987) in Kairupan, Joseph, & Yusuf (2018), the assessment of land capability is carried out by considering various aspects that reflect the overall condition of the land. Each type of land use has different needs, so the value of land capability can vary according to the characteristics of its use. Therefore, it is important to conduct an in-depth analysis of the potential and limitations of land in each region before determining its use. This will ensure that land use is carried out efficiently, considering sustainability factors and reducing the risk of environmental damage.

Land Capability Unit (LSC) Analysis is an approach used to assess the potential and limitations of land in supporting various types of land use or utilization. The purpose of this analysis is to determine the capacity of land to support human activities, such as agriculture, plantations, settlements, and others, based on existing physical and environmental characteristics. In SKL analysis, land is evaluated based on several main factors, such as soil texture, soil depth, drainage, slope, soil type, and rainfall. These factors are then used to determine the land capability class which includes the categories of very high, high, medium, low, and very low suitability. The SKL analysis process is usually carried out by utilizing spatial data obtained from topographic maps, satellite imagery, and field data. The results of this analysis provide important information for spatial planning and natural resource management, and can be used to support policy decisions in sustainable land use.

Overall, SKL analysis aims to maximize the potential of existing land by considering environmental factors that can affect the success of land use in the long term. This is very important to prevent environmental damage due to land use that is not in accordance with land capabilities, such as erosion, soil degradation, and decreased soil fertility. South Nias Regency, located on Nias Island, North Sumatra, has an area of around 253,375.9 hectares divided into 35 sub-districts. The population in 2023 reached 382,539 people, with an average population density of 2 people/hectare. The population distribution in South Nias is uneven between sub-districts. Several sub-districts have a high population, such as Teluk Dalam Sub-district 26,708 souls and Fanayama District 20,028 souls in 2023.

Table 1 Area, Number and Population Density in South Nias Regency 2023

No	Subdistrict	Amount (Ha)	Population (People)	Population density (people/ha)
1	Amanda	9,367.9	15,494	2
2	Aramo	6,409.2	10,617	2
3	Boronadu	3,649.7	8,182	2
4	Fanayama	7,368.9	20,028	3
5	Gomo	2,981.1	11,529	4
6	Hibala	32,272.1	8,242	0
7	Hilimegai	3,006.8	7,211	2
8	Hilisalawa'Ahe	3,572.9	5,728	2
9	Hurun	5,266.9	14,570	3
10	Idanotae	5,408.2	11,046	2
11	Lahusa	8,043.6	22,404	3
12	Lolomatua	4,165.6	12,282	3
13	Lolowau	4,802.5	9,619	2
14	Luahagundre Maniamolo	4,815.4	11,337	2
15	Maniamolo	5,255.0	13,809	3
16	Mazino	5,106.5	8,767	2
17	Mazo	2,583.5	12,516	5
18	Onohazumba	3,096.3	6,864	2
19	Onolalu	3,605.5	8,880	2
20	O'O'U	4,359.0	8,801	2
21	The Rock Islands	4,843.0	9,866	2
22	West Rock Islands	4,041.4	2,352	1
23	East Stone Islands	36,981.5	3,258	0
24	Northern Rock Islands	6,912.5	3,948	1
25	Sidua'Ori	4,089.8	12,196	3
26	Simuk	2,067.5	1,961	1
27	Somambawa	5,254.0	15,148	3
28	Milk	3,649.7	17,186	5
29	Land of Time	33,378.7	5,134	0
30	Deep Bay	4,178.7	26,708	6
31	Tom	3,823.0	15,295	4
32	Ulu Idanotae	3,379.9	7,856	2
33	Ulunoyo	6,951.1	14,460	2
34	The Greatest	5,226.3	11,756	2
35	Umbunation	3,462.1	7,489	2
Total		253,375.9	382,539	2

The agricultural sector in South Nias is dominated by food crops such as rice, corn, and cassava. However, to increase food security and farmer income, the local government has encouraged crop diversification. For example, in 2019, the Regent of South Nias carried out the first corn planting on food security land as an effort to increase local food production. In addition, the plantation sector also has great potential with commodities such as coconut, cocoa, and patchouli. Based on research, patchouli plants have a productivity of 0.13 tons per hectare, coconut 0.96 tons per hectare, and cocoa 0.38 tons per hectare, indicating significant development opportunities. As an archipelago, South Nias has abundant fisheries potential. Local communities rely on marine resources for their livelihoods, with main commodities being fish, shrimp, and seaweed. However, challenges such as unsustainable fishing and climate change affect the catch and sustainability of this sector. South Nias also has attractive tourism potential, especially marine and cultural tourism. Beautiful beaches and the tradition of stone jumping are tourist attractions. However, the development of the tourism sector must be carried out by paying attention to environmental sustainability and local culture so that its benefits can be felt sustainably.

Despite its great potential, South Nias faces several challenges in land use, including: Land Degradation, Land use that is not in accordance with soil capacity can cause erosion and decreased soil fertility. Lack of Infrastructure The limited infrastructure such as roads, irrigation, and post-harvest facilities hamper the distribution of agricultural and plantation products. Climate Change, Weather variability and climate change affect cropping patterns and agricultural yields, and increase the risk of natural disasters. South Nias Regency, located in a disaster-prone area, has experienced various natural disasters in the last 10 years. Based on data from the Regional Disaster Management Agency (BPBD), disasters that often occur include earthquakes, landslides, and floods. Earthquakes have been recorded to have occurred more than five times, with several major events in 2016 and 2023, causing significant damage to buildings and settlements. Landslides are an annual threat, especially during the rainy season, with more than 10 incidents disrupting infrastructure and community activities, especially in hilly areas such as Idonatae District and Teluk Dalam District. Floods also occur repeatedly, with more than seven major incidents submerging settlements and agricultural land, especially in areas adjacent to rivers. These disaster incidents demonstrate the importance of mitigation and preparedness efforts in dealing with potential disasters that always threaten the South Nias Regency area.

To overcome these challenges, comprehensive and sustainable spatial planning is needed, as well as increasing the capacity of human resources in natural resource management. In supporting comprehensive spatial planning, it is necessary to conduct a land capability analysis in determining the direction of spatial planning. The application of modern agricultural technology and the development of supporting infrastructure are also key to increasing the productivity and welfare of the South Nias community. With the right approach, South Nias has the potential to optimize sustainable land use, improve the local economy, and maintain environmental sustainability. This study aims to evaluate the level of land capability in South Nias Regency, focusing on basic physical elements. In this study, land capability units (LCAP) are the main element in assessing the physical potential of the land. LCAP is used to identify and analyze the morphology of the area, so that it can design appropriate land use and in accordance with its function. With this approach, it is expected that land management can be carried out in a more planned manner, considering the physical conditions of the land to support the sustainability and efficiency of land use in the area.

a. Problem Formulation

The problem in this research is how is the condition of land capacity in the South Nias district area in supporting development plans?

b. Research purposes

The aim of this study is to determine the condition of land capability in South Nias district so that it can be used as a consideration in carrying out development planning.

II. METHODOLOGY

This research is a quantitative research to process and interpret the collected data, as well as spatial analysis methods to evaluate land capability. In spatial analysis, the superimpose method is used, thus facilitating understanding of the potential and characteristics of land in the area studied. This approach allows for mapping and analyzing the distribution of land capability more clearly and in a structured manner. The weighting required in this superimpose analysis refers to the Regulation of the Minister of Public Works No. 20/PRT/M.2007.

a. Land Capability Unit (SKL) Morphology

The purpose of the Morphological SKL analysis is to identify the landforms in the planning area that are suitable for development based on their function. This analysis uses morphological map and slope map data as input, and produces a Morphological SKL map along with an explanation of the potential land use in the area.

Table 2 Morphology SKL Weighting

No.	Morphological Map	Slope	SKL Morphology	Mark
1	Steep Hills	> 45 %	Very high	1
2	Medium Hills	25 – 45 %	Tall	2
3	Gentle Hills	15 – 25 %	Currently	3
4	Wavy Plains	2 – 15 %	Low	4
5	Flat Land	0 – 2 %	Very Low	5

Source: Regulation of the Minister of Public Works No. 20/PRT/M.2007

b. Land Capability Unit (SKL) Ease of Work

The purpose of the SKL Ease of Work analysis is to assess the extent to which land in an area is easy to prepare or work on for construction or development purposes.

Table 3 SKL Weighting Ease of Work

No.	Morphology	Slope	Height	Type Land	SKL Convenience Done	Mark
1.	Steep Hills	> 45 %	2500 – 3672 m	Mediterranean	Very Low	1
2.	The Hills Currently	25 – 45 %	1500 – 2500 m	Grumosol, Latosol	Low	2
3.	Gentle Hills	15 – 25 %	500 – 1500 m	Andosol,	Currently	3
4.	Plains Wavy	2 – 15 %	100 – 500 m	Gleisol, Lithosol	Tall	4
5.	Flat Land	0 – 2 %	0 – 100 m	Alluvial	Very high	5

Source: Regulation of the Minister of Public Works No. 20/PRT/M.2007

c. Land Capability Unit (SKL) Slope Stability

The purpose of the SKL Slope Stability analysis is to evaluate the extent to which the slope stability in the development area is able to withstand the given load. This analysis process requires input data such as topographic maps, morphological maps, slope gradient maps, soil type maps, hydrogeological maps, rainfall maps, natural disaster maps (including potential volcanic disasters and their vulnerability to landslides), and existing spatial pattern maps.

Table 4 SKL Weighting of Slope Stability

No.	Morphology	Slope	Height	Type Land	Rainfall Rain	Vulnerability Movement Land	SKL Stability Slope	Mark
1	The Hills Steep	> 45 %	2500 – 3672 m	Mediterranean	> 3000 mm/yr	Very Vulnerable	Very Low	1
2	The Hills Currently	25 – 45 %	1500 – 2500 m	Grumosol, Latosol	2000-3000 mm/yr	Vulnerable	Low	2
3	The Hills Sloping	15 – 25 %	500 – 1500 m	Andosol,	1000-2000 mm/yr	Currently	Currently	3
4	Plains Wavy	2 – 15 %	100 – 500 m	Gleisol, Lithosol	< 1000 mm/yr	Low	Tall	4
5	Plains Sloping	0 – 2 %	0 – 100 m	Alluvial		Very Low	Very high	5

Source: Regulation of the Minister of Public Works No. 20/PRT/M.2007

d. Land Capability Unit (SKL) Foundation Stability

The purpose of the Foundation Stability SKL analysis is to assess the ability of the soil to support heavy building loads in urban development areas, as well as to determine the most appropriate type of foundation based on soil conditions. This analysis requires input data such as slope stability SKL maps, soil type maps, effective soil

depth maps, soil texture maps, hydrogeological maps, and existing spatial pattern maps. The results of this analysis are in the form of Foundation Stability SKL maps and their explanations.

Table 5SKL Weighting of Foundation Stability

No.	SKL Slope Stability	Soil Type	SKL Foundation Stability	Mark
1	Very Low	Mediterranean	Very Low	1
2	Low	Grumosol, Latosol	Low	2
3	Currently	Andosol,	Currently	3
4	Tall	Gleisol, Lithosol	Tall	4
5	Very high	Alluvial	Very high	5

Source: Regulation of the Minister of Public Works No. 20/PRT/M.2007

e. Land Capability Unit (SKL) Water Availability

The purpose of the Water Availability SKL analysis is to assess the extent of the availability and ability of water supply at each level required for regional development. In this analysis process, input data is required in the form of morphological maps, land slope maps, rainfall maps, hydrogeological maps, soil type maps, and existing spatial pattern maps. The result of this analysis is a Water Availability SKL map along with its explanation.

Table 6SKL Water Availability Weighting

No.	Morphology	Slope	Soil Type	Rainfall Map Rain	SKL Availability Water	Mark
1	Steep Hills	> 45 %	Mediterranean		Very Low	1
2	Medium Hills	25 – 45 %	Grumosol, Latosol	< 1000 mm/yr	Low	2
3	Gentle Hills	15 – 25 %	Andosol,	1000 – 2000 mm/yr	Currently	3
4	Wavy Plains	2 – 15 %	Gleisol, Lithosol	2000 – 3000 mm/yr	Tall	4
5	Flat Land	0 – 2 %	Alluvial	> 3000 mm/yr	Very high	5

Source: Regulation of the Minister of Public Works No. 20/PRT/M.2007

f. Land Capability Unit (SKL) Drainage

The purpose of the SKL analysis for Drainage is to evaluate the extent to which land can drain rainwater naturally, so as to prevent the occurrence of puddles, both local and wider.

Table 7Drainage SKL Weighting

No.	Morphology	Slope	Height	Type Land	Rainfall	SKL Drainage	Mark
1	Steep Hills	> 45 %	2500 – 3672 m	Latosol		Very high	5
2	Medium Hills	25 – 45 %	1500 – 2500 m	Andosol	< 1000	Tall	4
3	Gentle Hills	15 – 25 %	500 – 1500 m	Lithosol	1000 – 2000	Currently	3
4	Wavy Plains	2 – 15 %	100 – 500 m	Gleisol	2000 – 3000 mm/yr	Low	2
5	Flat Land	0 – 2 %	0 – 100 m	Alluvial	> 3000	Very Low	1

Source: Regulation of the Minister of Public Works No. 20/PRT/M.2007

g. Land Capability Unit (SKL) Against Erosion

The purpose of the SKL analysis against erosion is to identify areas that are vulnerable to soil erosion, so that land resilience can be evaluated and its impacts can be prevented in downstream areas. This analysis requires input data such as morphological maps, slope gradients, soil types, hydrogeology, soil texture, rainfall, and existing spatial patterns, with the result being a SKL map against erosion.

Table 8Weighting (SKL) Against Erosion

No.	Morphological Map	Map Slope	Map Type Land	Rainfall Map Rain	SKL Erosion	Mark
1	Steep Hills	> 45 %	Regosol, Litosol	> 3000 mm/yr	Very Low	1
2	Medium Hills	25 – 45 %	Andosol, Gromosol	2000 – 3000 mm/yr	Low	2
3	Gentle Hills	15 – 25 %	Mediterranean	1000 – 2000	Currently	3

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				mm/yr		
4	Wavy Plains	2 – 15 %	Latosol	< 1000 mm/yr		4
5	Flat Land	0 – 2 %	Alluvial, Gleisol		Very high	5

Source: Regulation of the Minister of Public Works No. 20/PRT/M.2007

h. Land Capability Unit (SKL) for Waste Disposal

The purpose of the Waste Disposal SKL analysis is to identify areas that can be used as suitable locations for the storage and processing of waste, both solid and liquid waste.

Table 9 Weighting (SKL) of Wastewater Discharge

No.	Morphological Map	Map Slope	Height	Map Type Land	Rainfall Map Rain	SKL Disposal Waste	Mark
1	Steep Hills	> 45 %	2500 – 3672 m	Latosol	> 3000 mm/yr	Very high	5
2	Medium Hills	25 – 45 %	1500 – 2500 m	Andosol	2000 – 3000 mm/yr	Tall	4
3	Gentle Hills	15 – 25 %	500 – 1500 m	Lithosol	1000 – 2000 mm/yr	Currently	3
4	Plains Wavy	2 – 15 %	100 – 500 m	Gleisol	< 1000 mm/yr	Low	2
5	Flat Land	0 – 2 %	0 – 100 m	Alluvial		Very Low	1

Source: Regulation of the Minister of Public Works No. 20/PRT/M.2007

i. Land Capability Unit (SKL) Against Natural Disasters

The purpose of the SKL analysis of Natural Disasters is to assess the land's ability to cope with natural disasters, especially those related to geological factors, in order to reduce or prevent negative impacts and victims caused by the disaster.

Table 10 Weighting (SKL) Against Disasters

No	Morphology	Slope	Height	Soil Type	Rainfall	Flood Prone	Vulnerable Mountain Fiery	Vulnerability Movement Land	Disaster SKL Natural	Mark
1	Steep Hills	> 45 %	2500 – 3672 m	Regosol, Litosol	> 3000 mm/yr	Very high	Very high	Very high	Very Low	1
2	The Hills Currently	25 – 45 %	1500 – 2500 m	Andosol, Gromosol	2000 – 3000 mm/yr	Tall	Tall	Tall	Low	2
3	The Hills Sloping	15 – 25 %	500 – 1500 m	Mediterranean	1000 – 2000 mm/yr	Currently	Currently	Currently	Currently	3
4	Plains Wavy	2 – 15 %	100 – 500 m	Latosol	< 1000 mm/yr	Low	Low	Low	Tall	4
5	Flat Land	0 – 2 %	0 – 100 m	Alluvial, Gleisol		Very Low	Very Low	Very Low	Very high	5

Source: Regulation of the Minister of Public Works No. 20/PRT/M.2007

j. Land Capability Development Unit

Land Capability Unit Analysis (LSA) is a method for assessing and classifying the ability of a land to support various types of uses or activities based on the physical and natural characteristics of the land. This analysis aims to determine the level of land suitability for various activities such as agriculture, settlements, industry, or waste storage, as well as to identify potential and existing constraints.

Table 11 SKL Development Weighting

No.	Land Capability Unit (SKL)	Weight
1	SKL Morphology	5
2	SKL Ease of Work	1
3	SKL Slope Stability	5
4	SKL Foundation Stability	3

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5	SKL Water Availability	5
6	SKL for Drainage	5
7	SKL against Erosion	3
8	SKL Waste Disposal	0
9	Natural Disaster SKL	5

Source: Regulation of the Minister of Public Works No. 20/PRT/M.2007

Table 12SKL Development Classification

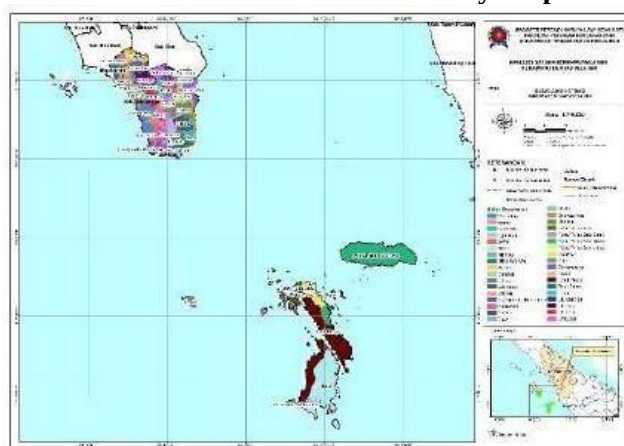
No.	Total Value	Development Classification
1	32– 58	Very Low Development Ability
2	59– 84	Low Development Ability
3	85 – 110	Medium Development Ability
4	111– 136	Somewhat High Development Ability
5	137– 160	Very High Development Ability

Source: Regulation of the Minister of Public Works No. 20/PRT/M.2007

III. RESULTS AND DISCUSSION

South Nias Regency is one of the regencies in North Sumatra province with an area of 253,375.9 hectares divided into 35 sub-districts. In 2024, South Nias Regency had a population of 369,370 people. South Nias Regency has an area consisting of small islands and 3 large islands after Nias Island. Based on the South Nias Regency spatial planning (RTRW) data, South Nias Regency is divided into 92 islands.

Picture1Administrative Boundary Map



a. Land Capability Unit (SKL) Morphology

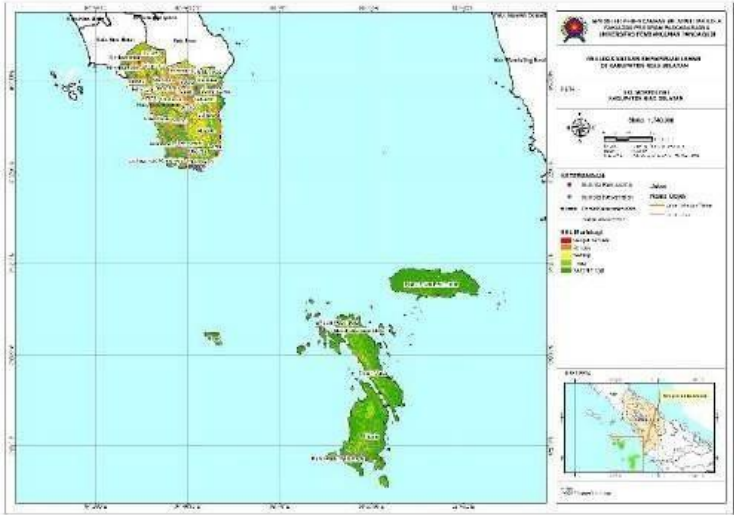
Based on the results of the Morphological SKL analysis, it can be seen that South Nias Regency is dominated by land with Very High Morphological SKL, which is 118,603.3 ha and High Morphological SKL is also 86,908.3 ha. If viewed based on land with low capability, it is only 10,634.5 hectares while very low capability is only 6 hectares. Thus, South Nias Regency is dominated by land with very high capability.

Table 13Area Based on Morphological SKL

No	SKL Class	Area (Ha)
1	Very Low	6.0
2	Low	10,634.5
3	Currently	37,223.7
4	Tall	86,908.3
5	Very high	118,603.3
Total		253,375.9

Source: 2024 Analysis Results

Picture2SKL Morphology Map



b. Land Capability Unit (SKL) Ease of Work

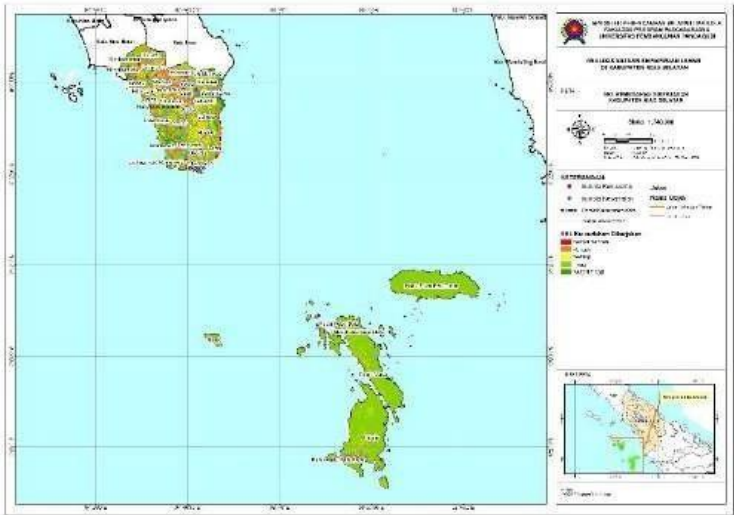
Based on the results of the SKL analysis of Ease of Work, it can be seen that in South Nias Regency, the SKL for ease of work is Very High covering an area of 12,018.9 ha and high covering an area of 195,534.8 ha. If viewed based on land with low capability, it is only 14,841.9 hectares and there is no very low capability. In terms of land capability, the ease of work in South Nias Regency is dominated by high land capability.

Table 14Area Based on SKL Ease of Work

No	SKL Class	Area (Ha)
1	Very Low	
2	Low	14,841.9
3	Currently	30,980.3
4	Tall	195,534.8
5	Very high	12,018.9
Total		253,375.9

Source: 2024 Analysis Results

Picture3SKL Map Ease of Work



c. Land Capability Unit (SKL) Slope Stability

Based on the results of the SKL Slope Stability analysis, it can be seen that in South Nias Regency, the Very High SKL Slope Stability covers an area of 168,028.0 ha and the high SKL covers an area of 56,035.9 ha. While if viewed based on the low class SKL, there is only an area of 4,471.7 and there is no very low class. Thus, it can be concluded that the SKL Slope Stability is dominated by Very high capabilities.

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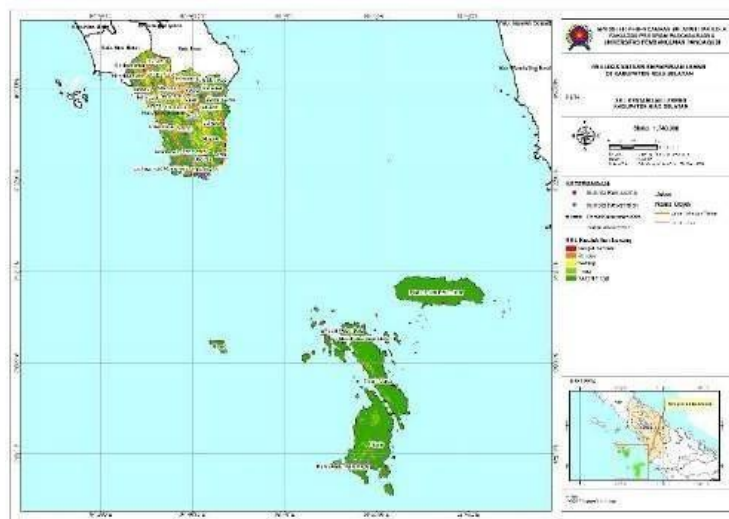
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Table 15 Area Based on SKL Slope Stability

No	SKL Class	Area (Ha)
1	Very Low	
2	Low	4,471.7
3	Currently	24,840.3
4	Tall	56,035.9
5	Very high	168,028.0
Total		253,375.9

Source: 2024 Analysis Results

Picture 4 SKL Slope Stability Map



d. Land Capability Unit (SKL) Foundation Stability

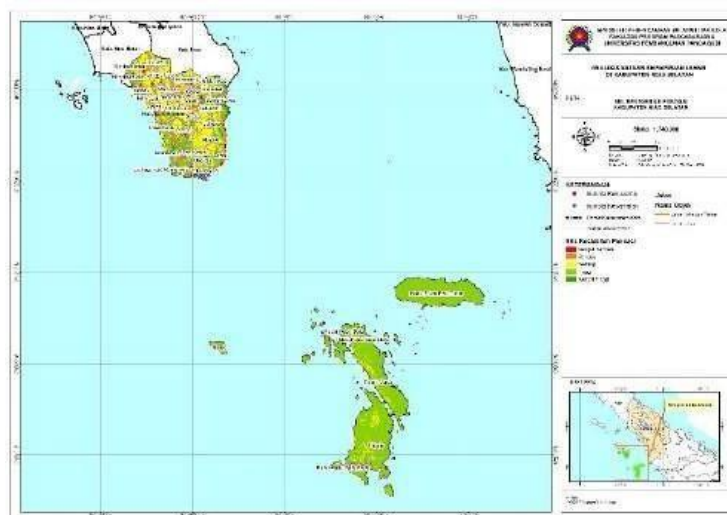
Based on the results of the SKL Foundation analysis, it can be seen that in South Nias Regency, the SKL Foundation Stability is Very High covering an area of 7,493.1 ha and a high area of 163,564.6 hectares. Based on the SKL Foundation Analysis, in South Nias Regency there is no land with very low capability while low capability covers an area of 4,160.2 hectares. Thus, South Nias Regency in terms of capability in Foundation stability is dominated by land with high capability.

Table 16 Area Based on SKL Foundation Stability

No	SKL Class	Area (Ha)
1	Very Low	
2	Low	4,160.2
3	Currently	78,158.0
4	Tall	163,564.6
5	Very high	7,493.1
Total		253,375.9

Source: 2024 Analysis Results

Picture5SKL Map of Foundation Stability



e. Land Capability Unit (SKL) Water Availability

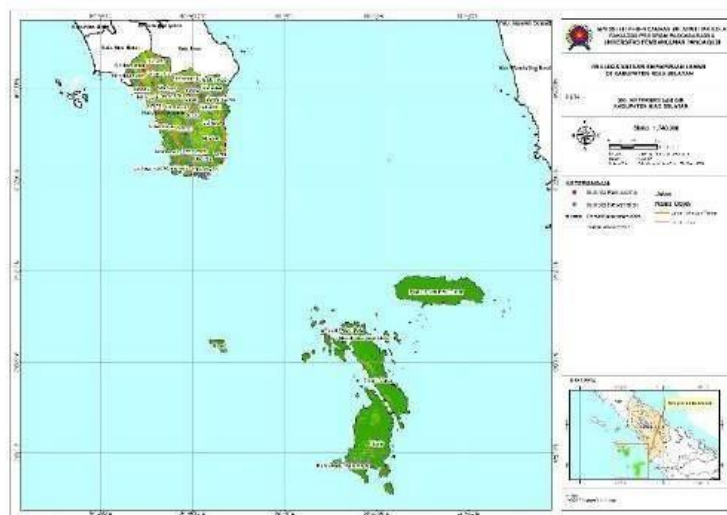
Based on the results of the analysis of SKL Water Availability, it can be seen that in South Nias Regency, SKL Water Availability is Very High covering an area of 168,653.7 ha and high covering an area of 81,741.8 hectares. When viewed based on the low and very low land capability classes, there are none, so that South Nias Regency in terms of land capability in water availability is dominated by the very high class.

Table 17Area Based on SKL Water Availability

No	SKL Class	Area (Ha)
1	Very Low	
2	Low	
3	Currently	2,980.4
4	Tall	81,741.8
5	Very high	168,653.7
Total		253,375.9

Source: 2024 Analysis Results

Picture6SKL Water Availability Map



f. Land Capability Unit (SKL) Drainage

Based on the results of the SKL Drainage analysis, it can be seen that in South Nias Regency, SKL Drainage has no land with a Very High class, while the high class is 2,096.1 hectares. If viewed based on land with a very low capability class, there is none, but in the low capability class there is 205,408.6 hectares. Thus, in terms of land capability for drainage, it is dominated by land with low capability.

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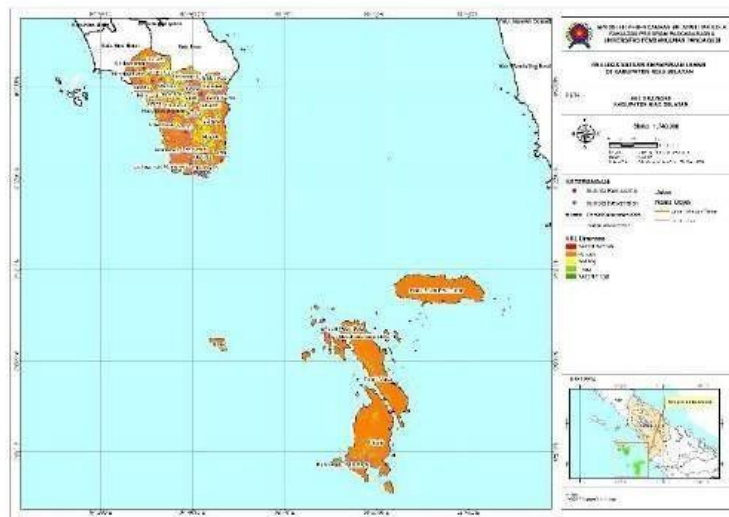
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Table 18 Area Based on Drainage SKL

No	SKL Class	Area (Ha)
1	Very Low	
2	Low	205,408.6
3	Currently	45,871.2
4	Tall	2,096.1
5	Very high	
Total		253,375.9

Source: 2024 Analysis Results

Picture 7 SKL Drainage Map



g. Land Capability Unit (SKL) Against Erosion

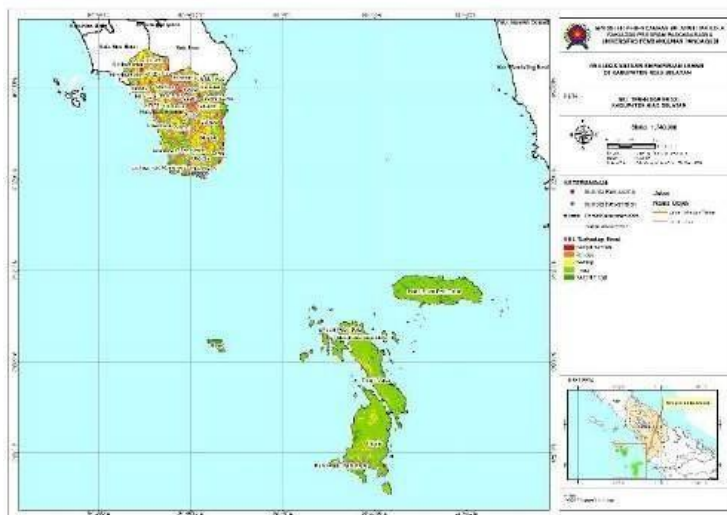
Based on the results of the SKL analysis against erosion, it can be seen that in South Nias Regency, the SKL against erosion is very high covering an area of 12,018.9 ha and high covering an area of 195,534.8 ha. If viewed, the area of land with a very low class is 2,980.4 hectares while the low class is 24,655.6 hectares. Thus, the land capability unit against erosion in South Nias Regency is dominated by land with high capability.

Table 19 Area Based on SKL Against Erosion

No	SKL Class	Area (Ha)
1	Very Low	2,980.4
2	Low	24,655.6
3	Currently	57,086.2
4	Tall	157,043.6
5	Very high	11,610.2
Total		253,375.9

Source: 2024 Analysis Results

Picture8SKL Map Against Erosion



h. Land Capability Unit (SKL) for Waste Disposal

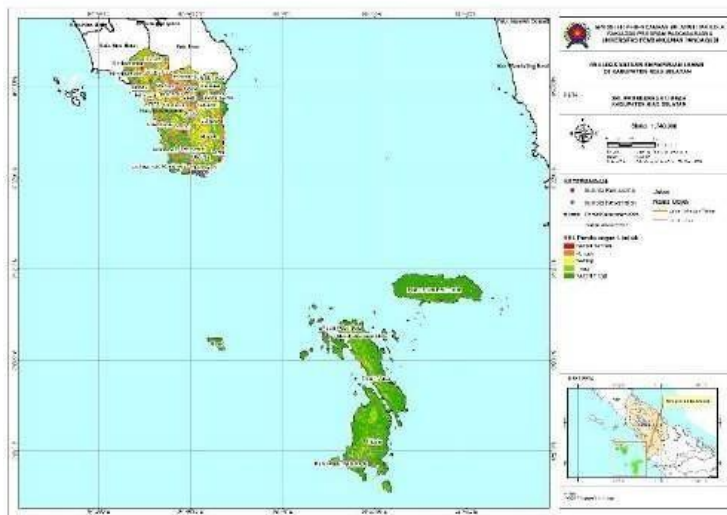
Based on the results of the Waste Disposal SKL analysis, it can be seen that in South Nias Regency, the Very High Waste Disposal SKL covers an area of 118,290.8 ha and the high SKL covers an area of 85,610.0 ha. Land with very low capacity covers an area of 701.1 ha and low class covers an area of 12,788.8 ha. Thus, South Nias Regency is dominated by land with very high waste disposal capacity.

Table 20Area Based on Waste Disposal SKL

No	SKL Class	Area (Ha)
1	Very Low	701.1
2	Low	12,788.8
3	Currently	35,985.2
4	Tall	85,610.0
5	Very high	118,290.8
Total		253,375.9

Source: 2024 Analysis Results

Picture9SKL Waste Disposal Map



i. Land Capability Unit (SKL) Against Natural Disasters

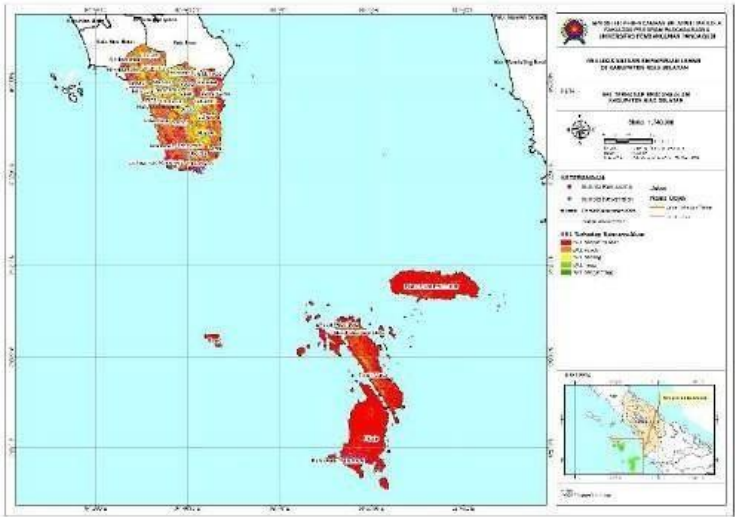
Based on the results of the SKL analysis of Natural Disasters, it can be seen that in South Nias Regency, the SKL for Natural Disasters is Very High, covering an area of 19.5 ha and a high area of 9,383.8 hectares. If viewed, the area of land with very low capacity is 137,429.0 hectares and low capacity land is 72,284.0 hectares. Thus, South Nias Regency has land with very low land capacity in dealing with natural disasters.

Table 21Area Based on SKL for Natural Disasters

NO	SKL Class	Area (Ha)
1	SKL Against Disasters Very Low	
2	Low Disaster Response SKL	
3	SKL Against Medium Disasters	
4	SKL Against High Disaster	
5	SKL Against Disaster Very High	
Total		

Source: 2024 Analysis Results

Picture10Map Against Natural Disasters



j. Land Capability Development Unit

Based on the results of the SKL Development analysis, it can be seen that in South Nias Regency, the Very High Development SKL covers an area of 134,769.8 ha and a high area of 44,280.1 ha. While if viewed based on land with very low capability, it is only 3,063.6 hectares and low capability is 11,669.3 hectares. Thus, based on the results of the Land Capability Unit analysis that has been carried out in this study, it is stated that in South Nias Regency there is an area of 179,049.8 ha (the sum of high development with very high development). This will have a positive effect on land use planning in South Nias Regency, where there will be many planning options that can be developed because of the supportive land conditions.

Table 22Area Based on Development SKL

No	SKL Class	Area (Ha)
1	SKL Development Very Low	3,063.6
2	Low Development SKL	11,669.3
3	Medium Development SKL	59,593.2
4	High Development SKL	44,280.1
5	SKL Very High Development	134,769.8
Total		253,375.9

Source: 2024 Analysis Results

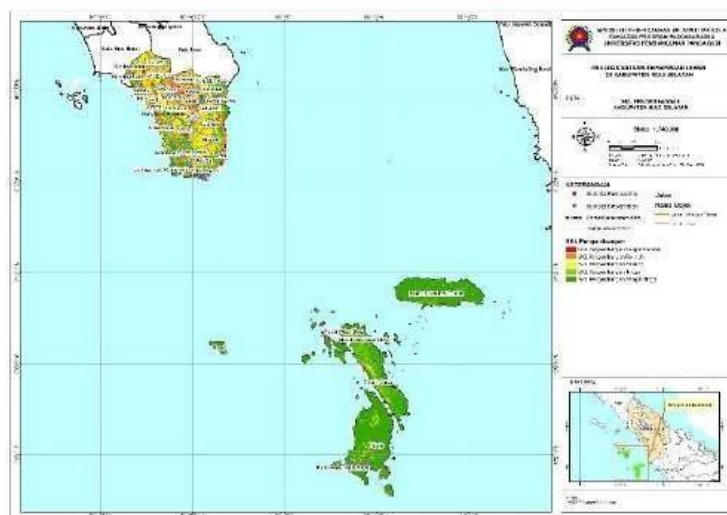
From the results of the analysis of land capability units in South Nias Regency that have been carried out previously, the area of each class of land capability units can be detailed per sub-district. If viewed based on data per sub-district, there are several sub-districts that are the highest in contributing land with very high land capability, namely Hilibala sub-district with a very high class of 28,466.4 hectares, Pulau-Pulau Batu Timur sub-district with a very high class of 33,546.4 hectares and Tanah Masa with a very high class of 24,994.4 hectares. For more details on each class and sub-district, see the table below.

Table 23 District Area Based on Land Development Capacity

No	Subdistrict	SKL Development					Amount (Ha)
		Very Low	Low	Currently	Tall	Very high	
1	Amanda	73.3	237.4	2,606.3	3,096.2	3,354.8	9,367.9
2	Aramo	91.7	286.2	2,827.9	1,555.4	1,648.0	6,409.2
3	Boronadu	432.9	1,481.3	1,569.9	116.0	49.6	3,649.7
4	Fanayama	18.0	337.3	3,812.7	1,849.6	1,351.4	7,368.9
5	Gomo	65.7	184.4	1,532.3	640.1	558.6	2,981.1
6	Hibala		116.3	1,239.2	2,450.2	28,466.4	32,272.1
7	Hilimegai	84.3	215.5	2,114.9	383.0	209.1	3,006.8
8	Hilisalawa'Ahe	62.3	43.3	1,321.8	1,091.7	1,053.9	3,572.9
9	Hurun	104.6	449.9	3,024.2	1,341.9	346.3	5,266.9
10	Idanotae	94.1	259.8	1,930.1	1,296.0	1,828.1	5,408.2
11	Lahusa	267.7	603.1	3,905.8	1,467.9	1,799.2	8,043.6
12	Lolomatua	67.9	486.6	2,501.4	829.9	279.8	4,165.6
13	Lolowau	57.7	101.2	1,651.7	1,042.8	1,949.0	4,802.5
14	Luahagundre Maniamolo			205.5	652.4	3,957.6	4,815.4
15	Maniamolo		51.7	738.0	1,610.3	2,855.0	5,255.0
16	Mazino	99.6	589.9	3,132.9	717.6	566.4	5,106.5
17	Mazo	326.3	632.8	1,435.6	110.2	78.6	2,583.5
18	Onohazumba	0.6	118.5	2,196.3	593.1	187.7	3,096.3
19	Onolalu		148.4	1,515.1	1,109.7	832.3	3,605.5
20	O'O'U	30.1	177.0	2,381.9	982.5	787.5	4,359.0
21	The Rock Islands		4.6	32.5	508.3	4,297.7	4,843.0
22	West Rock Islands		11.5	108.5	220.0	3,701.5	4,041.4
23	East Stone Islands			42.9	3,392.1	33,546.4	36,981.5
24	Northern Rock Islands			6.2	2,240.3	4,665.9	6,912.5
25	Sidua'Ori	61.9	198.3	1,953.9	965.9	909.8	4,089.8
26	Simuk					2,067.5	2,067.5
27	Somambawa	45.0	75.6	568.7	1,387.9	3,176.7	5,254.0
28	Milk	65.0	537.1	2,658.0	330.3	59.2	3,649.7
29	Land of Time		129.1	1,248.2	7,007.1	24,994.4	33,378.7
30	Deep Bay		49.6	445.3	1,169.2	2,514.6	4,178.7
31	Tom	108.8	148.0	905.6	1,377.1	1,283.4	3,823.0
32	Ulu Idanotae	34.5	125.1	2,388.4	637.1	194.8	3,379.9
33	Uluoyo	254.3	2,088.3	3,097.2	1,051.8	459.6	6,951.1
34	The Greatest	142.6	797.9	2,741.3	901.9	642.6	5,226.3
35	Umbunation	474.7	983.7	1,752.8	154.5	96.4	3,462.1
Total		3,063.6	11,669.3	59,593.2	44,280.1	134,769.8	253,375.9

Source: 2024 Analysis Results

Picture 11 SKL Development Map



IV. CLOSING

a. Conclusion

From the results of the analysis of the Land Capability Unit (SKL) in South Nias Regency, it is stated that there are two land capability units with a dominant low capability. The first is the Drainage Capability Unit with a low dominant, this is influenced by the type of soil and rainfall in South Nias Regency which do not support High Capability for drainage. The second is the Land Capability Unit for Disaster Prone where this is also dominated by low class SKL. This is influenced by the geological position of South Nias Regency which causes the South Nias Regency area to be an area prone to high earthquake disasters.

b. Suggestions

South Nias Regency consists of many islands, both large and small. Of course this will affect the length of the coastline where South Nias Regency has a fairly long coastline. Based on the analysis of land capability that has been carried out, the islands technically have a high capacity to be developed. So to anticipate wild utilization, a strict type of utilization must be determined so that land utilization does not affect marine habitats.

REFERENCES

- Andri Estining, Putri Tipa Anasi, La Orde Nursalam, Rina Astarika, La Ode Muhammad, Ruspan Takasi. (2024), *Buku Analisis Spasial Overlay 2024*, CV. Eureka Media Aksara
- Cahyadi, A., Marfai, MA., Rahmadana, A.D.W., Nuciera, F. (2012). *Perencanaan Pengguna lahan karst berbasis analisis kemampuan lahan dan pemetaan kawasan lindung sumberdaya air*. Seminar National Science, Engineering and Technology.
- Kementerian PUPR, (2007) Pedoman Teknik Aspek Fisik dan Lingkungan, Ekonomi Serta Sosial Budaya Dalam Penataan Ruang
- Notohadiprawiro, T. (1987). *Dasar-dasar Ilmu Tanah*. Gadjah Mada University Press
- Dinas PUPR Kabupaten Nias Selatan (2024), *Revisi RTRW Kabupaten Nias Selatan*
- Badan Pusat Statistik Kabupaten Nias Selatan (2024), *Kabupaten Nias Selatan Dalam Angka 2024*