

ANALYSIS OF POTENTIAL LAND FOR RELOCATION RESIDENTIAL AREA IN SIMALUNGUN REGENCY

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Abstract

Spatial planning is a structured planning from various considerations of analysis and projection results so as to produce concrete planning to be used as a reference in effective, efficient and sustainable spatial utilization. Emergency or urgent conditions such as disasters, conflicts, strategic projection development and so on that require an existing residential area to be relocated, then the handling has the potential to be inconsistent with spatial planning. Placement of relocation areas is often directed at land with the status "Available" without having to ensure its status "In accordance" with the spatial plan. This study was conducted to find land that is available and in accordance with the spatial plan as a potential area for relocation of residential areas. This study is a quantitative study with the superimpose analysis method, namely carrying out a spatial overlap process on the variables (Disaster Prone, Land Capability Unit, Spatial Pattern Plan, Existing Land Cover and Land Legality Status) that have been determined. From the results of the research that has been carried out, there is land that is suitable to be used as a relocation area 12,161.6 hectares. However, based on the availability of land ownership legality data, Simalungun Regency has 6 locations to be used as alternatives for relocation of residential areas with a total area of 20.68 hectares. For greater needs in the future, land with an area of 112,161.6 hectares can be used as an alternative.

Keywords: *Simalungun Regency, Settlement, Relocation, Superimpose, Spatial Planning*

1. INTRODUCTION

A. Background

Spatial planning is a system of spatial planning processes, spatial utilization, and control of spatial utilization. If viewed based on its objectives, the objectives of spatial planning are to realize harmony between the environment and nature and the artificial environment, to realize integration in the use of natural resources and artificial resources with attention to human resources; to realize protection of spatial functions and prevention of negative impacts on the environment due to spatial utilization. This is mandated in Law No. 26 of 2007 concerning Spatial Planning. From the definition and objectives of spatial planning above, the planning should have been arranged before development was carried out, but in reality, development had occurred long before there were regulations on spatial planning.

According to Nuraini, C., (2019). The process of forming a residential environment in an area always has unique characteristics, which reflect the character of its residents. Along with changes in norms, cultural roles, and behavior, the character of society can also change due to modernization and environmental character. One of the challenges in spatial planning is the existence of built-up areas before their functions are determined through spatial analysis, causing functional incompatibility. Achieving spatial planning goals requires a long process with various strategies, one of which is by reducing the incompatibility of space utilization.

After the issuance of the spatial planning law, there are still many uses of space that are not in accordance with their original purpose. This is caused by violations of regulations and emergency conditions that force changes in the function of space. Emergency conditions can occur due to natural disasters such as floods, landslides, earthquakes, or volcanic eruptions, which require relocation to safer areas. In addition, strategic projects such as the construction of toll roads and railways can also cause the relocation of residential areas. In emergency situations, the objectives of spatial planning are often neglected, so that space is utilized not in accordance with the established plan. To overcome the inconsistency of spatial utilization due to violations of regulations, strict enforcement of regulations is needed. Meanwhile, in dealing with emergency conditions, it is necessary to plan a reserve area that is

in accordance with the spatial plan, has adequate land capacity, and clear legality so as not to cause administrative obstacles when built. Each region needs to have an alternative plan for emergency conditions. Therefore, this study will examine the readiness of land for development in emergency conditions with a case study: Simalungun Regency. Simalungun Regency is one of the regencies in North Sumatra Province which is in 4th position as the regency with the largest population in North Sumatra province. Based on data from the Central Statistics Agency 2024 in Simalungun Regency in Figures 2024, the population of Simalungun Regency reached 1,035,920 people.

In certain conditions, residents in Simalungun Regency need land for relocation of existing residential areas because they experience an emergency condition caused by natural disasters or urgent development. When viewed from the disaster incident data for the last 6 years in Simalungun Regency, it was recorded that several times and resulted in fatalities and material losses. There are 3 types of disasters that often occur in Simalungun Regency, namely landslides with a random number of incidents over the last 6 years of 124 times with 8 fatalities, then floods 74 times and tornadoes 5 times in a period of 6 years. In addition to disaster event trace data, the environmental service index for regulating natural disaster prevention and protection in Simalungun Regency also shows that the dominant environmental capacity is moderate and tends to be low. Of course, this must be watched out for and good mitigation planning must be prepared to avoid greater risks and impacts, one of which is by preparing relocation land for the area that is in accordance with physical and spatial criteria.

b. Problem Formulation

Are there any areas in Simlaungun district that can be used as alternative land for residential area relocation areas that are in accordance with the technical criteria for residential areas, in accordance with the spatial pattern plan and have legal land status?

c. Research Objectives

To determine alternative land plans in Simlungun district that can be used as alternative land for residential area relocation areas that are in accordance with the technical criteria for residential areas, in accordance with the spatial pattern plan and have legal land status.

d. Scope of Research

The scope of this research area is the Simalungun Regency area as a whole with a total area of 460,141.7 hectares. While the scope of the substance in this study is to conduct research with an analysis of the technical suitability of residential land, an analysis of the suitability of residential land to the Spatial Pattern Plan of the Simalungun Regency RTRW and an analysis of the legal status of the land that will be used as a plan.

2. LITERATURE REVIEW

a. Previous Research

In order for this research to be more focused on the problems to be studied and can produce new research and describe the position of this research, researchers need to conduct a literature study of similar research that has been done previously. From that, the literature study of previous research is as follows:

Table 1 Summary of Previous Research

NO.	DESCRIPTION	RESULTS
1	Researcher Name	Widya Kartika, Buddha Sukindrawati, and Sarju
	Research Title	Identification of Potential Land as a Disaster-Based Housing Relocation Location
	Research Year	2023
	Research methods	quantitative
	Research result	This study concludes that the characteristics of a spot disaster need to be handled with an independent and non-integrated relocation pattern.
	Differences with Current Research	making disaster prone areas the main variable determining relocation areas because the focus is on handling disaster prone areas, while in this study the variables are Disaster Prone Areas, SKL, Spatial Pattern Plans, Land Cover and Land Legality
2	Researcher Name	Jihan Shafira, Cathas Teguh Prakoso, and Dini Zulfiani
	Research Title	Relocation Program for Residents of the Karang Mumus Riverbank Settlement to the Wanyi Flats in Bengkuring Raya, North Samarinda District
	Research Year	2019
	Research methods	Descriptive Qualitative

NO.	DESCRIPTION	RESULTS
	Research result	Relocation of residential areas on riverbanks will face obstacles, namely demands for compensation from residents who will be relocated.
	Differences with Current Research	This research focuses on analyzing the types of problems that will be faced in the process of implementing the relocation of residential areas, while the research that will be carried out focuses on determining the location of the relocation area itself.
3	Researcher Name	Mella Febri Nurfikasari, Eppy Yuliani
	Research Title	Literature Study: Land Suitability Analysis for Settlement Locations
	Research Year	2021
	Research methods	qualitative
	Research result	The main factors that influence the suitability of residential land include natural physical parameters, land characteristics and directions for spatial use.
	Differences with Current Research	literature research that focuses on the study of factors that influence the determination of residential areas and does not focus on determining the location of the settlement itself, while the research that will be conducted focuses on research to determine the location that will be used for residential relocation.

b. Definition of Residential Area

According to Law No. 1 of 2011, residential areas are part of the living environment outside protected areas, whether in the form of urban or rural areas, which function as residential environments or residential environments and places for activities that support life and livelihood. Relocation of residential areas is the process of moving residents' residences from one place to another predetermined area. Relocation of residential areas is carried out if an area is located on land affected by a disaster or is also located on land that is strategic to infrastructure development projects. In addition, relocation also often occurs in residential areas that are not in accordance with their designation such as on riverbanks. According to a study conducted by the Asian Development Bank in 1995 entitled "Policy on Involuntary Resettlement" showed that the causes of relocation (resettlement) are government projects that require the release of land that is not in accordance with its designation also for the purposes of building city facilities and infrastructure in addition to Force majeure conditions or emergency conditions such as natural disasters, fires, wars.

3. METHODOLOGY

a. Type of Research

In this study entitled Analysis of Potential Land for Relocation of Residential Areas in Simalungun Regency, a quantitative research method is used which aims to formulate a mathematical model based on theories to answer previously formulated hypotheses. This research was conducted by conducting spatial-based mathematical assessments and calculations to produce mathematical conclusions in spatial form.

b. Research Focus

In this study, it was conducted with a focus on the problems raised, namely whether in Simalungun Regency there is potential land that can be used as an alternative for residential relocation if at some point a condition occurs that requires an area to be relocated. In determining potential land as an alternative, the things that are considered are the technical suitability of the residential area (land capability units and disaster prone), suitability of the RTRW spatial pattern plan, and land legality. One of the backgrounds of the research is the frequent occurrence of violations of spatial planning in the provision of residential relocation areas due to emergency conditions, so the desired result is to present land that is ready to be built and does not violate the objectives of spatial planning, where this research does not discuss economic and social considerations.

c. Data Collection

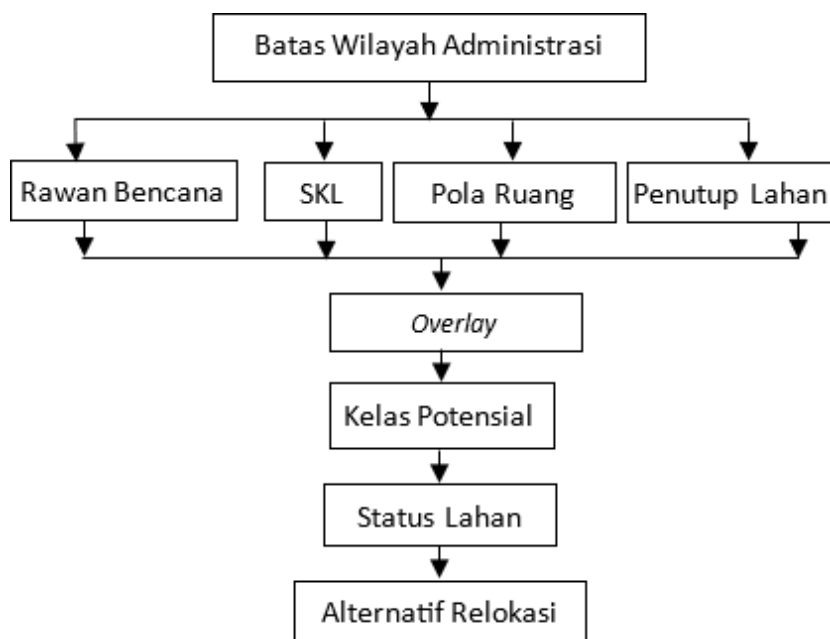
This study uses secondary data (existing land cover, land capability units, disaster prone, spatial pattern plans, land legality status) and primary data (existing conditions of potential land). In collecting secondary data, the document study method is used, namely by collecting previously existing secondary data from related OPDs. While primary data is collected using the observation method, namely by conducting direct reviews in the field.

d. Analysis Method

The analysis method used in this study is the Superimpose method. This method is carried out with several variables, namely disaster prone, Land Capability Unit (SKL), Existing Land Cover, Spatial Pattern Plan and Land

Legality Status. This Superimpose method is carried out with the Intersect Tool in the ArcGis 10.8 application, so the data needed is spatial data in shapefile format.

Figure 1. Thought Flow



1. Disaster Prone

According to the National Disaster Management Agency (BNPB), disaster-prone areas are areas that are at high risk of experiencing natural disasters or other disasters that can be caused by several factors, including: geographical conditions, geological conditions, demographic conditions and human actions.

Disaster prone is one of the important variables to consider in this study, so that the determination of potential relocation land can be avoided on land that has high and very high class disaster proneness. The weighting of disaster prone area variables is as in the following table:

2. Land Capability Unit

Land capability unit (SKL) is a class of land capability to be developed as a place of activity, so that it can be categorized as land that can be used as residential land and that which is not suitable for residential land. Weighting is carried out on each land capability class as in the following table:

3. Existing Land Cover

This study will categorize land cover into built-up land and non-built-up land. This aims to focus the analysis on unbuilt land, so that potential land is not recommended on built-up land.

4. Spatial Pattern Plan

The spatial pattern plan variables are categorized into 3 indicators, namely Settlement, Cultivation and Protected Zone. In the analysis of potential land, priority will be given to the direction of the settlement zone spatial pattern plan and avoided in the protected zone. The weighting is as follows.

5. Land Legality Status

Obstacles that are often faced when determining a land as a development location are land ownership and release status (the land in question can be released by its owner), so that the land recommended as a potential relocation land is land whose legal ownership is clear. In this case, the recommended land must be land that can be released for development land, so the information must be obtained from the land owner.

The weights for each variable are as follows.

Table 2 Weight and Score of Potential Land Determining Variables

Variables	Parameter	Weight	Score
Disaster Prone	Very Low	40	5
	Low		4
	Currently		3
	Tall		2
	Very high		1
Land Capability Unit	Very Low	15	1

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	Low		2
	Currently		3
	Tall		4
	Very high		5
Existing Land Cover	Non Awakened	20	5
	Awake		1
Spatial Pattern Plan	Settlement		5
	Other cultivation	25	3
	Protected Zone		1

Based on the score calculation from the overlay results, a classification of potential land is carried out with the following score division:

Table 3 Potential Classification

Total Score	Classification
< 100	Very Low
101 - 200	Low
201 - 300	Currently
301 - 400	Tall
> 400	Very high

Source: - PUPR Ministerial Regulation 41 of 2007 concerning Guidelines for Technical Criteria for Cultivation Areas
 - PUPR Ministerial Regulation 20 of 2007 concerning Technical Guidelines for Physical & Environmental Aspect Analysis

Table 4 Alternative Land Determining Variables

Variables	Parameter	Information
Land Legality Status	There is Ownership Status	Alternative
	No Ownership Status Data	Not an Alternative

Source: - PUPR Ministerial Regulation 41 of 2007 concerning Guidelines for Technical Criteria for Cultivation Areas
 - PUPR Ministerial Regulation 20 of 2007 concerning Technical Guidelines for Physical & Environmental Aspect Analysis
 - Nugraha, Kencana Yoga, et al. (2014)

4. RESULTS AND DISCUSSION

a. General Profile of Simalungun Regency

1. Administrative and Population Areas

Simalungun Regency is one of the regencies in North Sumatra province which has a total area of 460,141.7 Ha which is divided into 32 sub-districts. Simalungun Regency is located at an altitude of 0 - 1,500 meters above sea level (asl). Geographically, Simalungun Regency is located at coordinates 2 ° 36 ' - 3 ° 18' North Latitude and 98 ° 32 ' - 99 ° 35' East Longitude. Simalungun Regency directly borders 6 (six) regencies, namely:

- North: Serdang Bedagai and Deli Serdang Regencies
- East : Batubara Regency and Asahan Regency
- South: Toba Regency
- West : Karo Regency

Based on data from the Central Statistics Agency in Simalungun Regency in Figures in 2024, Simalungun Regency has a population of 1,035,920 people.

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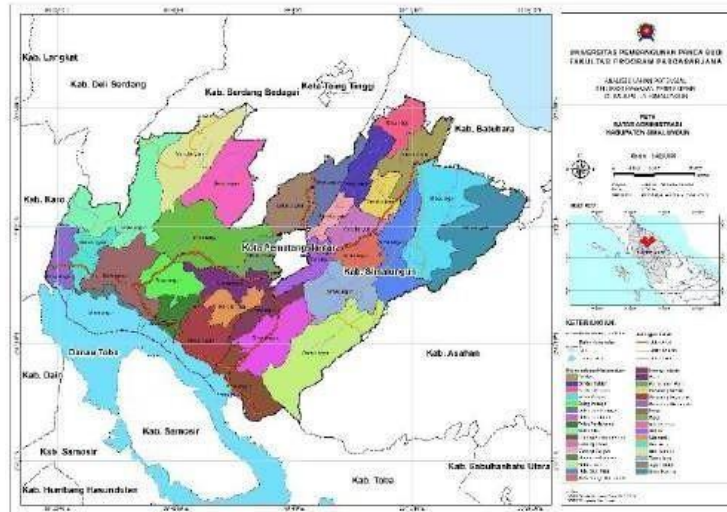
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Table 5 Area and population density in Simalungun district

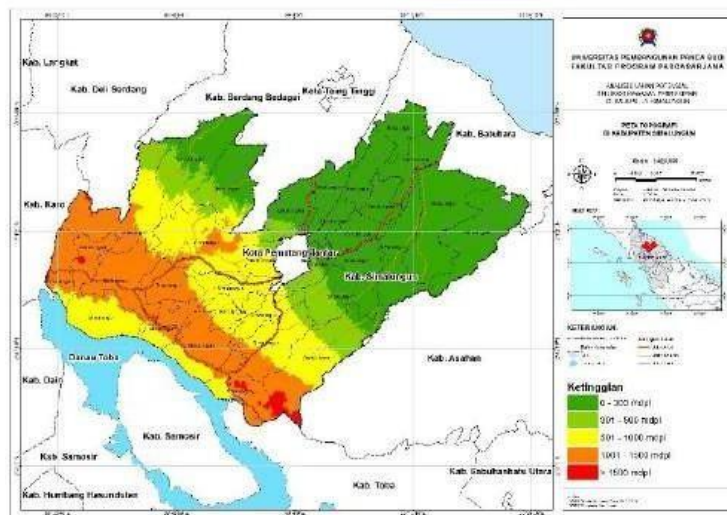
No.	Subdistrict	Wide	Population (Souls)	Population Density (People/Ha)
1	Port	13,141.5	81,889	6
2	Huluan Port	10,461.5	30,083	3
3	Masilam City	9,109.2	31,071	3
4	Maligas Boss	29,065.1	43,986	2
5	Masagal Dolog	10,661.3	14,268	1
6	The Stone Hill of Nanggar	9,842.8	46,699	5
7	The Thousand Islands	17,837.3	22,765	1
8	Pardamean Hill	8,618.1	15,549	2
9	The Glare of the Dolok	28,822.2	18,476	1
10	Girsang Sipangan Bolon	13,997.2	18,624	1
11	Mount Malela	8,819.1	42,811	5
12	Mount Maligas	4,990.2	35,214	7
13	Haranggaol Horizon	14,938.2	7,479	1
14	The end of the world	29,958.3	27,678	1
15	The King of Bayu Forest	17,366.9	36,565	2
16	Javanese Maraja Bah Jambi	7,036.8	23,365	3
17	The Hataran	7,587.3	19,878	3
18	Pane	9,110.4	29,715	3
19	Panombeian Pane	7,552.1	26,141	3
20	City embankment	7,436.7	40,053	5
21	Sidamanik Embankment	17,191.4	20,334	1
22	Silima Huta Embankment	8,825.3	13,992	2
23	Ancient	18,554.6	28,624	2
24	Raya	27,701.3	31,139	1
25	Kahean Kingdom	21,109.3	22,364	1
26	Siantar	7,332.0	75,323	10
27	Sidamanik	7,238.0	31,453	4
28	Silimakuta	7,881.2	18,233	2
29	Silou Kahean	23,923.6	19,873	1
30	Land of Java	16,711.3	56,328	3
31	Tapian Dolok	12,637.3	46,242	4
32	The Edge of the Field	24,684.2	45,401	2
Total		460,141.7	1,021,615	2

Source: BPS, Simalungun Regency in Figures 2024

Map 1 Administrative Boundaries of Simalungun Regency



Map 2 Topography in Simalungun district



2 Slope Gradient

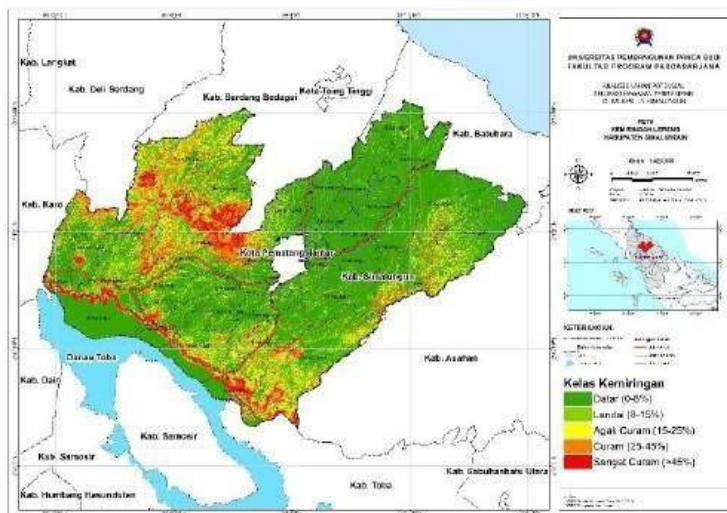
When viewed based on the slope conditions, Simalungun Regency is dominated by land with flat surface conditions, which is 280,144.1 hectares or around 60.9 percent of the total area of the regency. While land with steep conditions is 45,479.9 hectares or around 9.9 percent and very steep is 18,686.6 hectares or around 4.1 percent of the total area of Simalungun Regency.

Table 6 Land Area Based on Slope Gradient in Simalungun Regency

No.	Slope	Area (Ha)	Percentage (%)
1	Flat 0 - 8%	280,144.1	60.9
2	Ramp 8 - 15%	67,727.8	14.7
3	Slightly Steep 15 - 25%	48,103.3	10.5
4	Steep 25 - 45%	45,479.9	9.9
5	Very Steep > 45%	18,686.6	4.1
Total		460,141.7	100.0

Source: RTRW Simalungun Regency

Map3Slope Gradient in Simalungun Regency



3. Slope Gradient

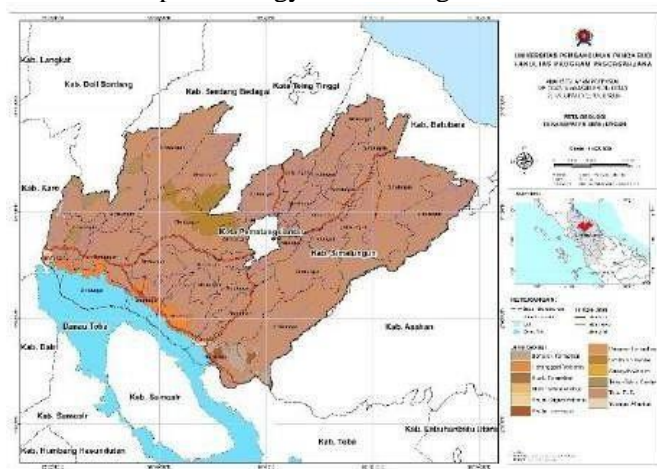
When viewed based on the geological conditions obtained from the thematic map of the Simalungun Regency RTRW, the Simalungun Regency area is dominated by the Toba Tuffs geological type covering an area of 397,229.3 hectares or around 86.3 percent of the total area of Simalungun Regency.

Table 7 Land Area Based on Geological Type

No.	Geological Types	Area (Ha)	Percentage (%)
1	Bohorok Formation	6,669.3	1.4
2	Haranggaol Volcanic	31,756.2	6.9
3	Kuala Formation	384.1	0.1
4	Minor Granite Intrusion	107.4	0.0
5	Peuet Sague Volcanic	900.1	0.2
6	Peutu Formation	1,258.4	0.3
7	Samosir Formation	2.5	0.0
8	Simbolon Center	13,574.2	3.0
9	Subayak Center	110.3	0.0
10	Takur Takur Center	4,931.8	1.1
11	Toba Tuffs	397,229.3	86.3
12	Younger Alluvium	3,217.9	0.7
Total		460,141.7	100

Source: RTRW Simalungun Regency

Map 4 Geology in Simalungun district



Year	Landslide	Flood	Tornado
2023	2	1	1
Total	124	74	5

Source: Simalungun Regency Disaster Management Agency (BPBD)

Table 10 Number of Disaster Incidents in Simalungun Regency

Year	Die	wounds	Affected/Displaced	Damaged/Submerged House
2018				
2019	1			17
2020		1	73	
2021	3			18
2022			177	144
2023	4		100	65
Total	8	1	350	244

Source: Simalungun Regency Disaster Management Agency (BPBD)

b. Disaster Prone Areas

Based on disaster-prone data from the Regional Disaster Management Agency (BPBD), there are 3 types of disaster-prone areas in Simalungun Regency, namely landslides, floods and earthquakes.

Table 11 Land Area Based on Landslide Disaster Prone

No.	Landslide Disaster	Area (Ha)	Percentage (%)
1	Very Low	357,051.38	77.60
2	Low	49,452.83	10.75
3	Currently	1,327.07	0.29
4	Tall	27,818.99	6.05
5	Very high	24,491.47	5.32
Total		460,141.74	100.00

Source: 2024 Data Compilation Results

Map 6 Landslide Prone Area

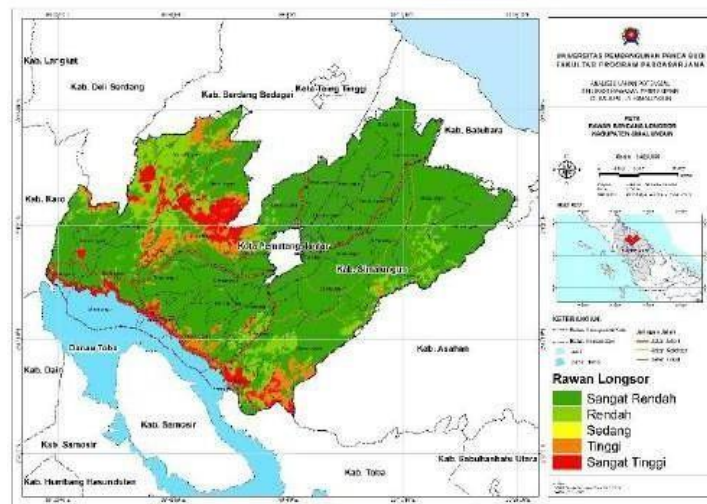


Table 12 Land Area Based on Flood Disaster Prone

No.	Floods	Area (Ha)	Percentage (%)
1	Very Low	419,910.01	91.26
2	Low	391.25	0.09
3	Currently	20,339.99	4.42
4	Tall	19,500.48	4.24
Total		460,141.74	100.00

Source: 2024 Data Compilation Results

Map 7 Flood Disaster Prone

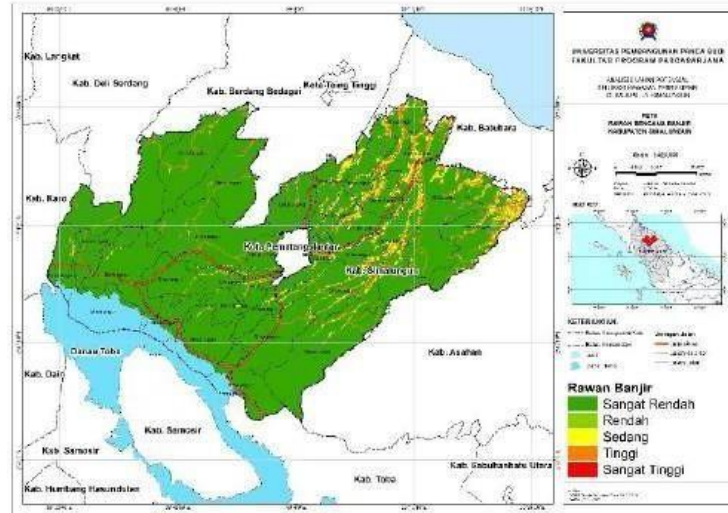
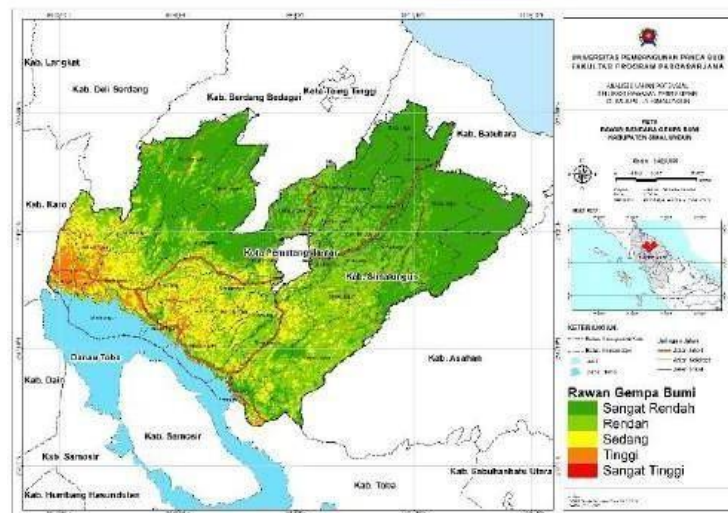


Table 13 Land Area Based on Earthquake Disaster Risk

No.	Earthquake	Area (Ha)	Percentage (%)
1	Very Low	206,849.22	44.95
2	Low	145,832.36	31.69
3	Currently	65,573.74	14.25
4	Tall	25,204.35	5.48
5	Very high	16,682.06	3.63
Total		460,141.74	100.00

Source: 2024 Data Compilation Results

Map 8 Earthquake Disaster Prone



c. Land Capability Unit

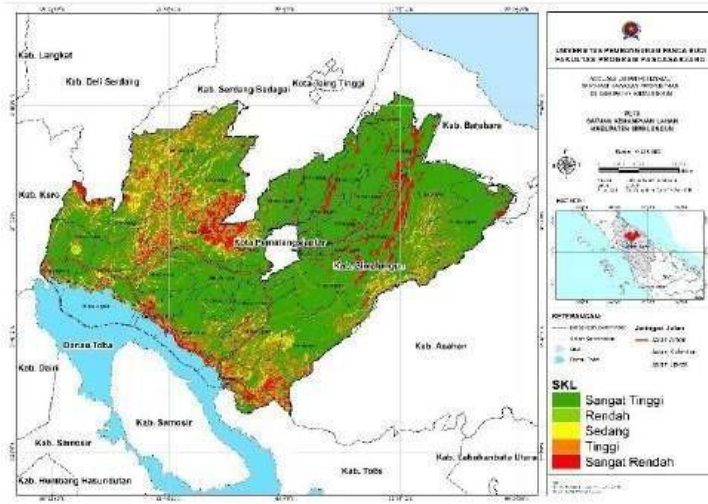
Based on the Land Capability Unit (SKL) in Simalungun Regency, it can be seen that 72.4 percent of land has Very High capability and around 12.49 percent has High Land Capability.

Table 14 Land Area Based on Land Capability Units

No.	SKL	Area (Ha)	Percentage (%)
1	Very high	333,127.02	72.40
2	Tall	57,472.25	12.49
3	Currently	20,262.73	4.40
4	Low	15,635.32	3.40
5	Very Low	33,644.43	7.31
Total		460,141.74	100.00

Source: 2024 Data Compilation Results

Map 9 Land Capability Unit



d. Existing Land Cover

From the existing land cover data for 2022 obtained from the Simalungun Regency Environmental Service, the built-up land is 2.25 percent and the rest is land that has not yet been built.

Table 15 Land Area Based on Existing Land Cover

No.	Land Cover	Area (Ha)	Percentage (%)
1	Non Awakened	448,413.36	97.45
2	Awake	11,728.38	2.55
Total		460,141.74	100.00

Source: 2024 Data Compilation Results

Map 10 Existing Land Cover



e. Spatial Pattern Plan

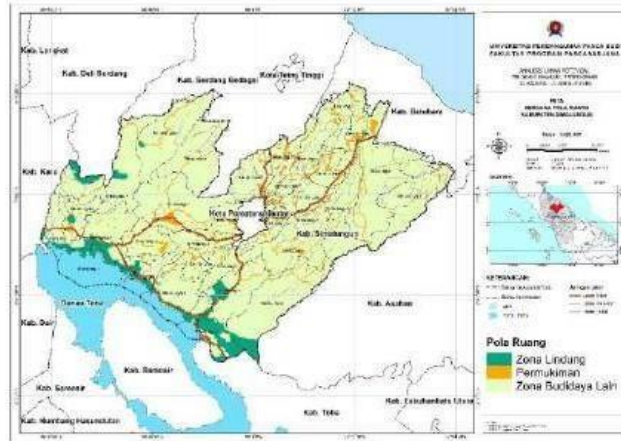
From the processing of spatial planning data for the 2022 Simalungun Regency RTRW Revision, the planned residential zone area is only 26,564.48 ha or 5.77 percent of the total area of Simalungun Regency.

Table 16 Land Area Based on Flood Disaster Prone

No.	Spatial Pattern Plan	Area (Ha)	Percentage (%)
1	Settlement	26,564.48	5.77
2	Other Cultivation Zones	386,325.42	83.96
3	Protected Zone	47,251.84	10.27
Total		460,141.74	100.00

Source: 2024 Data Compilation Results

Map 11 Spatial Pattern Plan



f. Relocation Potential

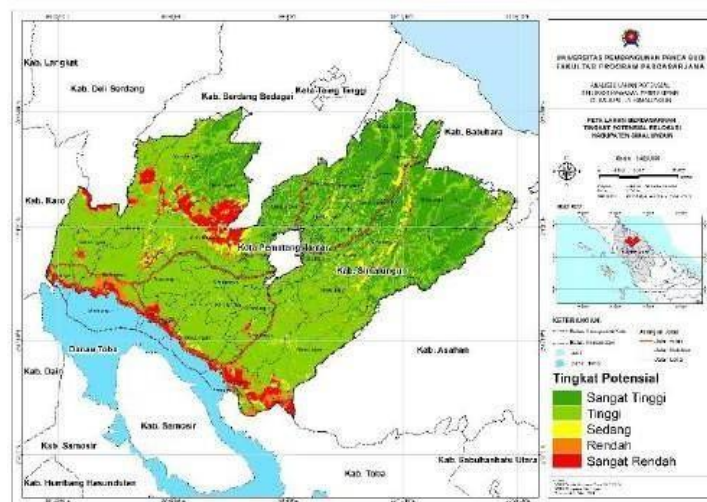
Based on the results of the analysis using the superimpose method (overlying) on the variables of Disaster Prone, Land Capability Unit, Land Cover and Spatial Pattern Plan, a potential land class for the settlement relocation area was obtained. From the results of the analysis, in the district there is land with a very high potential class with an area of 112,161.6 ha and a high class of 267,000.0 ha. for more details can be seen in the table below.

Table 17 Land Area Based on Potential Class

No.	Potential Class	Area (Ha)
1	Very Low	46,219.9
2	Low	11,399.9
3	Currently	23,360.3
4	Tall	267,000.0
5	Very high	112,161.6
Total		460,141.7

Source: 2024 Analysis Results

Map 12 Potential Relocation Class



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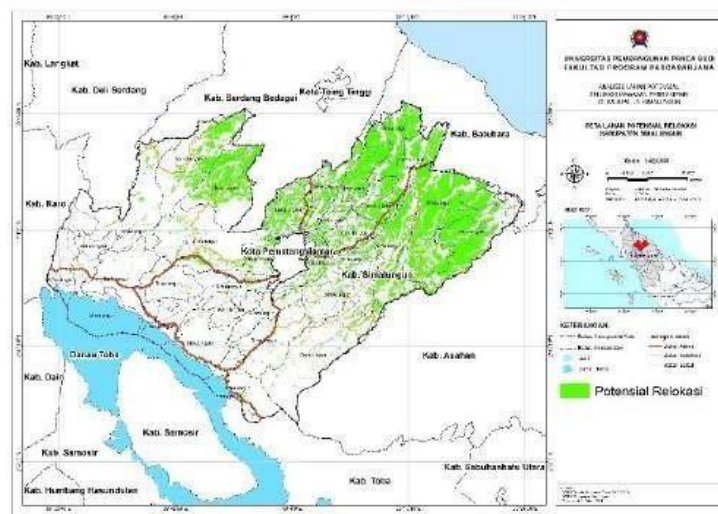
When viewed based on the type of spatial pattern for each potential class, only the very high class does not have an area in the protected area, while the high class has land in the protected area of 4,493.1 ha. Thus, to support the implementation of the spatial pattern plan, in this study only land with a very high class will be focused on as an alternative so that there is no potential relocation land in the protected area.

Table 18 Land Area Based on Potential Class

No	Potential Class	Spatial Pattern Plan			Amount (Ha)
		Residential Zone (Ha)	Other Cultivation Zones (Ha)	Protected Zone (Ha)	
1	Very Low	126.0	13,152.1	32,941.8	46,219.9
2	Low	61.4	2,582.2	8,756.3	11,399.9
3	Currently	4,207.9	18,091.7	1,060.7	23,360.3
4	Tall	13,184.6	249,322.4	4,493.1	267,000.0
5	Very high	9,015.3	103,146.3		112,161.6
	Total	26,595.3	386,294.6	47,251.8	460,141.7

Source: 2024 Analysis Results

Map 13 Distribution of Potential Relocation Land



From the distribution of potential relocation land from the analysis results, Bosar Maligas sub-district is the sub-district with the largest potential land reaching 19,393.6 ha. while Silima Huta sub-district is the sub-district with the least relocation potential.

Table 19 Land Area Based on Potential Class

No	Subdistrict	Area (Ha)
1	Port	6,953.3
2	Huluan Port	7,781.4
3	Masilam City	5,558.1
4	Maligas Boss	19,393.6
5	Masagal Dolog	226.1
6	The Stone Hill of Nanggar	4,404.0
7	The Thousand Islands	569.9
8	Pardamean Hill	14.4
9	The Glare of the Dolog	856.1
10	Girsang Sipangan Bolon	235.8
11	Mount Malela	3,299.7
12	Mount Maligas	1,768.5
13	The end of the world	1,717.5
14	The King of Bayu Forest	7,262.5
15	Javanese Maraja Bah Jambi	1,781.5
16	The Hataran	428.1
17	Pane	488.7
18	Panombeian Pane	1,322.5

19	City embankment	4,341.7
20	Sidamanik Embankment	95.4
21	Silima Huta Embankment	0.5
22	Ancient	59.3
23	Raya	2,045.4
24	Kahean Kingdom	9,393.7
25	Siantar	1,661.7
26	Sidamanik	170.6
27	Silimakuta	9.7
28	Silou Kahean	6,877.0
29	Land of Java	2,012.4
30	Tapian Dolok	6,137.8
31	The Edge of the Field	15,294.6
Total		112,161.6

Source: 2024 Analysis Results

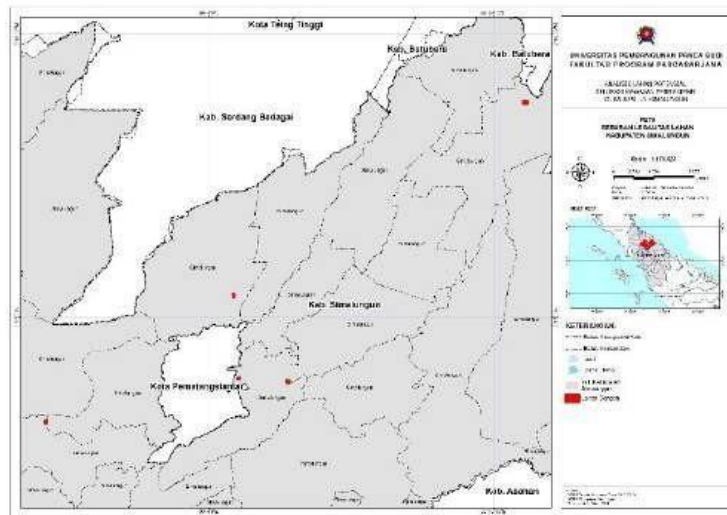
g. Land Legality

Based on data obtained from the Simalungun Regency Settlement Service, there are six land locations that can be used as residential land where the land ownership belongs to the Simalungun Regency area. The status of this land is currently not being utilized and so based on information from the Simalungun Regency Settlement Service, the land can be released. From the data it is known to have a total area of 24.67 ha.

Table 20 Land Area Based on Legality

Land Location	Area (Ha)
Location 1	1.22
Location 2	1.11
Location 3	3.37
Location 4	10.34
Location 5	6.25
Location 6	2.37
Total	24.67

Map 14 Distribution of Land Legality



Based on the results of the analysis by overlaying potential land with the land legality map, an area of 20.64 Ha of land was obtained that could be used as an alternative land for the relocation location.

Table 21 Alternative Land Area for Relocation

Land Location	Area (Ha)	Address	
		Village	Subdistrict
Location 1	1.22	The Great Plains	Tapian Dolok
Location 2	1.11	The Great Plains	Tapian Dolok
Location 3	3.37	The Great	Pane
Location 4	6.37	The journey	Port

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Location 5	6.23	Forward View	Siantar
Location 6	2.37	Siantar Estate	Siantar
Total	20.68		

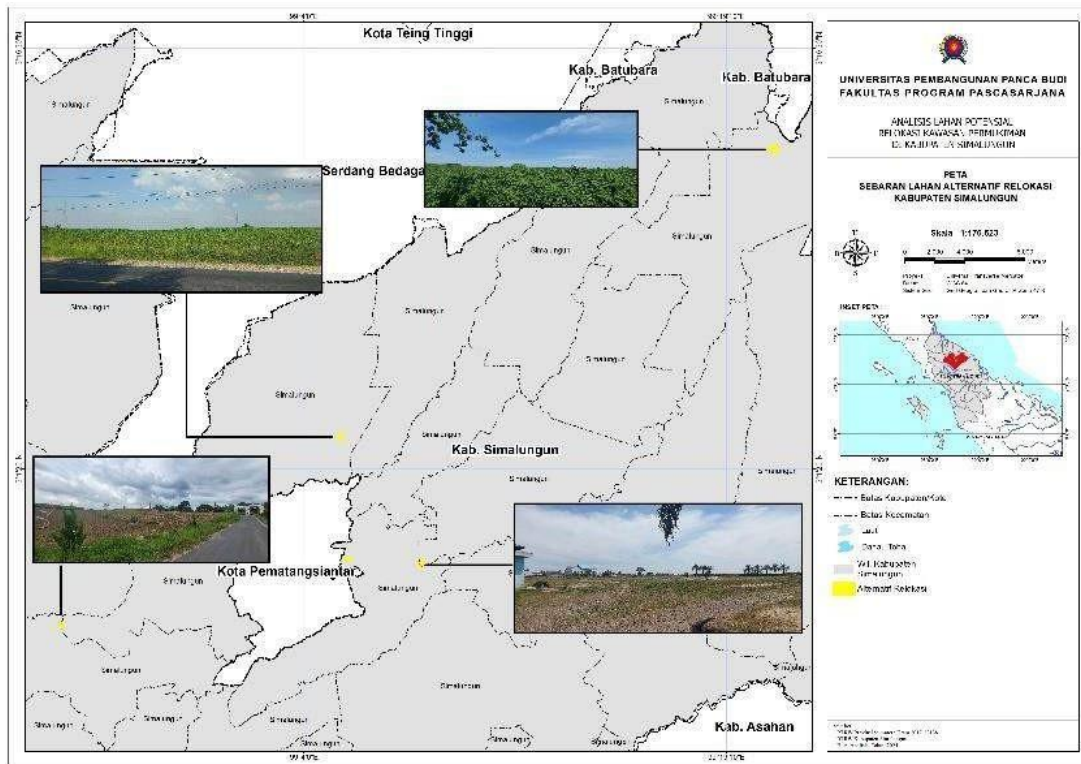
Source: 2024 Analysis Results

Table 22 Alternative Land Profile for Relocation

Description	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6
Wide	1.22 Ha	1.11 Ha	3.37 Ha	10.34 Ha	6.25 Ha	2.37 Ha
Coordinates	X : 99° 5'18.341" E	X : 99° 5' 19.058" E	X : 98°55'17.281"E	X : 99°20'51.327"E	X : 99°8'11.680"E	X : 99°5'34,520"E
	Y : 3° 2' 34.599" N	Y : 3° 2' 27.184" N	Y : 2°55'43.434"N	Y : 3°12'51.870"N	Y : 2°57'53.373"N	Y : 2°58'3.453"N
Address	Jl. Pematangsiantar – Tebing Tinggi Crossing Road	Jl. Pematangsiantar – Tebing Tinggi Crossing Road	Stone XX, Jl.	Jl. Kuala Tanjung	Jl.	Jl.
Village/Sub-district	The Great Plains	The Great Plains	The Great	The journey	Forward View	Siantar Estate
Subdistrict	Tapian Dolok	Tapian Dolok	Pane	Port	Siantar	Siantar
Spatial Pattern Allocation	Urban Settlement	Urban Settlement	Rural Settlements and Horticulture	Rural Settlement	Rural Settlement	Urban Settlement
Disaster	Low	Low	Low	Low	Low	Low
SKL	Very high	Very high	Very high	Very high	Very high	Very high
Existing Use	Cassava Farming	Cassava Farming	Corn Farming	Palm Oil Plantation	Empty land	Vacant Land / Former Government Building
Ownership	District Government Assets	District Government Assets	District Government Assets	District Government Assets (Former HGU)	District Government Assets	District Government Assets (HGB)

Source: Results of Field Analysis and Survey 2024

Map15 Distribution of Alternative Relocation Land



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