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MAPPING OF CONSERVATION AREA PLAN IN NORTH POLOMBANGKENG DISTRICT, TAKALAR REGENCY

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Abstract

North Polombangkeng District is one of the districts in Takalar Regency, South Sulawesi, where 44% of the total land area of 9495 ha out of 21225 ha are steeply sloped areas. Therefore we need a policy direction on the arrangement of the use of conservation areas to support the sustainability of the existing environment in the form of mapping conservation area plans. This study uses a soil survey method and evaluation of land capability. Physical Factors the environment is a limiting factor in determining land use policy, namely slope factors, soil sensitivity to erosion, and rainfall intensity. The research shows that Barugayya Village, Towata Village, and Kampung Baru Village are included in class IV land grade classification and Ko'mara Village in Class VI. At the same time, the Scoring Assessment of Physical Environmental Factors in Forest Areas has a range of values ranging from 160 to 215, the area of which is planned to be a conservation area. Determination of Conservation Area refers to the function criteria of forest area based on the scoring System of the Minister of Agriculture Regulation in Minister of Agriculture Decree No. 837/Kits/Um/11/80.

Keywords: *Mapping, Conservation areas, Takalar*

INTRODUCTION

The need for land is increasing every year, resulting in the conversion of land from the property, which should be a conservation area instead used as an area of farming, settlements, and industry with all forms of human activity in it. Regional development planning is a whole and integrated concept with local development, especially in areas close to the provincial capital.

Development in Makassar City which is the capital of South Sulawesi province has an impact on growth in Takalar Regency, especially in North Polombangkeng District, which is included in the development of the Mamminasata Metropolitan Area (Perpres 55/2011) which covers 4 districts/cities namely: Makassar, Maros, Sungguminasa, and Takalar.

The concept of the Metropolitan Area cannot be separated from the complex implications of the need for facilities and infrastructure, because according to its purpose, it is prepared to be the center of growth of the economic sector in Eastern Indonesia so that the demand for land will increase.

The continued use and use of land in various regions often conflict with applicable regulations on land and environmental resource management. Not only that, many steeply sloped land which functioned as residential areas and agricultural cultivation areas with processing techniques and farming methods that do not pay attention to the problem of the slope of the property, which results in land damage with more significant erosion problems.

Land with steep or steep slopes should be directed as a conservation area, because the steeper a hill is, the higher the level of erosion that occurs. Soil conservation is the use of land according to land use and capability. Based on Fajeriana (2018), North Polombangkeng District is one of the Districts in Takalar Regency which is the center of agricultural and plantation cultivation with 21225 ha of land with the total area divided by the following designation: irrigated rice fields 9463.61 ha; dryland agriculture 4070.2 ha; shrubs 7212.8 ha; secondary forest 102.5 ha; residential area of 45.5 ha; open land 121.7 ha and area of river (body of water) 207.98 ha; and also has different slope levels, i.e., they are in the slope class 0 - 3% (flat) with an area of 3960 ha. Slope class 3-8% (sloping) with an area of 6972 ha, slope class 15-25% (slightly steep) with an area of 798 ha, and slope class> 45% (very steep) has an area of 9495 ha.

Based on slope data, it shows that 44% of the total land area in the North Polombangkeng District has steep slopes.

Areas that have steep slopes for each unit area should be forested for the preservation of the business area below them (Hardjowigeno and Widiatmaka, 2011). Therefore, it is necessary to have a policy direction on the arrangement of the use of conservation areas to support the sustainability of the environment in the form of mapping of conservation area plans in the North Polombangkeng District, Takalar Regency.

MATERIALS AND METHODS

This study uses a survey method and evaluation of land capability with limiting factors. Land capability evaluation is the process of assessing a land that is related to land components systematically and grouping them into several categories based on the characteristics or characteristics of potential and inhibitors in their sustainable use (Sitorus, 2010).

This research was conducted in the North Polombangkeng District, Takalar Regency, from April to September 2018.

The materials in this study are the Map of the Earth, Bakosurtanal sources, 1999 with a scale of 1: 50,000, Land System Map RePPProT sources Bakosurtanal 1989, Map of Distribution Facilities and Infrastructure of North Polombangkeng District (BAPPEDA Kab. Takalar), Slope Maps, Distribution Maps Land, Google Earth Image Map, Geological Map, Land Type Map, other secondary data socio-economic data, population, and supporting facilities as well as rainfall data for the last 10 years from Malolo I. Station

The tools used in this study are GPS (Global Positioning System), DIP (Profile List), Munsel Soil Color Book, compass, shovel, hoe, crowbar, ground drill, plastic bag, digital camera, label paper, meter, pH meter, cutter, writing stationery and a set of laboratory equipment.

The preparatory stages include the collection of the RePPProT Land System Map (Bakosurtanal 1989), the 1: 50,000 scale Earth Map (Bakosurtanal, 1999), the Making of a Google Earth Image Map, the Geological Map, the Soil Type Map, the Map of Distribution Facilities and Infrastructure of North Polombangkeng District (BAPPEDA Kab.Takalar), other secondary data socio-economic data, population, and supporting facilities.

Slope maps are made based on maps of the earth by looking at an area that is estimated to have a topography that is almost the same as looking at the density of contour lines. After that, the tightest and thin lines are drawn so that later slopes will be obtained in the area. The length of the sequence obtained, measured using the bar. The slope

calculation results are grouped according to the slope class criteria.

Climate data is calculated from the rainfall data available by the procedure for calculating the type of climate according to the Schmidt-Ferguson and Oldeman classification, namely the dry month average annual rainfall <60 mm per month and for wet months> 100 mm per month.

Stage of Making the Work Map

The working map is a Land Unit Map as a reference in determining the location of soil profile observations and soil sampling. A land unit map is a map made from the overlay of a soil type map, a slope map, a geological map, and a land-use map that has a uniform scale that is using a range of 1: 150,000. From the overlay results, there are 2 points of land units from each of the 4 villages in North Polombangkeng district, Barugayya Village, Ko'mara Village, Kampung Baru Village, Border Village Lassang and Towata Lahan Village representing 8 land profiles for further description and analysis.

Field Survey and Soil Sampling

Conduct field observations by determining the location and coordinates of field sampling for each Land Unit. The coordinates of the location of the sample points that have been identified, recorded, and entered into the GPS, then assisted with a compass, which will then be used to assist in achieving it.

Soil samples are taken approximately 1 kg for analysis of physical and chemical soil properties in each land unit by making soil profiles to a depth of 100 cm or the boundary layer of the host rock if the solution is shallow.

After that, soil profile observations and location observations include the shape of the area or slope, soil drainage conditions, vegetation, solum, flood hazard level, soil texture, soil structure, soil consistency, boundaries between layers, surface rock conditions and level erosion which results are written in the profile entry (DIP).

Profiles that have been excavated, recorded in the form of photographs as well as the natural conditions in which this profile was taken.

Laboratory Analysis and Observation Parameters

Soil analysis using soil samples ± 1 kg / sifted soil samples and air-dried and next analyzed.

Soil analysis conducted in the laboratory includes:

1. Cation Exchange Capacity (CEC) is determined by NH4Oac compliance
2. Soil acidity (pH) (H2O 1: 2.5) with a pH meter.
3. C-organic with the Walkley and Black method.
4. P2O5 is available in ppm by the Bray I method.
5. N Total, using the Kjeldahl method.

Determination Stage of Land Ability Class

Based on climate data, field observations, and laboratory analysis of each profile representing the soil map unit, the land capability class is determined. The parameters observed were then matched with the land capability classification criteria, both physical and chemical characteristics, and the limiting factors.

Land Use Analysis

Land use analysis includes the percentage of land area for various uses, the level of land productivity, where this land use analysis refers to the use of conservation areas.

RESULTS AND DISCUSSION

Climate

The climate of North Polombangkeng District based on rainfall data for the last 10 years is included in climate type C (Schmidt-Ferguson Classification) where the category of the area is slightly wet with marked jungle vegetation, which is a type of vegetation in the dry season the leaves fall including teak based on the System.

Type of soil

Soil types in North Polombangkeng District consist of Inceptisol (Dystropepts, Ustropepts, and Tropaquepts) soils that are young but are more developed than Entisol and generally have a relics horizon and Ultisol (Haplustuls) soils which are soil accumulated (accumulation). Clay in the lower horizon (argillic horizon), acid, base saturation (number of cations) at a depth of 180 cm from the ground surface is less than 35%.

Hydrology

There are 4 rivers in North Polombangkeng District, namely the Pamukulu river, the Jenemaeja river, the Pappa river, and the Lantang river. Water discharge from the four rivers is influenced by rainfall intensity. The high intensity of rain in this area results in flooding from November to May, but in the

dry season, there is no flow of water in small rivers, but there are still puddles.

Land Ability Class

Based on the results of the analysis of the land capability class conducted, it has been shown that 8 units of land were studied from 4 villages with slope boundaries with the following data:

Table 1. Quality / Characteristics Value of Each Land Unit

Quality/Characteristics of Land	Land Unit							
	Barugayya Village		Ko'mara Village		Towata Village		Kampung Baru Village	
	1	2	1	2	1	2	1	2
Temperatur e(t) - Annual average	25	25	25	25	25	25	25	25
Water availability (w)								
- Dry month (<75mm)	4	4	4	4	4	4	4	4
- Rainfall/year	3100	3100	3100	3100	3100	3100	3100	3100
Rooting media (r)								
- Soil drainage	Average	Average	Average	bad	Average	Average	Average	Average
- Texture	rs	rs	rs	rs	rs	rr	rs	rr
- Effective depth (cm)	105	49	115	100	130	100	78	100
Nutrient retention(f)								
- CEC land	27,20	26,40	27,80	25,40	23,80	24,20	21,60	24,20
- Soil pH	6,58	6,33	6,27	6,28	6,26	6,76	6,47	6,76
- C-organic (%)	0,45	0,48	1,97	0,72	0,53	1,40	0,89	1,40
Nutrient available (n)								
- N-total	0,70	0,77	0,77	0,98	0,91	0,98	0,84	0,98
- P_2O_5	16,62	17,53	19,46	13,83	12,87	13,36	12,94	13,36
Terrain (s/m)								
- Slope (%)	15-25%	25-45%	25-45%	40-45%	25-45%	25-45%	25-45%	25-45%
- Rock on the surface (%)	5	5-15	15-40	5-15	5-15	15-40	5-15	5
Erosion(e)	h	h	Vh	Vb	H	vh	h	h
Flood hazard (h) - Puddle	F1	F1	F0	F1	F0	F0	F0	F0

Notes:
Texture, vs = very smooth (clay type 2:1); s= smooth; rs = rather smooth; rr = rather rough;
Erosion, sr = very light; r = light; b = heavy; sb = very heavy.
Puddle, F0 = without a puddle; F1 = light; F3 = rather heavy

Source: Primary Data after processing, 2018.

Based on data on the quality and characteristics of each land unit, Barugayya Village, Towata Village, and Kampung Baru Village are in Class IV which has inhibiting factors such as steep slopes, considerable erosion sensitivity, allotment of land use in this area can still be used as agricultural land but requires intensive treatment. This is in following Baja (2012) that Class IV is a land with a severe limiting level so that it reduces the number of choices for the type of land use, or requires conscientious conservation efforts, or both.

For Ko'mara Village is in the VI land capability class with a very steep slope limiting factor, the danger of erosion is very heavy and rocky with high rainfall. With a hefty limiting level, so it is not suitable for agriculture. By Hardjowigeno and Widiatmika (2011), that class VI land can only be planted with grass for fodder or forested, due to very heavy limiting/limiting factors that are not suitable for agriculture.

The level of the steep slope has a significant risk impact if forced to designate it as cultivation or industrial area. Tillage on steep slopes for intensive agriculture with all kinds of engineering or processing techniques still dangerous. Farid (2011) states that the hill influences the level and velocity of surface runoff. The steeper or steep a slope is, the faster the surface runoff and rate, the little infiltration, the higher the volume of surface runoff, and vice versa.

So, by increasing the slope presentation, erosion is more significant, so conservation techniques are needed for the land unit.

Because all the villages that are the research areas are in the land capability class whose designation is directed to the suitable area to be used as a forest or conservation area as a follow-up of the land limiting factor owned, a scoring table is presented to determine the forest area as follows:

Table 2. Scoring Assessment of Environmental Physical Factors of Forest Areas

Physical Environmental Factors	Land Unit							
	Barugayya Village		Ko'mara Village		Towata Village		Kampung Baru Village	
	1	2	1	2	1	2	1	2
Slope Factor	60	80	80	100	80	80	80	80
Soil Sensitivity to Erosion (Erodibility)	60	60	75	75	60	75	60	60
Daily rainfall intensity Factor (Erosivity)	40	40	40	40	40	40	40	40
Total Score	160	180	195	215	180	195	180	180

Source: Primary Data after processing, 2018.

From the scoring results, it can be seen that only in Barugayya Village on land unit 1, whose designation can still be used as a Limited Production Forest with a scoring value of 160. According to Article 1, Number 10 Government Regulation Number 104 the Year 2015 concerning Procedures for Changing the Designation and Function of Forest Areas (" PP 104/2015) is a Forest Area with

factors of slope class, soil type, and rainfall intensity after each multiplied by the weighing number having a value between 125-174 outside the protected forest area, nature reserve forest, nature conservation forest, and the hunting park (Hasanah, 2017).

As for the land unit, 2 in Barugayya Village and all land units in Ko'mara Village, Towata Village, and Kampung Baru Village have a scoring value> 175 where the designation is as a Protected Area. Furthermore, the determination of the procedure for establishing a protected forest is regulated in a decree of the Minister of Agriculture No. 837/Kpts/Um/11/80 (Putro, 2013).

From the analysis of the quality/characteristics of each land unit and the Scoring Assessment of the Physical Factors of the Forest Area Environment, a Map of the Conservation Area Plan in the North Polombangkeng District of Takalar with 4 target villages is as follows:
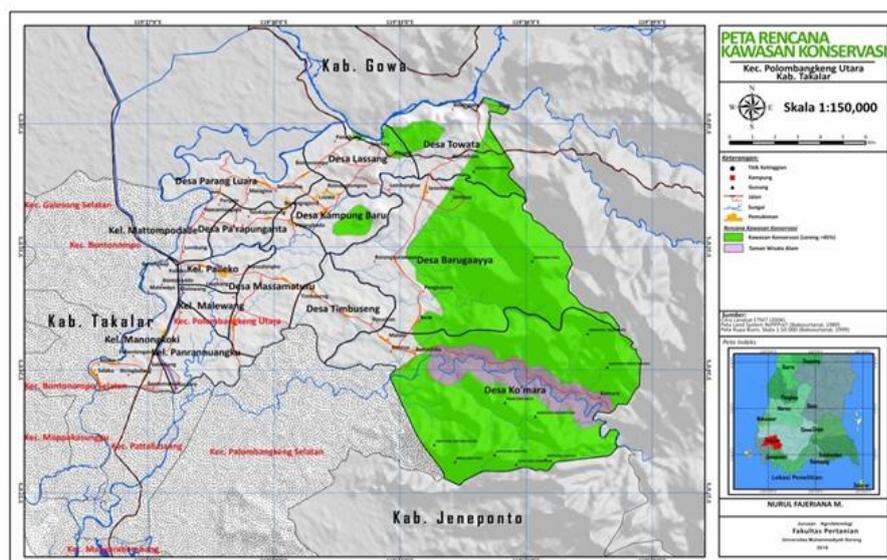

Figure 1. Map of Direction of Conservation Area of North Polombangkeng District

The plan to use the conservation area is emphasized on strengthening the protection function, in the form of:

Determination of protected/ conservation areas according to their types on the Map of Conservation Area Plan of North Polombangkeng District according to the location criteria stipulated in Presidential Decree No.32 of 1990 and Decree of the Minister of Forestry Number: 08.1/Kpts-II/2000 Concerning Criteria and Standards for Utilization in Forests Sustainable production.

Consolidation and control of the function of protected areas to ensure the preservation and balance of nature.

Control of spatial use (cultivation activities) already in the protected area so as not to damage the protected area's function activities.

The utilization of protected areas for cultivation activities can be done on a limited basis as long as the said activities meet the applicable requirements.

CONCLUSION

Physical Factors The environment is a limiting factor in determining land use policy. Barugayya Village, Ko'mara Village, Towata Village, and Kampung Baru Village, which have steep slopes, are planned as conservation areas. Determination of Conservation Areas refers to the criteria for the function of forest areas based on a scoring system that refers to the regulation of the Minister of Agriculture in Minister of Agriculture Decree No. 837/Kpts/Um/11/80.

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