ASSESSMENT OF LAND SUPPORT AS DIRECTION OF LAND DEVELOPMENT CENTRAL PARIAMAN DISTRICT

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ASSESSMENT OF LAND SUPPORT AS DIRECTION OF LAND DEVELOPMENT CENTRAL PARIAMAN DISTRICT

* Haryani[1], Agus Irianto[2], Nuhasan Syah[3]

[1]Doctor Programe of Environmental Science, Padang State University, and Faculty of Civil Engineering and Planning, Bung Hatta University
[2] Environmental Science-Padang State University
[3] Environmental Science-Padang State University
E-mail: irharyanimtp@yahoo.co.id

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ABSTRACT: Changes in the development of the built area of Kota Pariaman can be seen in 1982 covering an area of 269.42 Ha, continuing to grow to 493.71 Ha in 2003. According to the developer, the growth of the built area in Kota Pariaman is influenced by economic factors (profit) and safety and comfort factors, namely considering safe areas from the tsunami disaster and free from flooding. While the community believes that the influencing factor is the proximity factor to public facilities and social facilities because of the completeness of the types of facilities many are located in the city center as well as the accessibility factor of the downtown area which has infrastructure conditions the good one. The problems in this study are; a) how is the carrying capacity of the North Pariaman District and b) how the direction of land development plan is in accordance with the carrying capacity of the land. The research objectives are a) analyzing land capability and b) formulating direction for land development plan in accordance with land capability in the District of North Pariaman. This type of research is descriptive research, GIS analysis methods and map overlays and analysis of land capability and land carrying capacity. Based on the physical condition of North Pariaman Subdistrict, Pariaman City, Land capability class 3 is a medium development capability class (C) and a maximum land cover ratio of 20%, the development direction is to limit the area built up and directed for non-settlement cultivation.

Keywords: Land Capability Class, Land Carrying Capacity, Land Development

1. INTRODUCTION

North Pariaman Subdistrict is one of the sub-districts located in Pariaman City, West Sumatra Province with coordinates of 0° 37′ 32.41″ S 100° 7′ 23.10″ E. North Pariaman Subdistrict is on the west side of Pariaman City which is directly adjacent to the Indian Ocean which has 17 Sub-districts and an area of 2020 Ha. The population growth in Kota Pariaman continues to increase, namely in 2007 there were 77,480 people, while in 2016 it became 85,691 people [1][2][3]. Changes in the development of the built area of the City of Pariaman can be seen in 1982 through a map of Jantop covering an area of 269.42 Ha, but this area continues to increase, namely in 2003 to 493.71 Ha. Furthermore, the post-regional autonomy period built in 2007 continues to increase until now [4][5][6].

According to the developer, the growth of the built area in Kota Pariaman is influenced by economic factors (profit) and safety and comfort factors, which are considering an area that is safe from the tsunami disaster and is free from flooding [7][8][9][10][11][12]. While the community believes that the influencing factor is the proximity factor to public facilities and social facilities because of the completeness of the types of facilities many are located in the city center as well as the accessibility factor of the downtown area which has infrastructure conditions the good one [13][14][15].

North Pariaman District in the 2010-2030 Pariaman RTRW is a residential and trade development area directly adjacent to the center of Kota Pariaman which is experiencing rapid growth in the area of development. Land use in North Pariaman District is a mixed garden of 542 Ha (30.94%), 535 Ha of rice fields (26.09%), community plantations of 530 Ha (24.41%) and shrubs 1.11%.

Based on BPS City Pariaman data, North Pariaman District is located at an altitude of 0-10 masl. The topographic condition of Pariaman City can be grouped into morphological types of terrain with heights between 0-15 meters. Because it is located on the edge of the beach in general is a stretch of sloping lowlands. Morphology in Pariaman Utara District consists of Estuarin plain of 803 Ha along the river and

coast downstream, 652 Ha Volcanic Plain, and 565 Ha Volcanic Hills. Geomorphology of the hill with an area of 565 Ha and the Volcanic Plain with an area of 654 Ha and estuarine plain with an area of 803 Ha.

North Pariaman District is traversed by the Batang Manggung river with a length of 11.5 Km. Geologically, it is located on two paths of the world's plate fault, the Eurasian Plate and the Indo - Australian Plate. The types of soil in North Pariaman District are Lanau, Lempungan and sand. Geology of Alluvium with an area of 839 Ha and Tuff of Pumice and Andesite (Basat) with an area of 1183 Ha. Temperature ranges from 22ºC to 25.6ºC with an average rainfall of 337 mm / month and the humidity is around 86.6% per month [16][17][18] [19][20][21]

Luntung (1998: 12) explained that the direction of the land use function is the study of land potential for the designation of an activity into a certain area based on its main function. The direction of land use function can be interpreted as an effort to organize land use in an area according to its ability. In this case the purpose of the land use function directive is to achieve a balance between land capability and the type of use and technology used as an effort to protect the continuity of the functions and benefits of resources natural.

Based on the background above, the problems in this study are; a) how is the carrying capacity of the North Pariaman District and b) how the direction of land development plan is in accordance with the carrying capacity of the land. The purpose of this study, namely; a) analyzing land capability and b) formulating directives for land development plans according to land capability in the District of North Pariaman.

2. RESEARCH METHODS

The type of research used is descriptive research. Descriptive research is a form of research aimed at describing phenomena that exist, both natural phenomena and man-made phenomena. These phenomena can be in the form of activities, characteristics, changes, relationships, similarities, and differences between one phenomenon and another [22][23][24]. Geographic Information Systems (GIS) can be applied to various fields of scientific study [25][26][27]. One of the functions of GIS is the application in the field of natural resources which includes inventory, management and land suitability, for agriculture, plantation, forestry, land use planning, analysis of natural disaster-prone areas, and so on. GIS is a computer system used to collect, examine, and analyze and disseminate information relating to the surface of the earth. GIS is defined as an organized collection of computer hardware, software, geographic data and personnel that are efficiently designed to obtain, store, update, manipulate, analyze and display all forms of geographic reference information. The analysis function in GIS is the spatial analysis function and the attribute analysis function. Spatial analysis functions include overlaying and buffering. Overlay is one of the functions of spatial analysis that produces new spatial data from a minimum of two spatial data input. To produce areas suitable for cultivation, data on earth surface height, soil water content, and soil type are required, then the overlay spatial analysis function will be subject to the three spatial data (and attributes) [28][29][30].

Land capability analysis is a systematic assessment of land and its grouping into categories based on characteristics that are potential and inhibitors of their sustainable use. In this study the analysis of land capability refers to the Regulation of the Minister of Public Works No.20 / PRT / M / 2007 concerning Guidelines for Physical & Environmental Analysis Techniques. Data requirements in the analysis of Land Capability Unit (SKL), namely: climatology, topography, geology, hydrology, Mineral Resources, natural disasters and land use. The purpose of the Land Capability Unit (SKL) analysis is to obtain a description of the level of land capability to be developed as urban and as a reference for land suitability directives.

Analysis This land carrying capacity analysis refers to [31][32]. and explained in the Regulation of the Minister of Public Housing Number: 11/PERMEN/M/2008 concerning Guidelines for the Harmony of Housing and Settlement Areas, with the classification of land carrying capacity based on land capability, namely:

- Class 1 land capability (Very High Development Capability), maximum land cover ratio of 70%.
- Class 2 land capability (High Development Capability), maximum land cover ratio of 50%
- Class 3 land capability (Medium Development Capability), maximum land cover ratio of 20%
- Grade 4 land capability (Low to Very Low Development Capability), land cover ratio 0%.

The formula used in determining the carrying capacity of land is related to the determination of Building Coverage (BC) at a location.

3. RESULTS AND DISCUSSION

The shape of the landscape (morphology) of Central Pariaman District that is able to be developed according to its function is as follows.

Table 1. Morphological SKL Analysis in North Pariaman District

No.	Morphology	Slope (%)	SKL Morphology	Score	Area(Ha)
1	Volcanic Hill	25 - 39	That's enough	2	2
2	Volcanic Hill	15 - 24	I do	3	564
3	Volcanic Plains	8 - 14	Low	4	84
4	Volcanic Plains	3 - 7	Low	4	1370
5	Estuarin Plateau Along the Coastline	0 - 2	low	4	8
Total					2020

Ease of work is to determine the level of ease of land to be excavated/matured in the process of development/regional development.

The results of the SKL analysis of facilities carried out in North Pariaman District are as follows.

Table 2: Ease of Analysis SKL for North Pariaman District

No	Geomorphology	Slope (%)	Geology	Landuse	Ease of Doing Land Capability (SKL)	Score	Area (Ha)
1	Volcanic hills	25 - 39	Tuf Batu Apung & Andesit (Basal)	Mixed use	Less	2	2
2	Volcanic hills	15 - 24	Tuf Batu Apung & Andesit (Basal)	Mixed use	Less	3	564
3	Volcanic Plain	8 - 14	Aluvium Tuf Batu Apung & Andesit (Basal)	Mixed use	High	4	84
4	Volcanic Plain	3 - 7	Aluvium Tuf Batu Apung & Andesit (Basal)	Mixed use	High	4	1370
5	Estuarin Plateau Along the Coastline	0 - 2	Aluvium Tuf Batu Apung & Andesit (Basal)	Mixed use	High	4	8
Total							2020

Analysis SKL aims to determine the level of slope stability in the development area. The results of the analysis of the Slope Stability Analysis in the North Pariaman District are as follows.

Table 3. Slope Stability Analysis Slope District of North Pariaman

No.	Morphology	Slope (%)	Topography	Landuse	SKL Slope Stability	Skor	Luas (Ha)
1	Volcanic hills	25 - 39	High enough	Mixed use	Less	2	2
2	Volcanic hills	15 - 24	I do	Mixed use	Is	3	564
3	Volcanic Plain	8 - 14	Low	Mixed use	High	4	84
4	Volcanic Plain	3 - 7	Low	Mixed use	High	4	1370
5	Estuarin Plateau Along the Coastline	0 - 2	Very low	Mixed use	High	4	8
Total							2020

The SKL Analysis of Foundation Stability aims to determine the level of land capability to support heavy buildings in urban development, as well as the types of foundations suitable for each level. The results of the SKL Foundation Stability Analysis in North Pariaman District are as follows.

Table 4. SKL Analysis of the Foundation of North Pariaman District

No.	SKL Slope Stability	Landuse	SKL Foundation	Score	Area (Ha)
1	Less	Mixed use	Less	2	2
2	Is	Mixed use	Less	3	564
3	Is	Mixed use	Less	3	8
4	High	Mixed use	High	4	1446
Total					2020

Analysis SKL is to find out the level of water availability and water supply capability at each level, for the development of the area. The results of the SKL analysis of Water Availability in Kecamatan Pariaman Utara are as follows.

Table 5. SKL Analysis of Water Availability in North Pariaman District

No.	Morphology	Slope (%)	Landuse	SKL Water availability	Score	Area (Ha)
1	Volcanic hills	25 - 39	Mixed use	Very low	2	2
2	Volcanic hills	15 - 24	Mixed use	Is	3	564
3	Volcanic Plain	8 - 14	Mixed use	Is	4	84
4	Volcanic Plain	3 - 7	Mixed use	High	4	566
5	Estuarin Plateau Along the Coastline	0 - 2	Mixed use	High	4	804
Total						2020

The SKL analysis for Drainage is to determine the level of land's ability to drain rainwater naturally, so that the possibility of inundation both local and widespread can be avoided. The results of the SKL analysis for Drainage in North Pariaman District are as follows.

Table 6. SKL Analysis for Drainage in North Pariaman District

No.	Morphology	Slope (%)	Topography	Landuse	SKL Drainase	Score	Area (Ha)
1	Estuarin Plain along the Lower Coast River	0 - 2	Very low	Mixed use	Height	4	804
2	Volcanic Plain	3 - 7	Low	Mixed use	Height	4	566
3	Volcanic Plain	8 - 14	Low	Mixed use	Height	4	84
4	Volcanic hills	15- 24	I do	Mixed use	Height	3	564
5	Volcanic hills	25 - 39	High enough	Mixed use	Height	2	2
Total							2020

Analysis of Erosion is to find out areas that have experienced soil erosion, so that the level of land resilience against erosion can be identified and anticipated impacts on downstream areas. The results of the SKL analysis of Erosion in North Pariaman District are as follows.

Table 7. SKL Analysis of Erosion of North Pariaman District

No.	Morphology	Slope (%)	Laand use	SKL Erosion	Score	Area (Ha)
1	Volcanic hills	25 - 39	Mixed use	Enough	2	2
2	Volcanic hills	15 - 24	Mixed use	Is	3	564
3	Volcanic Plain	8 - 14	Mixed use	Very low	4	84
4	Volcanic Plain	3 - 7	Mixed use	Very low	4	320
5	Estuarin Plateau Along the Coastline	0 - 2	Mixed use	Very low	4	804
Total						2020

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Analysis of SKL Waste Disposal is to find out areas that are capable of being occupied as final storage locations and waste management, both solid and liquid waste. The results of the SKL analysis of Waste Disposal in Pariaman Utara District are as follows.

Table 8. SKL Analysis of Waste Disposal in North Pariaman District

No.	Morphology	Slope (%)	Topography	Land use	SKL Waste Disposal	Score	Area (Ha)
1	Volcanic hills	25 - 39	High enough	Mixed use	Less	2	2
2	Volcanic hills	15 - 24	I do	Mixed use	Enough	3	564
3	Volcanic Plain	8 - 14	Low	Mixed use	High	4	84
4	Volcanic Plain	3 - 7	Low	Mixed use	High	4	320
5	Estuarin Plateau Along the Coastline	0 - 2	Very low	Mixed use	High	4	804
Total							2020

SKL Analysis of Natural Disasters is to determine the level of land's ability to receive natural disasters, especially in terms of geology, so as to avoid / reduce losses from victims of the disaster. The results of the SKL analysis of Natural Disasters in Pariaman Utara District are as follows.

Table 9. SKL Analysis of Natural Disasters

No	Geomorphology	Slope (%)	Topography	Geology	Land use	SKL Natural Disasters	Score	Area (Ha)
1	Volcanic hills	25 - 39	High enough	Aluvium & Tuf Batu Apung & Andesit (Basal)	Mixed use	High	4	2
2	Volcanic hills	15 - 24	I do	Aluvium & Tuf Batu Apung & Andesit (Basal)	Mixed use	High	4	564
3	Volcanic Plain	8 - 14	Low	Aluvium & Tuf Batu Apung & Andesit (Basal)	Mixed use	Enough	3	84
4	Volcanic Plain	3 - 7	Low	Aluvium & Tuf Batu Apung & Andesit (Basal)	Mixed use	Less	2	320
5	Estuarin Plateau Along the Coastline	0 - 2	Very low	Aluvium & Tuf Batu Apung & Andesit (Basal)	Mixed use	Less	2	804
Total								2020

Analysis is carried out to obtain a picture of the level of land capability to be developed and as a reference for land suitability direction in the next stage of analysis. There is a weighting of 9 SKL according to each land capability unit and multiplied by the score so that the following results are obtained.

Table 10. Weighting of Land Ability Unit North Pariaman District

Morphological SKL	Facility Works SKL	Slope Stability SKL	Foundation stability SKL	Water Availability SKL	SKL for Drainse	SKL Against Erosion	SKL Waste Disposal	SKL Against Natural Disasters
Bobot : 5	Bobot : 1	Bobot : 5	Bobot : 3	Bobot : 5	Bobot : 5	Bobot : 3	Bobot : 0	Bobot : 5
2	2	2	2	2	4	2	2	4
3	3	3	3	3	3	3	3	3
4	4	4	4	4	2	4	4	2

4. CONCLUSION

The results of the analysis of Land Capability Class in North Pariaman Subdistrict Pariaman City consists of one land capability class, namely Land Capability Class C. Land Capability Class C is included in the classification of Medium development or included in the category of having a land bearing capacity. The land capability class Class C has a maximum land cover ratio of 20%, meaning that the land that can be built is only 20% of the total area. The area of North Pariaman Subdistrict is 2020 Ha where the

total area that has been built is 47.61%. The conclusion that can be drawn from this analysis is that the North Pariaman District land cover has exceeded the maximum land cover ratio classification of 20%. Based on the physical condition of North Pariaman Subdistrict, Pariaman City, Land capability class 3 is a medium development capability class (C) and a maximum land cover ratio of 20%, the development direction is to limit the area built up and directed for non-settlement cultivation.

5. SUGGESTION

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