



UTILIZATION TECHNOLOGY SPATIAL IN MAKING CLASS MAPS SUITABILITY OF MANGO PLANTATION LAND IN KAKAS DISTRICT, EAST COAST MINAHASA

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ABSTRACT

Land suitability evaluation is very important in the process of matching land types for specific uses. This research aims to create map of the distribution of land suitability classes for mango plants in Kakas District using technology Spatial . This research was carried out using field survey and geoprocessing methods . Data collection techniques include: documentation , observation and analysis laboratory . Determination class suitability land use method from FAO ie matching observation variables that is condition grow plant Mango and its qualities / characteristics land . In this study, 22 units were obtained land map (SPL) covering an area of 3927.07 Ha spread over several village in Kakas District . Class map suitability resulting land _ that is class suitability S1 land (very suitable) for criteria nutrient retention and available nutrients . Whereas criteria temperature and rooting media included in class suitability S2 land (enough appropriate) scattered and for criteria water availability and levels danger erosion generally enter the S3 class (according to marginal) spread across all SPL. Temporary level danger erosion is criteria give class N (no appropriate) for plant mango at 10 (ten) SPL with area 1351.93 Ha.

Keywords: Technology Spatial , Land Evaluation , Mango

INTRODUCTION

plant (*Mangifera indica* L) is plant type fruit that has mark selling high in the local market . In the world, plants mango including in group of five plants fruit main besides bananas, oranges , grapes and apples (Suwardike et al , 2018). By general , the world market requires fruit mango For material standard industry (fruit processed) and fulfill need consumption as fruit table . Plant mango developed in a way also widespread in Indonesia, incl Regency Minahasa . However production fruit mangoes in the Regency Minahasa Keep going experience decrease in each the year . Based on data from the Central Statistics Agency (Regency Minahasa in Figures, 2022), production plant mangoes in the Regency Minahasa decrease from 7172 quintals in 2019 to 3048 quintals in 2021. Meanwhile __ production Mango plants in Kakas District were recorded only 35 quintals in 2020. This _ showing that production fruit There are still very few mangoes in Kakas District . Apart from that , farmers mango in the area This generally utilise fruit mango For consumed Alone Not yet think about For marketed in scale big . One _ instrument used _ is approach evaluation land , that is something assessment that provides information potential and or use

land as well as hope possible production _ obtained as well as use friendly land _ environment (Sukarman, 2018). Evaluation results land will give information and/ or instruction use land in accordance with necessities (Ritung et al ., 2007).

Kakas District is located district _ in area Minahasa East Coast tourism , where area This experience sufficient development _ fast along it was built infrastructure network Trans Sulawesi road . Beauty the beach is attractions hidden nature _ during this and now become crowded visited traveler local nor abroad . With see potency area tourist that , also so that you can add mark economy for public around , be important For noticed for Kakas District so you can get it transformed as area center production plant mango . Research study Utilization Technology Spatial in Making Class Maps Suitability of Mango Plantation Land in Kakas District , East Coast Minahasa This done For answer need public in management plant suitable mango _ characteristics the land so that influential For development production plant sustainable mangoes in the region that .

1.2 Formulation Problem

How make map spread class suitability land Mango plants in Kakas District with utilise technology spatial ?

1.3 Research Objectives

Make map spread class suitability land Mango plants in Kakas District with utilise technology spatial .

1.4 Benefits of Research

Study This expected can give benefit form information suitability land to user land that is farmers , government and private sector in development production plant sustainable mango

METHOD

Study This implemented in Kakas District , Regency Minahasa North Sulawesi Province . Kakas District has wide ± 6702.61 Ha or about 67.02 Km² consisting of from 12 (twelve) villages. Rinondor Village is village with area biggest namely 1515.31 Ha or about 22.59% of wide Kakas District . Whereas village with area smallest is capital Kakas District is Pahaleten Village own area 123.73 Ha or about 1.84% of wide Kakas District . Location map study can seen in Figure 2.1 below this .

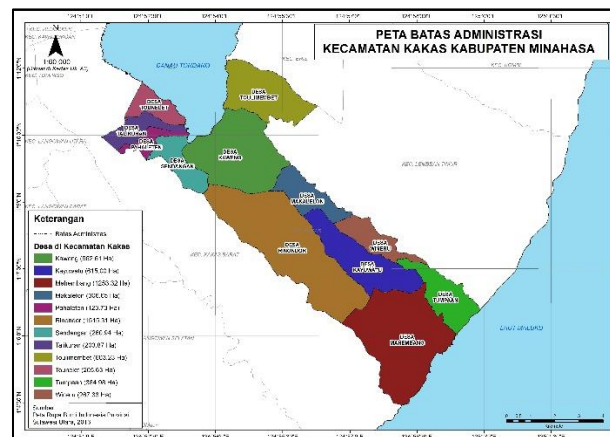


Figure 2.1 Administrative Boundary Map Kakas District

Tools and Materials

Tools used that is set personal computer (PC) with device software , Arc GIS 10.4 Software, Ms. Excel 2010, Avenza Map, as well equipment Work field consists top : drill land , compass , plastic , meter, camera and tools write . Materials used in study is sample land , map slope slope , map type land , map use land , map administration Kakas District , SAS Planet Software and materials chemistry for laboratory tests .

Research Methods

Methods used in research This is method matching or purposeful matching _ For analyze condition land in the field with criteria or condition grow plant mango (Ritung , 2011). Study This use unit land as population and every unit land taken sample with purposive sampling in accordance with objective unit map land . Unit land in Kakas District was obtained from results overlays map in ArcGIS application with use system information geographic . Overlaid map is map slope slope , map type land and maps use plots of land each with a scale of 1:50,000 were obtained from Indonesian Earth Map and Regency RTRW Minahasa . Research data taken with method observation field , laboratory tests and primary and secondary data collection , then processed in ArcGis and analyzed in a way spatial For determination classification suitability land plant mango and map spread in Kakas District . Assessment results form class and subclass suitability land . Classes and subclasses suitability land determined from factor barrier heaviest . Barrier land can consists from One or more characteristics land .

research variables is as following : (1) C- Organic (Kjedadl Walkey Method); (2) Total Nitrogen (Kjedadl Method); (3) P available (Bray Method I); (4) K available (Bray Method I); (5) pH (pH meter); (6) Climate data (bulk rainfall and average temperature); (7) Texture soil (Kang Biau pipette method Tjwan and Putu Djapa Winaya); (8) Slope Slope; (9) Depth land ; (10) Soil Structure .

RESULTS AND DISCUSSION

Unit land is group related locations _ with form owned land _ characteristics particular region one with others. In research This unit land obtained from map use land , map slope slope , map type land , map bulk rain and map level danger erosion .

Based on data from the 2013 Indonesian Earth Map of North Sulawesi Province , there are 7 (seven) types use land in Kakas District . _ Use land This is dominated by plantations / gardens covering an area of 3333.72 Ha or about 49.74% of wide Kakas District . Use land in Kakas District can be obtained seen in Table 3.1 below this .

Table 3.1 Land Use in Kakas District

Land Use	Area (Ha)	Percentage (%)
Swamp Water	6.74	0.10
Plantations / Gardens	3,333.72	49.74
Settlements and Places of Activity	133.27	1.99
Ricefield	566.15	8.45
Shrubs / Alang Alang	1,045.57	15.60
Empty / Bare Land	1.13	0.02
Moor / Farm	1,616.03	24.11

Total	6,702.61	100
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Source : RBI Map of North Sulawesi Province (2013)

Evaluation Suitability of Mango Plantation Land

From the results study class suitability land obtained description condition every SPL. Class suitability land For Mango plants (*Mangifera Indica* L) in Kakas District can seen in Table 3.2 below this and the map spread class suitability land can seen in Figure 3.1.

Table 3.2 Class Suitability of Mango Plantation Land in Kakas District

SPL	Land Use	Village	Class Land Suitability	SubClass Land Suitability	Area (Ha)
1	Plantations / Gardens	KAWENG	S3	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S3-e	347.09
2	Plantations / Gardens	KAWENG	N	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, Ne	2.78
3	Moor / Farm	KAWENG	N	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, Ne	177.77
4	Plantations / Gardens	KAYUWATU	S3	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S3-e	593.57
5	Moor / Farm	KAYUWATU	N	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, Ne	6.31
6	Plantations / Gardens	MAHEMBANG	S3	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S3-e	547.22
7	Moor / Farm	MAHEMBANG	N	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, Ne	265.05
8	Plantations / Gardens	MACALLELON	S3	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S3-e	4.92
9	Plantations / Gardens	MACALLELON	S3	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S3-e	55.95
10	Moor / Farm	MACALLELON	N	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, Ne	20.40
11	Moor / Farm	MACALLELON	N	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, Ne	196.12
12	Plantations / Gardens	RINONDOR	S3	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S3-e	81.93
13	Plantations / Gardens	RINONDOR	S3	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S3-e	348.41
14	Moor / Farm	RINONDOR	N	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, Ne	265.48
15	Plantations / Gardens	SENDING	S3	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S3-e	78.60
16	Plantations / Gardens	TOULIMEMBET	S3	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S3-e	81.42
17	Moor / Farm	TOULIMEMBET	S2	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S2-e	0.68
18	Moor / Farm	TOULIMEMBET	N	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, Ne	289.53
19	Plantations / Gardens	SPELL	S3	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S3-e	211.66

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20	Moor / Farm	SPELL	N	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, Ne	96.75
21	Plantations / Gardens	WINERU	S3	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, S3-e	223.69
22	Moor / Farm	WINERU	N	S2-t, S3-w, S2-r, S1-f, S1-n, S2-n, Ne	31.74

Source : Analysis Results (2023)

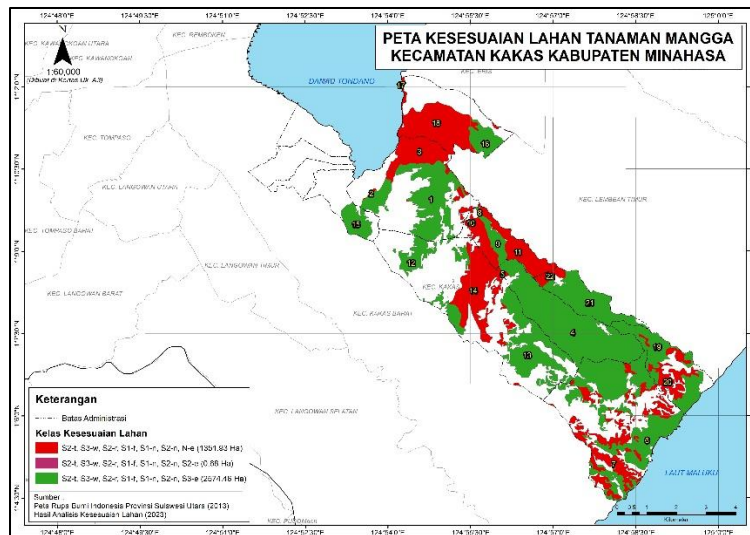


Figure 3.1 Map of Mango Plantation Land Suitability

CONCLUSION

In this study, 22 units were obtained land map (SPL) covering an area of 3927.07 Ha spread across several villages in Kakas District , namely Kaweng , Kayuwatu , Mahembang , Makalelon , Rinondor , Sendangan , Toulimembet , Tumpaan and Wineru Villages . Suitability land For development plant mangoes in Kakas District are in class suitability S1 land (very suitable) for criteria nutrient retention and available nutrients whereas criteria temperature and rooting media included in class suitability S2 land (enough appropriate) and for criteria water availability and levels danger erosion generally enter the S3 class (according to marginal). Temporary level danger erosion is criteria that provide class N (no appropriate) for plant mango at 10 (ten) SPL with area 1351.93 Ha or around 34.43%. Meanwhile, 12 (twelve) SPLs cover an area of 2575.13 Ha or about 65.57% appropriate For development plant mango .

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