EVALUATION COMPLIANCE LAND ON PLANT COCOA *Theobroma cocoa* L *)* IN SUBDISTRICT TANO TOMBANGAN ANGKOLA, SOUTH TAPANULI REGENCY

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ABSTRACT

The research aimed to investigate an evaluation of land suitability for Cocoa plants *(Theobrom cacao* L. *)* at subdistrict of Tano Tombangan Angkola district of South Tapanuli. This research was carried out on May to June 2016 in a few agricultural areas around subdistrict of Tano Tombangan Angkola. Soil sampling is based on land units and soil analysis is carried out in the soil laboratory of the Andalas University. This study used a purposive sampling method based on specific objectives, concept mapping, and land suitability analysis in Tano Tombangan Angkola sub-district. The observed survey is in terms of using or land characteristics. The results showed that the evaluation of land in Theobroma cacao in Tano Tombangan Angkola Subdistrict, South Tapanuli Regency was not suitable with the method of matching within characteristics of the soil with the requirements for growing cacao plants in the district. Cacao plants in Tano Tombangan Angkola Sub-district are not suitable for cultivation and further research is needed to obtain plants that are suitable with the characteristics of the land in this area.

Keywords : *cocoa plant, land evaluation, Tano Tombangan*

INTRODUCTION

Cocoa *(Theobroma cacao* L. *)* is a commodity with high economic value and great potential for development. Global demand for cocoa beans tends to increase year by year. to years and the increase in the area of cocoa commodities is also able to provide employment and sources of income and increase the country's foreign exchange. Cocoa also plays a role in encouraging regional development and agro-industry development.The North Sumatra Provincial Plantation Service carried out optimization Land to increase cocoa production. One example of this land optimization is in South Tapanuli, where immature plants (TBM) cover an area of 1,000 hectares. 998.50 ha, productive plants (TM) covering an area of 2,445.45 ha, cocoa plant production of 2,081.55 tons in 2013. One of the sub-districts in South Tapanuli Regency, namely Tano Tombangan Sub-district Angkola own Cocoa plantation crops. The area of cocoa plantations in Tantom Angkola District, immature plants (TBM) is 38.00 ha, mature plants (TBM) are 38.00 ha. produces (TM) covering an area of 166.00 ha, while cocoa production in Tantom Angkola District is 148.00 tons (BPS, 2015).

Evaluation of land suitability for plantation crops in Tano Tombangan Angkola District This is necessary, considering that the area has sufficient land to increase cocoa production. This assessment is crucial to ensure optimal land utilization and optimal production. To date, there has been no research evaluating land suitability for cocoa cultivation in the area.The most effective and easiest evaluation method is the matching method. This method matches the growing requirements of the plant with the characteristics of the land being evaluated. The results of the land evaluation yield a suitable land use. commodities according to land use requirements so that the land can be used according to its capabilities.

Based on this background, the author is interested in conducting research with the title " **Evaluation of Land Suitability for Cocoa Plants *(Theoroma Cacao L)* in Tano Tombangan Angkola District, South Tapanuli Regency".**

METHODOLOGY STUDY

This research was conducted in July 2016 in Tano Tombangan Angkola District, South Tapanuli Regency. in several places/villages in Tano Tombangan Angkola District in agricultural areas. Soil analysis was carried out in laboratory Faculty Department of Agriculture, Andalas University, Padang.The materials used in this study were soil samples, Land map. The tools used in this research are *Global Positioning System* (GPS), altimeter, camera, tape measure, hoe, slope meter, plastic label, and stationery.The method used in this study was purposive sampling, which was based on the needs and objectives of creating maps and land suitability analysis that would later be used in Tano Tombangan Angkola District. To obtain representative data elements in Subdistrict the then the samples are placed at each coordinate point determined via the sub-district map.The location determination is based on the coordinate points shown on the land unit map, where the locations where soil samples will be taken will be spread across certain points, the locations where soil samples will be taken the sample is as much as 10 location spread that is in the village Aek Utcim as much as 2 point, in the village Aek Kahombu, Jaji Mauli village, Panabri village, Huta Raja village, Lumban Jabi-jabi village, Harean village, Simaninggir village 2 points.The land is taken based on the land where the plants are cultivated. Which has been determined, the location of the commodity land suitability can be seen in Figure 1 of the following land suitability map:

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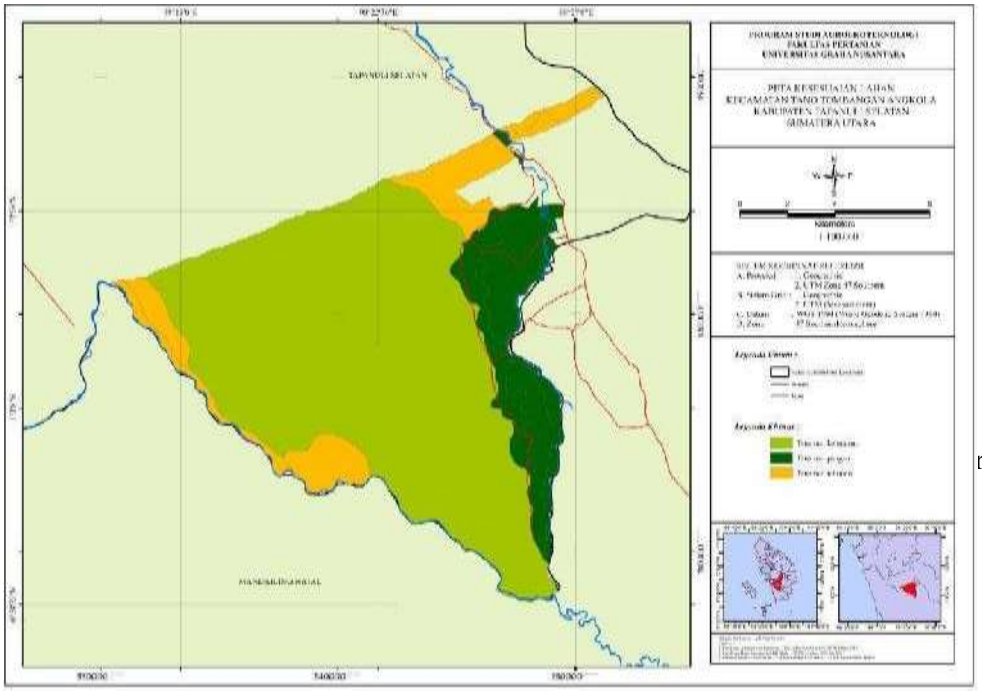

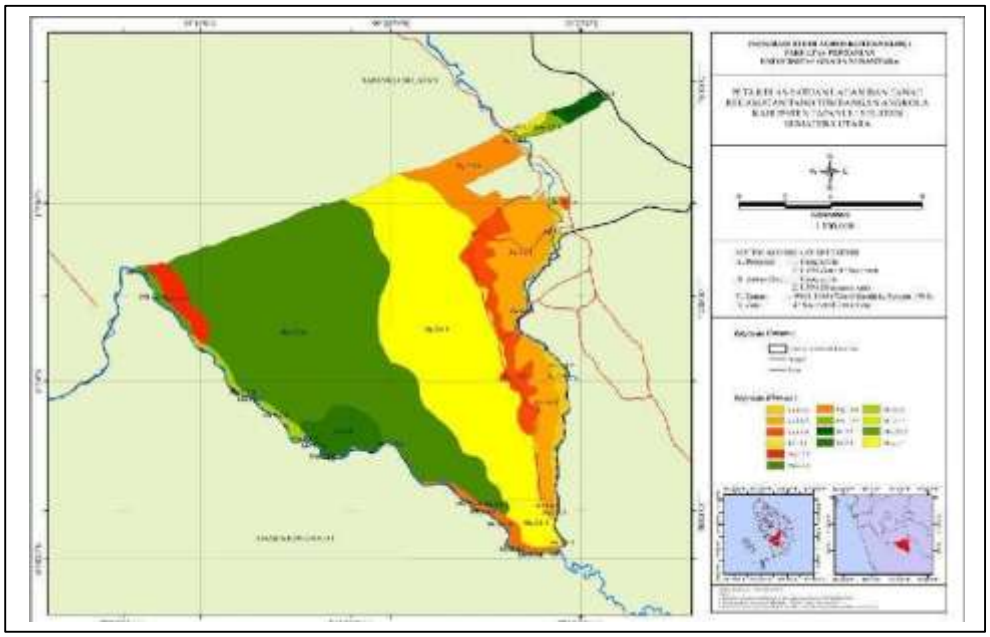

Picture 2. Map unit land And land subdistrict Tano Tombangan Angkola

Table 1. Information map unit map land And land in Subdistrict Tantom Angkola.

NO	LAND UNIT	SOIL	SYSTEM	COMMODITY
1	Au.1.4.1	Eutropepts	Plant food	Paddy gogo, Corn, soya bean, green kc., land kc., stump kc., sweet potato, cassava, tobacco, onion red, Cayenne pepper
2	Au.1.4.2	Tropaquepts	Plant food	Paddy ricefield
3	Au.1.4.3	Tropaquepts	Plant food	Paddy ricefield
4	Hf.1.3.3	Hapludults	Plant annual	Palm oil, rubber, coconut, coffee robusta, pepper, clove
5	Hg.1.3.4	Dystropepts	Plant annual	Palm oil, rubber, coconut, coffee robusta, pepper, clove
6	Hu.1.2.3	Dystropepts	Plant annual	Palm oil, rubber, coconut, coffee robusta, pepper, clove
7	Kc.5.3	Eutropepts	Plant annual	Palm oil, rubber, coconut, coffee robusta, pepper, clove
8	Kc.5.4	Eutropepts	Plant annual	Palm oil, rubber, coconut, coffee robusta, pepper, clove
9	Ma.2.2.4	Humitropepts	Plant annual	Coffee robusta, cocoa, durian, orange, clove
10	Ma.2.3.4	Dystropepts	Plant forestry	Vegetation experience
11	Mfq.2.2.3	Dystropepts	Plant annual	Coffee robusta, cocoa, durian, orange, clove
12	Mq.2.2.3	Troporthents	Plant annual	Vegetation experience
13	Mu.2.3.4	Dystropepts	Plant forestry	Palm oil, rubber, coconut, coffee robusta, pepper, clove

Sampling is done by taking soil intact every unit soil map (SPT) by hoeing part of the land scattered on a land based on a point soil mapping unit (SPT). Samples that taken as much as one kilogram (Kg)/sample for one unit map land (SPT), so that 10 intact soil samples were obtained from Tano Tombangan District.

Analysis of soil physical and chemical properties will be conducted in the laboratory using laboratory equipment. Data obtained from laboratory and field analysis on land characteristics in the research area are compiled in tabular form as land quality or characteristic data and then compared with plant requirements at a semi-detailed level. Land suitability evaluation uses a *matching system* , as well as comparing land characteristics with plant growth requirements formulated in the technical guidelines for land evaluation for Agricultural Commodities (Hardjowigeno, 2007).Plant growth requirements are criteria in suitability evaluation. land, the results of the suitability of the land for each land crop commodity dry displayed in form table suitability actual land and potential to use GIS software, then mapped suitability land actual and potential land suitability.

Results And Discussion

The results of the evaluation of the suitability of cocoa plantation land in soil map units (SPT) 1 to SPT 10 can be seen in table 1 below.

Table 2. Results of evaluation of actual land suitability and potential land suitability for cocoa plants in Tanotombangan District.

No	Location Study	Compliance Land Current	Compliance Land Potential
1	Village Aek Utcim 1	**S3.eh**	**S2.tc, rc, nr, eh**
2	Village Aek Utcim 2	**N.eh**	**N.eh**
3	Village Aek Kahombu	**N.eh**	**N.eh**
4	Village Janjimauli	**S3.rc, nr, eh**	**S3.eh**
5	Village Panabari	**N.eh**	**N.eh**
6	Village Forest King	**S3.rc, nr, eh**	**S3.rc**
7	Village Lumban Jabi- jabi	**N.eh**	**N.eh**
8	Village Harean	**N.eh**	**N.eh**
9	Village Simaninggir 1	**N.eh**	**N.eh**
10	Village Simaninggir2	**S3.rc**	**S3.rc**

Location on village Aek Utcim 1 is Au.1.4.2, soil tropaquepts, system food crops, lowland wet climate food crop subsystems, and rice commodities ricefield. It can be seen that the actual land suitability class is the most limiting factor. minimum is S3.eh can repaired so that class suitability land potential to rise to one level, namely S2.tc.rc.nr.eh.Evaluation results at the Aek Utcim2 Village location Based on land map units (SPT) 2, 3 and SPT 5 have the same suitability class. In land units Au.1.4.1, soil eutropepts, food crop system, dryland food crop subsystem of lowland wet climate. The minimum potential land suitability class of limiting factor is N.eh, improvement efforts to increase the land suitability class cannot be carried out so the requirements for land use/characteristics for cocoa plants are not suitable. It can be seen that the minimum actual land suitability class of limiting factor is N.eh, cannot be improved.The results of the evaluation of land suitability classes for cocoa plants in the unit map Land suitability class (SPT).4 in Janjimauli Village based on the land map unit (SPT) from land unit Mu.2.3.4, soil dystropepts, forestry plant systems, non-agricultural plant subsystems, and natural vegetation commodities. It can be seen that the land suitability class actual with The minimum limiting factor is S3.rc.nr.eh. After carrying out repair efforts, the limiting factor is only the slope (S3.eh).

Evaluation of land suitability classes for cocoa plants in units map Land suitability test (SPT).5, 7, 8 and SPT 9 produce the actual land suitability class, namely N.eh (not suitable with the most severe limiting factor being slope characteristics). Thus, the most severe limiting factor cannot be improved by improvement efforts with the addition of materials.

The results of the evaluation of land suitability classes for cocoa plants in the unit map The land suitability (SPT).6 can be seen in Table 2, namely the actual land suitability is S3.rc, nr, eh and the potential land suitability is S3.rc. The results of the evaluation of the land suitability class for cocoa plants in the land suitability unit map land (SPT).10 is

S3.rc both on actual and potential land suitability.Land characteristics that can be improved include organic materials and Nutrient retention. In this case, Winarso (2005) stated that the process of organic material decomposition by soil microorganisms generally runs smoothly if the pH is close to neutral-alkaline (6-8). If the pH is too acidic, the organic material decomposition process will be imperfect. Efforts that can be made to improve soil quality are by liming. According to (Hardjowigeno, 2002), lime contains the element Ca, but the addition of lime to the soil is generally not due to soil deficiencies. element Ca but the soil is too acidic.According to Kohnke (1979) the role of organic matter in the properties physique And Soil chemistry includes increasing aggregation, protecting aggregates from water damage, making the soil easier to cultivate, increasing porosity and aeration, increasing infiltration capacity, and percolation as well as organic C, total N, P and K.Soil properties that cannot be improved through the addition of materials or physical improvements are improvements to cut slopes (land slopes). According to Arsyad (2000), several soil properties that influence erosion are texture, structure, organic material, depth, and nature of the layers. land, And the level of soil fertility, while the sensitivity of the soil to erosion indicates how easily or not the soil experiences erosion. erosion determined by various physical properties of the soil.According to Cahyo et al. (2013), erosion is the detachment of soil particles from their original location and their transport to another location. Erosion can be caused by water or wind. The occurrence of erosion is determined by climate, topography, soil characteristics, soil susceptibility to erosion, ground cover vegetation, and land use.

CONCLUSION AND SUGGESTION

Based on the results of research and discussion of land suitability evaluation for *Theobroma cacao L. cocoa plants* in the District Tano Tombangan Angkola, South Tapanuli Regency, the requirements for land use/characteristics for cocoa plants are not suitable for planting cocoa plants in Tano Tombangan District, Angkola because the actual and potential land suitability classes have the most severe limiting factor, namely slope (N.eh) as many as 6, namely SPT 2, 3, 5, 7, 8 and SPT 9. Possible locations for planting cocoa are limited to 4 locations, namely SPT 1, 4, 6 and SPT 10.Cocoa plants in Tano Tombangan Angkola District in recommend to plant forest plants or industrial forest plants, as well as planting plants that are tolerant to slopes such as conservation plants and there also needs to be further research evaluating the suitability of land for plants. which is different in Tano Tombangan Angkola District, South Tapanuli Regency.

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