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ANALYSIS OF RELIABILITY LAND IN VARIOUS SYSTEMS IN VILLAGE TEMBUNG AREAS DELI SERDANG.

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ABSTRACT

The results of a land unit in a map or Land Map Unit (SPL) are obtained from overlapping slope maps slope, soil depth map, and land use map. where in this research the sampling method soil and litter based on purposive sampling method, laboratory analysis for each selected data function (Minimum Data Set / MDS) indicator MDS is then summed to find out the Soil Quality Index (IKT), using statistical analysis, correlation test, and non correlation test parametric Spearmans to find out the relationship between people's perceptions with IKT. Also this research showed that the Soil Quality Index in various systems land use which has the highest IKT is the land of TP fields equal to 33.3, the lowest IKT on TK moor is 29.4. Most indicators effect on the IKT of soil porosity (r = 0.739). so fertilization is recommended by using manure to improve soil physical, chemical and biological properties with the dosage of using manure originally 2-3 tons ha-1 to 20 ton ha-1 , management of litter by being buried and made compost, arrangement cropping patterns between annual plants (teak plants, cashew, melinjo), plants annuals (cassava plants, peanuts, corn), and conservation plants (Setaria grass), planting cover crops, repairing bench terraces with good construction and making rorak, activities need to be carried out counseling on conservation actions carried out serially on the village area of Tembung Tambak Rejo.
Keywords: *soil quality, land use system, land management,*

I. INTRODUCTION.

In 1980 around 80% of the village of Tembung, Kecamatan the sandpaper field, the deli was covered by abandoned plantations, but there were reforms resulting in illegal logging and massive land use change being agricultural land and settlements in 1998, has resulted land degradation, which is characterized by the number of layers of soil surface which is eroded by rainwater. Land degradation in Ngadipiro village is one of the largest sediment contributors on the Keduang river. Research result JICA (2007) states that the average land loss per year from Sub

The Keduang watershed is the largest (5.112 tons ha-1) compared to sub-watersheds others in Wonogiri (average ranges from 4,786 tons ha-1) The sediment is mainly originating from agricultural activities on dry land (1,726 tons ha-1) and yard (2,758 tons ha-1) The surface layer of the land is a large part of the soil containing organic matter and nutrients needed by plants.

The loss of the surface layer due to the erosion of rain water causes it the soil decreases its fertility, unproductive and quality downhill. According to Plaster (2003) soil quality is the capacity of
a land to function within the boundaries of its ecosystem and interact positive with the external environment of the ecosystem Soil degradation can be characterized by decreased soil capacity for production and conservation functions. There is a public perception about land management carried out by farmers can affect the pace soil degradation.

Land management is strongly influenced by people's perceptions of soil quality. Good quality land will guarantee the sustainability of functions land, both production functions and

ecological functions. Soil quality is determined based on the Soil Quality Index using the minimum data set from
various indicators of physical, chemical and biological soil. Determination of Quality Index the land of a land will be useful for the direction of land management sustainable.

II. LITERATUR REVIEW.

2.1. Definition of soil quality

Soil quality is the capacity of a deep soil a land to provide functions needed by humans or natural ecosystems for a long time. The function is its ability to maintain growth and productivity of plants and animals, maintaining air quality and water or maintain environmental quality. Quality land help the forest to stay healthy and grow plants good (Plaster, 2003). Soil quality combines physical, chemical and biological elements land and its interactions. So that the land can function effectively, third these components must be included. The end result of the processes degradation and conservation that takes place on a land will affect soil quality. Therefore, soil quality not only includes productivity and environmental protection, but also food security and human and animal health (Kennedy & Papendick, 1996 cit. Purwanto, 2009). The negative impact of the inability of the land to fulfill its function is the disruption of the quality of the soil, giving rise to increasing the extent of critical land, decreasing soil productivity and environmental pollution. The existence of these impacts can be used to monitor changes in soil quality in order to continue to meet its function. Decreasing the quality of land contributes greatly the quality of the environment will get worse in general (Nazam and Suriadi, 2008).

Soil quality is measured based on observations of dynamic conditions land quality indicators. Measurement of soil quality indicators produce a soil quality index. Land quality index is index calculated based on the value and weight of each quality indicator soil. Land quality indicators are selected from the characteristics shows the function capacity of the soil. Based on the function of the land want to be assessed and then selected a number of appropriate indicators. According to Mausbach and Seybold (1998) in Partoyo (2005) elections indicators based on the concept of minimum data set (MDS), i.e. little possible but can meet the needs (Partoyo, 2005).

Land Quality Index Assessment can be through use key soil properties or indicators that describe important processes land, that is by using the addition index method. Besides that, the assessment can also be done by measuring a land function change in response to internal management
the context of land designation, soil inheritance, and environmental influences for example rain and temperature (Andrews et al., 2004).

2.2. Determinants of soil quality

The results of research from JICA in 2007, such as those listed in table 1.1 states that the average loss land per year from the Keduang watershed is the largest (5,112 tons) ha-1) compared to other sub-watersheds in Wonogiri. Land loss this is what can reduce the quality of land as a function of production and conservation, which results in a decrease in production agriculture in the Ngadipiro village area, Nguntoronadi District Wonogiri. Plants provide input of organic matter through leaves, the fallen branches and branches which then play an important role in improving soil quality both in chemical, physical and biological properties soil. Litter that falls on the ground can protect the surface of the ground from blows of rain water and reduces evaporation, able to bind large amounts of water so that it

can reduce the amount of water lost. In terms of chemistry, litter plays a role in increase nutrients and increase cation exchange capacity.

This increase in CEC can reduce the loss of nutrients added through fertilization so that it can increase efficiency fertilization. In terms of biology, litter can provide benefits biology through providing energy for the ongoing activities organisms thus increasing micro and macro activities in
in soil (Suprayogo et al., 2003).

According to Gonggo, B.M et al. (2005) decrease in stability the structure and content of soil organic matter can cause changes other soil properties such as decreasing soil porosity, permeability soil, and soil biology.

2.3. Efforts to Maintain Land Quality

In an effort to convert Imperata land into land productive and sustainable agriculture, it needs to be done improvement of soil properties, especially management of soil organic matter by setting cropping patterns that are in accordance with regional conditions local. The conservation farming system aims to increase soil productivity and maintain it. Processing land without being supported with soil conservation measures can cause declines rapid soil productivity. Utilization of Imperata land for
agriculture by improving productivity is far better compared to opening a forest, because forest clearing will have a negative impact on the quality of the environment and soil (Gonggo, B.M et al., 2005).

The existence of a land degradation process will reduce the condition of land quality in an area. According to Parr et al., 1992, cit. Kennedy et al. (1996), soil quality is the end result of processes degradation and conservation practices that take place on a land. Therefore, efforts can be made in maintaining quality land can be through the cultivation of soil conservation, crop rotation, increased reduction, management of organic residues by means of fertilization (both organic and inorganic), system improvement accordingly with soil type, climate and cultivars, it can also be done with water preservation, terracing, contour farming, increasing nutrient cycling (Purwanto, 2009).

The main problems encountered in the watershed are in the form of the high rate of land loss and land degradation is necessary a conservation action is carried out on dry land as well as yard. JICA (2007) recommends conservation projects for

The Upper Solo River Basin which includes: a) Handling soil conservation physical and vegetative, b) Development of annual crops and agroforestry, and c) Supporting programs for the promotion of watershed conservation projects. Consider the recommendations of JICA (2007), then one
conservation action that needs to be done is by development agroforestry patterns in fields and yards.

2.4. Land Use System and Its Effect on Soil Quality

The success of agricultural businesses using agroforestry systems very much depends on the level of understanding of interactions between the trees of the annual plant based on observation, experience, and research in the field. Basically agroforestry management lies in the business suppress adverse effects and optimize that influence beneficial by regulating the physical appearance and morphology of the tree, so that it can affect the soil conditions on a land (Suprayogo et al., 2003).

The yard is a simple form of agroforestry there are many in Java. In this form a permanent combination of food crops and forest plants are mixed in a mixture so that there is a canopy structure like a forest. Interesting thing from this way is the economic and

ecological role of the form can be produce food, animal feed, fuel wood and building wood, fertilizer green and at the same time the yard can stabilize and maintaining soil fertility (Yoeliani et al., 2003). Upland fields are stretches of land that have never been flooded or water inundated for a period of time most of the year. Technique
the farm does not have irrigation facilities. The typology of this land can be found from the lowlands (0-700 m asl) to the highlands (> 700m asl).

Management of moor in general rarely uses intensive labor and rarely use animal power. Cultivated plants especially plants that are resistant to drought and are included in annual crops (Anonim, 2008). Land use system with monoculture and tree patterns mixed trees will cause various interactions between plants, which in the short term emphasized on the influence on crop production season. Positive interactions of avalanches from various plants to the ground useful as a ground cover, so it can increase the rate soil infiltration and can increase the supply of other nutrients useful for annual crops.

III. METHOD OF RESEARCH.

This research is a descriptive study, which approaches the variable is done through observation and measurement in the field, as well as interview with the research community by using
questionnaire.

· Determination of Land Map Unit (SPL)

Most research sites have the same type of soil namely Inceptisols, but the attack, soil depth and use the land is different, so to determine the sampling point need to use a Land Map Unit (SPL). Based on the results field observations and mapping using a 1: 25,000 scale, then slope of the slope in the study area is divided into four classes ranging from flat to steep. Depth of soil in the study area
divided into four classes which range from very shallow in. While for land use in this study more focused on community forest land, fields and yards. Map unit land obtained from the results of overlapping slope maps, maps soil depth, and land use map. The maps are made based on field survey results, using maps earth form, base map, and contour map. Overlap the map carried out using the GIS facility. Whereas technique land sampling in each land unit is done intentionally (purposive sampling) based on the concept of homogeneity of land characteristics. The results of overlapping maps obtained 9 SPL as presented in figure flowchart.

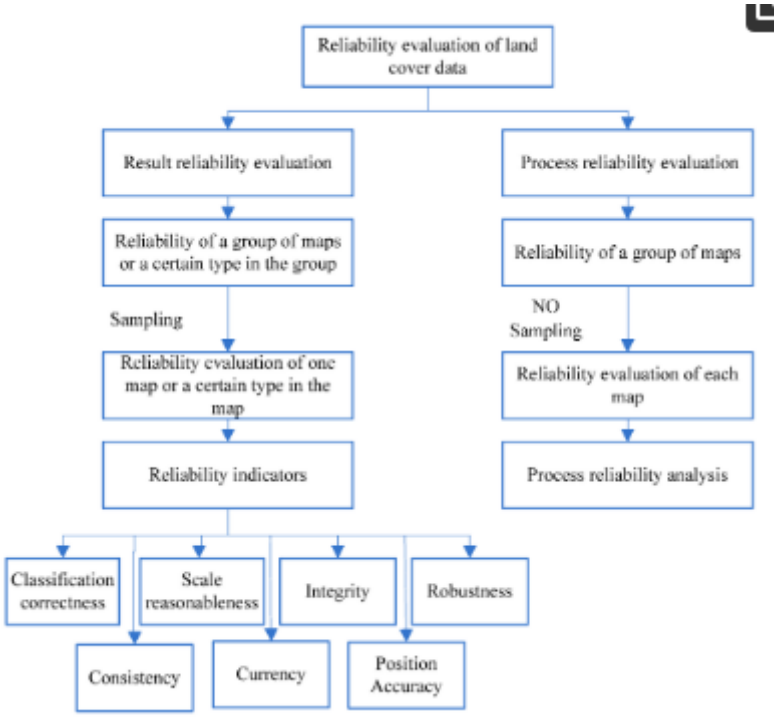

Figure 1. General framework of the reliability evaluation of land.

Data obtained from all subsequent studies were analyzed using Minitab version 13 and SPSS programs. To know differences in the diversity of land use systems in each SPL using the T test. To find out the closeness of the relationship between each variable the correlation test is used. To find out the relationship of perception community with Land Quality Index using non correlation test parametric Spearmans. Next, to find out the most factors effect on soil quality used stepwise regression and test
statistics for regression coefficient values (r).

IV. ANALYZE AND RESULT.

Results of measurements of tree diversity, basal area, and biomass trees on various land use systems, namely in community forests with monoculture teak plants (SPL 3, 5, 8), moorings with patterns agroforestry, with a mixture of various types of trees (SPL 6, 9), moor with agroforestry patterns, with the dominance of cassava plants and species shade trees of teak plants (SPL 4, 7), and yards around the place resident (SPL 1, 2), listed in Table 1.

Table 1. Diversity of vegetation, basal area, biomass of trees in the Unit Land Maps (SPL) grouped by similarity land use system

Usage System Land	SPL	Vegetation diversity	Basal Area %	Biomasa tree (Mg ha-1)
Community forest	3, 5, 8	Teak (Tectona grandis L)	90.87	101.86
Upright with mixed variety tree type	6, 9	Teak (Tectona grandis L), Guava cashew (Anacardium occidentale), Gliricidae (Glyricidia sepium), Mahagoni	38.43	63.06
Upright dominance tree cassava plants	4, 7	Teak (Tectona grandis L), Cassava tree (Manihot esculenta)	58,56	4,90

Based on Table 4.1, shows that the system is used land for community forests with monoculture teak plants (SPL 3, 5, 8) has the highest basal area value (90.87%) compared to other land use systems, while for the lowest basal area (38.43%) found on dry land with agroforestry patterns, with a mixture of various types of trees (SPL 6 and 9). In accordance with the statement of Rahayu et al. (2006) which states that it is low tree populations in land use systems cause low land cover level, which is also indicated by the low basal area.

Based on these statements, it has been proven that the system use of upland land with agroforestry patterns, with mixtures various types of trees (in SPL 6 and 9) have a basal area value Lowest. This is due to SPL 6 and 9 having density lower vegetation (1875 trees ha-1) when compared to SPL 3, 5 and 8 (2133 trees ha-1).

The presence of soil organisms plays an important role in decomposition soil organic matter and nutrient dynamics in mineralization and processes humification, so that it will affect the soil chemical properties. Besides that, soil macrofauna that can form channels, holes, collections soil, and soil mounds will also affect the nature of physics soil. So that the presence of soil organisms will be able to describe the causal chain that connects decisions land management for final productivity and plant health.

Tables 2. The results of the measurement and scoring of the quality indicators of the land of Tebung Village

SPL	KA		BV		Porositas		pH		K_2O		N tot		P_2O_5		C org		qCO_2		IKT
	%	skor	gr/cm^3	skor	%	skor		skor	mg/100gr	skor	%	skor	ppm	skor	%	skor	lbs CO_2-C/ac/hr	skor	
1	60	3	1,15	5	48,61	5	5,28	2	10,14	2	0,48	3	30,77	5	0,29	1	66,25	5	34,4
2	70	3	1,93	1	18,97	3	5,65	3	10,32	2	0,62	4	21,64	5	0,35	1	65,45	5	30
3	90	5	1,33	4	44,24	5	5,08	2	9,71	2	0,47	3	24,63	5	0,27	1	64,65	5	35,6
4	70	3	1,39	3	34,96	4	6,3	3	20,38	3	0,84	5	26,79	5	0,19	1	67,05	5	35,6
5	70	3	1,42	3	39,21	4	5,24	2	5,47	2	0,61	4	10,01	5	0,1	1	63,86	4	28,9
6	70	3	1,87	1	12,98	1	5,49	2	10,25	2	0,47	3	43,37	3	0,11	1	65,45	5	25,6
7	80	3	1,6	3	32,03	4	4,99	2	14,45	2	0,41	3	27,61	5	0,15	1	64,65	5	31,1
8	100	5	1,25	4	45,07	5	5,13	2	8,69	2	0,18	2	24,18	5	0,1	1	59,87	4	33,3
9	80	3	1,06	5	52,06	5	5,13	2	3,91	1	0,54	4	26,63	5	0,11	1	57,47	4	33,3

Based on the results of the analysis, it was found that the Soil Quality Index (IKT) at Ngadipiro village is in the range of 29.4 to 33.3, The method for determining IKT appreciation is presented in Table 2. From the results of the T test it is known that the Land Quality Index in various systems of use different land is not real

The proposed vegetative action by JICA is also in line with statement of Idjudin, et al (2006) in Winarno et al. (2008) which stated that the application of conservation measures by planting Maupu Bush grass (King, Setaria, Gliriside) can improve physical properties soil. Besides that, the role of the roots of grass (king and setaria) and gliricidae helps in the process of forming micro and macro aggregates soil and stimulate micro and macro activity of soil organisms. Root grass plants (elephants, setaria, vertiver and king) cause physically bonding clay particles and permitting improvement biological activity in inceptisols. Whereas to strengthen building terrace benches, then the use of certain annual plants is sufficient effective as a reinforcement terrace. In addition, plant combinations are needed annuals and annuals that match the conditions of the research area. Making rorak is an alternative conservation measure for reduce the high level of erosion in various systems of use research area. This effort is generally associated with water requirements on a land. Pattern making is intended for accommodate and absorb surface runoff water into the ground, slow down the flow rate, collect the sediment makes it easy to return it to the field if.

V. CONCLUSION.

Based on the results of the research and discussion, it can be taken some conclusions as follows:

1. Soil Quality Index (IKT) in various land use systems at Ngadipiro Village is not significantly different, with the following values:

a. Dominant fields dominated by secondary crops have the highest IKT value amounting to 33.3 with a moderate price

b. Public forest land has an IKT value of 32.6 with a price is being

c. The yard has an IKT value of 32.2 with a price is being

d. Perennials of domination of perennials have the lowest IKT value amounting to 29.4 with a low price

2. From some land indicators, it turns out that the indicator gives the most response to Soil Quality Index is soil porosity (r = 0.739)

3. Public perception of land management carried out in the village Ngadipiro is that most farmers already understand good land management and conservation actions.

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