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Vegetation characteristics in The Soil Geomorphology Perspective

Vegetation characteristics in The Soil Geomorphology Perspective

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Abstract. This research lies in the hamlet of the village wells are Klompangan, Ajung, Jember. Research carried out aims to analyze the coordinates of the location, the degree of slope (elevation), soil pH, soil texture, soil moisture, the availability of organic materials, and the color of soil on land relate with tobacco and soil geomorphology aspect. Measurement and research carried out on 3 May 2019 by using descriptive method. Location of site selection has taken 500 meter minimum distance of each point by taking a 5 point location. With research and measurement of physical and chemical aspects of the soil in tobacco fields. From the research and measurement in mind that the average pH in the region ranges from 5.9, with the texture of sandy loam rara average, at an average altitude of 84mdpl, average humidity 9.2. Moreover, this study shows that there is a relationship between tertiary volcanic landforms and tobacco growth as an example of vegetation type.

1. Introduction

Indonesia is a country that has a topography that is very good at all for the benefit of agriculture and plantation. This was due to land in Indonesia average is due to the volcanic land of volcanoes that traverse the average surface Indonesian state which makes the soil becomes fertile and can be planted with various crops. Jember commodity that can be said of the most prominent is the result of the tobacco plant. Good quality from Jember tobacco plants and a well-known commodity of this city. Jember is one of the areas in East Java province which is recognized as a center of tobacco production. The main varieties of tobacco that can be grown in Jember is Besuki Na-Oogst Tobacco.

Tobacco is a product of agriculture which is not included in the food commodities it entered on commodities. The tobacco plant is not consumed as food but as for use as a pastime or as a form of entertainment as a raw material, and also smoking cigars. Besides being used as raw material for cigarette, tobacco can also be used as a drug for secondary metabolites terkandungnya therein and also can be used as a pesticide. And the result of the tobacco plant itself can provide economic benefits as well, especially in the Indonesian economy because of these plants results obtained clearance immense used for the development of the nation. Rapid population growth and increasing demand for resources and production, particularly irreversible resources such as water, bring to the attention of authorities consumer demand require planning and control [1]

To be able to get quality tobacco plants then have to consider several important aspects and if passed it will greatly affect the quality of the tobacco itself like such as soil geomorphology conditions which will be planted with tobacco in the area, whether good or watering conditions are still difficulties in terms of irrigation. For instance in choosing a location to be planted with tobacco, the tobacco plants require a location that is open and in lighting require full sun exposure. Because if daylighting in tobacco plants is low, the impact of tobacco leaves become thinner. And the land also includes the low, medium or high. Tobacco plants can be planted in the highlands and low. the dangers of agricultural activities, deforestation, settlement expansion, and mining for building materials increase the change in landscape which is quite large [2]

Then from the irrigation process, tobacco plants enough water need much about the need for water is needed close to the needs of rice plants need water. And no less importantly, the level of fertility of the soil, which also includes a variety of factors such as the depth of the soil layer, soil texture and also organic material contained. Pay attention some aspects are very important so that later can be produced in tobacco plants want and also qualified.

Previous studies conducted by entitled Mole tobacco farm income and Virginia in Garut[3]. Research does state that tobacco farming community is hereditary and activities that will result from the tobacco harvest directly processed by separating good-quality tobacco leaf and then in the oven to dry the tobacco leaves, the leaves dry runs then chopped tobacco leaves in print- small and then sold. Research conducted with the title of systems analysis business administration tobacco Mole stated that the process of cultivation and processing of tobacco leaves harvested almost the same as that of Sumbara by selecting the first leaf quality and not after it leaves chopped, Kertawangi adding that the tobacco harvest is divided based on quality is the quality of one and two (pieces) seven pieces, quality three and four (middle and upper) six sheets, quality five (leaf Kepel) two pieces and the quality of six (koseran) three pieces [4].

From their discussion of previous research can be seen that different with this study. Present study is more be focused on land planted with tobacco plants and its relationship with soil geomorphology aspect such as elevation and land form. Examples of things that were examined by this study that examines how the color, moisture and PH contained in the soil planted with tobacco. Then the content of organic matter contained in it as well as adequate lighting to support the growth of tobacco. In this study we investigated groups in different places where we examine the five location.

Based on some issues or things you want to know the group we did a study to find out some of these things where our group doing research in the sub Ajung District more precisely in the village Klompangan where there can be found people who raise tobacco but in the planting. It can be seen that the Klompangan village land can be planted various crops or arable tiger more than one kind of plant only. This study aims to analyze the coordinates of the location, the degree of slope (elevation), soil pH, soil texture, soil moisture, the availability of organic materials, and the color of soil on land relate with tobacco and soil geomorphology aspect.

2. Method

The research was conducted in the area of tobacco plant that is located in the District Ajung, Jember. This study focused on the analysis and measurement of cultivation of tobacco. The method used in this research is descriptive method. Descriptive method is a method to solve a problem is found with how to collect data, organize, explain, process and analyze in order to obtain the final result. The end results were used for deduction of the problems found. Then the kind of research that is used for surveying. The survey is a study that was done to the facts of phenomena that exist and seek factual information. The data used are samples taken from the population and then discovered the relationship between variables. Explained that the exhaustive survey will then be continued exclusively on specific aspects when necessary depth study [5].

This study used a sample of soil as a material for the test soil measurements. Soil samples were collected in some predetermined point. Soil samples representing the land at that location. Then, to determine the characteristics of tobacco fields to be studied, we interviewed one of the speakers that landowners own tobacco. By interviewing such sources can help us get information to do research.

Table 1. Name Location Research in Land Tobacco

No.	name Location
1.	Tobacco Land Plot I, Rural District of Ajung Kelompangan
2.	Tobacco Land Plot II, the village of the District Kelompangan Ajung
3.	Plots of Land III Tobacco, Kelompangan Rural District of Ajung
4.	Tobacco Land Plot IV, Village Kelompangan District of Ajung
5.	Plot V Land Tobacco, Kelompangan Rural District of Ajung

Table 2. Measurement Indicators

No.	Measurement indicators
1.	Coordinate
2.	Elevation
3.	Humidity
4.	Ph
5.	Organic ingredients
6.	Texture
7.	Color

3. Results and Discussion

Based on observations and measurements, the results obtained on the coordinates, elevation, soil moisture, pH, organic matter, color, and texture were obtained from 5 plot or a predetermined point with the provisions of each point having a minimum distance of 500 meters. To plot or the first point have coordinate point S:08o12'55.19 " and E: 113 ° 40'42.33 ", plot or point to two have S: 08 ° 13'06.84 " and E: 113 ° 40'56.09 ", the plot into three have S: 08 o 12'53.36 " and E: 113 ° 40'44.81 ", the plot into four had S: 08 ° 13'09.25 " and E: 113 ° 40'30.05 ", while for the plot or point to five have S: 08 ° 13'09.79 " and E: 113 ° 40'07.59 ".Based on research conducted at the sub-district village AjungKlompangan obtained the following results:

Table 3. Measurement of elevation

No.	Location	Elevation
1	I	85 masl
2	II	88 masl
3	III	84 masl
4	IV	83 masl
5	V	80 masl

Based on measurements of elevation on tobacco land in the village sub-district KlompanganAjung obtained measurement results are not much different between the first plot to plot V, which is the average elevation above 80 meters above sea level. This land can be said to be suitable as a tobacco cultivation due basically suitable height for the cultivation of tobacco, namely with elevations between 0-900 masl,

Table 4. Soil Moisture Levels

No.	Location	Humidity	Information
1	I	8	Moist
2	II	> 10	very humid
3	III	> 10	very humid
4	IV	8	Moist
5	V	> 10	very humid

Based on measurements of soil moisture using a moisture meter that has been done in the tobacco fields Klompangan sub-district village Ajung, found that land has a good moisture level for tobacco plants. Basically tobacco plants do not really need the water it is very suitable to be planted in temperate regions with average rainfall of 1500 to 2000 mm per year. Tobacco plants are also not too founded of water and excessive rain the most ideal temperature for the cultivation of tobacco is about 21 to 320C.

The type of soil suitable for growing tobacco are alluvial soil, regosol and andosol. That is because the alluvial soil readily biodegradable and good for the tobacco plant, regosol land next to this land is basically derived from decaying materials or materials from the activities or the eruption of Aropuro Mount in order to fertilize. While andosol land is also not much different from regosol soil formation is also affected by volcanic activity, tobacco cultivation also requires several conditions in order to develop properly, and one of them is to be planted in soil andosol.

Table 5. Content of Materials orgaik (BO)

No.	Type of soil	Organic Ingredients	Information
1	Land in Plot I	Frothy	The content of organic matter in the soil is very high
2	Land in Plot II	Frothy	Organic matter content is very high and is still the same land as the soil in the plot I
3	Land in Plot III	Frothy	The content of organic matter in the soil is still high and the same land with the land in plots I & II
4	Land in Plot IV	Frothy	Very high organic content
5	Land in Plot V	Frothy	Very high organic content

Based on the testing ground tobacco fields using H_2O_2 liquid is obtained which is not much different from a land plot of land in the plot I to V. All of the land in the study site on average have a high fertility rate. Laboratory test results show that when the soil in the solution H_2O_2 soil will react and appear many froth and remove smoke and feel hot. It shows that the soil on land that contains a lot of organic substances. The higher the organic content in the soil so the soil will also make changes to the color that makes dark earth tones over have a high orgaik material. Good use of organic fertilizers is also one of the factors of fertile land in the land. Judging from the surrounding areas that this land is not planted with tobacco,

Table 6. Soil Texture

No.	Location	Texture	Information
1	I	sandy loam	Rough taste on this ground feels a bit obvious and also will form a ball rather hard but easily broken
2	II	sandy loam	Rough taste on this ground feels a bit obvious and also will form a ball rather hard but easily broken
3	III	sandy clay	The ground was slippery but a bit rough, it can be formed in a dry state, it is difficult to be massaged but easily rolled up and has a high adhesion.
4	V	loamy	The ground was heavy, can mementuk ball well and has a high adhesion (attached once)
5	IV	loamy	The ground was heavy, can mementuk ball well and has a high adhesion (attached once)

Based on the research that has been done on tobacco fields in the village Klompangan subdistrict Ajung showed some land that has the same texture that is the plot I and II have the texture sandy loam of sand on the plot IV and V have the texture of loamy while in plot III had the texture of sandy clay. Land in the area is said to be suitable as tobacco fields as it has suitable soil texture.

Table 7. Soil pH

No.	Location	Information
1	1	7
2	2	5.5
3	3	5.5
4	4	6.5
5	5	5

Based on soil pH measurement using a moisture meter that has been done in the tobacco fields Klompangan sub-district village Ajung, found that land has a pH level varied. In the table above can be seen the number of pH on each plot element that has the highest pH 7 and the lowest 5.5, each plot has not so much difference between one another. From the total pH was known at each plot can be concluded that the condition of the soil in each plot is still quite good, because the lower the pH is contained in a land then the fertility rate would be lower as well. On soil with a neutral pH soil nutrients contained much in this regard is needed by the development of plants that will be able to make a healthy plant. The low pH of the soil will cause a decrease in the availability of nutrients for plants, which in turn will reduce the production of fresh fruit bunches (FFB). But in tobacco plants when land values are high nutrient content does not cause normal yellow color on the tobacco plant itself. For soils with a pH of 5 to 6.5 average soil contains a lot of iron, copper, manganese does not have a high material content orgaik. The low pH of the soil will cause a decrease in the availability of nutrients for plants, which in turn will reduce the production of fresh fruit bunches (FFB). But in tobacco plants when land values are high nutrient content does not cause normal yellow color on the tobacco plant itself. For soils with a pH of 5 to 6.5 average soil contains a lot of iron, copper, manganese does not have a high material content orgaik. The low pH of the soil will cause a decrease in the availability of nutrients for plants, which in turn will reduce the production of fresh fruit bunches (FFB). But in tobacco plants when land values are high nutrient content does not cause normal yellow color on the tobacco plant itself. For soils with a pH of 5 to 6.5 average soil contains a lot of iron, copper, manganese does not have a high organic material content.

Table 8. Soil Color

No.	Location	Soil color
1	1	Dark brown yellowish
2	2	Dark gray
3	3	Reddish brown
4	4	Dun
5	5	Gray, dark reddish

According to the existing data is in the table above can be seen that there are different colors for each plot. In the land that has a dark color usually have a high nutrient content. But the dark color usually there are other colors in this case is caused because it contains other elements that are in the soil. Brightly coloured or slightly reddish soil is usually contained in iron or oxide containing iron. On earth tones tend to be darker usually organic matter content is more dominant, the land is usually colored dark gray, dark brown and even black.

Klompangan village is a village of seven villages in the districts of Jember district Ajung. In general, Klompangan village is located in a strategic position, which is on the path of economic zone within 11 km to the south of the capital of district. Klompangan village located at an altitude of 100 meters above sea level with an annual rainfall of 2,471 mm - 3767 mm. Based on these aspects, agriculture became the main forms of people's daily activities. Klompangan agricultural land in the village is also fairly widespread, the majority of land planted with tobacco, rice and corn alternately in accordance climate. Tobacco plants suitable for planting in the land because basically the tobacco plants will grow well at elevations between 0-900 meters above sea level and requires an average rainfall of 2000 mm / year with temperatures between 21-32ț C. It is also in accordance with the opinion states that less sunlight exposure can cause poor plant growth so the productivity is low[6]. Therefore, the location for the tobacco plants

should be selected in the open and adapted to the type of planting time. Temperatures suitable for growing tobacco plants with a height ranging 21-32,3ŗC ie 0-900 masl. Less sunlight exposure can cause poor plant growth so the productivity is low. Therefore, the location for the tobacco plants should be selected in the open and adapted to the type of planting time. Temperatures suitable for growing tobacco plants with a height ranging 21-32,3ŗC ie 0-900 masl. Less sunlight exposure can cause poor plant growth so the productivity is low. Therefore, the location for the tobacco plants should be selected in the open and adapted to the type of planting time. Temperatures suitable for growing tobacco plants with a height ranging 21-32,3ŗC ie 0-900 masl. According the component height or elevation given by the GPS is high, which refers to the surface of the ellipsoid, not high which is commonly used for practical purposes of everyday life, ie the height orthometris, which refers to the surface of the geoid (commonly approached with sea level average -rata, mean sea level) [7].Tobacco plants will thrive in loose soil, crumbs, easy to bind water, have water management and good air. Dharmawan et al, suggests that the organic material is closely related to soil aggregate stability because the organic material acts as an adhesive between the primary mineral particles. Based on the observations that have been made klompangan rural land and has a textured sandy loam where, according , soil texture layers is best to plant tobacco on growth is normally recorded is sandy loam or clay sand, with a sandy clay subsoil [8]. Its because these lands have a proportion of air and ground water that is optimum for the growth of the roots of tobacco plants. To increase the water content in the soil organic matter is carried out in order to reduce evaporation. Seismic explained that with increasing soil organic matter will increase the holding power of the water phase, thereby reducing the rate of evaporation that occurs in the soil [9]. Neither the corn will grow well at an altitude of 1000-1800 meters above sea level with ideal soil loose, fertile, and the optimum temperature of 21-34^0C. While rice will also grow well at an altitude of 0-1500 meters above sea level with a rainfall of 1500 to 2000 meters above sea level. Neither the corn will grow well at an altitude of 1000-1800 meters above sea level with ideal soil loose, fertile, and the optimum temperature of 21-34^0C. While rice will also grow well at an altitude of 0-1500 meters above sea level with a rainfall of 1500 to 2000 meters above sea level. Neither the corn will grow well at an altitude of 1000-1800 meters above sea level with ideal soil loose, fertile, and the optimum temperature of 21-34^0C. While rice will also grow well at an altitude of 0-1500 meters above sea level with a rainfall of 1500 to 2000 meters above sea level.Tobacco plants are also not too fond of water and excessive rain the most ideal temperature for the cultivation of tobacco is about 21 to 32^0C. It is also consistent with studies that have been done which states that the drought is often struck several areas in Jember district, these disasters cause a variety of problems encountered including water shortages, crop failure and social conflict[1]. Based on the state of the majority of people in Jember utilizing agricultural land to grow crops that do not require much water is like tobacco.

Elevation is the vertical position of an object from a certain point (datum). Datum commonly used is the sea surface and the surface of the WGS-84 geoid, used by GPS. Therefore, the elevation is often expressed as altitude or commonly abbreviated asl. According Ashadi (2018), the component height or elevation given by the GPS is high, which refers to the surface of the ellipsoid, not high which is commonly used for practical purposes of everyday life, ie the height orthometris, which refers to the surface of the geoid (commonly approached with sea level average -rata, mean sea level).

Land suitable as a tobacco cultivation due basically suitable height for the cultivation of tobacco, namely with elevations between 0-900 meters above sea level, it is also supported by an intensive search that has been done states that less sunlight exposure can cause plant growth unfavorable low productivity. Therefore, the location for the tobacco plants should be selected in the open and adapted to the type of planting time [6]. Temperatures suitable for growing tobacco plants with a height ranging 21-32,3^0C ie 0-900 masl. Suggested that soil with high organic content will show a darker color than the organic content of the soil are low [10]., However, the research results in the region Sanmenxia, China stated that, a high content of organic echo to the ground is an indication of soil fertility enrichment [11]. However, for the tobacco plant if the soil organic matter content is higher, the tobacco leaf can not be a normal yellow, and the contents of nicotine and protein would be too high and would be a bad color function and quality will be lower. Thus, the rate of soil organic matter affects the quality of the tobacco plant.Land in the area is

said to be suitable as tobacco fields as it has suitable soil texture. To determine the suitability of land can use parametric methods, according to Parametric method is one of the traditional methods of conformity assessment of land, where land characteristics tailored to the needs of the plant, a ranking of suitability for each land characteristics [12]. In general, soil texture layers are best for tobacco plants sand sandy loam or clay, with sandy clay subsoil. Backed by the research results in Henan Province, China which states that Sandy clay soil that is most suitable for planting tobacco plants because it has unconsolidated aggregate structure, which can add to the aroma of tobacco leaves produced from there [13]. The clay contains high amounts of organic matter, which can increase the fertilization at different stages of growth in the next tobacco, and reduce the amount of tobacco leaf aroma, According, the main function of the soil as a growing medium is as a root looking for space to penetrate both horizontally and vertically [14]. According to soil texture on tobacco growing areas included in the texture of the medium, the medium textured soils, with structured crumb, slightly porous, fine sand (light soil) with good aeration is more suitable for the growth of tobacco plants [15,20]. This kind of soil types have a great opportunity to get the leaves thin, elastic and kerosok brighter colors.

Then from the results of research conducted showed that the organic matter content of post-harvest will be increased when compared to areas that are not harvested [16]. Because of the lost vegetation cover would lead to penetration of sunlight and leading to increased soil temperature ensuring decomposition of crop residues. One important mechanism in the process of decomposition above or below ground level ie microbial respiration by heterofik. The positive influence of the frequency of the harvest will cause the organic matter content of the soil increased because of it increasingly active residue decomposition process both above and below ground. Organic fertilizers be one contributing factor fertile land. However, from the total pH was known at each plot can be concluded that the condition of the soil in each plot is still quite good, because the lower the pH is contained in a land then the fertility rate would be lower as well. States, BO has an important role as support to soil fertility[17]. On soil with a high pH soil nutrients contained much in this regard is needed by the development of plants that will be able to make a healthy plant. The low pH of the soil will cause a decrease in the availability of nutrients for plants, which in turn will reduce the production of fresh fruit bunches (FFB). States that the amount in the soil is the result of equilibrium factors of climate and vegetation, topography, soil physical and chemical properties, human activities and time [17]. The higher levels of BO, the higher the total content.

According to soil texture layers is best to plant tobacco on growth is normally recorded is sandy loam or clay sand, with a sandy clay subsoil [8]. It because these lands have a proportion of air and ground water that is optimum for the growth of the roots of tobacco plants. As for the land that is textured clay height is less suitable, based on research conducted gained ground levels of clay high will produce leaves a relatively thick, heavy, and low quality, land preparation is difficult and often flooded when it rained [18]. In terms of the physical arrangement of the ideal soil for plant growth is 50% solids and 50% of the pore, divided into 25% air and 25% water. Geological and geophysical survey aspects are also very important to support the development of geomorphological based agriculture [21].

Then from the interviews with sources indicate that it is in the village of the District Klompangan Ajung lot of tobacco lands when the dry season has arrived. However, when the dry season is over land that had been planted with tobacco will be replaced by rice or corn. Given that the land was not planted by the plant. That makes the soil more fertile over time. Klompangan Village District of Ajung also known as tobacco-producing well in Jember. Have many farmers who plant the turn of the seasons there. Because from there is also a source of income to the necessities of life.

4. Conclusion

From measurements carried out obtained as follows. The existing soil on the plot I & II are included in the sandy clay because the rough texture and crumbly, then the plot III soil sandy clay for texture is smooth and slightly rough and attachment to high, while in the plot IV & V soil including clay for texture heavy and attachment are also high. Land in the land the land of color tend to be colored dark gray to dark reddish brown. Then in the dilahan land mostly high organic content, it signifies that the lands that high

fertility rate. The statement was proven by laboratory tests of soil samples per plot drip with fluid H_2O_2, then the soil react and emit bubbles. It is not uncommon that the surrounding tobacco fields that we examine a lot of vegetation-vegetation. Vegetation such as corn and rice. The average soil in tobacco fields we studied have a pH <7-7 that indicates that the soil has the acidity to neutral effect on the vegetation that grows around. Meanwhile, moisture from the soil in relatively high, reaching 8 to 10, it shows that the soil can absorb more water. High soil moisture indicates low absorption of water in the soil. Suitable tobacco plants grown at a height of about 80-85 meters above sea level.

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