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Abstract. At the upstream of Jeneberang watershed, horticultural cultivation is a primadonna that is very much in demand by the farmer community, although the cropping system practiced by farmers is still far from the rules of soil and water conservation. The research aims to obtain information about the cropping system models and soil and water conservation techniques implemented by farmers on the upstream of Jeneberang WATERSHED. The results showed that the vegetable cropping system, practiced by farmers, was to grow vegetables in line with the slopes and the application of conservation techniques was not carried out by reason: 1) The high groundwater content that resulted in Plant tuber to be quickly rotten/damaged, 2) high moisture content on the soil will result in pests will develop rapidly.

1. Introduction

At the upstream of Jeneberang watershed, horticultural cultivation is very much in demand by the farmer community, especially in the district Tinggimoncong and District Tombolopao. The most widely cultivated horticultural commodities by farmers are potatoes, carrots, cabbage, and the last is strawberry. Unfortunately, the cropping system practiced by the farmer is far from the rules of soil and water conservation.

Based on land capacity class, the land that used as a field of horticultural cultivation is generally land with the land capacity class for no cultivation [1]. Discloses that land use that is not following its capabilities will cause land degradation and potentially become a critical land. If land becomes critical, there will be decreased productivity and land quality and lower the value of the farmer's income.

The leading cause of land degradation in the arable area is erosion [2]. It explained that the risk of eroding in the land is enormous because it influenced by the slope. The effect of soil erosion is the widespread damage and costly value, both in the place of erosion and in places of sedimentary deposition. Damage to the physical, chemical, and biological properties of soil in the incidence of erosion in the form of infiltration power and soil ability to hold water (water holding capacity), increased soil penetration resistance, decreased soil structure quality, and reduced Content of organic matter and soil organisms [3].

Improper management of the land area will trigger land degradation caused by erosion and high surface flow intensity [3]. It explained that the cultivation of vegetables in the Highlands is done intensively throughout the year, without the application of soil conservation techniques to suppress

erosion. However, it knew that the vegetable land located on the undulating topography, hilly to a mountain, so the land will be easily erosion.
The research aims to obtain information about the cropping system models and soil and water conservation techniques implemented by farmers on the upstream of Jeneberang watershed.

2. Methods

The research conducted at the upstream part of Jeneberang in three different locations, namely in Pattapang Village, Buluballea Village, and Kanreapia village. The method used in this research is a survey method by conducting primary data collection through approaches and interviews with farmers and the retrieval of secondary data through related agencies.

3. Results and discussion

3.1. Vegetable cultivation system

The observation system of vegetable cultivation presented in table 1 and figure 1, 2 and 3 shows that on the location of Pattapang and Buluballea, farmers generally grow vegetables in line with slopes, while in Kanreapia, farmers who plant The onion has begun planting according to the contours although the area is still limited. Land management in the Highlands is generally not following soil and water conservation rules and accelerate the occurrence of land degradation [4].

Table 1. Horticultural commodity cropping system at the research site.

Location	Type of plants	Planting system
Pattapang	Potato, carrot	In slope direction
Buluballea	Scallion	In slope direction
Kanreapia	Scallion	Cut the slope

Figure 1. Scallion planting pattern in Kanreapia.

At the site of research, the use of manure is already more than 10 tons per hectare, and if not using manure, then the production will decline drastically, this indicates that the land-planting horticulture productivity has begun to need high nutrient inputs. The evidence illustrates that lands degraded as a result of the cropping system that conducted during this time. On degraded lands, fertility rates, and soil quality will decline [4]. Changing the habit of farmers to try to farm the land and water conservation rules is not easy, so it takes ongoing dissemination efforts so that farmers can adopt and apply [3].

3.2. Soil conservation

The soil type at the research site classified into the Andisol order, which formed from the volcanic ash of the Bawakaraeng-Lompobattang volcano. The land of Andisol includes soil that has no erosion, as long as it has not saturated because the land of Andisol has a high porosity if the soil is saturated, then the land of Andisol becomes very sensitive to erosion caused by very high dust content that quickly transported through the surface flow [4].

Figure 2. Onion planting pattern in Buluballea.

Figure 3. Potato cropping pattern in Pattapang.

Observations (Figure 2 and 3) and interviews with farmers showed that the application of conservation techniques in horticultural crops was not carried out for reasons: 1) high groundwater content that resulted in plant tuber being quickly rotten/damaged, 2) High moisture content on the soil will result in pest disease will develop rapidly. The most common cropping Model found at the research site is to use the same direction with the slope, and according to the farmer, this is very good because the moisture content maintained because of the rapid drainage process the slope is not under conservation rules because it facilitates the formation of surface flow [4]. Agricultural cultivation activities on high altitude, generally do not follow the rules of soil and water conservation, because it does not use the terracing and planting without following contour lines [1]. Furthermore, if this continues to be left, the land will be critical and prone to landslides during rain and drought during the drought. The utilization of the land for agricultural production required the proper application of soil and water conservation technology in order to increase sustainable land productivity and sustainability [3]. The environment is sustained.

4. Conclusions

Cropping system used by farmers is a slope planting that has not fulfilled soil and water conservation rules, thus triggering the occurrence of land degradation that resulted in decreased productivity and quality of the land.

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