Environmental Study and Land Suitability for Livestock Farming in Flores Bajawa

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ABSTRACT: The livestock sector is classified as a subsector of agriculture that continues to develop in national development, playing a role in improving community welfare. Development in the livestock sector within the cultivation subsystem (on-farm) in Indonesia generally aims to increase livestock production and productivity. Land suitability evaluation requires environmental data and soil quality data for a specific area. The assessment of land suitability for a particular crop cultivation is conducted by identifying land characteristics, including topographic data, climate, soil conditions, and soil quality, as well as several physical environmental properties of the land to be evaluated for its suitability. The Bajawa region is very suitable for livestock farming activities. The purpose of this research is to understand the environmental study and land suitability for livestock farming in Flores Bajawa. The method used in this research is a literature review approach. (library research). The results show that the environment in Flores Bajawa is very suitable for livestock farming with a cool climate, green hills, and an abundance of available livestock feed sources. With the suitability of the farming land, it supports the agricultural efforts undertaken by the community. The suitability of the farming land can also be seen from the relatively high economy of the community in the livestock sector, which includes pigs, cattle, horses, goats, and chickens, with pigs being the dominant livestock in the Flores Bajawa region.

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INTRODUCTION

The livestock sector is classified as a subsector of agriculture that continues to develop in national development, playing a role in improving community welfare. Development in the livestock sector within the cultivation subsystem (on-farm) in Indonesia generally aims to increase livestock production and productivity. Food needs are highly dependent on the population and productivity of livestock maintained in a region. If the potential and productivity of the livestock are high, then the food needs of the community will be met. The livestock potential in Wolomese District, Ngada Regency, East Nusa Tenggara Province is classified as high, with the highest number of livestock being large livestock (cattle 2,203 heads), small livestock (pigs 1,948 heads), and poultry (chickens 6,779 heads). Meanwhile, the grazing land area in Wolomese District is 50 hectares (Ngada Dalam Angkat, 2021).

According to Widarti & Sukaesih (2015), feed plays an important role in supporting livestock life, as it directly affects production, productivity, and livestock health. Forage can be cultivated by paying attention to the quality of the forage. The quality of forage is greatly influenced by forage variation, genotype, maturity, season, and management. The older the age of the plant at the time of cutting, the lower the crude protein content, and it decreases the digestibility value of the plant due to the high lignin content in older plants. Land evaluation is an approach or method to assess the potential of land resources (Harahap et al., 2019). Additionally, land evaluation is the process of assessing the utility of land for various uses. With this land evaluation, the potential of the land can be assessed based on the level of management conducted (Nugroho et al., 2014).

Land suitability evaluation requires environmental data and soil quality data for a specific area. The assessment of land suitability for the cultivation of a particular crop is conducted by identifying land characteristics, including topographic data, climate, soil condition and quality, as well as several physical environmental properties of the land to be evaluated for its suitability (Iswan et al., 2019). Conducting a land suitability evaluation will yield data in the form of biophysical land resources such as climate and soil, thereby determining land suitability classes and identifying limiting factors for improvement efforts.

(Jawang et al., 2018). The purpose of this research is to understand the environmental study and land suitability for livestock farming in Flores Bajawa.

METHOD

The method used in this research is the library research approach. The use of library study or literature review as an activity related to the method of library data collection, reading, note-taking, and processing research materials. Data collection in the research is conducted by reviewing and exploring several journals, books, and documents (both printed and electronic) as well as other data sources and information deemed relevant to the research or study.

RESULT AND DISCUSSION

Ngada Regency is located between 8°20'24.28"–8°57'28.39" South Latitude and 120°48'29.26"–121°11'8.57" East Longitude. The northern part borders Flores Sea, the southern part borders Sawu Sea, the eastern part borders Nagekeo Regency, and the western part borders East Manggarai Regency. Ngada Regency has a land area of 1,776.72 km², a water area of 708.64 km², and a coastline of 102.318 km with the following details: The water area of the northern coast is 381.58 km² with a coastline of 58.168 km, and the water area of the southern coast is 327.06 km² with a coastline of 44.15 km.

Ngada Regency is classified as a tropical region with a short rainy season (December-April), while the dry season is very long. (May-November). Although it has a tropical climate, Ngada Regency possesses very potential natural wealth, including vast agricultural lands filled with agricultural commodities, all types of livestock and pastures, as well as wealth in the field of tourism.

According to FAO (1976; Dewi et al., 2020), there are two types of land suitability, namely qualitative land suitability and quantitative land suitability. Each type of land suitability can be assessed as actual or potential, also known as actual land suitability and potential land suitability. Qualitative land suitability is land suitability that is based solely on the physical condition of the land, without precisely calculating the production, inputs, and profits that can be obtained. Quantitative land suitability is land suitability that is not only based on the physical condition of the land but also considers economic aspects, such as input-output or cost-benefit.

The determination of Land Suitability Class (LSC) is based on the parametric method of Sys et al. (1991; Rayes, 2007; Katili, 2022), using several factors that can influence the characteristics of a land. These factors include climate (c), topography (t), erosion hazard (eh), wetness (w), soil physical properties (s), nutrient retention (nr), and available nutrients. Land suitability analysis is necessary to determine whether the use of land resources can proceed effectively or not (Katili & Sari, 2021).

The actual land suitability class indicates land suitability based on data from soil surveys or land resources that have not yet considered the inputs needed to address constraints or limiting factors related to plant growth requirements (Katili et al., 2022; Sariani et al., 2023).

This is due to limiting factors such as drainage, wetness saturation, K2O, and total N present in elephant grass, setaria, and legume groups with the same yield; thus, land improvement efforts can enhance land suitability classes in the study location (Katili, 2020). Land improvement efforts are carried out by examining the potential land suitability in the research area, represented by the four soil profile examples mentioned (Ritung et al., 2011).

Land improvement efforts are carried out by examining and considering the land conditions with the potentials present in the research area, represented by the four soil profile examples mentioned. (titik 1, titik 2, titik 3, dan titik 4). Based on the Sys criteria system, all lands have the potential for cultivating cattle feed crops, but of course with different yield classes (Katili, 2021). According to Surjana et al. (2015), intensive fertilization is the act of adding nutrients to the soil to meet the needs of the plants to be cultivated. Furthermore, according to Gani et al. (2021), intensive fertilization is carried out based on agricultural land according to the needs of each developed plant.

Kartasapoetra (2010) stated that irrigation is the effort to provide water in the form of soil moisture as needed for the growth and development of plants. In other words, irrigation is the artificial addition of soil moisture deficiency by systematically supplying water to the cultivated soil. Lime application to acidic soil affects the soil pH, soil nutrient status, and reduces the toxic effects present in acidic soil conditions. Increasing the soil pH from very low levels due to liming positively impacts the decomposition of organic matter because it causes changes in the composition of microorganisms involved in the decomposition process.

CONCLUTION

The environment in Flores Bajawa is very suitable for livestock farming with its cool climate, green hills, and abundant livestock feed sources. The suitability of the pastureland supports the agricultural activities carried out by the community. The suitability of the pastureland can also be seen in the relatively high economy of the community from the livestock sector, which includes pigs, cattle, horses, goats, and chickens, with pigs being the dominant livestock in the Flores Bajawa region.

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