

I. INTRODUCTION

1.1 Background

Indonesia is an archipelagic nation with a rich biodiversity and a forest area of over 120,060,000 hectares (Ministry of Environment and Forestry, 2018). Over 38,000 different plant species have been identified, and they are distributed over all of Indonesia's islands, including Sumatra. One of Indonesia's larger islands, Sumatra Island, is reputed to have a high level of endemism and biodiversity. This is due to the generally constant climate and rainfall patterns seen on the island of Sumatra (Susanti, Suraida, and Febriana, 2013).

One of the provinces on the island of Sumatra is West Sumatra. The forest area in this province is approximately 2,600,286 hectares, according to the Minister of Forestry and Plantation's Decree Number 422/Kpts-II/1999, dated June 15, 1999, concerning the Designation of Forest Areas in the Dati I Province Region of West Sumatra. This region, which makes up around 54.43% of the West Sumatra Province, is split into the Natural Reserve Area (KSA), Protected Forest (HL), Limited Production Forest (HPT), Production Forest (HP), and Convertible Production Forest (HPK). According to the Department of Forestry (2002), forests that serve as Natural Reserve Areas (KSA) are separated into hunting parks, grand forest parks, national parks, wildlife reserves, nature tourism parks, and nature reserves.

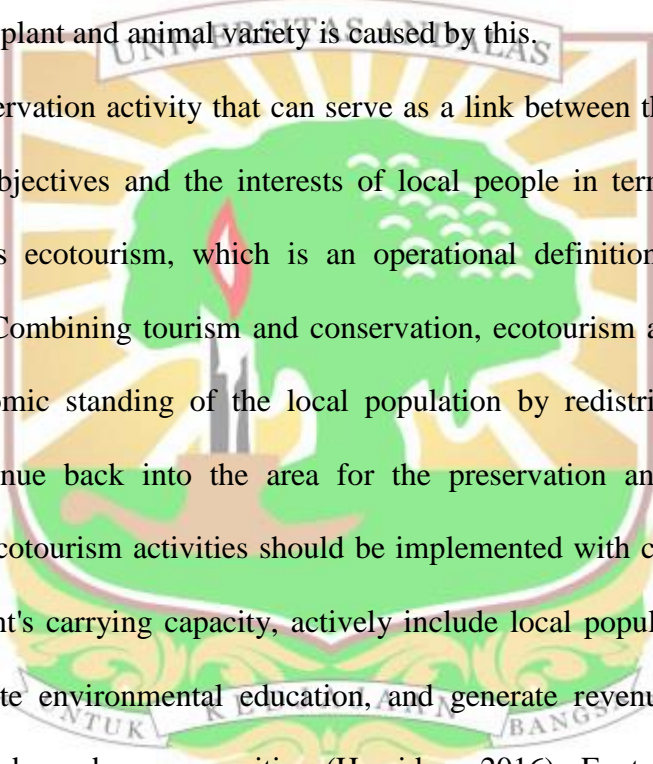
Nature tourism parks, as defined in Article 1 paragraph 16 of Law No. 5 of 1990 about the Conservation of Biological Natural Resources and Ecosystems, are natural conservation areas primarily used for tourism and natural recreation. Meanwhile, Joko Untoro and Paulus in Murianto et al. (2023) define a natural

tourist park as a tourist forest with the potential for natural beauty, including flora and fauna. Because of its unique design, the forest is utilized for both cultural and recreational purposes. Throughout Indonesia, there are 133 nature tourism parks; Sawahlunto City's Rantih Village Nature Tourism Park is one among them.

One of the cities in the Province of West Sumatra is Sawahlunto City. The region is bordered to the north by Tanah Datar Regency, to the south and west by Solok Regency, and to the east by Sijunjung Regency. Astrologically, Sawahlunto City lies between $100^{\circ} 41' 59''$ and $100^{\circ} 49' 60''$ East Longitude and $0^{\circ} 33' 40'' - 0^{\circ} 48' 33''$ South Latitude. With a total size of 27,344.7 Ha, Sawahlunto City makes up just 0.65% of the province of West Sumatra. With a total area of 99.39 km² (36.35%), Talawi District is the sub-district with the biggest area (Sawahlunto City Central Statistics Agency, 2022).

Rantih Village is 12 kilometers from Sawahlunto City's core and is situated in the Talawi subdistrict. The Batang Ombilin River crosses the village's hilly terrain (Sawahlunto City Tourism Office). Rantih Village is situated in Sawahlunto City's Talawi District and spans an area of roughly 1,981.74 Ha. This settlement is situated between 197 meters above sea level and can be found at coordinates of $00^{\circ} 38'08.5''$ South Latitude and $100^{\circ} 46'04.8''$ East Longitude (Yulianis, 2018). Rantih Village is 12 kilometers from Sawahlunto City's core and is situated in the Talawi subdistrict. The Batang Ombilin River crosses the village's hilly terrain (Sawahlunto City Tourism Office). Rantih Village is situated in Sawahlunto City's Talawi District and spans an area of roughly 1,981.74 Ha. This settlement is situated between 197 meters above sea level and can be found at coordinates of $00^{\circ} 38'08.5''$ South Latitude and $100^{\circ} 46'04.8''$ East Longitude (Yulianis, 2018).

Rantih Village features a woodland area with four waterfalls and has been designated a tourist village since 2008. In addition to being an ecotourism community, this town offers a range of tourism experiences, from natural to cultural, making it a popular destination for travelers. The community's use of natural tourism parks for family recreation frequently undergoes a shift in function because of a variety of causes, including the local community's ignorance of conservation, according to Solfiyeni, Chairul, & Marpaung (2016). The decline of an ecosystem's plant and animal variety is caused by this.



A conservation activity that can serve as a link between the government's conservation objectives and the interests of local people in terms of economic development is ecotourism, which is an operational definition of sustainable development. Combining tourism and conservation, ecotourism aims to improve the socioeconomic standing of the local population by redistributing tourism-generated revenue back into the area for the preservation and protection of biodiversity. Ecotourism activities should be implemented with consideration for the environment's carrying capacity, actively include local populations and their culture, promote environmental education, and generate revenue for the local government and nearby communities (Hamidun, 2016). Ecotourism activities undoubtedly have an impact on resources, particularly forest resources, causing forests to shift and play a less optimum or disturbed function. As a result, information about the vegetation state is critical for planning and evaluating forest processing operations.

The existence of vegetation is one of the most essential data points for creating forest management models. Vegetation affects the balance of the

ecosystem on a wider scale, such as managing the balance of oxygen and carbon dioxide in the air, increasing the physical, chemical, and biological qualities of soil, regulating groundwater management, and reducing the pace of erosion. The study of vegetation potential is seen from the parameters of density (the number of individuals of a species per unit area), frequency (the proportion of the number of samples with a particular species to the total number of samples), dominance cover (the proportion of the ground area occupied by a species to the total area of habitat), and Index Important Values (INP) (Arrijani, 2008). The presence of vegetation in forests is required to promote forest success and sustainability, allowing forests to perform their roles, which are social, economic, and ecological.

Anisyah (2021) conducted earlier research on sapling-level vegetation analysis in the Sigaluik Forest, Rantih Tourism Area, Sawahlunto City, at coordinates $00^{\circ}37'47.958''$ S and $100^{\circ}47'03.119''$ E. This study identified 14 families and 17 genera, as well as 17 species and 335 individuals. The major families were Euphorbiaceae (27.76%), Moraceae (25.07%), and Myrtaceae (20.06%), with Malvaceae (12.83%) being the co-dominant family. The species *Mallotus paniculatus* (Lam.) Müll.Arg. (54.08%) from the Euphorbiaceae family had the greatest significance rating, while the lowest was *Vitex pubescens* Vahl (1.07%) from the Lamiaceae family. The species diversity index (H') in Sigaluik Forest, Rantih Village, Sawahlunto City is moderate, at 1.896.

Considering that there is still minimal research regarding the composition and structure of vegetation in the Sigaluik Forest in the Rantih Tourism Area, it is important to carry out further research regarding Tree Level Plant Vegetation Analysis in this area. According to Kusumaningtyas and Chofyan (2013), trees have

an important role in the economic, ecological, hydrological, and other functions. Trees are able to produce oxygen and absorb carbon dioxide, store water, resist erosion and landslides, and play a role in maintaining the shape of the forest. This research will be carried out in an area located near the Bikan River Waterfall, which is thought to have different environmental conditions from Anisyah's (2021) research, especially in terms of altitude and humidity. According to Karamina, Fikrinda, and Murti (2017), good humidity makes the soil have sufficient pore space so that air circulation in the soil can run well. Good soil conditions tend to have a neutral pH, which indicates that nutrient ions can be absorbed well by plants. This triggers plants to grow faster. If plants can grow faster, denser vegetation will form with more varied diversity. Therefore, it is necessary to carry out research to determine the potential for species diversity for conservation efforts.

1.2 Problem Formulations

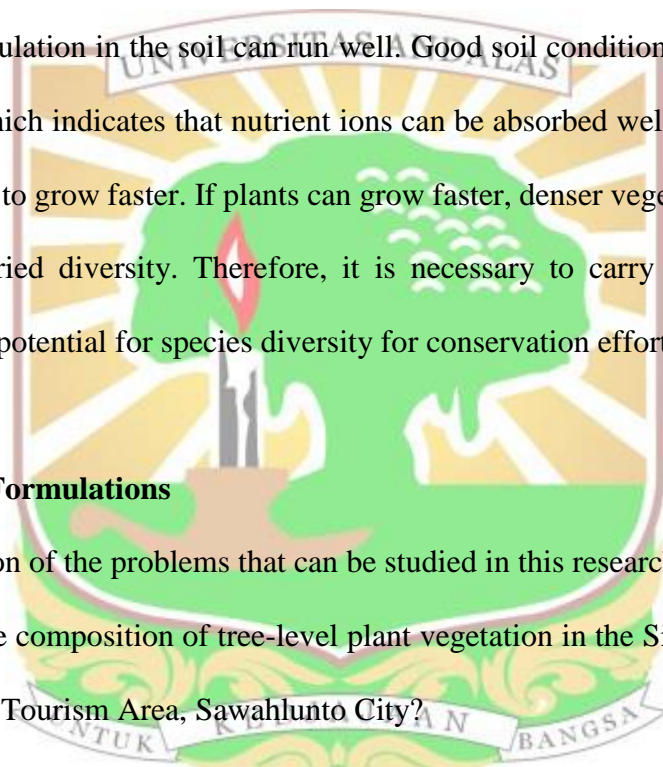
The formulation of the problems that can be studied in this research are:

1. What is the composition of tree-level plant vegetation in the Sigaluik Forest in the Rantih Tourism Area, Sawahlunto City?
2. What is the structure of tree-level plant vegetation in the Sigaluik Forest in the Rantih Tourism Area, Sawahlunto City?

1.3 Research Objectives

The objectives of the research are:

1. To determine the composition of tree-level plant vegetation in the Sigaluik Forest, Rantih Tourism Area, Sawahlunto City.



2. Knowing the structure of tree-level plant vegetation in the Sigaluik Forest, Rantih Tourism Area, Sawahlunto City.

1.4 Research Benefits

The benefits of this research are to assist in providing data on the composition, structure, and diversity of plant vegetation at the tree level, which can be used as a reference for managers as a source of information regarding the diversity of plant biological resources and can be used as consideration in efforts to manage forests, develop and protect plant species in the Sigaluik Forest, Rantih Tourism Area, Sawahlunto City, and this research can be used as a source.

