I. INTRODUCTION

1.1 Background

A forest is a community of plants dominated by trees that occupy a specific area and have environmental conditions different from those outside the forest. Forests have abundant natural resources and play a significant role in the lives of living beings (Kusmana et al., 2022). Based on the basic forestry Law No. 41 of 1999 by the Indonesian Government, forests are defined as ecosystems consisting of expanses of land filled with biological natural resources, especially trees, that are interconnected and inseparable from one another.

Forest damage affects ecological functions, such as the root systems of forest trees being disrupted, ground cover plants being unable to enhance soil stability, thereby failing to reduce water flow velocity which causes erosion and flooding. Additionally, forest damage reduces the absorption and storage of carbon by plants, thereby affecting plant biological activities and impacting biodiversity (Ridlo, 2023).

Amid the increasing threats to forests, such as deforestation and development pressures, the community-based management model, or Social Forestry (HKm), has emerged as a conservation solution. The existence of community forests in Indonesia is regulated by the Minister of Environment and Forestry Regulation Number 4 of 2023 concerning the management of social forestry in forest areas with special management (Permen LHK, 2023).

Social forestry is a form of sustainable forest management carried out by local communities or indigenous peoples in state forest areas, customary forest

areas, or adat forest areas. Based on the Minister of Environment and Forestry Regulation Number 9 of 2021, there are several social forestry schemes, including community forest plantations, community forest business permits, village forests, forestry partnerships, and recognition and protection of customary law communities. Social forestry aims to provide legal access for communities to manage forests in the long term to enhance their participation in environmental preservation and their welfare. Government support includes institutional strengthening, the preparation of annual management plans, the enhancement of production value, and the strengthening of entrepreneurship, aimed at optimizing social forestry efforts to positively impact community welfare and the environment. Through agroforestry programs, which combine forestry and non-forestry plants, social forestry can also maximize land use and harvest yields sustainably (Trison et al., 2024).

Agroforestry, according to the definition from the World Agroforestry Centre (ICRAF), is a land-use system that involves planting tree crops alongside agricultural crops or livestock within the same management area. This system can be arranged based on space or time and creates relationships between ecological and economic factors between woody and non-woody plants (Lundgren, 1982 in Firdaus et al., 2013). Suharjito et al., (2003) state that in the implementation of agroforestry, there are several aspects that need to be considered, namely agronomic techniques, silviculture, socio-economics, and ecology. The agronomic and silvicultural aspects discuss the suitability between forestry and agricultural plants to enhance productivity.

In the Ministerial Regulation (Permen) LHK No. 83/2016, Social Forestry is defined as a system of sustainable forest management implemented in state forest areas, customary forest areas, or adat forest areas. Social Forestry is essentially carried out by local communities or customary law communities residing around forest areas to enhance welfare, environmental balance, and local socio-cultural dynamics (Malik & Ramdha, 2019). Community Forests (Hutan Kemasyarakatan, HKm) are one of the schemes in the Social Forestry program initiated by the Ministry of Environment and Forestry (KLHK) to provide legal certainty for forest area management to the community. HKm operates in state forest areas, including protected forests and production forests, with the main goal of empowering local communities. In West Sumatra, HKm Padang Janiah, located in Lambung Bukik Village, Pauh District, Padang, was inaugurated through the Ministry of Environment and Forestry Decree No. 2051 of 2017 and covers a community-managed forest area of 250 hectares.

Vegetation is a community of certain plants that can work together in certain groups to form plant associations, these groups are called communities (Wally, 2021). Vegetation analysis according to Susanto (2012) is a way of studying the arrangement or composition of types and shapes or structures of vegetation. The vegetation unit studied in vegetation analysis is a plant community which is a concrete association of all plant species that occupy a habitat. The results of the plant vegetation analysis are presented descriptively. One type of plant found in this mountainous area is a tree which is a forest-forming plant which is much larger than shrubs or herbs, has woody and hard stems. Vegetation is a collection of several types of plants that live together in one place and there is interaction between the

constituent components, both between plants and animals that live in that environment.

Forests consist of various types of vegetation that form a forest structure, where these plants interact with each other in one place, both between individual plants and with animals and the surrounding environment. This vegetation forms a community of plants that depend on each other, not just a collection of individual plants (Geovana & Chairul, 2023). Forest communities are divided into several levels of tree growth which are influenced by various factors, with classification based on tree diameter and height. Trees can be divided into seedlings with a diameter of less than 2 cm, saplings with a diameter of 2-10 cm, as well as poles and mature trees with a diameter of ≥ 10 cm (Soerianegara & Indrawan, 2005) .

Sapling vegetation or seedlings is a critical phase in the natural regeneration of forests. Saplings are one of the growth phases in a forest stand that play a role in determining the future sustainability of the forest. Sapling vegetation has an important role in determining the subsequent development of plants into mature trees. Tree regeneration (saplings) acts as a determinant in the natural regeneration process in the forest, continuing the life development of a plant (Nursal et al., 2005).

The field of study that focuses on the quantitative assessment of vegetation is known as phytosociology (Mandal & Joshi, 2014). Understanding the phytosociological characteristics of tree species is crucial for gaining deeper insights into their ecological roles. Identifying plant communities provides valuable information about their growth forms, habitats, ecological niches, vegetation structure, and the interactions among species (Khan et al., 2017). In a similar vein, recognizing vegetation types and species diversity patterns is essential for the

conservation of natural habitats, and these patterns are often central to ecological research (Zhang et al., 2013). To investigate the dynamic nature of vegetation in relation to specific environmental conditions, detailed information about plant diversity is necessary (Sorecha & Deriba, 2017). Hence, vegetation analysis is a vital tool for plant ecologists, offering numerous applications in range management and comparative ecological studies (Tarin et al., 2017).

Previous research has been conducted by Marqfirokh (2024) in the social forestry area of Nagari Sumpur Kudus, Sijunjung Regency. From the analysis of vegetation at the mature tree and sapling conducted, a composition of sapling vegetation was obtained, consisting of 17 families, 29 genera, 36 species, and 40 individuals. The families found are co-dominant families, with the Phyllanthaceae family at 17.5% and the Euphorbiaceae family at 15%. The highest Importance Value Index at the sapling was found in the species *Cephalomappa malolpticarpa* at 21.78%. The diversity index (H') at the sapling is classified as high with a value of 3.507.

Other research has also been conducted by Rima (2017). Composition and structure of tree saplings in the conservation forest area of Prof. Dr. Sumitro Djhojohadikusumo PT. Tidar Kerinci Agung, West Sumatra. This study uses the transect method and the placement of transects through purposive sampling and the placement of plots systematically. The research results show that at the sapling, 25 families, 64 genera, 104 species, and 172 individuals were found. The highest important value index was found in the species *Monocarpia marginalis* (41.96%) and the lowest important value in the species *Parashorea lucida, Elaeocarpus* sp.,

Horsfieldia coriacea, and *Glochidion glomerulatum* (1.37%). The species diversity index was classified as high at 4.25.

Research on vegetation analysis in West Sumatra has been conducted in various contexts, ranging from primary forests to social forestry areas. These studies show that the level of vegetation diversity in West Sumatra is greatly influenced by topography, soil type, and human activities. In the HKm Padang Janiah, the planting of plantation crops has altered the composition of the original vegetation, thereby affecting the regeneration of forest trees.

Based on the description in the background, due to the lack of research in the Padang Janiah community forest area, it is necessary to conduct a study on the "**Vegetation Analysis of Saplings in the Padang Janiah Community Forest (Hkm), Lambung Bukik, Padang**" which aims to determine the composition and structure of saplings in that community forest area. This study is expected to fill that gap and provide a clear picture of the regeneration capacity of the community forest in Padang Janiah.

1.2 Problem Formulation

Based on the description above, the formulation of the problem is as follows:

1. What is the composition of saplings in the Padang Janiah Community Forest area, Lambung Bukik, Padang?

2. What is the structure of saplings in the Padang Janiah Community Forest area, Lambung Bukik, Padang?

3. What is the diversity of saplings in the Padang Janiah Community Forest area, Lambung Bukik, Padang?

1.3 Research Objectives

The purpose of this research is:

1. To understand the composition of saplings in the Padang Janiah Community Forest area, Lambung Bukik, Padang.

2. To understand the structure of saplings in the Padang Janiah Community Forest area, Lambung Bukik, Padang.

3. To understand the diversity of saplings in the Padang Janiah Community Forest area, Lambung Bukik, Padang.

1.4 Research Benefit

This research is expected to provide data and information regarding the composition and structure of sapling vegetation in the Padang Janiah community forest area, Lambung Bukik, Padang, so that it can serve as a reference for future research and as a consideration in the management, development, and protection efforts of plant species in the Padang Janiah community forest area, Lambung Bukik, Padang.