Composition Of Agroforestry Cropping Patterns To The Contribution Of Community Income In Community Forest Areas

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Abstract.

The composition of planting patterns using agroforestry techniques contributes to income for communities around the forest. The agroforestry system is developed in a pattern of crops with forestry in a plot of land that provides a specific composition. The types of crops that farmers usually plant are expected to significantly influence income. This research aimed to identify land ownership strata and crop composition with the highest income. This research was conducted in January-March 2022 in the Kediri Regency Community Forest Area. The variables analyzed consist of the identity of the respondent, type of plant, total revenue, and total costs for managing the agroforestry system during 2022. The results of the research show that in Strata II, the composition of crops with income from each composition ranges from IDR 24,200,000/ha/ year. In Strata I, the lowest income is IDR 15,725,500/ha and the highest is Strata III, there is an income of IDR 30,100,100/ha/year. The difference in farmers' income is due to differences in the types of plants developed by farmers.

Keywords: *Community, income, forest land, composition and farmers.*

I. INTRODUCTION

Agroforestry is a land use system that combines crops with forestry crops [1]. The general characteristic of the agroforestry pattern is the deliberate planting of trees and crops or livestock on the same land unit [2]. Agroforestry is a form of sustainable forest land management economically, ecologically, and socially [3]. The agroforestry system's formation of economic, ecological, and social interactions occurs because the land use system is used with various technologies through annual, annual plants or livestock simultaneously or alternately at certain times [4]. The agroforestry system provides significant benefits for farmers, one of which is economic, by providing farmers' income [5]. In many areas, agroforestry is applied with various types of components that vary according to the existing potential of the place; different plant compositions have different effects on the income received by farmers, and combinations of banana and cocoa plants with other filler plants such as cloves, areca nut, avocado. , durian, mango, chili, sugar palm, and coconut contribute more than other types of plants [6]. The agroforestry pattern is widely applied in managing Community Forest work areas by combining various types of plants on one land. The contribution of agroforestry to farmers' income shows that agroforestry makes a significant contribution compared to income from non-agroforestry activities [7]. The amount of income received from agroforestry management depends on the types of plants cultivated; the composition of plant types in the agroforestry system are the types of plants that are widely consumed by the public in the form of fruit-producing plants that have marketable value [8] l. This research was conducted to identify land ownership strata and crop composition that have the highest income.

II. METHODS

Data was collected in January-March 2022 in the Albizzia people's forest area of Kediri Regency. The object studied is the people's forest management community. The primary and secondary data used in this research are in the form of references from library sources supporting the research. Primary data includes:The identity of the respondent.,Type of plant.,Total revenue.,Total costs for managing the agroforestry system during 2022

Fig 1. Community forest research area

The number of respondents used in this research was 50 agroforestry farmers. The sampling technique for agroforestry composition was carried out using Purposive Sampling, namely taking respondents deliberately (not randomly) according to the research objectives or problems; in this case, the farmers selected were farmers with different plant compositions and different land areas. This difference in land area will undoubtedly influence the types of crops farmers choose. Data was collected using interview techniques such as quests, legionnaires, field observations, and literature studies. Interview techniques were needed to obtain primary data such as the plant type, number, age, and amount of harvest production and selling prices. Quantitative analysis for agroforestry income was carried out by identifying each plant's composition on income by calculating how much income there is from each composition. [9] stated that farming income is the difference between total revenue (TR) and total costs (TC), where farming revenue is the product of selling price and production. The total costs are all costs incurred for managing the farming business

Pd = TR - TC

Pd is total income, TR is total revenue, and TC is total costs. All of these components are calculated in units of rupiah per hectare per year.

III. RESULT AND DISCUSSION

The community members of farmer groups are a diverse mix of immigrants and residents, all of whom have a long-standing connection to the forest. This diversity is further reflected in the various farmer characteristics, including educational background, ethnicity, land area, and length of residence, which vary among the group members.

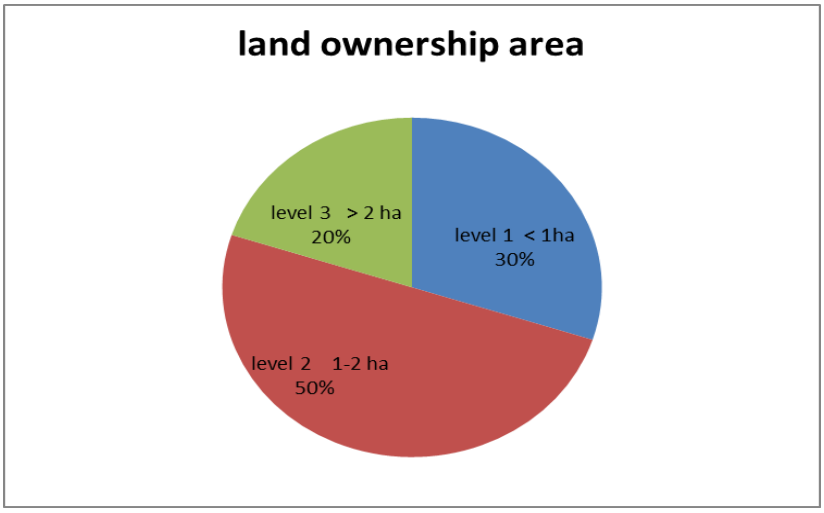

Fig 2. .Level Land ownership area

Figure 2 shows that farmers' cultivated land size varies from 0.5-2ha. Most people have a land area of 1.0ha—2ha, and that land area has a significant effect on farmer income [10]. The main crops on forest farmers' land are coffee, pepper, and durian. These plants were chosen because they have high economic value to meet the farmers' subsistence needs. The dominant crop planted by agroforestry farmers is coffee. Even though the dominant crops of the farmer groups are the same, the income earned differs depending on the type of crop used. The plants that make up agroforestry usually consist of agricultural plants (rice, cocoa, coffee, cloves), woody plants, and fruit plants [11].

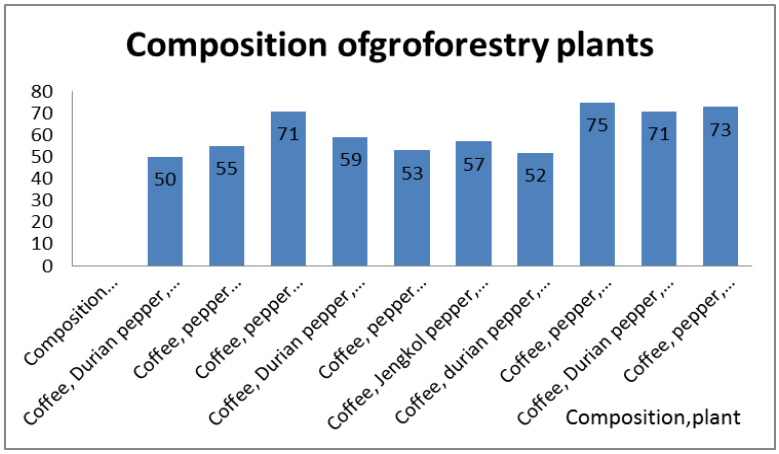

Fig 3. Physiographic Plant Composition Main Plant Types Filler Plant Types

The type of plant that dominates on forest farmers' land is coffee. Based on Figure 3, it can be seen that there are ten different plant compositions based on the filler plants with relatively the same central plants, namely coffee, banana, and pepper. The highest average income is in the land composition in high physiography, with the main crop being coffee and understory (filler) crops such as nutmeg, clove jengkol, and durian. Composition VIII provides the highest income value with the fill crop sengon, nutmeg, durian, and cloves. , and Jengkol. The composition with the lowest income is in composition I, which includes coffee, pepper, nutmeg, durian, and clove plants. This is partly due to decreased coffee and pepper productivity and a need for more maintenance on these plants. The average age of nutmeg plants is 3-5 years. The main crops in farming groups around forest areas are coffee and pepper, with various filler crops such as durian, avocado, jengkol, petai, candlenut, lamtoro, and cocoa. Many jungle tree types, such as mahogany, rosewood, and sengon, are used as shade plants. Shade plants are woody plants with a stem diameter of >25 cm [12].

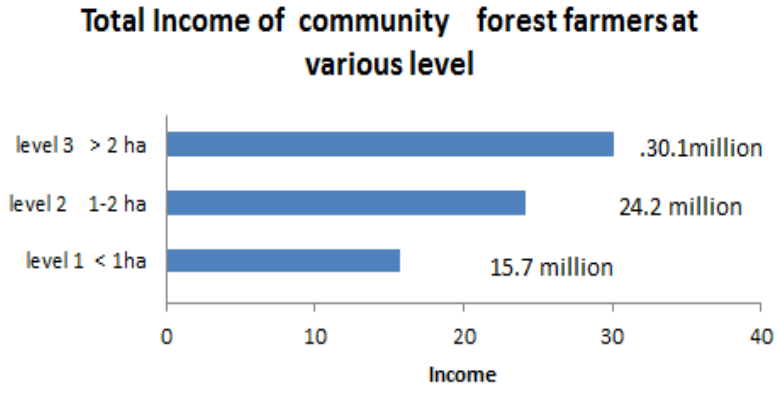

Fig 4. Farmer income at various levels

From Figure 4, it can be seen that agroforestry farmers in medium and highland areas choose coffee as the main crop. This is due to the location and land conditions suitable for coffee plants. Coffee plants will grow well in certain climates. Climatic factors influencing coffee plants include temperature and light intensity [13]. Coffee will grow optimally at an average temperature of 28℃ with a soil pH of 3.0—8.0 [14]. Based on the picture, it is known that there are ten different plant compositions based on the filling plants. Composition V III provides the highest income of Rp. 30,100,100/ha/year, with the main crops being coffee

and pepper and filler crops such as banana, avocado, johar, jengkol, durian, and chili. Filler plants are mostly commercial because they provide high economic value and benefit the environment. Farmers plant bananas to meet their daily needs because bananas can be harvested approximately twice a month. Bananas are the dominant crop in the composition of lower and middle land. The results of the coffee plant contribute quite a large amount of income. Based on this research, throughout 2020, the average price of Ikopi beans was IDR. 25,000.00—Rp. 30,000.00. The composition of plants with the lowest income is in composition I, namely Rp. 15,725,500/ha/year with filling crops of durian, jengkol, avocado, rosewood, mahogany, johar. This land has fewer types of commercial plants than other cultivated land due to the decreased productivity of certain types, and the plants have not yet reached their productive age. Composition I has a medium income of Rp. 24,200,000 /ha/year with filling crops of durian, avocado, jengkol, petai, candlenut, and johar. Apart from coffee and pepper plants, other commercial crops such as durian, avocado, jengkol, petai, and candlenuts have quite a high selling value, thus influencing farmers' annual incomes.

On average, farmers who grow pepper plants have johar plants used as vines and a source of animal feed. Composition I with coffee, pepper, jengkol, petai, and randu I plant types. This is due to differences in the intensity of land management. Jengkol and Petai plants have fairly high selling value to increase their revenue. Planting with the agroforestry pattern applied is classified as a coffee agroforestry system. Coffee is a plantation crop many farmers plant because it is considered very suitable for planting on the land they cultivate and has a fairly high selling value compared to other crops. Apart from coffee, pepper is the leading crop in farming. Pepper has a much greater selling value than coffee. However, there has recently been a decline in pepper productivity due to climate change, which has caused many pepper plants to die.The composition of agroforestry found in people's forest areas is quite varied. The differences in the composition are based on the filling plants, with the main crops being coffee, pepper, and rubber. Ten agroforestry compositions were carried out, the main crops of coffee and pepper. Based on this composition, the income of forest farmers is lowest in composition I, with the main crops being coffee and filler crops, cloves, and jengkol, with an IDR income. of 15,725,500/ha/year. The highest farmer income is in Composition VIII, amounting to Rp. IDR 30,100,100/ha/year with main crops of coffee and pepper as well as filler crops such as banana, avocado, johar, sengon, mahogany, jengkol, durian, and chili. The difference in income earned by farmers is due to differences in the types of plants on their land. Agroforestry provides many benefits for society, one of which is as a source of income. However, in practice, many people need to learn how to properly manage land or select types of plants suitable for planting on cultivated land. This makes people's income from agroforestry vary. For this reason, it is necessary to socialize the selection of plant types and procedures for managing agroforestry land well so that the income earned by the community can increase and be appropriate to meet their needs.

IV. CONCLUSION

The differences in the composition are based on the filling plants, with the main crops being coffee, pepper, and rubber. Ten agroforestry compositions were carried out, the main crops of coffee and pepper. Based on this composition, the income of forest farmers is lowest in composition I, with the main crops being coffee and filler crops, cloves, and jengkol, with an IDR income. of 15,725,500/ha/year. The highest farmer income is in Composition VIII, amounting to Rp. IDR 30,100,100/ha/year with main crops of coffee and pepper as well as filler crops such as banana, avocado, johar, sengon, mahogany, jengkol, durian, and chili. The difference in income earned by farmers is due to differences in the types of plants on their land. Agroforestry provides many benefits for society, one of which is as a source of income. However, in practice, many people need to learn how to properly manage land or select types of plants suitable for planting on cultivated land. This makes people's income from agroforestry vary. For this reason, it is necessary to socialize the selection of plant types and procedures for managing agroforestry land well so that the income earned by the community can increase and be appropriate to meet their needs

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