

ASSET ANALYSIS AND SUSTAINABLE STRATEGIES FOR FOREST MANAGEMENT: A CASE STUDY OF THE ORGANIC FOREST FARMER GROUP AND THE CITARUM WATERSHED UPSTREAM FARMER GROUP

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ABSTRACT

Forestry is one of the sectors that is of concern to the government, especially in management methods that are still not good so that many passive and poorly managed lands are found. Management becomes increasingly uncontrolled when the land area is very large and controlled by individuals and the government. The Hutani Farmer group or an organization that cares about the destruction of forest land can be a group that can play a local role in maintaining forest land more optimally in its management. This study aims to analyze forest assets that are a source of income in forest areas, strategies and stages of the forest asset management process, analyze product products that are output in asset management, analyze environmental and economic quality improvements on the impact of asset management and analyze environmental management related to support for the *Sustainable Development Goals* (SDG's). The object of research is on the management of organic forest land in megamendung and the Citarum watershed forest area in Bandung, with qualitative research methods analyzed using content analysis. Data collection was obtained from interviews of resource persons in this case forest land managers and questionnaire results as well as processed data from internal reports of the management. The results showed that forest land management requires existing forest assets in the form of trees and land as well as the existence of competent Human Resources. The main assets owned are also processed through strategies and stages in the form of agroforestry strategies and cultivation stages in the form of land zoning so as to produce outputs / products in the form of wood and non-timber which have an impact on creating better forest land for ecology, both land improvement and air quality from the results of planting existing tree species, another impact is the addition of economy for the actors in the form of vegetables and fruits and product yields. wood from several trees that can be randomly harvested. This sustainable asset management contributes to the Sustainable Development Goals (SDG's), especially in the Environment pillar and the Economic Pillar. Suggestions and implications in general so that farmer groups can maximize their HR assets to be able to form strong governance, further research can be carried out on other forest farmer groups, conduct research on downstream activities that are greater than each output produced.

Keywords: *forest assets; strategies and stages; forest and non-forest products; Improving environmental and economic quality; Sustainable Development Goals*

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INTRODUCTION

The Ministry of Environment and Forestry actively carries out a social forestry program that grants forest sleeping land permits to the community to be able to process it properly (Sahide et al., 2018). Incorrect forest land management can be the cause of natural disasters, for example the pattern of sloping land management which is used as a field for vegetable and food crops so that it becomes prone to damage to the land that cannot absorb water, eventually resulting in landslides and floods (Lusiana et al., 2008).

Previous research from [Jang-Hwan, Jo](#) et al (2019) conducted research on assets and strategies in managing sustainable forests in South Korea, with the results of research that the correct use of assets and good strategies will have an influence on the income of surrounding communities / Forest Farmer Groups. Some of the aspects of the study are Household Income

from Forestry, Income from Forests and Non-Forest Income. Another aspect of the research is the relationship with the assets owned and strategies in forest management which have implications for income.

Another study conducted by [Eriksson, et al](#) (2018) is about how the Swedish State manages sustainable forests through an integrated landscape approach to forest ecology or sustainability involving various sectors and stakeholders through forest land conservation, forestry restoration and Agroforestry.

Forestry policy and management strategies were initially focused on production, but recently the Government together with communities has begun to integrate climate change mitigation of biodiversity conservation, social aspects and regulation of water resources (Diana, 2011). A good land restoration process and integration for the benefit of communities, forests, and water are key to sustainable development (Ulum & Ngindana, 2017).

METHOD

This study uses qualitative methods to analyze sustainable assets and strategies for forest management that have an impact on the economy and the environment from the case of 2 (two) Forest Farmer Groups, namely the Organic Forest Farmer Group in the Mega Mendung area of Bogor and the Forest Farmer Group in the Upper Citarum River Basin Canning Bandung, which is analyzed using primary and secondary data using content analysis (Fatkhullah et al., 2021).

These two farmer groups were chosen because they started planting on critical land that needed restoration and were land areas that had begun to be encroached with various things including access to infrastructure, housing/villas, farming areas that were not suitable so that these natural assets were no longer of positive value and tended to damage the environment, resulting in damage to land and forests so that they needed Forest and Land Rehabilitation.

Measurement Variables and Indicators

No	Variable	Indicators
1	Asset or main capital	1. Land area of forest trees 2. The number of plants and their varieties 3. Water resources and precipitation 4. Household size (quality and capacity labor, how much is engaged in forest processing). 5. The level of education of the head of the household The age of the head of the household.

2	Management Strategy and Stages of Management	<ol style="list-style-type: none"> 1. Types and qualities of strategies in combining existing assets that add revenue (Types of businesses that run, Variants of the resulting product) 2. Land change 3. Zoning designation
3	Forest output	Timber forest products Non-timber forest products
4	a. Economics	<ol style="list-style-type: none"> 1. Forest household income 2. Income from Forest products, Non-forest product Income
	b. Milieu	<ol style="list-style-type: none"> 1. Rules and policies 2. Ongoing CSR assistance 3. Involvement of other parties 4. Water and carbon infiltration of planted tree trees
5	SDG's	<ol style="list-style-type: none"> 1. Access to Clean Water and Sanitation (No. 6) 2. Decent Work and Economic Growth (No.8) 3. Safeguarding Terrestrial Ecosystems (No 15) 4. Partnership to achieve the Goal (No. 17)

A. Discussion of research results

For the KTH Megamendung area, perennials that grow quickly and have an impact on the soil and the environment are african species (maesopsis emenii), sungkai, mahogany, teak mas, cinnamon, melinjo, white teak, jackfruit, avocado and mpts or West Java fruits. While the endemic ones are rasamala, walnut, meranti, puspa, Kemang, ulin, ebony, Merbau, rosin (agathis ssp), pine, and spruce. In the area, agroforestry planting patterns are also carried out which have a direct economic impact on the community in the form of vegetables, kapolaga, ginger, pepper, fruit, and melinjo. In general, almost all plants are plants that are good enough for combinations that have an impact on nature/soil and the environment as well as sharing forest products that have an impact on the community's economy.

For the Citarum Bandung watershed area, fastgrowing plants that grow quickly and have an impact on the soil and the environment are species of ecaliptus leda, ecaliptus alba, suren, african, mahogany uganda mpts local fruits while the endemic ones are rasamala, puspa, saninten, ki rhinoceros, huru, ki onje, angrit. Furthermore, for agroforesty planting patterns, the types are vegetables, coffee, fragrant lemongrass.

RESULTS AND DISCUSSION

1. Forest Assets and Human Resources

The findings show that the Organic Forest Farmer Group and the Citarum Watershed Upstream Farmer Group, which initially carried out critical land restoration for environmental improvement, then the land assets owned were planted. The types of trees planted as tree assets are almost mostly hard trees that have an impact on the environment and economy with 36 types of varieties.

The water source found is quite good considering that the surrounding area is a rainy area and natural spring water sources are made through steep land arrangement and planting water-absorbing tree species, the water pump mechanism for watering also uses a hydram pump system that utilizes pressure, so that there is no electrical energy used. In the process of determining tree species and making seedlings, using farm workers and the surrounding community through community development programs, as an asset for community human resources to be trained and given socialization of the economic and environmental impacts of this land rehabilitation program.

Trees and forests are central to the management of water resources based on their influence on infiltration, evapotranspiration, surface flow and subsurface flow (Gómez-Baggethun & Barton, 2013).

From the two descriptions above, it can be seen that the forest assets owned are the main pillars that are ready to become the main capital in forest management, including forest expanses, trees of various varieties, water sources and human resources.

2. Strategies and Stages of the Forest Land Management Process

The stages after land restoration, tree planting is carried out, which is then in the planning and development strategy because it is located in different areas: 33% is used for conservation of forest development, 22% is used for short-term economic activities in the form of annual planting plants (fruit, vegetables, coffee, pepper), 11% is used for utility activities in the form of buildings for management and also meeting areas for education etc.

Zoning and strategies in determining the types of land and trees planted are carried out for the purpose of obtaining optimal impacts on the short-term economy and maintenance of environmental quality. Agroforestry strategies are used to obtain economic value for land maintenance, zoning stages for long-term processes so that it is easy to determine the maintenance of environmental quality and economic improvement.

3. Product Output on forest land management

The types of trees planted as tree assets are almost mostly hard trees that have impact in the environment and economy with 36 types of varieties which along with the planting of hard trees, types of palawija or fruits and vegetables also become the output of non-wood products, Agroforestry Patterns that are run to create wood and non-wood products in the form of vegetables and annuals (fruit, coffee, pepper).

According to Hedges (2000), agroforestry is a form of deliberately growing and managing trees together with agricultural crops and or animal feed in a system with sustainable goals ecologically, socially and economically. In simple terms, it can be said to plant trees in the agricultural system. From the description above, it is clear that what has been carried out is a form of a system mechanism for managing forest assets that can maximize yields through

agroforestry in order to obtain the output of non-timber forest products and forest products in the form of wood.

4. Environmental and Economic Quality Improvement

Bargués Tobella Review (2014). Trees and forests are central to the management of water resources based on their influence on infiltration, evapotranspiration, surface flow and underflow. In most cases, the presence of forests provides water reserves locally and regionally which provide far greater benefits than the cost of reducing water flow in rivers due to water use by trees.

Starting from critical land caused by the invasion of property and infrastructure, farmer groups began to restore and rehabilitate the land back using existing land and by conducting several collaborations with institutions for afforestation program programs, currently it has begun to see the growth of hard trees planted, with many trees, especially trees that have roots binding the soil, So in general, the impact on the presence of this forest is that the soil and air become of higher quality, including the emergence of new springs.

In addition, the results of forest management also give rise to new biodiversity, and are in line with other studies that say that forestry operations carried out will affect biodiversity and water chemistry (Hansen et al., 2021). In terms of improving environmental quality, it is quite clear that the process of improving environmental quality will be in line with several things that exist including the number of hard trees that have almost grown throughout the land, the existence of new springs, the emergence of new biological diversity and of course air quality. Another thing that grows is the existence of new economic sources that have emerged since the time of planting agroforestry patterns through vegetable crops and other annual garden crops.

The HO Forest Farmers Group also adds to the livelihood of forest management through new non-forest products in the form of pioneering tourism village services and the impact of links in the form of food and beverage products that utilize local resources from the presence of forest tourism villages, including the use of environmentally friendly natural infrastructure as attractions in village areas with natural scenery, tracking areas and typical culinary, Thus, in general, the effect of the presence of forests also has an economic impact on local residents and farmer groups.

5. Forest Land Management is linked to support for the Sustainable Development Goals (SDG's).

Referring to the second edition of Metadata published by Bapenas, 2020 as a reference target and indicator for SDG's participation, especially goal No.15, namely Protecting, Restoring and Improving the Sustainable Use of Land Ecosystems, Managing Forests Sustainably, Stopping Desertification, Restoring Land Degradation, and Stopping Biodiversity Loss, especially in target 15.1, namely ensuring the preservation, restoration and sustainable use of terrestrial ecosystems and inland waters and their environmental services, particularly forest, wetland, mountainous and dryland ecosystems, in line with obligations under international treaties. And in Indicator 15.1.1, namely the proportion of forest area to total land area, Forest is defined as "land that stretches over 0.5 hectares with a tree height of more than 5 m and a canopy cover of more than 10%. This does not include land that is largely under agricultural or urban land use".

From the description above, it is clear that the analysis of the existing conditions in the research object where the main program of the research object is indeed starting from the implementation of the critical land rehabilitation conservation which is expected to prevent landslides and floods in the surrounding area, which until this research was carried out found that the process of land restoration and greening has been proven from field conditions with comparison before and after, thus the object of this study is included in the participation target in SDG's No. 15.

Overall, support and other participation in sustainable forest land management activities as outlined in the analysis above through assets, maintenance processes and product outputs produced are participation in the Environmental and Economic Pillars, namely in the SDG's: Access to Clean Water and Sanitation (No. 6), Maintaining Terrestrial Ecosystems (No. 15), Decent work and economic growth (no.8) and Partnerships to achieve the Goals (No. 17).

CONCLUSION

1. The Forest Farmer Group has natural forest assets in the form of forest land, tree seedlings and hard trees that are ready for planting and have been planted as well as human resources needed in a sustainable land management process.
2. The strategy process and stages of forest land management are carried out with an agroforestry pattern that combines forestry products, agricultural and livestock products, through stages and zoning of land use.
3. The process of asset management and strategy produces products or outputs that generally provide income for the continuity of land management.
4. Strategies and sustainable forest land management of assets have an impact on improving environmental and economic quality.
5. Through sustainable assets and strategies, forest land management in Megamendung and Hulu DAS Citarum has actively participated in and provided support for the Sustainable Development Goals (SDG's), especially in the Environment pillar, namely SDG's No. 15 (Maintaining Terrestrial Ecosystems), SDG's No. 6 (Access to Clean Water and Sanitation), as well as support for the Economic pillars, namely SDG's No. 8 (Decent Work and Economic Growth) and SDG's No. 17 Partnership to achieve the Goals.

Suggestion

Suggestions and recommendations for further research:

1. Research may involve Forest Farmer Groups and or broader Foundations.
2. Further research to include variables related to the calculation of *Social Return On Investment* (SROI).
3. Conduct research on downstream activities that are larger than each product / output produced.

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