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POLA PENGGUNAAN LAHAN DENGAN MODEL PRAKTIK AGROFORESTRI DI LERENG SELATAN GUNUNG MERAPI

LAND USE PATTERN BY AGROFOREST IN SOUTH SLOPE MERAPI MOUNTAIN

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ABSTRAK

Penelitian ini bertujuan untuk memberikan diskripsi karakteristik dari distribusi pola-pola penggunaan lahan (*land use*) dengan model agroforestri di Gunung Merapi. Hasil menunjukkan pola yang paling banyak dipraktekkan oleh masyarakat adalah 'tegalan' dengan pola-pola lainnya dengan prosentasi yang kecil. Identifikasi dari kepadatan secara ekologi adalah 300m/Ha berdasarkan data spasial. Dengan SDI berdasarkan groundcheck adalah 2.52. Analisis bentuk-bentuk pola penggunaan lahan yang menggunakan model agroforestry dibasiskan pada fungsi ekologi dan keuntungan ekonomi. Kondisi penggunaan lahan yang optimal yang dilihat dari tutupan lahan dengan sifat tersebar dan tegalan adalah model agroforestry yang paling banyak dipraktekkan oleh masyarakat lereng Gunung Merapi.

Kata Kunci : Agroforestri, Silvikultur, Merapi, Penggunaan Lahan

INTRODUCTION

Management of agroforestry model that have econoic and ecological functions have recently become a particular concern. Many forests have been converted into annual plantations, residential land, mining invasions, fires and uncontrolled exploitation of forest products. Agroforestry has important ecological effects on the needs of human life (Anonimous, 2011) including as a buffer zone for water and watershed protection against erosion, provision of habitat and food for animals and providers of animal feed and wood products as the main components. One of the best functions of forests as the stability of ecosystems and food formed a practical land use involving trees combined with agricultural crops and / or livestock on the same land (Suryatmojo, 2011). This practice is called an agroforestry system.

Cangkringan, Pakem and Turi are sub-districts areas in the Sleman district which directly adjacent to the Mount Merapi National Park on the southern slope as a mountain forest conservation area. All three regions have a stake as a buffer zone area. Agroforestry practices in the southern slope area as an effort to conserve land and water in a landscape. With agroforestry practices that have land cover vegetation such as forests, in addition to obtaining economic value from wood products, environmental services in the form of water regulators, oxygen providers and carbon stocks are also obtained (Huxley, 1999) . The economic and ecological function of the implementation of agroforestry practices by the community is very important for the sustainability of the surrounding ecosystem and indirectly influences the downstream area. Biophysically, the ecosystem area of

the volcanic landscape located in the upper reaches becomes the foundation for the sustainability of the ecosystem in the lower area (Anonimous, 2003). Furthermore, forest areas developed by the community as forest land cover on the southern slope spatially in the area are important to know the pattern of land use in agroforestry sustainability silviculture. This consideration makes it very important to carry out research into agroforestry models and the application of silvicultural practices as ecosystem corridors and land cover.

METHODOLOGY

Data Collecting Method

This research was conducted in Cangkringan, Pakem and Turi district of Merapi Volcano south slope. This study was conducted during early March to May, 2018. Materials needed were several land cover by vegetation in the area as known by buffer in the south slope of Merapi with total are 50 plot which image by camera. Data were collected using sampling method and systematic sampling (IS 2,5%) of total area of vegetation land cover by spasial analysis. The selection of plots was done systematically. This selection was intended to allow the data to be represented from the entire area under study ,

the sampling of vegetation was done by using multiple sample plots that are spread evenly

Data Analysis Method

Pattern analysis for land cover used sampling point centered method, many pattern observed were recorded, determined, and identified. In the vegetation analysis the following parameters were calculated: species name and number of individuals. Determination of dominant species was namely based on an Important Value Index (IVI) (Haruni, 2011) which refers to the Relative Density (KR), Relative Frequency (FR), and Relative Dominance (DR) values of each species.

RESULT AND DISCUSSION

Land Use Pattern

The results of observation and research in forthy plots of of South Slope Merapi Volcano shows that there are three pattern which observed. They are three of agroforest practice which done by their own. The data show like on the Figure 1. Agroforestry which is applied by farmers as land use patterns in the southern slope area is evenly distributed with the existence of villages that border directly with the Merapi National Park protected forest. There are eight villages directly adjacent to the three sub-districts. The eight villages are Glagaharjo, Argomulyo, Kepuharjo, Umbulharjo which are included in Cangkringan District; Purwobinangun and Hargobinangun in Pakem District and in Turi District there are two villages namely Wonokerto and Girikerto. The pattern of spread of each village can be seen in the following table 1.

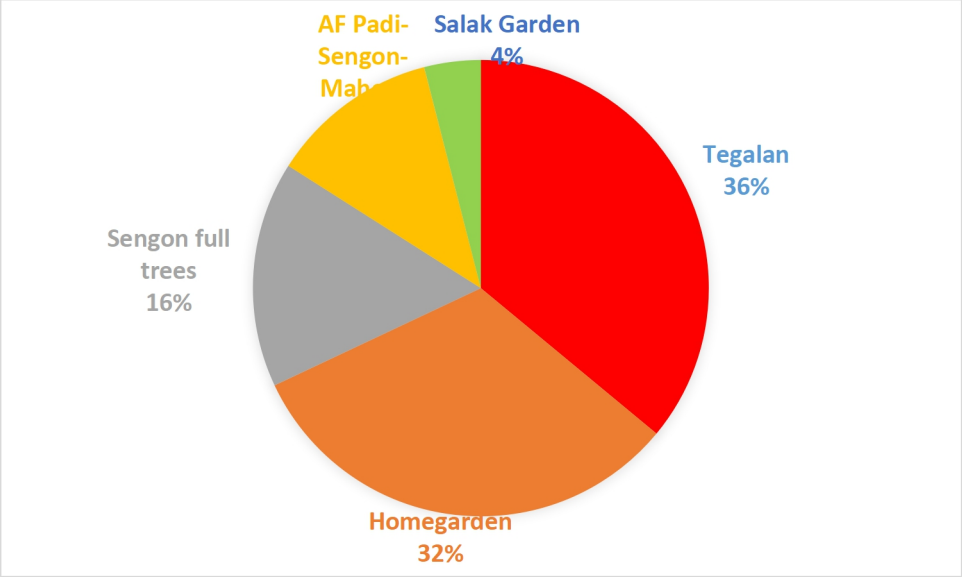

Figure 1. Agroforest Pattern Dominated in South Slope of Merapi Mountain

Tabel 1. Distribution Pattern in Land Use of South Slope of Merapi Mountain

Sub-district	Villages	Pattern
Cangkringan	Glagaharjo	*Tegalan*, Silvopasture
	Argomulyo	Mixed tree, Home garden
	Kepuharjo	Silvopasture, *Tegalan*, Larva tour
	Umbulharjo	Home garden, kebun campur
Pakem	Purwobinangun	Agro-tourism, homegarden, silvopasture, tegalan
	Hargobinangun	Agro-tourism, homegarden, silvopasture, *tegalan*
Turi	Wonokerto	Salakk garden Home garden
	Girikerto	Agro-tourism, Mixed tree

Land management based on spatial is practiced in a variety of application models. Its approach that combines economic and ecological interests as the basis for implementing agroforestry practices. The identification of various agroforestry models that are practiced becomes an interesting pattern as a patch in a landscape. The agroforestry model has various criteria, including cropping patterns, horizontal and vertical spatial division, structure and composition of vegetation compilers.

The dynamics of land cover with vegetation in a landscape are not only related to land use behavior, but also to natural cycles and changes caused by natural movements such as

succession and evolutionary processes and abiotic characteristics. These factors can be integrated in influencing vegetation cover in the landscape. The tendency is explained by Mc Garigal and Marks (1994), the processes that occur in open systems involve the flow of energy, material and movement of organisms that enter and enter the landscape system.

Composition Of Trees

The results of observation and research in 50 plots of 8 villages that directly adjacent to Merapi National Park shows that there are only five species that have dimeter 10 cm up. Based on the results of calculation of relative density, relative dominance, and relative frequncy can be calculated in to Important Value Index with summarize the results of relative density, relatuve frequncy, relative dominance of each species. Index with summing the results of relative density, relative frequency, relative dominance of each species. The results IVI of vegetation which have 10 cm up of diameters shows in the picture bellow.

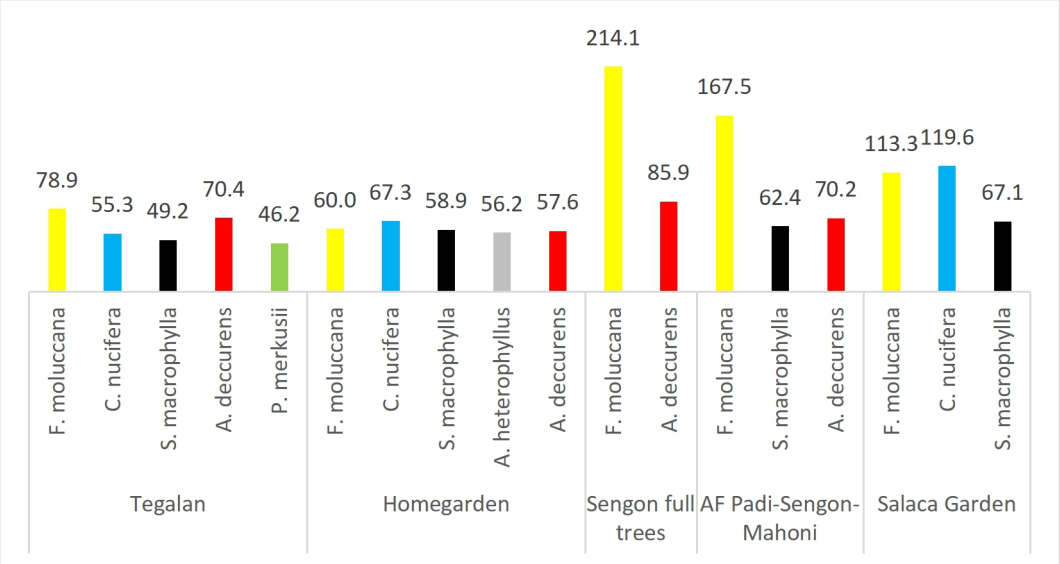

Figure 2. Recapitulation of important value index of stand trees in many pattern of land use of south slope Merapi Mountain

Source : Data processing in 2019

From the calculation of important value index in five pattern of land use, there are 6 spesies trees which have up 10 cm diameter in the 8 villages as buffer zone due to direct line with Merapi National Park, all of has above 10% of IVI each pattern. The highest IVI of *Falcataria moluccana* is occurs at full trees (214,1), then 113,3 in Salaca Garden, 78,9 in tegalan and 60 in the homegarden pattern. Another species include are Coconut (*Cocos nucifera*), *Switenia macrophyla*, *Acacia deccurens*, *Pinus merkusii* and *Artocarpus heterophylus*.

According to the data, as know that *Acacia deccurens* as invasif species alien plant since its dominance in the former eruption of Mount Merapi but by rehabilitation and reclamation its changed dominance to *Falcataria moluccana* as growing species same like it (Soekotjo, 2009).

Implementation of Agroforestry Model

Some agroforestry practice that often found include: dryland agroforestry systems, home gardens, paddy fields with several trees as a along border, salacca plantations combined with certain trees and land management for agro-tourism purposes. An alternative approach is to include various types of potential having varied yield functions and at the same time in the development scheme of buffer zone conservation in various types that have buffer functions (such as core connectivity zones) and connectivity corridors (such as river slopes and river banks) as well as coriodor with woody vegetation.

Identification of the landscape of the agroforestry model is examined from the system of interactions that occur between objects and elements in it. This interaction has an impact on the outcome of the interaction itself. In agroforestry landscape analysis, patterns of a system that can be understood both spatial and temporal can be studied. Spatial scale agroforestry research models include both simple agroforestry systems and those that have entered the complex agroforestry stage. From the analysis of several models with scoring indicators, the homegarden pattern

has the highest optimal yield among the other models. Yard patterns have the opportunity to become a model of sustainable agroforestry around the southern slopes of TNGM. This is faced with the increasing population growth and the rapid development of building infrastructure that will make the landscape of the southern slopes of TNGM fragmented. However, this pattern cannot be fully developed in KRB III because no housing or settlements are regulated in the district spatial plan Sleman. Other agroforestry model patterns, namely dry fields, paddy agroforestry (paddy) with trees, salak plantations and drylands with full-trees have scoring values below the yard model.

Spatially, the agroforestry system practice implementation model on the southern slope of TNGM will be dominated by the pattern of yards, fields and fields with species specificity. In this research, the adoptability of agroforestry farmers tends to choose the type of *Falcataria mucuccana* as a tree commodity that is widely planted. As an ecological and economic function, the homegarden pattern has an optimal balance value among other models. As an ecological function, the yard is enriched with tree commodity species so that the value of vegetation diversity is the highest compared to other identified models. In terms of economic function, the pattern of yard having a timber commodity is almost the same as the moor pattern, but it has an indirect value, with the presence of non-wood forest product by agroforestry (NWFP) that is utilized by the owner of each yard

Developing of the agroforestry model on the southern slope of TNGM in the eruption prone area of

Mount Merapi eruption has a tendency to develop from the existing model that has been practiced by the TNGM southern slope farming community. The agroforestry model practices are found on individual land owned and in local protected area areas, including 50 meters on either side of the river and around the spring

CONCLUSION

Based on the results of research from observation then analysis vegetation community in Gendol and Boyong Riparian River in South Slope Merapi Volcano, can be drawn some conclusions as follows:

1. There are five models of agroforestry that dominating applied in south slope of Merapi Mountain, they are: tegalan, homegarden, full trees of sengon, AF paddy and trees as along border and salacca garden.
2. There are 18 species of trees composing Riparian Ecosysytem in South Slope Merapi Volcano and almost that have above 10% of IVI and there are only 5 species which have under 10% consist of Puspa (*Schima wallichi*) 5,11%, Coconut (*Cocos nucifera*) 6,51%, Lamtoro (*Leucaena leucocepala*) 8,81%, Flamboyan (*Delonix regia*) 7,8% and Avocado (*Persea americana*) 6,81%.

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