

The Effect Of Forest Health On Social Conditions Of The Community

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Abstrak. Community forests have important values for community life, especially in rural areas. This value means that many benefits will be generated from the existence of the takyat forest. The benefits referred to are economic, socio-cultural and ecological benefits. This benefit is felt if the health condition of the jati community forests is in good health. The purpose of this study was to determine the value of forest health status status from indicators of productivity and to determine the benefits to the community. This research was conducted in September 2020 in Jati Peoples Forest, Natar District, South Lampung Regency. The objects in this study were eight Forest Health Monitoring (FHM) plot clusters containing jati stands in the seedling, sapling, poles and tree phase. The result of this research is that the forest health status is in good condition. Community forests provide benefits to the community such as increasing income, providing jobs and a place to live for wildlife. The conclusion of this research is that with good forest health conditions, community forests will provide many benefits to the community.

1. Introduction

Currently, the area of forest in Indonesia has decreased significantly (Pratama et al., 2015). This is due to an increase in population so that it requires space and the necessities of life from the forest area. One alternative solution to the problem of forest resources is community forest development (Alviya et al., 2007). Community forest is a forest that is built by the community on people's land (Aminah et al., 2013). Community forests can be owned by both individual and collective farmers (Safe'i et al., 2013). Community forest development currently has both strengths and beneficial opportunities, if government policies support and protect community forest farmers (Widiyanto et al., 2012).

Community forests in Indonesia have a high value. According to Dewi et al., (2004) community forests have an important value for community life, especially in rural areas. This value means that there are many benefits that will be generated from the existence of community forests. These benefits can be economic, socio-cultural in the form of agricultural work and ecological benefits (Anatika et al., 2019). Community forests also have great potential in terms of population and number of households operating them, which are capable of providing raw materials for the forestry industry (Anatika et al., 2019).

One of the community forests that has a focus on meeting industrial timber needs is community forest in RulungHelok Village, Natar District, South Lampung Regency. The wood commodity produced is jati (*Tectona grandis*). Jati was chosen because it has a very high quality wood. This is in line with the

statement of Martinah et al., (2015) which states that one of the most popular plants in the timber industry is jati because of its very high quality.

The quality of jati plants will be closely related to the health condition of the jati community forests. Forest health is an effort to control the level of community forest destruction (Safe'i et al., 2019). With controlled community forests, the quality and quantity of jati plants will indirectly be high. The quality of the jati plant will be proportional to the productivity level of the plant. Productivity is the growth rate of a tree or stand over a certain period of time or at this time. Productivity can be determined by measuring tree growth (Safe'i et al., 2019). Tree growth is calculated as basic area (LBDs) (Safe'i and Tsani, 2017). LBDs describe the rate of instantaneous growth or productivity of a tree over time. The data source for calculating LBDs is by measuring the diameter of the tree (Kuswandi, 2017).

By knowing productivity as an indicator of forest health, community forest management can lead to the principles of sustainable forest management and farmers will benefit from the existence of jati community forests. That way, research related to the health of community jati forests needs to be done.

2. Literature Review And Hypothesis Development

2.1 Definition and Development of Community Forests

Community forest is artificial forest, through planting perennial crops (perennials) on owned land, either individually, in clans or in groups (Anwar, 2018). There are also those who say that community forests are forests that are owned, developed, and managed by the people (Safe'i et al., 2019). This community forest was built to meet community needs and as an investment in the future. One of the benefits of community forests that can be felt by the community directly is increasing land productivity, sources of income and industrial raw materials (Safe'i et al., 2017).

Judging from its benefits, community forest can be divided into monoculture community forest and mixed community forest (polyculture / agroforestry) (Apriyanto et al., 2016). Community forest with a monoculture pattern becomes a management that is oriented towards the benefits of community forest as a supplier of industrial raw materials. This is because only wood is used. In Lampung Province, monoculture community forests have developed a lot and have a place in land use allocation (Sudrajat et al., 2016).

One of the developments that occurs is due to the important role of community forests in supplying raw materials for the timber industry after natural forests and industrial plantations. The demand for wood supply cannot be separated from the quality of wood produced by community forests. According to Apriyanto et al. (2016) community forests are no longer just "side jobs", but are demanded with high productivity and are still sustainable.

2.2 Forest Health

Sustainable forests are forests with good forest ecosystem health conditions (Safe'i et al., 2019). One of the criteria for achieving sustainable forest management is the condition and health of the forest ecosystem (ITTO, 1998). Information on the health condition of forest ecosystems in many countries has become the goal of forest management, such as in the United States (Safe'i et al., 2019).

According to Sumardi and Widyastuti (2007) that forest health is an effort to integrate knowledge about ecosystems, population dynamics, and plant-disturbing organism genetics with economic considerations to keep the risk of damage below the threshold of loss. The formulation of quality assurance (quality) for ecological indicators of forest health, namely productivity, biodiversity, vitality, and site quality (Supriyanto et al., 2001).

The forest ecosystem health assessment is carried out by periodically monitoring forest health, so that a comprehensive forest health assessment can be carried out (USDA-FS, 1999). Forest health monitoring is a system for monitoring the condition of forest ecosystems using the Forest Health Monitoring (FHM) method (Safe'i et al., 2019).

2.3 Jati Plant Productivity

Productivity can be found by measuring tree growth (Safe'i et al., 2019). Tree growth is an event of increasing tree size, which can be measured by increasing the size and height of tree organs (Hapsari et al., 2018). Tree growth can also be referred to as the increase in height and trunk diameter up to a certain time (Murtinah et al., 2015), the growth of the tree can be referred to as increment.

MAI is defined as the increase in the growth of tree dimensions (height, diameter, basal area, volume) or from stands associated with age in a certain unit area. Riap is one of the factors that must be considered in sustainable production forest management (Ruchaemi, 2013).

Plant growth can be measured from several parameters, namely diameter, height, crown area, volume, and so on (Sadono, 2018). Tree growth is calculated as growth in basal area (LBDs). LBDs are the cross-sectional area of a rod measured at breast height, so that it can be expressed as $LBDS = 1 / 4\pi (dbh)^2$ (Cline, 1995).

3. Research Methodology

3.1 Time and Location of Research

This research was conducted in September 2020. The location of the research was conducted in the community forest jati, RulungHelok Village, Natar District, South Lampung Regency.

3.2 Research Tools and Objects

The tools used in the study consisted of: tally sheets, plastic labels, nails, compasses, permanent markers, meters, meter tape (150 cm), Global Positioning System (GPS), hagameters, and digital cameras. The objects in this study were eight Forest Health Monitoring (FHM) plot clusters containing jati stands in the seedling, sapling, poles and tree phases.

3.3 Research methods

Forest health monitoring is carried out using the Forest Health Monitoring (FHM) method (Safe'i, 2015). Forest Health Monitoring (FHM) is a method of monitoring forest health conditions introduced by the USDA to monitor which is designed for forest health (Pratiwi and Safe'i, 2018). Determination of the number of plot clusters was carried out using a sampling intensity of 8% in order to obtain 12 cluster plots. This is based on the Regulation of the Director General of Forestry Planning and Environmental Management No.P.1/PKTL/IPSDH/PLA.1/1/2-17 concerning Technical Guidelines for Forest Inventory in Protected Forest Management Units (KPHL) and Production Forest Management Units (KPHP).) that the Sampling Intensity for inventory activities is 0.056%. Determination of the location for taking the 12 plot clusters was carried out by purposive sampling in accordance with the personal considerations of the researcher. The personal consideration of the researchers was to make a FHM plot calculator with consideration of area size.

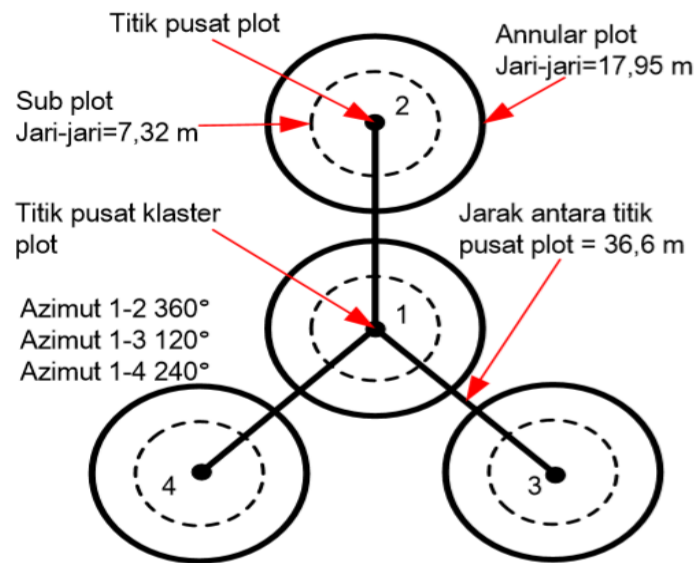


Figure. 1. Plot cluster design FHM

Data collection in the field is obtained by measuring the productivity indicator parameter. The parameters used in this study were tree growth (LBDs) whose data can be obtained through diameter measurements. The stem diameter is measured 1.3 m above ground level. Techniques for measuring tree growth or productivity were carried out on jati plants in each cluster plot. These measurements are carried out at the seedling, sapling, poles and tree phases.

Tree growth is calculated as growth in basal area (LBDs). LBDs parameter was chosen because it is a parameter that is easy to measure and has a high level of consistency. Therefore, tree diameter growth can be used as the basis for calculating the growth of the basal area (LBDs) of the tree (Cline 1995). The following is the formula for LBDs:

$$\text{LBDs} = \frac{1}{4} \times \pi \times d^2$$

Information :

LBDs = basal area of individual trees (m²)

d = trunk diameter (1.3 meters from the base of the tree)

π = constant (3.14)

Forest health assessments in jati community forests in Natar District were obtained from the final value of the jati forest health conditions. This assessment aims to determine the current health condition of the forest based on indicators of productivity. To get the final forest health value, you can use the following formula:

$$\text{NKH} = \text{NT} \times \text{NS}$$

Information :

NKH = final value of forest health condition

NT = parameter weighted value of the productivity indicator

NS = parameter score value of the productivity indicator

Where, NKH is the final value of forest health condition, NT is the parameter weighted value of each forest health indicator, NS is the parameter score value of each forest health indicator (Safe'i et al., 2018). The score value is obtained from the transformation of the parameter values of each plot cluster with a score range of 1-10. While the weighted value (NT) is obtained using the Analytic Networking Process (ANP) (Safe'i and Tsani, 2016).

To find out the role of community forests in the community, interview methods were used with key informants who were managers of community jati forests. This interview was conducted to find out what benefits the community got from the existence of community jati forests.

3.4 Results And Discussions

The results of interviews with the owners / managers of community jati forests in Rulung Helok Village, Natar District, South Lampung Regency, show that the community forest has its main function, namely production in the form of wood for timber industry needs in East Java. This function can be fulfilled by good forest health conditions. Forest health conditions can be determined by measuring forest health indicators (Sari et al., 2019). Health indicators that can be measured in jati community forests with a production focus are indicators of productivity or tree growth (Safe'i et al., 2019). This shows that the productivity indicator is the right one to measure in the jati community forest.\

Fulfillment of community forest production functions through productivity indicators is something that must be considered (Safe'i et al., 2013). The level of productivity will be a guarantee of quality (quality and support for jati plant growth (Safe'i et al., 2013). To determine the level of productivity, it is necessary to measure productivity indicator parameters, namely basal area or LBDs. LBDs can be determined by measuring tree diameter at breast height or 1.3 meters above ground level According to Philip (1994), tree diameter growth is a parameter of growth that is easy to measure and has a high level of consistency. The results of the LBDs assessment for each cluster-plot can be seen in Table 1.

Table 1: Value of LBDs in each Plot cluster

Klaster Plot	LBDs (m ²)
1	0,0390
2	0,0419
3	0,0397
4	0,0413
5	0,0378
6	0,0373
7	0,0312
8	0,0328
9	0,0461
10	0,0465
11	0,0461
12	0,0461

Source: Processed from field data

Jati plant growth tends to increase along with the age of the stands. The jati plants were planted in 2006, 2008, 2009 and 2011. The highest growth was in cluster plot ten with a value of 0.0465 m². While the lowest tree growth value is in cluster plot seven with a value of 0.0312 m². From the values obtained, all plot clusters have different values from one another. One of the factors that determine the size of the diameter is the spacing. A wide spacing will make plants more adaptable to the environment (Marliah et al., 2012). However, this community forest has a fairly tight spacing because it aims to make wood that is straight and tall. The score for tree growth parameters is based on the average LBDS value of trees per hectare in each cluster-plot (Table 2).

Table 2: Scoring values on LBDs parameters

Skor	LBDs
1	0,0312 - 0,0326
2	0,0327 - 0,0342

3	0,0343	-	0,0357
4	0,0358	-	0,0372
5	0,0373	-	0,0388
6	0,0389	-	0,0403
7	0,0404	-	0,0418
8	0,0419	-	0,0434
9	0,0435	-	0,0449
10	0,0450	-	0,0465

Source: Processed from field data

The scoring scores are given at intervals of 1-10. Value starts from the smallest value to the largest. The higher the score, the higher the health level of the jati community forest. Scoring of tree growth conditions is based on the average LBDs value per hectare (Safe'i, 2017). The 1-10 interval provides a level for each value that exists for each measuring plot cluster that has been previously obtained. The threshold value for forest health status is based on the value of the LBDs parameter score (Table 3).

Table 3: Threshold values for forest health status based on productivity indicators

No	Kategori	Kelas Nilai
1	Baik	7,00-10,00
2	Sedang	4,00-6,99
3	Buruk	1,00-3,99

Source: Processed from field data

The health condition value of the jati community forest on each cluster-plot with the health condition category of the jati community forest (Table 4)

Table 4: Final values of forest health status based on productivity indicators

Klaster	NKH	Status
1	6	Sedang
2	8	Baik
3	6	Sedang
4	7	Baik
5	5	Sedang
6	5	Sedang
7	1	Buruk
8	2	Buruk
9	10	Baik
10	10	Baik

Table 4: continuation

Klaster	NKH	Status
11	10	Baik
12	10	Baik

Source: Processed from field data

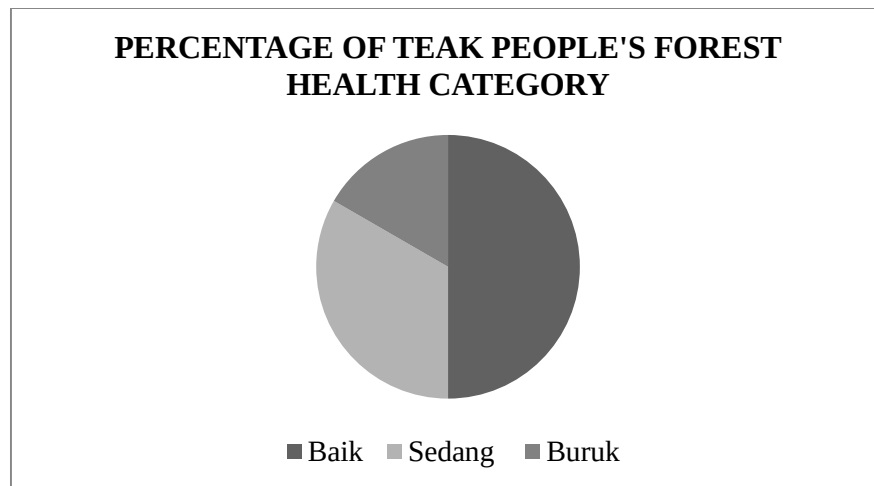


Figure 2. Percentage of teak people's forest health category

The results obtained from table 4 show that the health condition of the jati community forest in Rulung Helok Village, Natar District, South Lampung Regency is in good condition. There are twelve cluster plots made on an area of 60 Ha of community forest. Six plot clusters are in good categories, four are in medium categories and 2 plot clusters are in bad categories. The health condition assessment is obtained from the measurement of productivity indicators for each individual tree in the jati community forest. It can be said in broad outline that the community jati forests in Natar District have good forest health conditions.

According to Safe'i et al., (2015) the higher the forest health score indicates that the higher the community forest health level, conversely, the lower the score, the lower the forest health level. This community jati forest has good forest health conditions in terms of productivity, presumably because the jati seeds planted come from saplings in Perhutani's nursery. Where the broodstock of the finished plant has superior seed varieties. This will affect the growth of jati plants in the people's forests of Rulung Helok Village.

A high level of productivity can also contribute to the economic level of farmers. Community forest farmers will benefit more from the sale of wood. The wood from the community forest is sold to East Java to supply industrial raw materials. This is in line with the benefits of community forests, namely to increase community income (Pratama et al., 2015). However, these benefits can be felt if community forest farmers can manage the forest well. This means that community forest management must be based on the principle of sustainable forest management (PHL) (Safe'i et al., 2015). However, in order to achieve this, it needs proper and dynamic SFM so that it is adaptive to local conditions (Safe'i et al., 2015).

The existence of community forests also provides employment opportunities for local communities. In maintaining community forests, additional workers are needed so that the implementation is fast. Maintenance activities are activities carried out by community forest managers to maintain their plants so that they can grow well and give maximum results (Simon, 2004). The implementation of maintenance activities that are usually carried out in community forests are weeding, fertilizing, pruning branches, thinning, eradicating pests and diseases (Pratama et al., 2015). From these activities, it will reduce the unemployment rate in the local area.

4. Conclusion

The conclusion of this research is that the health status of community jati forests in Rulung Helok Village, Natar District, South Lampung Regency is in good condition. Of the twelve cluster plots made,

six were in the good category, four were in the medium category and 2 were in the bad category. From such a health status, community forest can be said to be in accordance with its function, namely production forest. In addition, the health of community forests can provide benefits to local communities in economic, social and ecological aspects.

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