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APPLICATION OF HARVESTING METHODS WITH MICROPLANNING IN HTI PT. SURYA HUTANI JAYA, MUARA KAMAN SUB DISTRICT, KUTAI KARTANEGARA

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ABSTRACT

Implementation of Harvesting Methods with a Cutting Path (Microplanning) at HTI PT. Surya Hutani Jaya, Muara Kaman Sub District, KutaiKartanegara.

This study aims to determine the characteristics of ex-harvested forest lands carried out by the Cutting Path Method (Microplanning) in the form of land cleanliness and soil density. The method used in this research is the descriptive method. Namely knowing the description of the quality of the former harvesting activities in the form of land cleanliness, and the state of soil density. Based on the data analysis conducted, it is concluded that; forest harvesting methods that apply the Cutting Path Method (microplanning) produce a level of cleanliness of logged-over land according to the categories specified in the HOA (Hand Over Area). Soil compaction in the harvesting using the Cutting Path Method (microplanning) is relatively non-occurring.

KEYWORDS

Cutting Path Method (Microplanning), MuaraKaman.

INTRODUCTION

Forest is an ecosystem unit in the form of a stretch of land containing biological natural resources which are dominated by trees in their natural environment, which cannot be separated from one another.

Therefore, in the processing and utilization of forests, we must pay attention to the concept of sustainability, so that our forests are maintained in a sustainable manner. So that we can pass on this forest to future generations.

However, along with the development of technology and demands for high productivity, so that in the process of harvesting forest products in achieving the desired target, less attention is paid to the impact of forest sustainability which should be jointly maintained.

Until now, there have been many Business Permits for the Utilization of Timber Forest Products (IUPHHK) which have been granted to IUPHHK-HTI or IUPHHK-HA, to process and utilize forest products in accordance with established provisions. Like PT. Surya Hutani Jaya which has obtained a Timber Forest Product Utilization Business Permit (IUPHHK), which has been carrying out its activities since 1996, based on the Decree of the Minister of Forestry No. 156/KPT.s-II/1996 dated March 8, 1996 in an area of ± 183,300 ha in KutaiKartanegara Regency and East Kutai Regency, East Kalimantan Province.

Where in the implementation of forest management, PT. Surya Hutani Jaya is committed to implementing industrial forest plantation management towards Sustainable Production Forest Management (PHPL) by implementing the sustainability of forest functions including; Preservation of production functions, preservation of ecological functions and preservation of social functions.

It is hoped that environmentally friendly harvesting can increase the productivity of the production area, forest harvesting always takes into account the impact on the environment apart from the economic impact.

To get environmentally friendly harvesting, several stages of harvesting are needed such as planning, the type of tools used and the harvesting techniques used (Aritonang, 2018).

Good forest harvesting planning is able to guarantee the certainty of maintaining biodiversity, maintaining the quality of soil, water and air as well as ensuring the preservation of the cultural life of the surrounding community.

In addition, the use of environmentally friendly mechanical system equipment such as excavators or other heavy equipment is more environmentally friendly but has higher productivity.

Harvesting with a slashing line (microplanning) is a harvesting method in which a detailed initial logging plan is made which will be used as a guideline for the implementation of harvesting work. Because the harvesting method using a slashing line or microplanning is one of the most well-planned harvesting methods so that the objectives of a good harvest can be achieved, namely: minimizing the presence of wood left after the harvesting process, reducing soil density, and minimizing environmental damage.

The purpose of this study was to determine the characteristics of ex-harvested forest lands carried out by the Cutting Line Method (Microplanning) in the form of land cleanliness and soil density.

RESEARCH METHODOLOGY

1. Time and Place

The research was conducted from October to December 2021 at PT. Surya Hutani Jaya, Muara Kaman Sub District, KutaiKartanegara Regency with three places of activity, namely: (1) in the office for making micro planning work maps using a computer using Arcgis software; (2) in the plot/land for the area to be carried out as the object of research in the field; and (3) at the Soil Laboratory of the Samarinda State Agricultural Polytechnic to calculate the density level of the soil used as a sample of research results.

2. Research Object

The object of the research is forest harvesting activities in one of the production forest plots in the PT. Surya Hutani Jaya in Muara Kaman sub District.

3. Materials and tools

The materials used in this study were microplanning maps with a scale of 1: 5000 (to implement the marking plans made on maps with field conditions) and soil samples (as objects of observation in soil density

research); and the tools used are GPS, PPE, machete, hoe, sample ring, meter, knife cutter, marking tape. paints, brushes, labels, gauze, transparent plastic, ropes, computers, and printers.

4. Research methods

The method used in this research is descriptive method. namely to describe the harvesting method in PT. Surya Hutani Jaya by observing the stages of forest harvesting activities and results using the Cutting Line Method (microplanning) both the product and the impact of logging from the abandoned field conditions.

5. Research procedure

In this study there are 2 stages of the procedure, namely;

5.1. Pre-harvesting Research Procedure

a. Prepare plots for micoplanning research objects with a cutting line width of 12-15 meters (see Figure 1.)
b. The plot selection must follow the Operational Plan for the 2021 Main Target which has the appropriate phasing interval and an SPK has been made for harvesting the plot.
c. Make a micoplanning map for felling directions and other complete information on the plots that have been selected for the research object.
d. Marking the field according to the information contained in the microplanning map.
e. Monitor activities in the field so that they are carried out properly according to the markings carried out until the harvesting activities are completed.

Example of harvesting simulation using the Cutting Line Method:

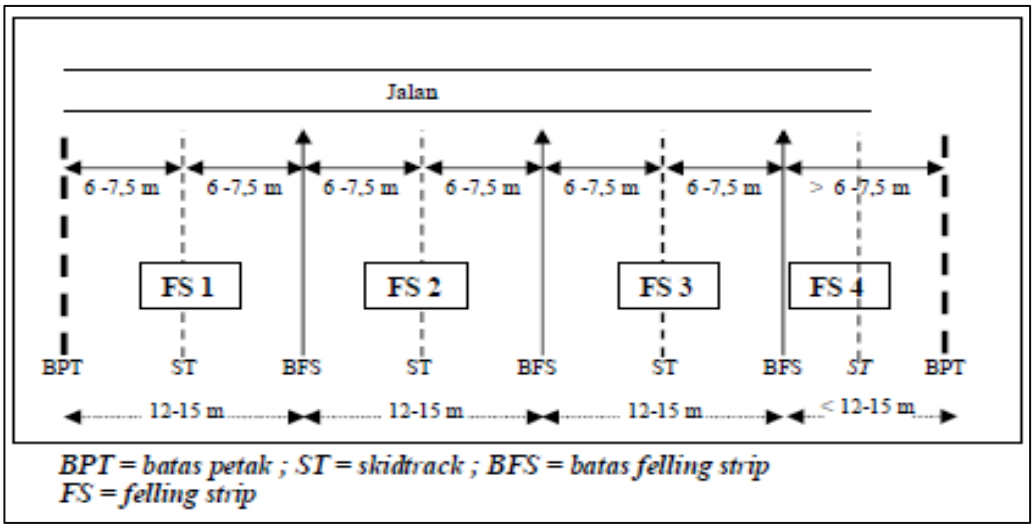

Figure 1. Harvesting using the Microplanning Method

5.2. Postharvesting Research Procedure:

a. Conduct land cleanness assessment and soil sampling by making 3 random plots on logging plots in different land topography, as well as observing a 5x5 m circumference (marked with white tape to determine the boundaries of the observation plots).
b. Soil samples taken consisted of intact soil samples at a depth of 0-20 cm and 20-40 cm. Remove the topsoil 4 cm. Carefully immerse the sample ring until it disappears from the soil surface.
c. For soil sampling 0-20 cm, taken approximately at a depth of 8 cm to 13 cm from the soil surface. Then dig the soil with a hoe to take a sample ring, so that the lumps of soil are carried well. Then trim the soil surface at the end of the sample ring using a knife (cutter).
d. For sampling 20 – 40 cm, remove the top soil layer 20 cm, then do the same as the sampling procedure for a depth of 0 – 20 cm. The soil carried is soil that is only in the size of the sample ring.

e. The sample ring that has been taken is then wrapped with gauze, then put in transparent plastic and tied with raffia/rubber rope to make it airtight. Label each sample, then the sample is taken to the laboratory for further analysis.
f. The excavated soil from which soil samples have been taken is covered again.
g. After assessing the level of cleanliness of the land and taking soil samples, take documentation for visual results of felling using the logging path method.
h. If the soil density value and the success rate of the land have been obtained, the data is compiled in tabulated form.

In the tabulation of land cleanliness data, it can be seen in the table of observations. So to determine that the land is declared clean if the results of the weight assessment are in accordance with the standards that have been set.

6. Observation and Data Collection

The data collected in this study include:

6.1 Primary data:

a. Land cleanliness, the data taken include; 1) Wood loss (logged wood left in the observation area, but can still be used with the provisions of p: >1.6 cm and d: 6 cm); 2) Wood residue (wood left in the observation area, due to errors in the felling process); 3) Stump height (stump height with a maximum provision of < 5 cm for HTI): 4) Spreading (scattered from twigs and other felled waste that is expected not to disturb the planting point, provided that 5 planting points and a thickness of 10 cm in the observation area).
b. Soil data, which is taken to find out the density or density of the soil traversed by the equipment by means of; take samples of intact soil in different topography at a depth of 0 - 20 cm and 20 - 40 cm, to be tested for density or density in the laboratory. Fill density is the weight per unit volume of oven-dried soil, usually specified in g/ml (Landoala, 2008 in Hakim et al, 1986).

6.2 Secondary Data:

Secondary data obtained from Standard Operating Procedures of PT. Surya Hutani Jaya, East Kalimantan, are as follows:

a. RKU PT. Surya Hutani Jaya, the data taken include; company background, topography, slope class and soil type.
b. MT 2021 PT. Surya Hutani Jaya, the data taken include; plot/land data, area and other information on areas that can be harvested in 2021.
c. SOPs PT. Surya Hutani Jaya, the data taken include; operational standards of work in the field and administration on activities related to Harvesting & Microplanning research).

7. Data analysis

After conducting an assessment of the cleanliness of the land in the field, the results of the assessment were tabulated to assess the level of land cleanliness from the harvesting method applied according to the company's HOA assessment form and a descriptive analysis was performed.

RESULTS AND DISCUSSION

1. General Condition of Research Area

PT. Surya Hutani Jaya obtained a Business License for Utilization of Plantation Forest Products in Industrial Plantation Forests (IUPHHK-HTI) based on the Decree of the Minister of Forestry No. 156/KPT.s-II/1996 dated March 8, 1996 in an area of ± 183,300 ha in Kutai Kartanegara Regency and East Kutai Regency, East Kalimantan Province.

Geographically, the IUPHHK PT. Surya Hutani Jaya is located at Coordinates00°32’ LU until 00°17’ LS and 116° 67’ until117° 14’ BT.

The location of the area is in the Sebuluh, Manamang and Beliwit River forest groups. Based on government administration, the working area of PT. Surya Hutani Jaya is included in the working area of

Sebuluh and Muara Kaman sub Districts, KutaiKartanegara District and MuaraBengkalsub District, East Kutai District.

Climatic conditions in the area of PT. Surya Hutani Jaya belongs to class A (very wet) according to Schmidt and Ferguson.

Topographical conditions at PT. Surya Hutani Jaya is relatively flat, some have very steep slopes.

2. Level of Land Cleanliness after Harvesting

The results of the assessment of the level of land cleanliness after harvesting activities are presented in Table 1 below:

Table 1. Results of Assessment of the Level of Land Cleanliness after Harvesting Activities

No	Parameter Land Cleanliness	Standard (Amount)	Circumstances in the Observation Sampling Plot			Results Evaluation
			I	II	III	
1	Wood loss in the observed cutting path) However, it can still be used by: P: >1.6m andØ: 6 cm)	0,5 m^3/Ha or 12 trunk/Ha or 8 trunk/line	Wood loss is smaller than 0,5m^3 or only 10 trunk/ha There are 6 trunks in the track observed	Wood loss is smaller than 0,5m^3 Or only 12 trunk/ha There are 8 trunks in the track observed	Wood loss is smaller than 0,5m^3 Or only 8 trunk/ha There are 5 trunks in the track observed	Meet the Clean Requirements
2	Wood Residue in the cutting line (observation area) due to errors in the felling process)	0,5 m^3/Ha or 27 trunks/Ha or 18 trunks/line	Wood residue only 24 trunks/ha or 16 stems on the observed cutting line	Wood residue only 27 trunks//ha or18 stems on the observed cutting line	Wood residue only 25 trunks//ha or 16 stems on the observed cutting line	Meet the Clean Requirements
3	Stump height maximum allowed lag < 5cm)	3 trunks/ line	3 trunksin plot 1	2 trunks in plot 2	3 trunks in plot 3	Meet the Clean Requirements
4	Spreading wood does not interfere with the planting point	≤ 5 planting point and thickness ≤ 10 cm	5 points on plot 1 with thickness 10 cm	4 points on plot 1 with thickness 10 cm	4 points on plot 1 with thickness 10 cm	Meet the Clean Requirements

Source: Research Results (2021)

Land Clean Assessment Plots are placed randomly in the path, where each plot is made with a size of 5 m x 5 m, to represent an area of ± 2 Ha on the harvested land, each plot is made in 3 different topography, in order to represent the situation in the field on the harvested land used as the research location.

In determining the cleanliness of the land, there are several aspects of the assessment that must be considered according to the HOA standard, including: (1) Wood loss (logged wood left in the observation area, but can still be used with the provisions of p: > 1.6 cm and d: 6 cm; (2) Wood residue (wood left in the observation area, due to errors in the felling process), (3) Stump height (maximum stump height with conditions

< 5 cm); and (4) Spreading (scattered from twigs and other felled waste that is expected not to disturb the planting point, provided that 5 planting points and 10 cm thickness in the observation area).

The results of field checks after the land has finished harvesting activities using an assessment form that follows the standard provisions for assessing land quality in the company with the following results: harvesting using the cutting path method (microplanning), in the process it is carried out by making cutting paths / tunnels with hoses. - alternating every 15 m (example in Figure 1), so that before making the next cutting lane, you can pay more attention to the cleanliness of the land on the path being worked on. With these efforts can further optimize the cleanliness of the land and reduce the risk of wood being left behind (timber production or wood residue due to mistakes in logging).

Harvesting using the cutting line method meets the clean requirements according to the parameter standards and the assessment standards used (HOA assessment)

2. Soil Density Level after Harvesting

The results of research on soil density testing/analysis in the laboratory are presented in Table 2 below:

Table 2. Results of Soil Density Analysis After Harvesting

No	Sample Ring			Average Soil Weight/Ring (g/ml)	Soil Sample Depth (cm)
	Plot 1	Plot 2	Plot 3		
	weight (g/ml)	Weight (g/ml)	weight (g/ml)		
1	1,379	1,253	1,302	1,311	0 - 20
2	1,391	0,374	1,417	1,061	20 - 40

Source: Research Results (2021)

Based on the data from the laboratory test results presented in Table 2 above, it can be seen that each soil density value is at each depth. In the harvesting method using a slashing line (microplanning), in the process details of the activities have been made for the direction of felling, the direction of wood withdrawal and the extraction path. So that when the stands/trees have been felled, the heavy equipment used to pull the wood moves in an orderly fashion following the extraction path that has been made (not moving freely/back and forth in all directions), plus the extraction path that is passed is made a foothold from residual waste. logging so as to minimize the level of compaction in the soil in the harvesting activity. Based on the results of sampling in the field that has been tested in the soil laboratory from the data, the average soil density value of the laboratory test results from the three plots for each depth is: (1) 0-20 cm depth of 1.311 g/ml ; (2) depth of 20 – 40 cm is 1.061 g/ml. The results showed that the condition of the top soil layer (0 - 20 cm) which was passed by heavy equipment did not cause changes in the underlying soil layer, 20 - 40 cm, i.e. the soil density value was still smaller than the topsoil, it could be interpreted that in some parts of the In most of the slash-line locations, there is no soil compaction to the bottom layer. According to Saleh (2020) soil density levels generally range from 2.6 to 2.75 g/ml and usually do not change. The level of soil density is also influenced by soil praxis or disturbances that occur on the ground surface. When compared to the density of the soil in general, the soil resistance at the study site is low, in our opinion this is influenced by the type of soil that dominates the area.

CONCLUSIONS

a. The harvesting method using a microplanning results in the level of cleanliness of the logged-over land according to the categories specified in the HOA (Hand Over Area).
b. Soil compaction in the harvesting method using a microplanning is relatively non-occurring.

RECOMMENDATIONS

Based on this research, it is suggested that the harvesting method using a cutting line (microplanning) can be applied to harvesting activities, especially in HTI (Industrial Plantation Forest) lands.

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