REDUCED IMPACT LOGGING :

Solution for saving money and the forest towards Sustainable Forest Management

(A case study in Labanan, Berau, East Kalimantan, Indonesia)

by.

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INTRODUCTION

Conventional harvesting system in the tropical rain forest do not fulfil the objectives of sustainable forest management.

Under the conventional harvesting in Indonesia only a small percentage of the great variety and sizes of trees are harvested, but the damaged to residual trees and the environment is too high.

PT INHUTANI I in collaboration with the Berau Forest Management Project (BFMP) is introducing a method of Reduced Impact Logging (RIL) in a forest concession managed by PT INHUTANI I. The project site is located in Labanan Forest Area, Berau Regency, East Kalimantan Province.

PT INHUTANI I is an Indonesian State Forest Enterprice, managing forest concessions from south to north side of East Kalimantan Covering total forest area of 1,1 million hektares.

Labanan, a forest management unit of about 95.000 hektares is one of four management units in Berau, producing about 45.000 cubic meters of logs annually.

Indonesian selective Cutting and planting system named Tebang Pilih Tanam Indonesia (TPTI) includes a series of operations :

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- Forest Gazzeting
- Pre-harvest inventory and Road alignment
- Road constructing
- Harvesting
- Past harvest inventory
- Refining
- Liberation cutting
- Enrichment planting and thinning

No work on skidding track alignment is done. As skidding is the major destructive operation during the harvest it is considered important to correct this.

Minimizing the length of skidding trail reduces damage to residual stand. The improvements presented in this paper focus on improving the accuracy of pre harvest inventory to produce detailed tree position and contour map.

These are used to plan carefully and correctly the most efficient skidding trail alignment.

METHODOLOGY

Comparison of three logging method

Three logging nethods where studied at an operasional scale in the Labanan concession, covering 237 trips extractting 1,500 m^3 of logs from three compartment (A,B and C)

Compartment	Techniques	Equipment	Maps used skid trail alignment
A	RIL	Bulldozer	Yes
B	RIL	Bulldozer+wheeled skidder	Yes
C	Conventional	Bulldozer	No

The basic difference between these methods was in planning of the operations. In the RIL plots, pre-harvest inventory (PHI) and slope data (contour) were collected with a high degree of accuracy and used to produce high-quality tree position and contour maps with SIPTOP (Topographical and Trees Information System) software developed by BFMP. These maps were used to accurately locate actual crop trees, plan skid trail location to minimize impact and maximized extraction utility. Conventional logging was done without proper planning.

Data Collection

Data was collected during normal harvest oparations, kept detailed records of 237 extraction event. For each trip, the following data was collected :
Machine hours used, size of logs moved, time ellapsed and terrain, including slope and distance.

RESULTS

1. The results strongly indicate that both log production cost and environmental damage are much lower under RIL than conventional logging. The major explanation is that bulldozer time used for skid trail cronstruction under RIL is much lower than under conventional logging.

   Bulldozer hour consumption for skid trail construction was 2.8 times higher in a conventionally harvested compartment than in compartment harvested under RIL

2. The cost of skidding in well planned compartment applying RIL principles was only 67 percent of the cost of conventional logging, mainly because of lower skid trail construction costs and avoidance of delays, both as the result of better planning.

3. To illustrate the saving , the basic data have been used to calculate the costs for standard compartment using the three logging treatment, and the results are :

- Conventional logging : Rp. 154 million (48 days of work)
- RIL (using bulldozer) : Rp. 103 million (32 days of work)
- RIL (using bulldozer+wheeled Skidder : Rp. 94 million (30 days of work)

Assumption :

- Standard compartment = 100 hectares = 3,000 m^3 of logs
- Average skidding distance = 400 m
- The usage of wheeled skidder is 30 % of the logs extracted from the compartment

LESSON LEARNED FROM THIS STUDY

1. Planning – the basis for RIL

Successful implementation of RIL is based on improved planning of the harvest operation. Reliable tree and topographic data for the compartment to be harvested is required. The accuracy of this data will reduces time wasted by fellers and the damaging skid trail opening.

2. Post harvest assesment

After completing the harvest operation, the maps are used again to record damage. This post harvest assesment could be done easily along skid trails. The result can be used to modify the stand data from pre harvest inventory, thereby eliminating the need to conduct a complete post-harvest residual stand inventory as would be required under the conventional TPTI logging system.

3. Indicator of environmental impact

Harvesting equipment such as bulldozers are very powerful and can do substantial environmental damage. This study basically suggests that the more hours they are active in a compartment the more damage they do. Consequently “machine hours per hectare” or “machine hours per m^3 extracted” could provide an excellent operational level indicator of environmental impact. These indicators have the added advantage of being directly related to operational costs. Managers accountants and environmentalists should be happy.