

APPLYING OF REDUCED IMPACT LOGGING (RIL) IN ONE FOREST CONCESSION IN EAST KALIMANTAN

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INTRODUCTION

Ecoregions are areas of similar ecological composition that share wide-ranging species or groups of forest types, including some very unique animals and plants, as well as features such as freshwater lakes or rivers that are responsible for keeping this natural diversity alive. There have been several methods of dividing the world into ecoregions – in this case we have utilized a combination of the WWF method with TNC's larger scale approach. Also, for practical reasons, especially the wealth of information that was available to us for this area, we chose to limit this assessment to the Indonesian province of East Kalimantan. This area has been identified as containing some of the best remaining forest types on the East Kalimantan province. Likewise, because the forests are still in relatively good condition, the plants and animals that depend upon the forests are also probably in the best position for surviving well into the future – if we are successful in meeting the conservation challenges (Stanley et al., 2002).

The ecoregional planning will be selected by The Nature Conservancy regarding the selections of the best places for them to work in East Kalimantan.

In particular, to select sites of the concessions that best represent:

- to ensure conservation of functional landscape-scale systems
- existing biological diversity at multiple scales
- have good commitment to certification (KKS-members)

In 2002, the management of PT Sumalindo Lestari Jaya/East Kalimantan and The Nature Conservancy (TNC) East Kalimantan launched a High Conservation Value Forest assessment.

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Sumalindo Lestari Jaya (SLJ) unit II, comprising 269,660 ha, is located in the upper watershed of the Mahakam River, East Kalimantan Province, Indonesia. The area has been identified by The Nature Conservancy as a critical upper watershed for the Mahakam area which conserves multiple forest types and ecological functions. Given Indonesia's The Nature Conservancy views sustainable forest management as the most suitable tool for conserving this area. In recognition of this the Nature Conservancy is working with the concessionaire to help them obtain FSC certification. Personnel with SLJ-II started working toward meeting certification criteria several years ago and they have made significant progress toward complying with FSC's nine principles. They specifically requested TNC's assistance In addition to helping SLJ with certification, this assessment was also used to test various tools applicable to identifying and managing HCVFs.

The Proforest toolkit for HCVF was used to identify potential HCVs present in the forest management unit. TNC's Participatory Conservation Planning methodology was used in the village of Mahak Baru to gain information on community perceptions of what is important to them. Finally TNC's Site Conservation Planning tool was tested for its applicability for developing conservation plans for forestry concessions.

The results of the exercise revealed that the concession area includes all 6 values as defined by FSC. This confirms the conservation importance of the area. In recognition of this the follow recommendations were made:

For maintenance of the ecological values SLJ-II should :

1. Continue the use and improvement of reduced impact logging techniques.
2. The preferential use of skyline in key HCVF areas.
3. Reduce harvest intensity in key HCVF areas.
4. Set-aside areas of containing representative forest types.

HISTORY OF RIL IMPLEMENTATION

Forest Management Unit (FMU) of PT. Sumalindo Lestari Jaya II (SLJ II) resides in the upper watershed of Mahakam River within the administration region of West Kutai District and Malinau District . It covers a total area of 269.660 Ha. Since a part (+/- 52%) of its forest is located on an area with medium to steep topography, the SLJ-II operational strategy adopts a certain logging technique and technology. Particularly in the selection of the skidding system, two main parameters are referred to, namely: topography and erodibility

Two skidding systems have been selected: Skyline system and Groundbase skidding with RIL application. The Skyline system was first introduced in 1992 through trainings and benchmarking to a company applying this system in Oregon, USA and Perum Perhutani Madiun, Indonesia. In 1994 Sumalindo started its investment with two yarders, that is, Koller K-300 (small yarder) and Thunderbird TTY-70 (medium yarder). Gradually, the Skyline system has become a part of the SLJ II logging operation.

The Groundbase skidding has existed in the logging operational scheme for a long time, but improvement of its planning and technical aspects remained important. The planning aspect supporting the RIL method for the Groundbase skidding was prepared in 1996, and continually developed until this system became relatively stable in 1999.

Improvements of the planning aspect include :

1. Timber Cruising
 - Scope of the data : trees, topography, biodiversity samples.
 - Data format : coordinate, GIS
2. Skid trail planning

It took some time before the logging operation was fixed to the planning framework, and the RIL method related to both planning and operation could be integrated into natural forest management in 2001.

Continuous improvements of the planning and operational aspects take place based on an evaluation system 'Block Inspection' that has an implication on the mechanism of reward-punishment.

In brief, Sumalindo develops its RIL through the following steps:

1. Improvement of the planning method
2. Improvement of the operational technique
3. Evaluation mechanism
4. Reward-punishment mechanism.

PLANNING

An Initial planning strategy implemented in the FMU area of PT Sumalindo Lestari Jaya II is to specify the logging system appropriate for the existing topographical condition and land erodibility. By means of ' Re-Tooling' analysis for the next 10 years (2002 to 2011), necessary equipment and its uses are identified.

As RIL planning requires more detailed and complex data, GIS equipment becomes supporting tools for analysis of planning attributes. Basic data on potentials, land erodibility and topography are presented in the GIS format.

The biggest data collection activity is Timber Cruising, because it collects not only data on commercial trees but also data on topography and sample species of fauna and flora. All of the data are saved in database that is useful for the next planning (i.e. road planning and skid trail planning).

LOGGING OPERATION

Three main operational activities that have been considered as the prime causes of forest destruction are: Road Construction, Felling and Skidding. Therefore, Sumalindo directs its RIL operational aspect to process improvement of the three activities.

1. Road Construction

- * Based on detailed planning that is realized in the least earthmoving Road Design.
- * Minimization of road wide, maximum 6 meter effective wide
- * Good road hardening and drainage
- * Average road density of 18 m/ha.
- * Adopting a batter ram technique using waste wood

2. Felling

- * Contour and tree location maps are used.
- * Felling activities take place after skid trail construction.
- * Felling direction are planned carefully to reduce damage on the residual stand.

3. Skidding.

- * The work maps (tree location map and topographic map) are used to plan each day work.
- * Skid trails are planned and opened up prior to felling
- * Avoid blading the soil – it may only be done if slopes are less than 26% (15°).
- * Make the skid trail as narrow as possible (the width should not exceed the width of the tractor blade, e.g. not more than 4.5 m);
- * Avoid damaging the trees along both sides of the skid trails.

In developing the operational techniques, PT. Sumalindo establishes cooperation with some competent institutions, such as: Forest Engineering Inc, PT. Exsa, PT. Artery Creature Plan, GTZ, and TFF.

Lessons learnt from the RIL implementation in the field include:

- Starting from small scale.

It is important to know the constraints and then carry out improvements, controlling and observation.

- Output should not be the target.

At the try-out stage, the target should be the process, rather than the output. Thereby, the development team has the duties to improve the system and then finally make a recommendation that the system is applicable.

- Inviting relevant external institutions to give opinions.

EVALUATION

RIL implementation is evaluated on the basis of on-going performance assessment. At PT Sumalindo, this work is handled by Block Inspection Division of Forest Planning Department. Assessment results are reported as work performance of each operator in his working unit.

Parameters for felling assessment:

- Using a harvest plan map.
- Felling direction.
- Stand utilization.
- Reduced waste.
- Tree labeling.
- Residual stand destruction.
- Using safety tools.
- Daily felling reports.

Parameters for skidding assessment:

- Using a harvest plan map.
- Skid trails construction before felling activities.

- Winching.
- Width of the skid trails.
- Closing up.
- Blading.
- Using safety tools.
- Daily felling reports.

Each parameter is given weight, and field assessment results determine the score. Combination between the weight and score determines whether felling/skidding activities meet the RIL standard. In this case, PT. Sumalindo sets the standard value of 70.

From the assessment of 2001 and 2002 RKTs (annual felling plan), the standard value is reached at 69% of the annual felling area. RIL assessment results have an implication on additional payment for operator (as reward) by range of scores: < 54, 55 to 69, 70 to 84, 85 to 100, and next felling quota (as punishment).

ENVIRONMENTAL IMPACT MANAGEMENT

Of a set of standards to be fulfilled, there are some key indicators that have to be measured to monitor environmental impacts (i.e. on water and soil), namely: ground openness, crown openness, logging intensity, and decrease/increase of residual stand.

Based on comparison between RIL and conventional locations, the following changes of environmental indicators are identified:

- Decrease of ground openness from 11 % to 2.2 % .
- Decrease of crown openness from 22% to 14 %.
- Increase of residual stand from 57% to 85%.
- Decrease of logging intensity: 25% (on flat terrain) and 8% (on steep terrain).

In general, the overall environmental indicators show a better environmental situation.

FINANCIAL IMPLICATION

The application of RIL concepts has a financial implication that requires cost adjustment. There are three components of expenditure that will be discussed in this paper. They relate to the following activities:

- * Planning.
- * Operation (Felling and Skidding).
- * Rehabilitation.

A. Planning Expenses

Planning expenses cover:

- * Cutting block plan.
- * Timber cruising.
- * Road planning.
- * Skid trail planning.

Apart from the GIS investment, the planning expenses increase by 36% and become fixed costs as they do not depend on the quantity of timber production. Significant cost increases are for timber cruising and skid trail planning.

B. Felling expenses

Most felling expenses are variable costs, so that the RIL implementation does not give significant influences. In fact, cost changes result from incentive factors, which are determined by the RIL quality. The average increase of felling expenses reaches to 8%.

C. Skidding expenses

Eighty four percents of the skidding expenses are fixed costs. That means, the cost per unit of output is determined by the productivity of skidding activities. The RIL implementation is able to increase the skidding productivity by 4%-8% and also the utilized timber volume as much as 9%. These increases have positive implications on skidding expenses that decrease to 9%-11% and even 26% on a larger scale.

On a heavier topographical condition (15%-35%), the difference in skidding cost between RIL and conventional systems is greater (11%) compared to that on flatter terrain (9%) This can be explained from the fact that skidding with the conventional system spends more time for maneuver unit and other unplanned activities. Meanwhile, the use of skid trail planning as the guidance for bulldozer operators to build the skid trails can reduce unnecessary maneuver units.

D. Rehabilitation expenses

Two rehabilitation activities affected by the RIL implementation are rehabilitation planning (ITT) and planting activities. With continual controlling towards felling processes and development of stand database, residual stand condition and land openness can be detected directly during block inspection. Consequently, the cost for rehabilitation activities decreases by 26%, and rehabilitation activities are limited to open areas (e.g. ex-skid trails and landing area). No enrichment activities are needed. Stand dynamics can be monitored by establishing permanent plots.

ADVANTAGES OF RIL APPLICATION

1. FULFILING THE FSC PRINCIPLES

SFM certification with the selected FSC scheme relates to four principles, namely principles # 5, # 6, # 7, # 8, and 13 LEI indicators. With a great proportion of RIL implementation in the certification context, every FMU deciding to get a SFM certificate has to develop environmentally-friendly logging techniques.

2. FINANCIAL CONTROL

Implementing the RIL method improves the control of operational expenditure, since the cost does not only reflect the output quality but also work quality (e.g. environmental damage, logging waste). The fact shows that even when the planning expenses increase, the next processes will require lower costs. Thus, the total cost does not change significantly (cost decrease by 1% to 5%).

CONSTRAINT AND THREAT

1. ORGANIZATION

RIL implementation needs adjustments in many aspects: planning, operational, evaluation system and improvement. As a result, the forest managerial organization should also reflect this process. As an illustration, PT. Sumalindo designs its organizational structure that covers the following divisions:

- * Planning : Forest Planning Department, Road and Yarding Planning Section.
- * Operational : Production Department, Road Construction Department.
- * Evaluation System: Road & Block Inspection Section.
- * Rehabilitation/Monitoring: Environment Department.

RIL processes will not run well, if relevant divisions are unavailable or the abovementioned functions become unbalanced.

2. HUMAN RESOURCES

The human resource aspect addresses both quantity and quality matters. For the quantity, one block inspection team supervises two felling-skidding teams, so that the number of personnel per annual felling block can be estimated. Insufficient number of inspectors/assessors will make the RIL target difficult to achieve..

From the quality point of view, all people involved in the process of planning up to evaluation should attend RIL trainings in order to synchronize their perception on what can be or cannot be done, and why a particular action should be done. Different understandings on the RIL system will affect on RIL implementation in the field

3. SYSTEM

The RIL should be implemented as an integral and binding system that covers the following elements:

- Standarad Operation Procedure
- Monitoring mechanism.
- Evaluation mechanism.

- Reward & Punishment mechanism.
- Improvement process.

Exclusion of the RIL method as a part of the forest management system, especially with regards to timber harvesting, will bring about inconsistency in the implementation of RIL itself.

3. COMMITMENT

There should be commitments among all parties from the top management to the implementers in the field to carry out Reduced Impact Logging as a timber harvesting method. All the consequences from this commitment should be borne together proportionally. Without commitment, RIL will be merely a momentary project.

CONCLUSION

- It takes some time to prepare a management unit to adopt the RIL concept as a part of the natural forest management system. PT. Sumalindo Lestari Jaya-II has started this process since 1994 and integrated the RIL method into its forest management system in 2001.
- It spends a long time for the process to take place since there is no (minimum) benchmark source that completely implements the RIL at an operational scale.
- PT. Sumalindo Lestari Jaya employs two environmentally-friendly timber harvesting techniques, namely Groundbase Skidding and Cable Yarding.
- Before a management unit implements the RIL method, it should have a clear platform concerning its business, since the RIL method will work well only on 2 categories of management units: a committed FMU (long-term business oriented, so that it cares about its residual stand) and or an FMU that is preparing for SFM certification processes.
- Implementing RIL does not increase operational expenses significantly. In many cases, it even reduces the costs for a larger scale (from planning to rehabilitation).
- Constraints and potential threats on RIL implementation are mainly caused by managerial factors (commitment, organization, system and human resources) and only a few come from technical factors.