

Concepts of Reduced Impact Logging in the evolution of forest-harvesting codes of Nepal¹

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1. Introduction

Reduced Impact Logging (RIL) has been one of the major concerns for sustainable forest management, as the damaging impacts of forest harvesting practices have led to forest degradation and deforestation. The issues began to surface in the forestry literature sporadically (Dawkins, 1958; Nicholson, 1958; Redhead, 1960; Wyatt-Smith and Foenander, 1962, Fox, 1968; Dawkins and Philip, 1998) with the initiation of mechanical harvesting under selection system, and later influentially in the 1990s (Dykstra and Heinrich, 1992; Putz and Pinnard, 1993) witnessing the effects of intensive harvesting of tropical forests. The selection felling in general needs special attention towards minimizing adverse impacts on remaining vegetation, and the issue is more serious particularly in tropical forests, where the logging of a particular species may be sparsely distributed over the large area. Accordingly international forestry community has initiated actions on developing and refining RIL technologies. The technologies can only be appropriate and sustainable if they recognise the ecological, economical, socio-cultural realities, and such realities may differ temporally and spatially. In such context development and implementation of national codes of practice for forest harvesting deserve high importance. Understanding on the historical evolution and the current state of forest harvesting is necessary for developing forest-harvesting codes for any nation. We attempt here in documenting how and to what extent the concepts of RIL were incorporated in forest harvesting history of Nepal.

2. Concepts of RIL:

Over the last decade, RIL models are developed and technologies are experimented widely but mainly concentrating in tropical forests. The studies (Dykstra and Heinrich, 1996; Sist et al.,1998; FAO, 1999; Dykstra, 2001) have come with the following general concepts of RIL:

- Pre-harvest inventory and mapping of individual crop trees;
- Pre-harvest planning of roads, skidtrails, and landings, in order to minimize soil disturbances;
- Pre-harvest vine cutting;
- Vine cutting was an act while marking the trees;

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- Appropriate felling techniques – cutting at low to the ground, directional felling, crosscutting;
- Yarding systems; and
- Post-harvest assessment.

3. Evolution of forest-harvesting codes in Nepal

The Forest Regulation enacted in March 1946 regarding selection felling made following mandatory provisions while collecting timber from the forests:

- Sawing not permitted in the forests, but chopping of branches and debarking was allowed in the forest;
- Except in natural catastrophic events, harvesting period was between January and mid-June. In case of natural catastrophic and family separation (that needs building house), harvesting permission could be issued throughout the year.
- In case someone wished to harvest the tree in August-September by recognizing the rot-prone of the timber harvested between January and June, permission can be made to harvest but the timber can only be extracted between January and June.

Forest sale rules (equivalent to harvesting codes) were developed in the mid-1960s for the selection and improvement felling in the Forests of Nepal. Although industrial felling activities were concentrated only in the Tarai (southern plain land) region, the codes were developed for hill species too, indicating the process for national forest harvesting codes. The selection felling systems were developed for the following species;

Sal (*Shorea robusta*)
 Khair (*Acacia catechu*)
 Sissau (*Delbergia sissoo*)
 Karma (*Adina cardifolia*)
 Asna (*Terminalia* spp)
 Simal (*Bombax* spp)
 Chir (*Pinus roxburghii*)
 Gobre (*Pinus wallichiana*)
 Devdar (*Cedrus deodara*)
 Spruce (*Picea smithiana*)
 Fir (*Abies* spp.)
 Miscellaneous spp.

3.1 Features of the codes:

The following provisions were made to reduce the impact of logging on forest vegetation and soil.

Marking of harvestable trees (Pre-harvest inventory) - Clauses 2, 4 and 5

Two blazes (one above 6 inches from ground and another about a foot above breast height) of 8 inches by 8 inches were to be made while marking trees for felling. The upper blaze had to face towards the beginning point of marking,

and this makes easy to inspect the marked trees. The upper blaze in the slope terrain should face the uphill side. The serial number of marked tree should be in systematic way starting from a corner.

Delineation of the felling area (mapping) - Clause 10

If possible the permanent features are to be followed while delineating the felling plot. In case such features are not present the boarder trees are to be encircled by paint at 5 ft height.

Felling precautions -Clause 7

If the felling of a particular tree is anticipated to damage regeneration and neighbouring trees, the mark 'L' had to be marked in both the blazes. This directs the logger to take special care while felling that tree, specially chopping branches prior to felling.

Cutting vines -Clauses 8 and 18

All vines growing or entangled on harvestable trees are to be cut before measuring trees. Vines need to be cut in two heights - one in ground level and the other at about 4 to 5 feet heights.

Harvestable diameter- Clauses 13, 15, 16 and 17

Harvestable girths at breast height (gbh) were determined for different species (e.g 3 ft for Acacia, 5 feet for sal, 6 feet for conifer, 7 ft for Michelia and Bombax, and 5 ft for miscellaneous). No trees smaller than the specified girth were allowed to mark for felling.

Harvestable trees were to be selected considering the opening of canopy for regeneration. However, precautions were to be taken not to widen the gap.

Considering the soil erosion issues, the selection of harvestable trees in slopes, river-bank, and road-side were to be done cautiously.

Pre-harvest assessments- Clause 21

Ranger used to be assigned for marking the harvestable trees, and Divisional Forest Officer had to check and certify the work. The list of the harvestable trees and their assessment were to be reported to respective Conservators, and cc to the chief conservator.

3.2 Institutionalization of the codes

The codes were institutionalized through enacting forest laws and bylaws. Any intentional damage in the forest or negligence of the codes was listed as forest

offense. The Act also made arrangements for yarding and post-harvest assessment of the forest.

4. Discussion and conclusion

The sections 2 and 3 above reflects that the Nepal's forest harvesting codes were developed with the broad objectives and norms envisaged by RIL elements. It reflects from the both cases that general focus has been on reducing impacts on tree, i.e. the timber. The experimental studies (for example, Pereira, 2002; Bolz et al., 2003; Sist et al., 2003) also give the similar impressions, indicating NTFPs are still neglected in forest management. However, the role of NTFP is ecological processes and socio-economic balances are vital for achieving sustainable forest management (Gautam and Devoe, 2002; Gautam and Watanabe, 2002 and 2003). NTFPs are important for the livelihood of people living in or close to the forests. They use numerous products from adjoining forest and simple actions such as lopping and litter may affect (positive and negative) their production (Gautam, 2001). Unless and until the forestry serves their interest, the efforts of controlling degradation and deforestation may not be materialized.

Finally we would suggest the following:

- As the concept of RIL may have been integrated in the forest-harvesting codes of many countries (as presented in Nepal case above), the challenge is how to get participation of different sector in implementing. However development process needs to be continued based on the implementation experiences.
- RIL work needs to consider NTFP issues, too.

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