SILVICULTURE PRACTICE GUIDE

SYNTHESIS OF ACIAR-FUNDED EnLiFT PROJECT SILVICULTURE DEMONSTRATION

STRIP SEED TREE

SYSTEM OVERVIEW

Seed tree silviculture system is removal of mature stand in a single entry cutting where seed trees are left as a source of seeds for regeneration. This system is suitable for species that are shade intolerant, seeded that can be disperse by wind, and resistant to windthrow. See tree silviculture system has three variants namely: uniform, group and strip. This guide presents the experience of EnLiFT project in implementing a strip seed tree system in pine plantations managed by community forest users' group in the mid-hills of Nepal, where the stand is harvested in strip-wise pattern.

Best Practice Guide

MEASURE AND MARK TREES.

Measure trees and obtain tree cutting approval from DFO. Mark trees to be harvested in the strips planned for harvesting following government guidelines. Identify and select seed trees following the guideline for selection of mother trees. Mark the seed trees spaced appropriately to keep a density of approximately 25 trees per hectare or 5 seed trees per strip.

STRIP-WISE HARVESTING – 1ST CUT

In the 1-ha model, tree harvesting occurred in 2 stages. The block was divided into 5 strips each with a width of 20 meters and length of 100 meters. The 2 outer and the middle strips were harvested in the first year, providing 2 unharvested strips in between the 3 strips.

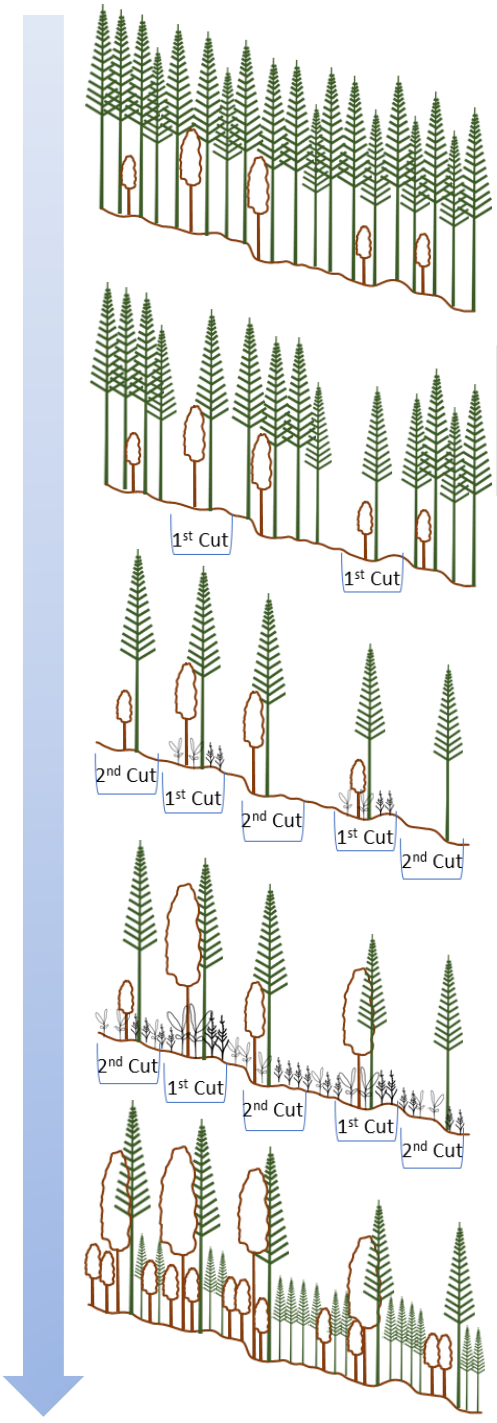
STRIP-WISE HARVESTING – 2ND CUT

The remaining 2 strips were harvested 2-3 years after the first cut to allow protection of seed trees and provide micro-climate for regeneration growth in the harvested strip.

REGENERATION MANAGEMENT

After every tree harvesting, the forest floor is cleared of weeds and forest debris to achieve higher regeneration rate. Fire breaks are also created on the edges of the blocks.

Schematic Stand Diagram



1

PRE-TIMBER HARVESTING.

Dominant trees are even -aged, intermediate is broad leaf species and no significant regeneration of dominant species.

2

1st ESTABLISHMENT CUT.

Stand after first establishment cut, 2 strips of 20 metres width were cut remaining 5 ??? seed trees of combined pine and broadleaf species.

3

2nd ESTABLISHMENT CUT.

Stand after second establishment cut, 5 strips of 20 metres width were cut. Seedlings of mixed pine and broadleaf species growing on first cut strips.

4

STAND RE-ESTABLISHMENT.

A healthy regeneration of mixed pine and broadleaf seedlings advancing to sapling stage. Thinning of regeneration is required.

5

FINAL STAND.

A mixed of pine and broadleaf in poles stage, seed trees in the dominant stratum creating a 2-age classes.

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EXAMPLES OF PRACTICE

At the start of EnLiFT2 in 2018 the prevailing forest harvesting guideline were the Scientific Forest Management Guideline 0215 and the Thinning Guideline 2007. Both harvesting regimes meant re-entry to harvested sites which could cause disruption to regeneration development. In addition, shelterwood system recommended at most 25 shelter trees per hectare which to forest users group members are almost clear felling which exposure the sloping terrain to erosion during monsoon season. The strip seed tree system is an innovative regeneration harvesting regime suitable to topography of midhills Nepal. Demonstration plots were established by EnLiFT2 in Chautara and Lisankhupakhar municipalities in Sindhupalchowk to show stand development in strip seed tree systems compared to silviculture regimes.

Table 1 shows the stand profile of the strip seed tree demonstration plots. Firstly, it is notable that the three demonstration sites represents different stand structures. Shreechap is a mix-pine and Schima forest which evolved from a pure Pine after a few selective harvest prior to EnLIFT2 Demo. Sansari is dominated by pine with a more open canopy due to a more intensive selective timber harvest prior to EnLiFT2 Demo. In Deupokhari CF, the stand has not been harvested as indicated by the pre harvest basal area and standing volume.

The resulting regeneration mirrors the pre-harvest structure. In Shreechap, 14,309 seedlings per hectare (sph) were found in Feb 2023 in which 13.6% are pine while the majority are broadleaf species primarily Schima. In Sansari, the regeneration was found at 10,958 sph in which 63.2% are pine while the remainder is broadleaf timber species. The Shreechap and Sansary CF demo plots were protected from grazing and grass cutting. Deupokhari has very low regeneration in which it was reportedly due to grazing by goats and cows.

Table 1. Stand profile of community forests' strip seed tree demonstration plot

CFUG Name		Shree Chap	Sansari	Deupokhari
Plot size (ha)		1	1	1
1st Cutting Year		2021	2021	2021
Main species		*P. roxburghii*	*P. roxburghii*	*P. wallichiana*
Stand strata		Dominant (Pine)	Dominant (Pine)	Dominant (Pine)
Tree density before harvest (tph)		333	263	378
Basal area (m^2/ha)		21	17	30
Stumpage volume (m^3/ha)		120	97	192
Volume harvested (m^3/ha)		54	52	103
Volume harvested at 1st cut (%)		55.4	53.8	53.4
Seedling density 2 years after 1st cutting (sph)		14,309	10,958	3,798
Tree seedling species	Pine	13.6	63.2	23.8
	Broadleaf	86.4	36.8	76.2

KEY LESSONS

- The uniform shelterwood silviculture system provided considerable amount of marketable timber to CFUG during the first harvest and demonstrated the ability of the stand to develop a mix of pine and broadleaf regeneration.
- Strip seed tree system has been appreciated by Forest Technician to be promising for the midhills because of its strength of keeping a stable slope during harvesting operation and in protecting mother trees from windthrow.
- As with any other silviculture system, the rate of regeneration development is dependent upon cultural regime for the site. As experienced in Shreechap and Sansari where the demo plot was closed for grazing and grass cutting, the regeneration is 3-4 times higher than Deupokhari where grazing and grass cutting were allowed.

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