

# Practicing Agroforestry in Eucalyptus Plantation Forests for Community Livelihoods (A case from Sagarnath Eucalyptus Plantation, Nepal)

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## Introduction

Nepal adopted a managing plantation forests in late 1970s when Sagarnath Forestry Development Project (SFDP) was established to encourage fast growing, multipurpose tree crops to meet the growing demand of fuelwood and electricity poles. In the meantime, SFDP adopted the practice of agro-forestry, also known as Taungya system, for three years within the eucalyptus plantation. Practicing agro-forestry within the eucalyptus provides substantial income to local communities whereas it also reduce the costs of protection, weed management and protection from forest fire.

About six to seven hundred hectares of eucalyptus plantation is harvested annually with a rotation of seven years with new plantation. Seven hundred families, mostly poor and marginalized communities, are engaged in practicing agro-forestry within this new plantation. A formal contract is done with these households forming agro-forestry groups with an average of half ha land, for three years.

Mostly, medicinal and aromatic plants (MAPs), vegetable crops, cereal crops (maize etc) and legumes (Lentils) are cultivated under the plantation forests, providing income of subsistence livelihoods.



Photo 1: Maize and vegetable cultivation in eucalyptus plantation ©author

## Materials and methods

This study is carried out in the three Village Development Committees (VDCs) of Sarlahi district, Nepal. VDCs were selected based on the total households practicing agroforestry within eucalyptus plantation. These VDCs have highest number of agroforestry groups covering 50% of the total households. Among 50%, a sample of 15% is randomly selected.

Semi structured questionnaire, community consultations, and assessing plantation are the major source of primary information. Selected published and unpublished documents, including tree crop growth data available from SFDP are analyzed. In addition, author's involvement in various capacity development activities for last two years also provided significant information for the purpose of this study.



Photo 2: Discussion with SFDP staff and agroforestry users in SFDP area. © author

## Results

Agroforestry practices within the eucalyptus plantation in SFDP area provides significant income and employment opportunities to local communities, in particular to poor and disadvantaged families. These households not only receiving income from the sale of different under crops, such as vegetables, cereal crops, medicinal plants but also do have access to forest products (fuelwood and fodder).

### Process:

SFDP formally have contractual agreement agroforestry groups for three years from the year of plantation. During the period, these households are also responsible for protecting plantation. This reduced the costs of protection, and weed control, which is equivalent to 500 man labor days (one labor day costs is about NRs 120)



Photo 3: Cultivation of agriculture crops in eucalyptus plantation.



Photo 4: silvi-pasture and Medicinal plants

### Income Generated:

On average, a five member family practicing agroforestry within eucalyptus plantation, secure food for nine months. Income from the cereal crops is relatively less than that of vegetable farming and medicinal plants.

The study shows that vegetable farming in half hectare land as intercrop can benefit farmer worth to 70 to 80 thousands Nepali Rupees (About USD1000) annually.

Cultivation of medicinal and aromatic plants, such as citronella, lemon grass, calamus, provides substantial income to farmers. An estimate shows that farmers involved in MAP cultivation as intercrop can earn about Nrs 40,000 (USD 600) from one hectare of land in one season.

### Social Capital and Networking:

Farmers engaged in agroforestry also initiated a saving and credit program. This program increased the access to financial resources at the local level for their sustainable livelihoods.

In the meantime, user groups and networking increased their level of interaction, ultimately building their capacity to deal with various issues such as price bargaining, access to market.

### Eucalyptus Growth and Increment in intercropping

Researches at the initial of SFDP shows that the maximum growth and increment in tree crop within agroforestry intercropping pattern (see table 1). In particular to legume species as an intercrop, the eucalyptus grows very nicely.

This study shows that the eucalyptus growth in intercropping is at least 1.5 times more than without intercropping, based on the DBH growth. At the same time, total survival count in intercropping is about 79 percent against only 57 percent in without intercropping plots. This data, however is much less, in terms of mean annual increment, than the initial of SFDP. This may be because of the present political unrest which increases illegal timber trade from the SFDP area.

### Eucalyptus Tree Growth in intercropping

Table 1: Stem biomass of 4 year eucalyptus in SFDP with and without intercropping

Category	Survival %	DBH cm	Height (m)	Tree weight (kg)	Mean Annual increment in Tonnes
Without intercrop	67	4.07	9.62	4.98	1.22
with intercrop	89	12.65	18.66	19.26	31.20

Adopted from White, K J, 1986

Figure 4 Eucalyptus Tree Growth in intercropping. Source: White, 1986



Photo 5: Eucalyptus stand with and without intercropping

## Conclusions

Agroforestry practice in eucalyptus plantation provides opportunities to poor communities for their subsistence livelihoods. Majority of the farmers involved in agroforestry poor and having less than quarter hectare of land.

For last couple of years, this practice not only provides direct income to poor farmers but also proves much beneficial for eucalyptus growth, increasing total productivity of land. At the mean time, involving farmers in agroforestry also saves resources of SFDP which it should invest on weeding, fire management and protection.

Supporting these poor farmers through strengthening eucalyptus value chain will provide additional benefits to all stakeholders and actors involved.

## Literature cited

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## For further information

Please contact [lhbhatta@snvworld.org](mailto:lhbhatta@snvworld.org). For further information on Sagarnath Forestry Development Project and Agroforestry practices therein, visit [www.mofc.gov.np](http://www.mofc.gov.np)