

# AGROFORESTRY MARKETING PATTERN, FACILITIES, AND PRICE TRENDS IN NORTHERN INDIA

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## ABSTRACT

Agroforestry has emerged as a most desirable and viable strategy for maintaining social, economic and ecological sustainability in India. The success of agroforestry in Haryana and neighboring districts of Punjab, U.P, and Uttranchal states of the northern region of India has led to evolution of an annual market for agroforestry based wood products worth more than Rs.10000 million (US\$ 210 million, US\$1= Rs.46) in Yamunanagar district of Haryana, India, benefiting not only farmers, but has also generated employment of various kinds at different levels in the northern region of India. (Hara, 2002) Agro forestry has an important role in ensuring socio-economic development in a country like India. A study was carried out to (i) assess the trends in agroforestry development (ii) analyze the price trends, marketing patterns and facilities for agroforestry products (iii) adoption of future strategy and suggest corrective policy and administrative measures.

Price trends show declining trends for Poplar prices and nearly stable prices for Eucalyptus species during the last five years. Agroforestry plantations have ensured an abundant and sustainable supply of agroforestry products, but to ensure sustainability and viability of agroforestry development, corrective policies and administrative measures are needed for protecting the reasonable interests of primary producers. Adequate price support mechanisms and farmer's cooperatives should be developed to ensure reasonable returns and sustainable agroforestry development. Efficient and diversified wood products utilization, development of high yielding and resistant varieties of Eucalyptus, Poplar and other suitable agroforestry species, development of diversified uses of wood based finished products, appropriate incentives for setting new wood based industries, adequate market research methodologies and healthy buyer seller linkages should be ensured.

## INTRODUCTION

The demand for agroforestry products and services in the country is increasing with rapid economic growth, industrialization and a growing population. The recorded forest area in India is about 76.5 million ha (23% of land mass). However, the actual forest/tree cover is just about 19 % of the geographical area (FSI, 2001). During last two decades (1980-2000), India has witnessed annual depletion of forest cover at a rate of 235 sq. km.(Malik and Dhanda, 2003). To meet the increasing demand of forestry products, fast population growth, urbanization, higher rate of economic growth and trade liberalization, agroforestry has emerged as the soul of socioeconomic and ecological sustainability. Complex agroforestry also has the potential to significantly reduce atmospheric concentration of Carbon dioxide and mitigate climate change (Retnowati, 2003).The paper is organized into the following

parts; Study Area, Methods and Materials, Results and Discussions, and Future Strategy. The results and discussion section is made up of subsections; Main Stakeholders, Agroforestry based forestry products, Adoption of Agroforestry, Prevalent Sizes, Price Trends, Girth Class and Price Analysis, Market Mechanism Dynamics, Economics and Returns.

## STUDY AREA

A study was undertaken in Yamunanagar district of Haryana, India to (i) Assess the trends in agroforestry development (ii) analyze the price trends, marketing pattern and facilities for agroforestry development. (iii) Adoption of future strategy and suggesting corrective policy and administrative measures. The study was conducted in twelve randomly selected villages of the Yamunanagar district of Haryana, which has emerged as a major agroforestry based wood market, benefiting farmers of Haryana, Punjab, and U.P and Uttranchal states of Northern region of India. Information from the neighboring states of Uttranchal, U.P, Punjab was also collected.

The map of the study area is shown in Figure 1.

## METHODS AND MATERIALS

Agroforestry development has enabled the emergence of primary producers, commission agents, and agroforestry produce-based wood industries. Seventeen commission agents, 10 plywood and wood based industries, 152 farmers, private and government nurseries were surveyed by adopting random sampling procedures. Farmer's preferences about agroforestry species, agroforestry practices, silvicultural/economic rotation, market linkages of producers, buyers, commission agents, sellers and consumers, prevalent sizes, market mechanism dynamics, and price trends are the main parameters, based on which a questionnaire was designed to collect information. Semi-structured interviews based on the questionnaire developed were used to collect the data from selected farmers by personal interview method.

## RESULTS AND DISCUSSION

### Main Stakeholders

Farmers or landowners are main sellers of the standing timber crop under agroforestry. The buyer seller relationships have caused emergence of intermediate buyers/users such as contractors, commission agents, timber merchants, saw mills, veneer/peeling units and secondary buyers/end users such as Plywood industries, manufacturers of wooden boxes and crates, food grain handling/storage agencies, building /construction works, brick kilns, paper industry, furniture shops and other users. The market linkages of buyers, sellers and consumers are depicted in Figure 2.

### Agroforestry Based Forestry Products

Ply based wood, particle board, fibre board, wood pulp, paper and paper board, veneer units, sports goods, and saw mills are the main industries, consuming agroforestry based wood products. The continued effect of economic growth and increasing population size on demand for agroforestry-based products is likely to be

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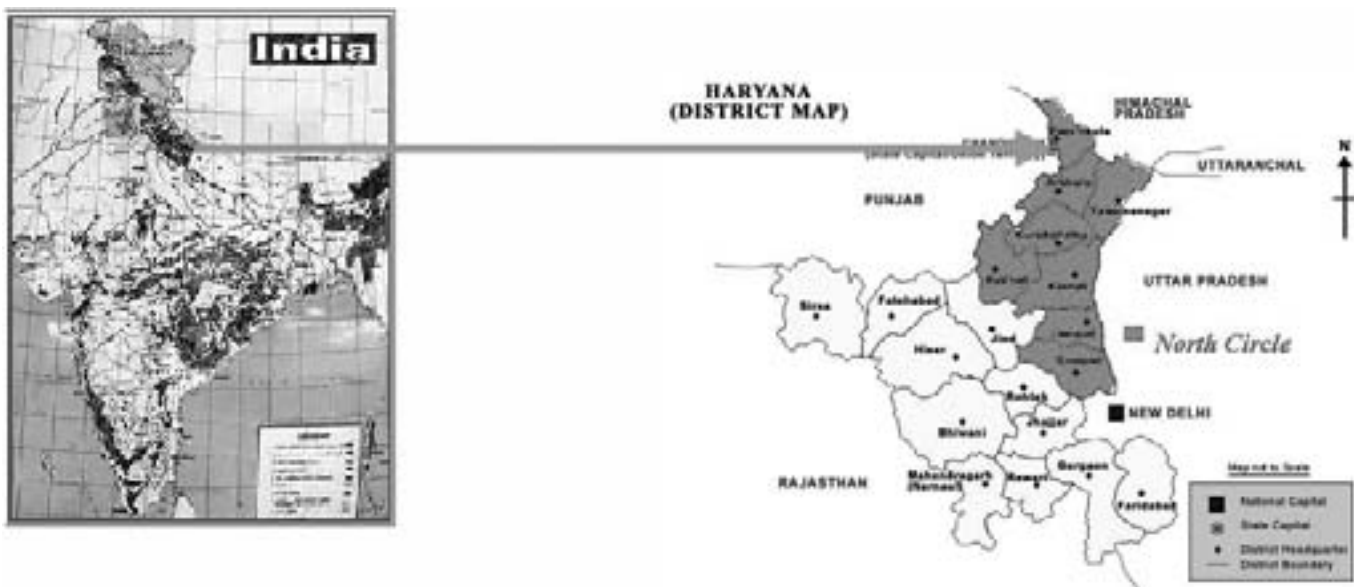


Figure 1.—Map showing India and Haryana state  
(Source: Forest Survey of India and Maps of India.com)

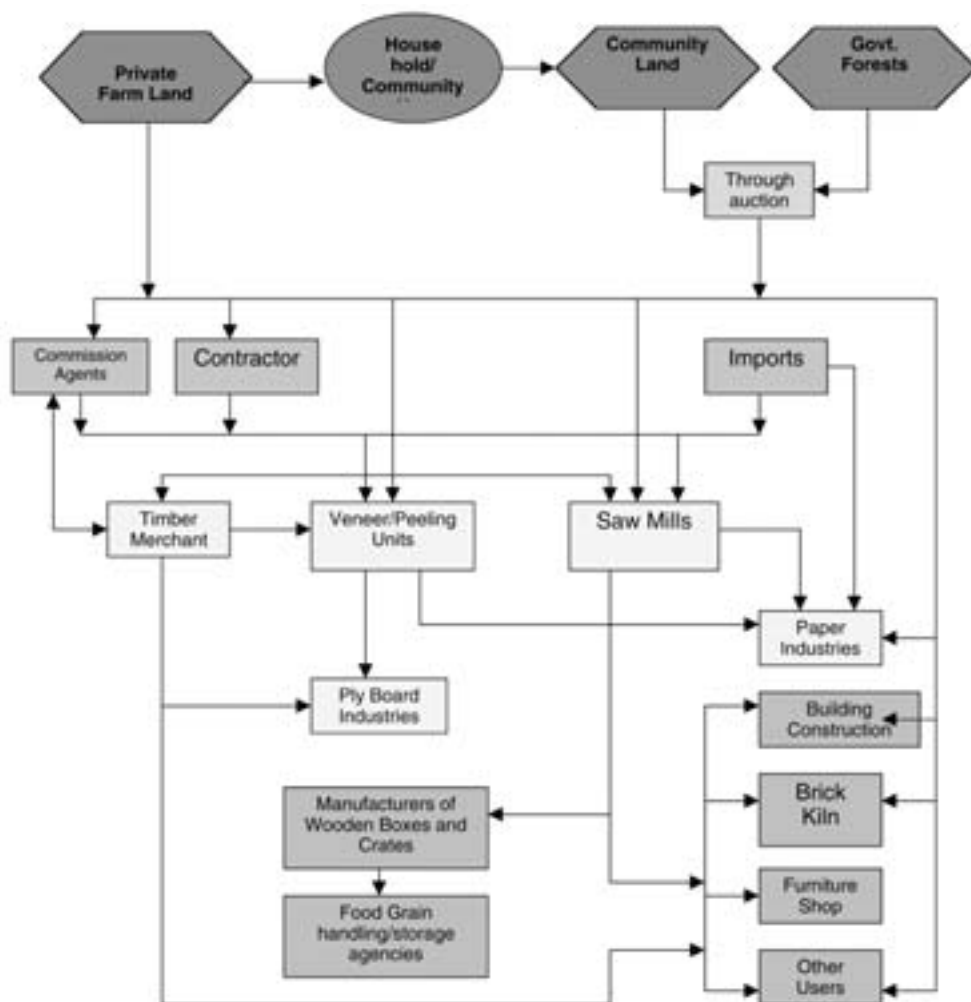


Figure 2.—Market linkages of BUYERS, SELLERS and consumers.

significant. Requirement of most of the products is expected to increase at a faster growth rate than production and a gap will exist between demand and supply (Malik and Dhanda,2003). The supply potential is to be enhanced by use of genetically superior planting material, improved seeds and technological interventions.

### Adoption of Agroforestry

Agroforestry has been adopted on a large scale in the region, as it supplements returns in addition to agricultural crops. Eucalyptus and Poplar are the main species preferred, due to short rotation, available market, available planting material and evolution of appropriate linkages between producers, contractors, buyers and consumers. The spacing between seedlings range from 2m\*2m, 3m\*3m, or 3m\*2m in the case of Eucalyptus planting, while for Poplar, it is 5m\*4m or 4m\*4m. Poplar being a deciduous species, has less effect on crop yield. The harvesting period of Eucalyptus ranges from 8–10 years, while for Poplar species, it is 4–6 years. The rainfall in the region varies from 400–800mm. Nearly 1.8% of the cultivable land has been brought under Eucalyptus hybrid (eucalyptus tereticornis) plantations in the northwestern region (Sapra, 1999). About 30 million seedlings of Eucalyptus and Poplar are being planted annually in the northern region of India, in farmers' fields, covering an area of approximately 50,000–60,000

ha. Average planting density per hectare ranges from 500–700. The percentage of successful plantations varies from 60–90%. Assuming 70% success on average, agroforestry plantations in the region have potential for wood production of approximately 3.7 million tones worth US\$ 222 million at present prices. Improved site-specific clones have potential of increasing productivity, two to three times. Planting patterns show availability of abundant raw material of Eucalyptus and Poplar based agroforestry products. This is a positive trend.

### PREVALENT SIZES

The size categorization followed in Yamunanagar, Haryana, India for eucalyptus and Poplar is given below.

### Price Trends

The price trends of Eucalyptus and Poplar in terse prices from 1995 to 2002 are presented in Figures 3, 4 and 5. (1 tonne=1000 kg).

Table 1.—Size Categorization of Eucalyptus and Poplar Species in Wood Market

Species	Girth Size (in inches)			Length sizes (in feet)		
	Sokhta	Under	Over	For veneer/Peeling		For shuttering / Scaffolding
Eucalyptus	<16"	16"-22"	22>"	4.25'	8.5'	10' to 22'
Poplar	<10"	10"-18"	24>"	4.25'	8.5'	10' to 22'

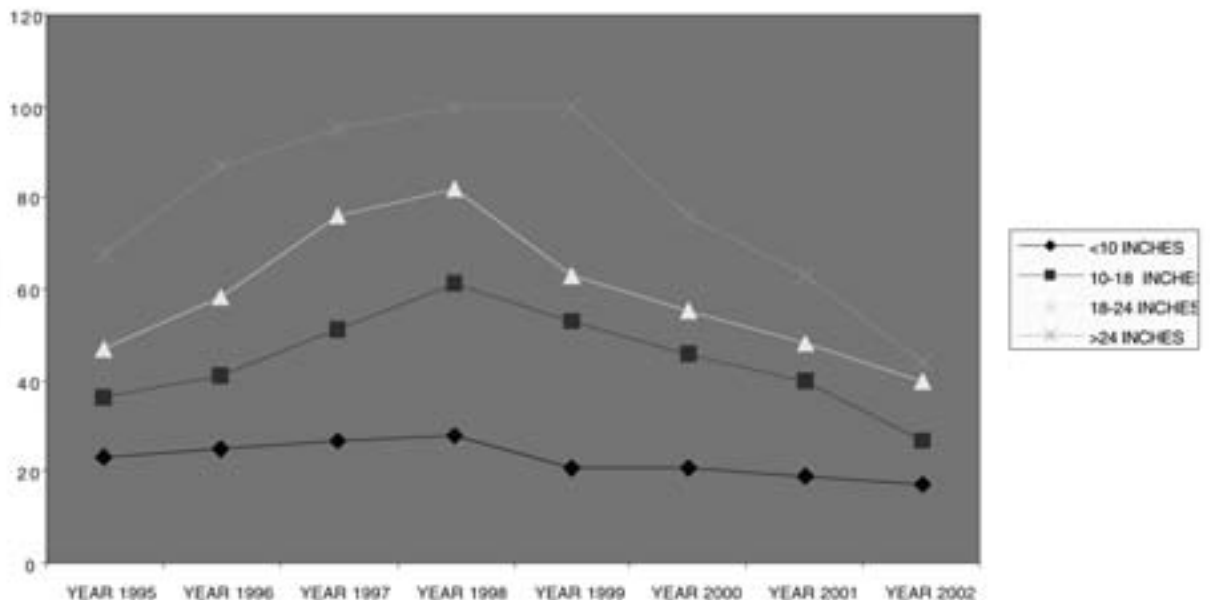


Figure 3.—Poplar Price Trends In US\$ Per Tonnes, (1995-2002).

### Girth Class and Price Analysis of Eucalyptus and Poplar in Farmers Fields

The field data from farmers' fields has been analyzed, showing that:

- (a) Poplar price was high during 1998–1999, which is showing a decreasing trend presently, whereas between 1983 and 1990, Eucalyptus experienced decreasing prices. From 1995–2002, it shows either a stable or increasing trend. The price trends have been shown in Figures 2, 3 and 4.
- (b) The proportion of Poplar in higher girth classes is about 67%, which shows that more Poplar trees were planted in last 5-6 years. The lesser number of trees in lower girth classes means that the preference for Poplar planting has started to decline.
- (c) Area under Poplar is about 81% compared to 19% under Eucalyptus. This shows Poplar is more preferable compared

to Eucalyptus for selected farmers in the past 5–6 years. The reason is relatively better economic returns from Poplar. However, Eucalyptus planting on farmers' fields is increasing as the figure shows more trees in lower girth classes for Eucalyptus. The analysis has been shown in Figures 6 and 7.

### Market Mechanism Dynamics

Farmers incur various expenditures, which reduce the net profit by US\$ 0.75 to US\$1.00 per quintal for the farmer. (1 quintal=100kg) These expenditures are in the form of felling and loading charges, transportation to timber market, dryage cut, octroi, weighing charges of loaded and empty vehicle, unloading charges, commission of timber merchants and other incidental expenses. The price of Eucalyptus and Poplar varies due to the quality of wood and demand/supply in the market. (Mohindra, 1998) The family size, literacy, landholding class, and distance of timber market from planting sites do not have any significant effect

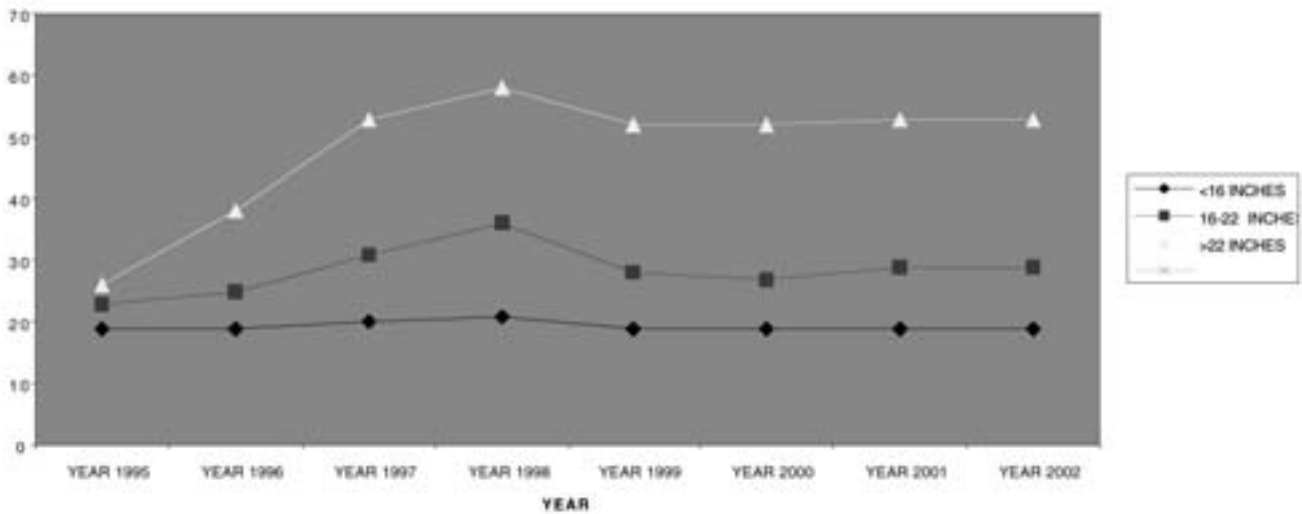


Figure 4.—Eucalyptus Price Trends In US\$ Per Tonnes (1995-2002).

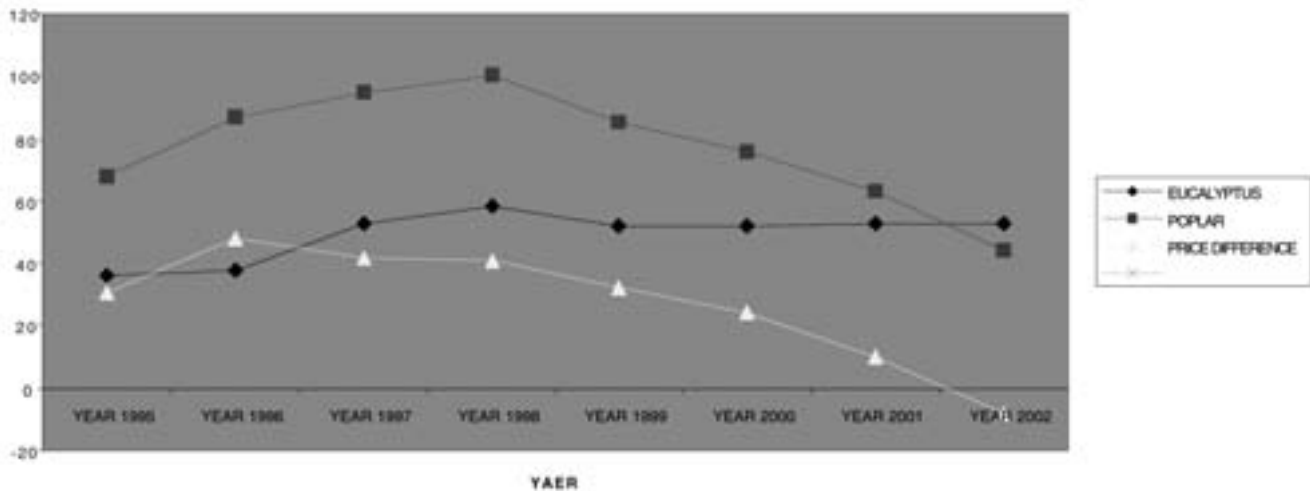


Figure 5.—In terse Prices of Eucalyptus and Poplar in US\$ per Tonnes (1995-2002).

on the marketing channels being practiced in the area. (Negi, et.al. 1998) Though the demand and supply position determine the price of a product in the market, but marketing of wood products plays a vital role in deciding its value and also the fate of timber species being planted on farm lands. (Sharma, 1998). The end users and buyers process the raw material through appropriate machineries before final marketing of the value added product.

### Economics and Returns

Agroforestry has not only benefited farmers, it has also created a wood industry, generated employment of various kinds, benefiting millions in related economic activities like transporters, wholesalers, retailers etc. (Hara, 2000) Farmers in the region are planting mainly *Eucalyptus* spp. and *Populus deltoides*, along field bunds and in blocks. The main associated agricultural crops are wheat, rice, turmeric, mustard etc. The approximate annual returns of agroforestry from one-acre (0.405 ha) ranges from Rs. 15,000(US \$ 326) to Rs. 30,000(US \$ 652). The returns depend on quality, market price, survival percentage and productivity of plantations.

The tree cover can be increased through improving the quality of planting stock to increase the productivity of plantations. Genetically improved varieties of *Eucalyptus* (ITC Bhadrachalam clones) and *Poplar* (Wimco clones) have been introduced in the region under different agroforestry systems. The results are encouraging. On reasonably fertile sites under rain fed conditions in suitable climates the trial clonal plantations of *Eucalyptus* have given yields that vary between 20 cum/ha/yr to 40 cum/ha/yr at 7 years age. (Chaturvedi, 2000)

### Future Strategy

Compared with the market for other agricultural products, wood markets are still not developed for farm supplies. (Saxena, 1991) For tree marketing, no mechanism has been developed to adopt surplus production and reduction of farmers' exploitation. Farm forestry has a greater future role for ensuring environmental sustainability and meeting sustainable development goals. The report on the task force on Green India for livelihood security and sustainable development, overseen by the Planning Commission

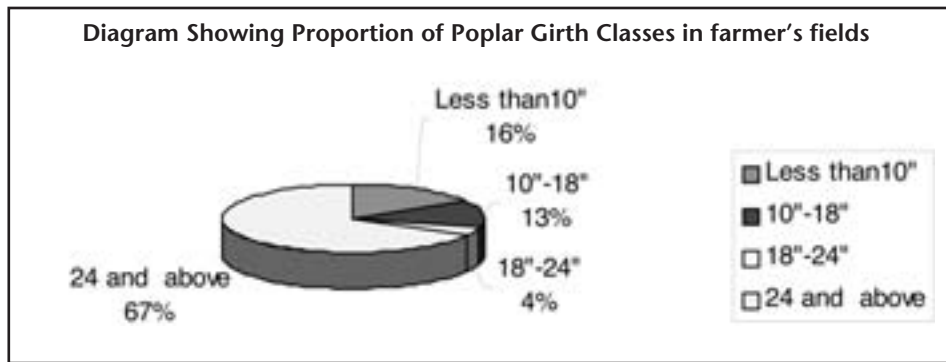


Figure 6: Girth Class Pattern of Poplar Plantations in Farmer's Fields.

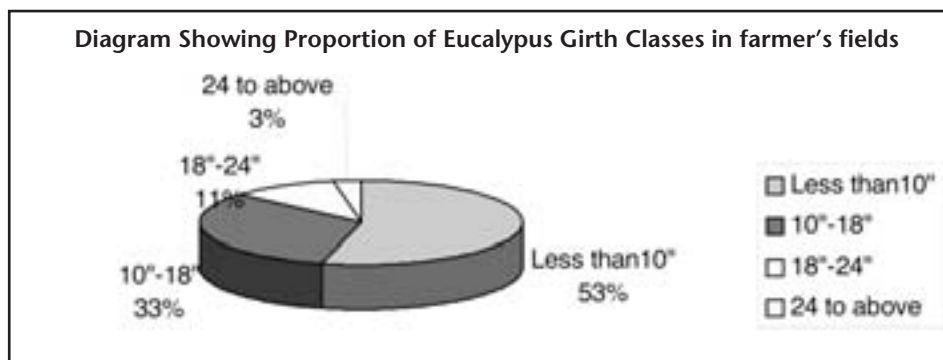


Figure 7: Girth Class Pattern of Eucalyptus Plantations in Farmer's Fields.

also emphasizes that, to achieve the desired objective of 25% tree cover by 2012, 10 million hectares of irrigated area and 18 million hectares of rain fed area will be brought under suitable agroforestry systems. (Planning Commission, 2002) .The Johl committee report on "Agricultural Production Pattern Adjustment Programme" has also emphasized specific research in agroforestry and regularization of the wood market system. (Tribune, 2002) The attainment of these objectives is possible only if, corrective buyer-seller linkages, competitiveness and rational protection of farmers are ensured. Raw wood produced by primary producers should be absorbed by the market at reasonable profits and returns. This also requires establishment of more wood based industries in the region, sufficient incentives for setting these industries, wood use diversification, production of quality wood based finished products at internationally competitive prices and strengthening of linkages between farmers and buyers. The market should be properly developed before growing the wood (ITTO, 2002) to ensure social, ecological, economic and environmental sustainability of agroforestry products.

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