

Greening of earth-necessity and role of pulp and paper industry : Eucalyptus as a raw material for forest based industries

KAPUR S. K.*

Introduction

Punjab is predominantly an agricultural state having 84% of its land area under plough. It is the most advanced and progressive state in the country in the field of agriculture. Most of the lands are fertile and irrigated. Area under forests is only 2,84,470 ha which works out to be 5.65% of total geographical area of the state. The per capita forest area is 0.014 ha much lower than the national figure of 0.11 ha.

Forest area in the state is very limited and it is not possible to increase the area under government forests. Thus the only scope to increase the forest resources of the state lies in extending the planting programme under social forestry on private lands. The importance of social forestry/farm forestry has not only been recognised from the point of view of maintaining environmental balance, but also from the point of view of income generation and effective use of marginal lands. With these objectives in view, the forest department initiated numerous measures to popularize social forestry/farm forestry by convincing the farming community about the gains of diversified land use system. The JOHAL COMMITTEE on DIVERSIFICATION OF AGRICULTURE in Punjab has also recommended that forestry is one of the economically viable alternatives which can be taken up to improve farm income as well as the environment. In China too farm forestry programme has resulted in the improvement of ecological conditions stable development of agricultural production, promotion in the readjustment of rural industry and strengthening of the rural economic strength. As per experts' reports of that country plain forestry which is regarded as an industry of planting growing and protecting of plain agricultural areas to obtain forest products and improve the ecological environment, has been acknowledged as an important

component in forestry production systems. It not only contributes to the increase in forest cover but also meets the requirement of small timber of the farming community.

This widely accepted beneficial planting programme has motivated the farmers of Punjab to raise a large number of forestry plantations in agri fields. As a result of which more than 30 crore saplings have been planted by the farmers in the last decade. General trend is to plant trees along boundaries of agricultural fields, irrigation channels and marginal lands. However some of the farmers have planted trees in block forms in their agricultural fields. *Eucalyptus tereticornis* has been the dominant species raised under farm forestry plantations.

The farmer has adopted *Eucalyptus* as a farm tree mostly because of its fast growth, thin crown, clean straight bole. About 90% of the seedlings supplied in the past by the department to the private people for planting have been of *Eucalyptus* species.

Spacing

In Punjab, there is little variation in spacing as far as boundary/line plantations are concerned. The commonly adopted distance between plants is 1.75 m to 2.25 m and if several rows of trees are planted line to line distance is kept at 2 m to 3 m. However, lot of variation exists in case of block planting, the spacing could be anything from 1.7 m x 1.70 m to 3 m x 3 m or even more. In Agro forestry plantations,

*Principal, Chief Conservator of Forests Punjab
Punjab State
17, Bays Building, Sector-17
Chandigarh-160 017

wider spacings i.e. 4m x 4m and 6m x 2m are also encountered, where inter cropping has been done. The farmers, who had benefited from the sale of tree, planted in a single row on farm boundaries started estimating returns on a per tree basis. They, therefore thought that close spacing in blocks would mean more return because of more trees. The trend in early eighties was, therefore, towards close spacings and most of the farmers in the state raised plantations on narrow spacings and as a result of which most of the produce now available is of small size suitable for pulp and firewood. However the plantations raised by the deptt. on the areas under its control are generally for timber.

Estimates of availability of Eucalyptus

Recent estimates of availability of Eucalyptus wood in the state is mentioned as under.

Sr. No.	Year	Availability (Green weight in lac tonnes)		
		Private land including coppice)	Govt. land	Total
1	1991-92	33.01	0.45	33.46
2	1992-93	27.14	1.83	28.97
3	1993-94	26.91	1.71	28.62
4	1994-95	26.15	1.26	27.41
5	1995-96	20.55	1.79	22.34
6	1996-97	20.16	1.23	21.39
7	1997-98	21.04	1.12	22.16
8	1998-99	27.12	0.99	28.11
9	1999-2000	28.13	0.97	29.10
10	2000-2001	23.34	0.83	24.17

As mentioned above production from govt, forests is mostly suitable for timber while bulk productions from private areas can be utilized for pulp. The under mentioned table indicates the % of out turn of Eucalyptus wood of various sizes from govt. forests and private areas.

Girth	Govt. Forests	Private Forests
90 cm. & above	20%	2%
60 cm. to 89 cm.	55%	13%
30 cm. to 59 cm.	15%	60%
Below 30 cm.	10%	25%

An other important species becoming popular as farm tree in the state is Poplar which is also a fast growing species. The govt. has also floated a bankable scheme for raising of this species on farm lands under which loan amounting to Rs. 47200 per ha. in 8 yearly instalments is advanced to the farmers by the Punjab State Cooperative Land Development and Agricultural Bank. Planting stock at subsidized rates and free technical guidance is provided by the department.

Marketing of Eucalyptus wood

As mentioned in the foregoing paras, the farmers took up tree planting on a large scale and during the last decade more than 30 crore plants were planted on the private lands. The state is now surplus in Eucalyptus wood, because this was the main species planted by the farmers. The state has indeed established an inspiring record of producing more than 20 lakh tonnes of surplus Eucalyptus wood annually, which is much more than other states with several times larger geographical area and area under forests.

It would be pertinent to point out that due to lack of demand of Eucalyptus wood in the market as also due to non availability of major outlets, such as paper & rayon grade pulp mills in state, the prices of wood have crashed substantially and the farmers are not getting remunerative price of their produce. There is in fact, glut of Eucalyptus in the market. The farmers are highly disappointed and some of them have even started uprooting their plantations. A strong resentment prevails in the country side as the farmers are compelled to sell their produce at throw away price of about Rs. 35-40 per qtl. against Rs. 100 per qtl. in Southern states. The above disturbing factor has caused serious set back to the state afforestation drive as would be evident from the fact that the planting targets under farm forestry had to be substantially reduced from 475 lakh during the year 1983-84 to 111.43 lakh during the year 1991-92. The trend of tree planting on private lands, thus, stands reversed.

There is not much difficulty in the marketing of big sized Eucalyptus wood which can be utilized for battons, doors and window frames, packing cases and furniture etc, However the state is surplus in Eucalyptus wood of small size to the extent of about 15-20

lakh tonnes annually. This quantity of wood is sufficient to provide raw material for 2 to 3 Eucalyptus based paper & pulp mills of 300 T. P. D. capacity. Unfortunately, there are no industries in the state to consume the small size wood.

The data collected from the plantations raised in the state during the last about 25 years indicates that it is possible to meet the demand of wood based industries by intensive tree cropping. The growth data of Eucalyptus and Poplars, collected from some of the farmer's field and Govt. forest areas are given in table I and II below.

In view of the agro-climate conditions of Punjab and the progressive outlook of the farmers, additional quantities of pulpwood can be produced even at short rotation once the paper mills based on Eucalyptus wood are established in the state.

TABLE-I

Growth Rate of Eucalyptus plantation in Punjab

Sr. No.	Location	Age (Yr.)	Spacing (mxm)	Av. dia (cm)	M. A. I. m ³ /ha	Soil type
1.	R.F. Chak Sarkar Distt. Fzr	7.0	3×3	12.3	13.0	Medium Sand
2.	—do—	7.0	3×2	10.5	12.3	—
3.	—do—	7.0	2.4×1	8.4	20.5	—
4.	—do—	5.5	5×2	12.3	13.5	—
5.	—do—	14.0	6.5×1.5	17.3	22.8	Sandy loam
6.	R.F. Ludhiana	10.0	7.5×1.5	—	24.4	Clay loam
7.	Govt. forest Nasrala Distt. Hoshiarpur	14.0	4×3	27.6	29.6	Sandy loam
8.	Bir Bhore Agol Distt. Patiala	20.5	3×3	35.2	22.9	Clay loam
9.	Balwinder Singh V. Dhillwan Khurd, Distt. Fdk.	8.5	2.0×2.25	14.1	15.6	Fine Sand
10.	Balwinder Singh V. Sodhiwala Distt. Fzr.	3.5	2.5×1.8	11.5	28.5	—
11.	Rup Singh V. Behlewala Distt. Fdk.	8.5	1.7×1.7	12.4	28.4	—
12.	Subash Chander V. Piareana Distt. Fzr.	6.0	3.0×2.5	12.3	18.04	—

TABLE II
Growth Rate of Poplars Plantation in Punjab

Sr. No.	Name of farmer	Clone	Age (Yr.)	Spacing (m×m)	Top Mt,	Av. dia (cm)	M.A-I. m ³ /ha	Soil Type
1.	Hardev Singh V. Dhamot Distt. Ludhiana	0-121	4.5	5×4	26.4	21.6	40.9	Sandy Loam
2.	Shivtar Singh V. Pawat Distt. Ludhiana	G-3	5.4	5×4	27.3	21.4	38.1	Loam
3.	G. S. Grewal V. Kadian Distt. Ludhiana	G-3	7.4	5×4	26.5	23.3	39.0	Sandy loam
4.	Gulraj Singh V. Mehawal, Distt. Ludhiana	G-3	4.2	5×4	25.1	20.8	41.1	
5.	Forest Deptt. Dina Nagar distributory Distt. Gurdaspur	G-3	8.5	3×3	26.0	23.1	39.3	Loam
6.	Forest Deptt. S.B. Canal RD 157- 158 Distt. Amritsar	G-3	9.3	3×3	25.2	25.4	43.3	