

Fibrous Raw Materials for Pulp Industry—Present Position and Scope for Expansion in Tamil Nadu

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Introduction

Afforestation of grass lands of Nilgiris and Palnis with *Eucalyptus globulus* (Bluegum) and *Acacia mearnsi* (Black Wattle) commenced as early in 1843. Subsequently large scale planting has been done all over the Nilgiris and Palnis under the Five Year Plans. The primary objects of the Plantations were afforesting the vacant grass land and meeting the fuel requirements of the local population. However, the blue gum yielded good timber for the construction of buildings on hills. But they are highly susceptible to termite attack and physical deformation when they are transported to plains. Wattle bark was used as a very good tanning material in the various tanneries of Tamil Nadu.

Total areas under Bluegum and Wattle both in Nilgiris as well as Palnis raised so far, are given in Table No. 1.

TABLE No. 1

	Under Bluegum	Under Wattle
Nilgiris	6678 ha	14889 ha.
Palnis (Kodaikanal)	770 ha	3874 ha
Total	7448	18763

When area under these species gradually increased the surplus wood

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Large scale afforestation of grass lands with Bluegum and Wattle was done in Nilgiris and Palnis under Five Year Plans. Based on the availability of the pulp wood from these species Messrs South India Viscose started a Pulp Plant with a capacity of 22,000 tonnes per year to manufacture Rayon and Staple fibre. The Tamil Nadu Forest Department supplies pulpwood from 400 ha. of blue gum plantations and 1,400 ha. wattle plantations annually.

*The company have proposed to increase the pulp production from 22,000 tonnes to 42,000 tonnes. To meet the increased demand, the possible ways and means are discussed in the paper. Suggestions are made to go for alternate available species like *Eucalyptus hybrid*. Also suggested to introduce high yielding varieties, application of fertilizers, plant protection measures etc. Encouraging private planters to grow pulp wood and offering reasonable price are also indicated.*

after meeting the local requirements found its way outside the Nilgiris as fuel as well as pulpwood to Messrs Gwalior Rayons, Mavoor.

ESTABLISHMENT OF PULP PLANT

After assessing the availability of the pulp wood in both Nilgiris and Palnis, Messrs South India Viscose has started a Factory at Sirumugai for manufacturing Rayon and Staple fibre. The factory commenced its pulp production in 1969 using bluegum for Rayon grade pulp and wattle for the production of staple fibre. The present capacity of the factory is 22,000 tonnes of pulp per year. The factory consumes about one lakh tonnes of air dried pulpwood annually. The company has entered into an agreement with Tamil Nadu Government for the supply of pulpwood both from Nilgiris and Palnis. Under this agreement, the Forest Department of Tamil Nadu has to

give 400 ha. of blue gum plantations and 1,000 ha. of wattle plantations in Nilgiris and 400 ha. of Wattle plantations in Palnis for meeting their requirement. However, the Department is also allotting additional areas whenever the company comes with request for more raw material to meet their deficit. Table No. 2 gives details of pulpwood supplied to Messrs South India Viscose by the Tamil Nadu Forest Department upto September, 1972.

TABLE No. 2

Year	Bluegum (In tonnes)	Wattle (In tons.)	Total (In tons.)
1967	801	Nil.	801
1969	12951	2932	15883
1970	43952	15192	59144
1971	74306.43	31281	1,05587.43
1972	49563.36	23658.36	73221.72
(Upto 30.9.72)			

Out of the above quantity of pulpwood supplied Messrs South India Viscose utilised only the quantity shown in Table No. 3.

TABLE No. 3

Year	Bluegum (T)	Wattle (T)	Total (T)
1969	666	..	666
1970	52078.64	7217.06	59295.70
1971	71081.74	28750.06	99831.80
1972	53374.74	28052.42	81427.16
(Upto 30-9-72)			

FUTURE REQUIREMENT OF THE INDUSTRY

Messrs South India Viscose Limited have proposed to increase the present pulp production of 22,000 tonnes per year to 42,000 tonnes by 1976. Their requirement of pulpwood, when expansion is completed, will be about 2 lakhs tonnes of air dried wood. To meet the increased demand of the raw material by the company, the Forest Department has to plan well in advance. In addition to maintaining the existing bluegum and wattle plantations, it is also proposed to take up large scale planting of *Eucalyptus grandis* (Rose gum) and *Pinus patula* in suitable localities. About 4,000 ha. found unsuitable for raising bluegum and wattle due to occurrence of heavy frost in the winter, was found suitable to raise *Pinus patula*. Trials of this Pine in various plots all over the Nilgiri plateau were found successful. Therefore, it is proposed to plant Pine over an area of 2,000 ha. in 10 years from 1973-74. A beginning has already been made by planting this species over an area of 55 ha. during the current year. There are about 2,800 ha. of *Eucalyptus grandis* plantations raised

from 1962 onwards and they are coming for felling from 1972. It is also proposed to establish 200 ha. of *Eucalyptus grandis* plantations every year from 1973-74.

The anticipated yields of pulpwood from Blue gum, Wattle and *Eucalyptus grandis* plantations raised by the Forest Department are given for next 10 years in Table No. 4.

TABLE No. 4

Year	(Available pulpwood, in tonnes)			Total
	Bluegum	Wattle	Euc. grandis	
1972	49,800	8,700	1,000	59,500
1973	65,400	25,075	2,080	92,555
1974	58,700	24,590	4,300	87,590
1975	62,000	24,850	4,100	90,950
1976	42,100	24,000	24,440	90,540
1977	56,400	21,755	13,640	91,995
1978	61,400	21,885	12,740	96,025
1979	67,600	22,520	15,220	1,05,340
1980	78,600	25,290	14,000	1,17,800
1981	60,300	24,485	11,460	96,245

Apart from this, there are blue gum plantations raised under Farm Forestry Scheme in lands vested with Village Panchayats. The anticipated yield of pulpwood from such plantations is given in Table No. 5. The Village panchayats are eligible for part of the revenue to be realised from the sale of the wood.

TABLE No. 5

Year	(Anticipated yield of pulpwood in tonnes) BLUE GUM.
1973	7,500
1974	19,100
1975	4,700
1976	8,400
1977	5,500
1978	9,300
1979	5,800
1980	5,200
1981	5,600
1982	7,000

On perusal of tables 4 and 5 it can be seen that on an average only about 1,01,670 tonnes of pulpwood per year is available as against their annual requirement of 2 lakhs tonnes.

SUGGESTIONS

In view of the in-adequate supply of bluegum and wattle wood, the company has to consider some other forest species to cope up with their increased demand of raw materials. The only alternate choice left to them is *Eucalyptus hybrid* (Mysore gum). In Tamil Nadu State, large scale planting of *Eucalyptus hybrid* had commenced since 1960 and they have come to harvest from 1971.

Being a good coppicer this species is likely to give increased yield in successive rotations. Details of avail-

ability of pulpwood from this species are given in Table No. 6.

TABLE No. 6

Year (Estimate yield in Tonnes of Eucalyptus hybrid)

1972	58,890
1973	1,30,500
1974	1,18,420
1975	1,14,260
1976	1,21,880
1977	1,08,650
1978	1,23,600
1979	95,420
1980	96,880
1981	91,610

The paper mill at Erode is also partly depend upon this wood as the bamboo supply is inadequate in this State. They used 8,500 tonnes of Eucalyptus hybrid wood during 1971-72. However, part of the wood will be available for Messrs South India Viscose. Keeping this in view, the company has to conduct various tests on the suitability of Eucalyptus hybrid wood for the manufacture of staple fibre. If they succeed in this venture, the company may not have much difficulty to get the required raw material.

They are also advised to consider the following species as they are available in sizable quantity in Tamil Nadu Forests.

(i) *Protium cordatum*: It is found in all over dry deciduous forests of Tamil Nadu. It attains its full growth in about 10 years and the yield would be 5 to 6 tonnes per acre. The un-bleached pulp yield of this wood is about 48 to 50%. Its fibre length is about 1 mm. About 5 to 10% of

this wood is used in the Paper Mill at Erode.

(ii) *Acacia planifrons*: It is a moderate sized thorny tree with a spreading umbrella crown common and gregarious in dry districts of Tamil Nadu. It can be cut once in 10 years and the yield will be 10 to 12 tonnes per acre. The unbleached pulp yield comes to 48%. Average fibre length is 1.2 m.m. This species is being raised on large scale under the Soil Conservation Scheme of the River Valley Projects.

(iii) *Albizia amara*: A medium sized tree found in the dry deciduous forests of Tamil Nadu. At present it is used as fuel. The wood has to be tested for its suitability in pulp industry.

(iv) *Wrightia tinctoria*: A medium sized tree found in association with *Albizia amara*. Sizable quantity is available in the dry districts. At present part of the quantity is utilised in Toy making. The fibre length is 1.026 m.m. and the unbleached pulp yield is 38.1%.

(v) *Grewia tiliifolia*: It is a tree found in moist and dry deciduous forests of Tamil Nadu in association with Teak. Fairly large quantity is available. A small quantity of this timber is utilised for truck body making locally. The fibre length is 1.09 m.m. and the pulp yield is 49.9% (Unbleached).

(vi) *Anogeissus latifolia*: This is also found in association with Teak in the deciduous forests of Tamil Nadu. Sizable quantity can be obtained from the various Forest Divisions. This is used as fuel at present. The fibre length is 0.985 m.m. The yield of pulp is 42%.

(vii) *Casuarina equisetifolia*: A clean boled tall tree planted in large scale on the river banks and along the Sea Coasts. Major portion of the area under this species is with the Forest Department. Large scale private plantations are also available. It is worked in 7 to 10 years rotations. At present, it is mostly used as fuel. It has a fibre length of 1.08 m.m. The yield of pulp is 71.7% (Unbleached).

(viii) *Cassia siamea*: A fast growing flowering tree found both in dry and moist localities. At present it is grown mostly for its green leaf manure and ornamental value. Fibre length is 1.04 m.m. and yields 69% of unbleached pulp.

(ix) *Acacia auriculiformis*: An exotic fast growing species under trial in Tamil Nadu. Rate of growth is encouraging on various trial plots. Fibre length is 0.840 m.m. and yields 47.4% and 41.2% unbleached and bleached pulp respectively.

(x) *Acacia arabica*: A medium size tree found mostly in tank beds. Large scale plantations are being raised under village forest (or Farm Forestry) schemes by the Tamil Nadu Forest Department. The wood is susceptible to insect attack in storage. Its suitability for pulp is under investigation.

II. Introducing high yielding varieties

Employing genetically superior stock to increase the output is of vital importance in reducing the cost of pulpwood. It is better to develop suitable strains of pulpwood for such conditions as frost resistant, drought resistant, different kind of soils etc., to ensure economic industrial plantation for the future.

III. Application of Fertilizers.

With availability of marginal lands in many cases for the future developments of pulpwood plantations, application of fertilizers becomes imperative, to step up yield. Investigations on Eucalyptus hybrid indicate that it can fair well in calcium and magnisum deficient soils but it may not thrive in Nitrogen or Phosphate deficient soils. The study also indicates that N & P nutrients are of vital importance in the growth of Eucalyptus hybrid. Observations have been made in Nilgiris where application of P_2O_5 has resulted in fast growth of *Acacia mearnsii* even in frost holes. However, much work has to be done on this line in the case of bluegum and wattle. A begnning has already been made in conducting nutrient trials on various species of Eucalyptus including bluegum.

IV. MECHANIZATION

One of the important factors that could be of immediate importance in reducing the cost of pulpwood is mechanization. Mechanization in plantation work under conditions in India may be of limited application depending upon the terrain of the country. Machines are employed in Tamil Nadu in raising industrial plantation of Eucalyptus hybrid in a few districts. Under conditions prevailing in India, it may not be possible to introduce mechanized logging. However, it can be profitably resorted to, to a limited extent such as use of power chain saws for felling and logging work. The F.A.O. Logging

Training Programme functioning in India is playing a vital role in this direction. However, practical difficulties are bound to arise in the matter of supply of necessary machinery which would decide the fate of these programmes.

V. PLANT PROTECTION MEASURES

Termite and other insect damage as well as damping off in nursery stocks of different species of Eucalyptus are common. Various insecticides are sprayed in the nursery and other plant protection measures are also undertaken. In this connection mention must be made of the large scale mortality in Eucalyptus grandis plantations at Chalakudy (Kerala State) raised on lower elevations. Therefore, the study of suitability of species for site and the need for trial plantations are also of vital importance in addition to plant protection measures.

VI. ENCOURAGING PRIVATE PLANTATIONS

In Nilgiris, it is estimated that about 500 ha. of bluegum plantations are with private land owners. Messrs South India Viscose has purchased 21,907 tonnes of bluegum and 2,140 tonnes of Wattle from the private land owners during 1972 alone. If private planters are encouraged by providing adequate finance, large areas can be brought under pulpwood production. The company may even think of taking these lands for long lease.

VII. INCREASING THE PRICE OF PULPWOOD

The present price paid by the company to the Forest Department is found to be inadequate when compared to the open market rate. As per the agreement Messrs South India Viscose pays Rs. 450/- per acre of bluegum whereas on an average about Rs. 3,000/- per acre is obtained in open auction. Cost of establishing plantations has also gone up. Planting new species like *Pinus patula* in frost holes almost cost Rs. 750/- per acre. Therefore, the necessity to increase the price of the pulpwood is imperative.

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