Fibrous Raw Material in Kerala State

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The need for more attention and higher investment in growing and utilising fibrous raw-material is stressed with reference to the growing demand for paper and pulp products in the country.

At present there are two factories in Kerala which utilise fibrous raw material (one producing Rayon Grade Pulp and the other Writing and Kraft paper). There are proposals to step up their capacity. There are also proposals to establish two more Mills for newsprint and writing paper. The availability of raw material in Kerala, taking into consideration the needs of the existing Mills and those proposed, is analysed.

The need for utilising more of mixed hardwood in future is explained. In view of the various problems connected with the industry and Forest Department, better co-operation and understanding between the two is stressed. Only with such an understanding and co-operation among those concerned with the production and utilisation of fibrous raw material, can the existing problems relating to pulp and industry be solved.

Introduction

India still continues to have a low consumption of wood pulp and paper when compared to advanced countries in the World. Eventhough we have made some progress in the last few years in pulp industry, the production is still far below the demand. Recent calculations (by Prof. Gregory, Ford Foundation Scholar) show that India will need pulpwood in the coming two decades as shown in table 1.

TABLE I

Pulpwood requirements for 1980-1990

Year	Conifer '000m³	Broadleaved '000m³	Total
1980	1555	3478	5033
1990	4461	8271	12732

It is also calculated that the requirements of bamboo for paper and pulp will be 2.19 million tonnes and 4.91 million tonnes for the years 1980 and 1990 respectively. These figures indicate the wide gap we have to cover during the next two decades to satisfy the requirements of the Nation. This calls for substantial increase in the extent of plantations of species suitable for paper and pulp and also intensification of necessary measures to increase the production of already existing raw material supply.

The interim report on Production Forestry-man-made Forest (Government of India, National Commission on Agriculture) has stressed the necessity for large investments in forestry sector to meet these demands. It is estimated that clearfelling of existing forests and raising Plantations of various species will alone need Rs. 242 crores and Rs. 306 crores for 1980 and 1990 respectively. Besides this, the total investment for industries using raw-materials produced by forests will be to the tune of Rs. 815 crores (1980) and Rs. 1187 crores (1990). Out of this investment in the wood based industry sector, the paper industry alone will require Rs. 611 crores by 1980 and Rs. 979 crores by 1990. It is therefore evident that in the coming years the paper industry is going to be the major investment sector as far as forest based industries are concerned.

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Present pattern of raw material utilisation in the country

The major requirement of the paper industry at present in India is met by the naturally grown bamboos and to some extent by man made forests mainly of Eucalyptus. Even though mixed hardwood species are being utilised on a limited scale by and large the main raw materials for paper industry continue to be bamboos and reeds in various parts of India. Attempts are being made however throughout the country to raise large scale plantations of Eucalyptus, Bamboos etc. to meet the future requirements of the industry. Eventhough it has been proved in research that various mixed hardwood species in the forest can be used either pure or in combination with long fibre pulp for production of paper, it is yet to be put into practical application by the industry

except at times of acute shortage of the best suited raw-materials.

Present pattern of utilisation of fibrous raw-material in Kerala

As far as Kerala is concerned there are two factories which utilise fibrous raw-material from our forests.

(1) **The Punalur Paper Mills, Punalur**

This mill is engaged in the production of writing and kraft paper mostly and is situated at Punalur near large areas of Evergreen Forests containing considerable stock of reeds. The mill is at present using about 30,000 tonnes of reeds annually. They are also using some mixed Junglewood, Bamboos, rags and Wastepaper.

(2) The largest wood using industry in the State is the Gwalior Rayons Silk Manufacturing and Weaving company Calicut which has an annual capacity of 54000 tonnes of Rayon Grade pulp. The factory is using bamboos and mixed hardwood species for pulping.

The estimated annual requirement of Punalur Paper Mills and Gwalior Rayons Company are about 30,000 tons of reeds and 2,00,000 tons of bamboos respectively. Both the mills have an expansion programme which would necessitate a very much increased supply of raw-material for future.

Future proposals :

There is a proposal to establish newsprint factory in the State by Hindustan Paper Corporation with an initial capacity of 250 tonnes a day and with a final capacity of 500 tonnes. This will require a quantity of 1,05,000 tonnes of reeds and 1,44,000 tonnes of Eucalyptus wood during the first stage and 2,50,000 tonnes of reeds and 3,45,000 tonnes of Eucalyptus wood in the second stage. Another proposal for a joint sector project with an initial capacity of 300 tonnes a day is also under the consideration of Government. Requirements of this mill will be about 1,25,000 tonnes of reeds and 1,25,000 tonnes of Eucalyptus in the first stage and 2,50,000 tonnes of reeds and 2,50,000 tonnes of Eucalyptus for the second stage. The following table gives the future requirements of existing and proposed paper mills.

TABLE II

Fibrous Raw-material requirement for Kerala State.

	Punalur Paper Mills existing (tonnes)		Gwalior Rayon Factory Existing (tonnes)		Hindustan Paper Corporation proposed. (tonnes)		Joint venture project proposed (tonnes)	
	R.	B.	Eu.	B.	R.	Eu.	R.	Eu.
1st Stage	30,000			2,00,000	1,05,000	1,44,000	1,25,000	1,25,000
IInd stage	81,250	12,500	31,250	2,00,000	2,50,000	3,45,000	2,50,000	2,50,000
Commitments	30,000		2,00,000		Nil		Nil	

R=Reeds B=Bamboo Eu=Eucalyptus

Prospects of raw-material availability in the State :

The two important raw-materials with long fibre now available in Kerala are Bamboos *(Bambusa arundinacea)* and reeds *(Ochlandra travancorica)*. The Preinvestment Survey of Forest Resources has estimated a total growing stock of 4.94 million tonnes of reeds for the southern zone. Most of this is in Kerala. They have also estimated that 10 percent of this quantity i.e. 0.49 million tonnes can be cut annually. This survey has also estimated a total growing stock of 1.195 million tonnes of bamboos in Southern Zone. The total growing stock of bamboos and reeds thus comes to about 6.1 million tonnes for the Southern Zone giving an annual cut of about 0.6 million tonnes.

A recent study of the Forests of Kerala by the Resources Survey Unit of the State Forest Department has estimated the total growing stock of bamboos and reeds together at 7.9 million m^3.

From the above it appears quite safe to assume that an annual cut of 0.5 million tonnes of bamboos and reeds will be available from the forests of Kerala in future.

Besides the above long fibred raw material available in the forests of the State, Kerala has raised large scale plantations of *Eucalyptus grandis* and *Eucalyptus hybrid* since 1959. At present there is a total extent of 10,040 hectares of *Eucalyptus grandis* and 13,070 hectares of *Eucalyptus hybrid* plantations at various places in the State. The Preinvestment Survey of Forest Resources has calculated an yield of 250 tonnes per hec-

tare from these plantations when they become mature. From the experience gained so far this appears to be on the higher side of estimation. It seems very safe to calculate the annual yield at 100 tonnes per hectare for *Eucalyptus grandis* and 75 tonnes per hectare for *Eucalyptus hybrid*. This will give approximately 1,00,000 tonnes of *Eucalyptus grandis* and 97500 tonnes of *Eucalyptus hybrid* annually from the plantations on a 10 year rotation. Thus the total availability of raw material for pulping will be about 0.7 million tonnes.

To feed the existing two mills and the proposed paper mills, the following quantities of reed, bamboo and Eucalyptus will be required during first and second stages.

TABLE III

Total requirements of Fibrous raw material for Kerala

Raw Material.	Total requirements during		Total annual yield available as per estimate.
	Ist stage.	IInd stage.	
Reeds	2,60,000	5,81,250	5,00,000
Bamboos	2,00,000	2,12,500	
Eucalyptus	2,69,000	6,26,500	2,00,000
Total	7,29,000	14,20,250	7,00,000

It is proposed to clearfell about 7,500 hectares of forests and plant it with various species during the fifth five year Plan. Out of this 500 hectares will be for raisng Industrial wood, mostly pulpwood. This will mean an additional area of 25,000 hectares of pulpwood Plantations during the fifth Five year Plan. This is expected to yield an additional quantity of about 1.875 or aporoximately 2 lakh tonnes of palpwood after 10 years (calculating the yield at 75 tonnes/hectares only). Besides this, large quantities of mixed hardwood also will become available from the forests annually cleared for raising Plantations.

From a study of the raw-material utilisation pattern of the existing Rayon Factory and paper mill it is seen that during the year 1969–70 out of the total raw material of 2,96,483 tonnes used by the Gwalior Rayons 88,620 tonnes (32%) was Bamboo. In the case of Punalur Paper mills also, mixed hardwood is now being used increasingly in the production of paper. Both Gwalior Rayons and Punalur Paper mills are thus using mixed hardwoods at present for the production of Rayon Grade pulp and paper. Experiments on pulp and paper making properties of mixed hardwood species in Kerala have shown that at "laboratory scale a mixture of about 20 hardwoods from the area proved suitable for both rayon pulp and bleached sulphate pulp from which printing or writing grade paper was made which had tensile strength properties that compared favourably with those of paper made only from Bamboo and with good opacity and printability" By proper mixture of bamboo or reeds, *Eucalyptus grandis* and *hybrid* and mixed hardwood species, various qualities of paper can be made. The laboratory test and existing raw-material utilisation pattern indicate therefore that besides bamboos and Eucalyptus, mixed hardwood will also be useful in the production of fibrous raw material in the state.

A considerable portion of bamboos and reeds estimated in the surveys mentioned above are situated in the forest with very little accessiblity at present. Good roads and other infrastructural facilities have to be provided to open up these areas before the entire estimated quantity of bamboos and reeds can be made available.

The progress of large scale Eucalyptus Plantations in the state has been slowed down considerabley due to heavy fungus attack and consequent mortality of plants in the Industrial Plantations in state. Unless we are able to overcome this difficulty large scale Plantation of the species can not be raised at the present rate and this will affect the future raw-material supply adversely.

Forest Development and fibrous raw-material production in the State

The National Commission of Agriculture in its interim report on Manmade Forest has clearly indicated that unless lage extents of forests in India are converted into Plantations of industrial wood in the shortest time possible with high investment we will not be able to meet the future demand. Our investment rate still is extremely low (Rs. 2·40 per hectare for fourth Plan) and per capita contribution of Forests to National income was only 1.6 pe cent during 1969–70. The expenditure on Man-

made forest was only Rs. 10/-per hectare with a net return of Rs. 11.50 per hectare while the expenditure for other countries like Australia, West Germany, Switzerland etc. are Rs. 256/-, Rs. 435/- and Rs. 304/- respectively with net revenue of Rs. 80/-, Rs. 130/- and Rs. 190/-. As far as Kerala is concerned it is estimated that we will need 1.86 million m^3 and 10.87 million m^3 of timber in various forms in 1980-1990 to meet our demands. Out of this the major share will be for fuel wood (5.95 and 7.2), pulpwood (1.236 and 1.597) and saw-logs (1.197 and 1.433). When the percentage of conversion of total forest area available for the whole of India is only about 2% Kerala has already taken a lead by converting about 14 percent of the forest area available into Plantations. The Preinvestment Survey of Forest Resources has estimated 66 percent of these areas as hilly region. It is felt as per the available data that only another 25 percent more of the total forest can be converted into plantations even with intensive management. There are large number of Plywood Industries in the State which look forward to the semi-evergreen and evergreen forests of the State for their raw-material supply. For sustained supply of bamboos and reeds to the existing and proposed paper and pulp industries the natural regions of bamboos and reeds have to be retained as such without clearfelling. Attempts made in the State so far raising plantations of Bamboo have met with little success. These limitations on the extent of areas available for conversion restrict the extent which can be set apart purely for species meant for paper and pulp.

At present we have a total of the following extent of Plantations in the State.

Teak	56,826	hectares
Softwood	17,633	,,
Eucalyptus	24,768	,,
Miscellaneous Plantations like bamboo etc.	4,398	,,

Large scale mortality of Eucalyptus plantations due to the attack of fungii, *Cylindrocladium quinquiseptatum* and *Cortisium salamonicalox* has retarded the pace of raising this species. Alternatively various other species like *Albizzia falcata, Sesbania grandiflora, Erythrina Sup. Acrocarpus fraxinifalius, Hibiscus cannbinus, Boroussanatia paperifera,* etc. suitable for pulping are being tried on a small scale in the Industry Plantation Circle.

From the balance area available for conversion, the proportion to be set apart for plantations of Industrial wood like Eucalyptus will have to be decided taking into account the relative importance, requirement and economics. Kerala is the most important teak producing State in the country. The State has at present a total of 56,826 hectares of Teak Plantations. In future also a good percentage of the demand for Teak in the country will have to be met by the State. It is clear, therefore, that the entire area available for conversion in future cannot be set apart for raising industrial wood solely.

An analysis of the existing conditions will show that if paper industry has to thrive in the state the dependence of the industry purely on bamboos and reeds will have to be reduced and more and more mixed hardwood will have to be used for production of paper pulp.

Future of fibrous raw-material supply as well as that of the industries is, therefore, largely dependent on the closer understanding between the Department and the industy on various problems connected with both. The industry must be able to appreciate that fibrous raw-material is a natural resource, the production of which has several limitations due to various reasons. They must also consider the demands of the country on the forest resources with respect to the requirements like constructional wood and fuel, though it may be less when compared to the requirement of paper and pulp raw material during the coming few years. It is also necessary to encourage and expand other wood based industries which are also capable of adding to the National wealth and increasing employment potential in the country. The Forester on his part must also make efforts to help the industry on the following lines, with proper techniques of planting, silvicultural practices and intensive management of forest, production should be maximised. Even while raising man-made forests the infrastructural facilities like roads etc. must be planned and executed in such a way that it may help the harvesting and transport of the raw-materials conveniently and at low cost to the factory. The industries must also co-operate and involve, if possiple, financially in the projects proposed for raising plantations. The plantations meant for the industry must be planned and located as close to the industry as possible so as to bring down

the cost of raw material.

On the side of industrialists also efforts must be made to understand the problems of the Department and orient their planning and management accordingly. The research and technology of paper making must be strengthened in such a way that more and more inferior species are utilised for paper manufacture so as to reduce wastage of raw material.

One important difference in opinion existing now between the industry and the Department everywhere appears to be with regard to price of raw materials. Even though the Preinvestment Survey of Forest Resources and the recent report of National Commission on Planning and Agriculture have recommended certain prices for bamboos and Eucalyptus the price at present received by the Department is far below this. A newly established factory may have its problems but it is discouraging that the industry should always insist on a low price. It is true that the industry will be able to make a high financial gain by this. But it must be remembered that if the producer of the raw-material is not assured of reasonable profit on his investment he will not be interested in future investment in similar industry oriented plantations. The promise of a better return will always encourage the department to invest more in producing fibrous raw material needed for the industry. Only when the Department is encouraged to invest on these pulpwood plantations it can result in higher raw material production. This would eventually help the industry not only to get suitable raw material in adequate quality but also to increase the production and profit. At present the price of the pulpwood is not related to the price of the end product.

Conclusion

Kerala has a high quality of tropical forest which is rich with a variety of useful species. We have also considerable stock of bamboos and reeds in these forests. The utilisation pattern of the various timber species, bamboos and reeds will depend upon not only the demands for the various products but also on our efforts to make use of them in the most profitable manner. The requirement of every industry depending upon forest resources have to be met taking in to account not only their demands but also looking at it from an economic point of view. The role our forests will be playing in the National growth and development will be effective and most profitable only if these resources are made use of in such a manner that they give maximum contribution to the present needs, of the country, both economic and social.

As already given in the earlier part of this paper the production and utilisation of paper and pulp industry is going to take the major share in the investment pattern in the country for the next two decades. This calls for greater co-operation and mutual involvement of industry and the Forest Department.