

Cellulosic Raw Materials Scenario in Future Availability, Constraints, Cost and Plantations.

Sharda A.K., Mukherjee S. and Ratho B.P.

ABSTRACT

The rapidly changing economic, technological and regulatory environment has affected the progress of Indian Paper Industry due to the poor availability of cellulosic raw materials. Amongst cellulosic raw materials, bagasse, straw and waste paper have inherent drawbacks of limited & scattered availability and non-availability of suitable technology for conversion into higher grade pulp. This makes it quite imperative to have a sustainable supply of forest-based raw material which accounts for 45% of raw material used in Indian paper industry. With the increasing shortage of forest-based raw materials, industry is left with no other option except that of importing pulp which will amount to a huge foreign exchange outflow. Considering that India is a poor country, this luxury can definitely be avoided, since there is adequate land for raising pulpwood plantations in 10-15 years. Since the current requirement and growing demand cannot be met from existing sources therefore wood fibre production on abundant degraded forest land (31.85 mha) of India, by the industry seems the only viable alternative. The industry having already indicated its willingness, has the requisite managerial, financial and technological means for development of plantations if the Govt. allows the use of degraded forest land. A pragmatic policy by the Govt. for removing the constraints can only bail the industry out of this crisis. India has already lost 22 years debating this issue of degradation of lands and policies to restore them whereas developing countries like China, Indonesia, Brazil, Argentina and Chile have already surged ahead.

In case of failure to develop such plantations, the nation will pay a heavy price not only by way of imports and further degradation of forest but also loose other advantages in terms of tree cover, employment opportunities and other direct/indirect benefits as regards competition.

INTRODUCTION

The social, intellectual and industrial progress of a modern society is interwoven with the usage of paper and paper board, whether in the process of communications, business, exchange of information through newspapers, magazines and books, or in education and the development of literacy. The global Paper Industry is capital intensive and resource based, it is a growth industry with growth following GDP. The current per capita consumption of paper in India is 3.8 kg and is expected to more than double at 7.9 kg by 2015.

Considering the rapidly changing economic, technological and regulatory environment, the ability of the industry to adapt is severely impaired due to poor availability of cellulosic raw materials. The expanded use of plantation wood has widened the cost differences between areas based on short and medium

**J K Corp. Ltd.,
P.O. JAYKAYPUR-765 017
Rayagada (Orissa)**

CELLULOSIC RAW MATERIALS

rotation plantation fibers. Besides, countries facing reduced growth in production on account of raw material shortages and expanding domestic demand are being forced to reduce exports of paper, the result - reduced participation in world markets on account of poor cost competitiveness, capacity utilisation and costly imports.

Cellulosic raw materials utilised for production of pulp, paper and newsprint are categorised as

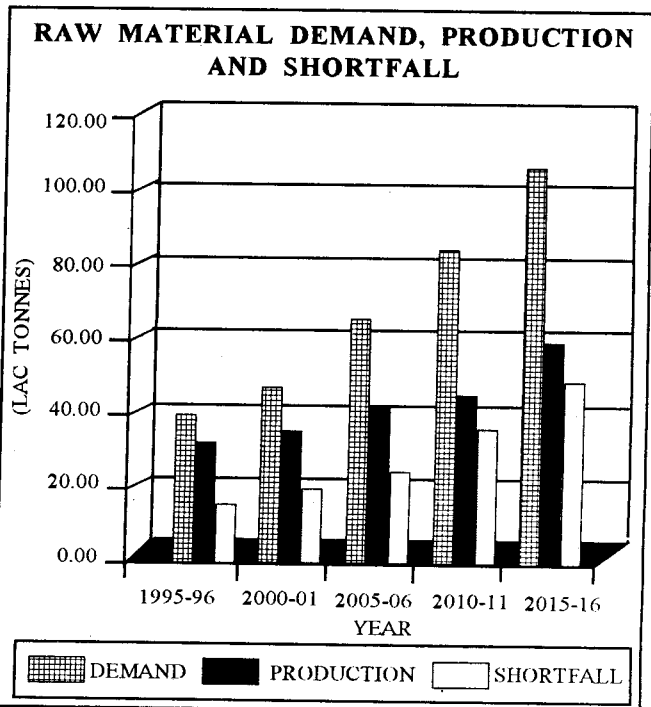
- (1) Forest based raw material
- (2) Agricultural residues
- (3) Recycled fibers and
- (4) Market pulp.

Besides Paper industry, the Rayon grade pulp units are the major pulpwood consuming industries. Their future requirements have therefore to be taken into account while presenting the raw material scenario of the Paper and Newsprint industry. The raw material requirement for production of paper, paperboard and newsprint at the levels of projected demand, forecast for the different categories of paper mills have been calculated on the basis of prudent formulas and available trends of capacity creation. The future raw material requirement of these three industries have been projected assuming that the production of pulp, paper and paper boards from forest-based raw materials will remain at the present level of about 42% till 2000-01 and subsequently increase to 45% on account of capacity creation being undertaken. (Reference No. 4&7)

FUTURE RAW MATERIAL AVAILABILITY

Forest Based Raw Material

Forest based raw material after accounting for plantations in the government as well as in the private sector, appear to be far too inadequate to meet the pulp and paper industry as estimated above, even at present the forest based paper mills are starved of raw material. The scenario shows further widening of gaps between supplies and demand of forest based raw material due to increasing restriction on felling based on normal silvicultural and sustained yield principles, increasing demand for non-industrial usage of bamboo and intense biotic pressures. The availability of bamboo is estimated at 15 lac tonnes, and that of pulpwood at 17 lac tonnes per annum. This is sufficient to manufacture 12.35 lac tonnes of paper taking into



Source: Action Plan for Pulp & Paper Industry, Report on Constraints & Status of Infrastructure, Vol III, (Jan. 1996).

account 2.6 tonnes of bamboo and hardwood on an average for every ton of paper manufactured. With continued shortage of forest-based raw materials their share in the total production of paper is declining and is currently at 42% from a peak of 84% in 1970.

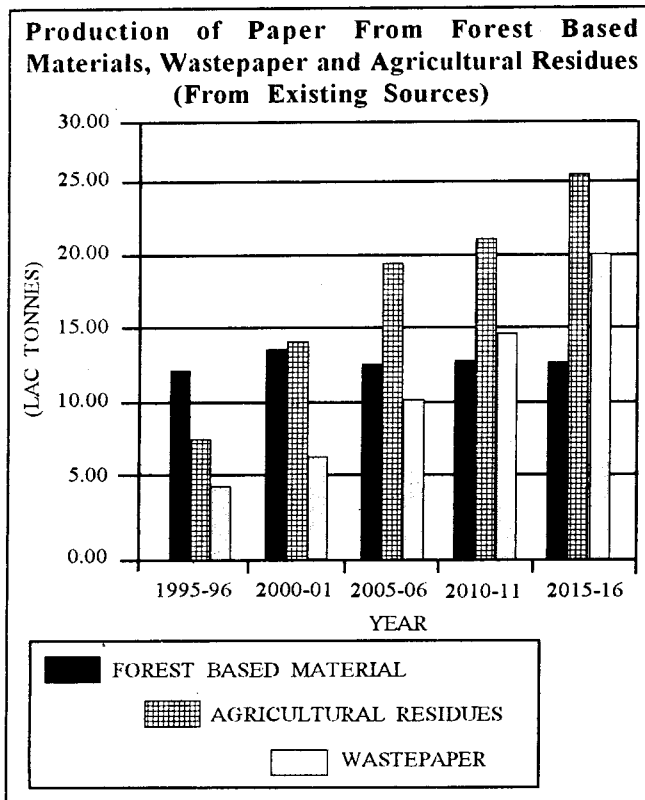
AVAILABILITY OF OTHER FIBROUS RAW MATERIAL

BAGASSE

The availability of sufficient quantity of bagasse for paper grade pulp production is highly doubtful as it is used for co-generation in the existing sugar mills, besides collection and transportation of the same from scattered areas is a problem. It is estimated that by the year 2000, only 10.9 lac tonnes of paper can be made from bagasse. Further, bagasse in itself is not sufficient to make suitable grade of paper and has to be blended with long fiber pulp upto atleast 30% of the furnish.

STRAW

The Development Council for Pulp, Paper and Allied Industries, Report of 1990 has indicated that only 2.5 Lac tonnes of paper can be produced from



Source: Action Plan for Pulp & Paper Industry, Report on Constraints & Status of Infrastructure, Vol III, (Jan. 1996)

straw. It is not expected to increase any further due to non-availability of suitable technology for conversion into pulp and scattered availability of straw which rules out the setting up of an economic sized plant (1 lac TPA.)

WASTE PAPER

Out of the total paper and paperboard produced in India, the present availability of paper for recycling is only about 15%. In 1994-95 nearly 3 lac tonnes were imported, but the availability is likely to suffer due to widespread adoption of recycling in the developed and fiber deficient countries. This is already pushing up prices of waste paper in the international market and is further aggravated due to the falling value of the Rupee.

Assuming 45% of wood-based fiber as raw material, pulpwood requirement for production of 30 lac tonnes of paper & paperboards will be of the order of 84 lac tonnes pulpwood by 2005-06. This would be 48.69 lac tonnes of paper, which translates into 136 lac tonnes pulpwood by 2015-16.

CONSEQUENCES OF SHORTAGE

The capacity utilisation of the existing units is decreasing due to the shortage of raw materials and further addition of capacity for meeting future demand will be hampered. Industry is already resorting to import of raw material besides paper, paperboard and newsprint. In the absence of any improvement in the supply of raw materials the requirement can only be met through imports. The foreign exchange that would be required for import of pulp to cover shortfall in production is projected at Rs. 3,290 crores in 2005-06 and at Rs. 15,265 crores in 2015-16. Whereas, the cost of pulp from plantations is projected as Rs. 2,790 crores in 2005-06 and Rs. 12,980 crores in 2015-16.

Table-1
Comparison of Cost of Pulp with Pulpwood from Indigenous Plantations, Existing Sources & Imported Pulp (Projections)

YEAR	COST OF PULP (IN Rs./Tonne)		
	THROUGH INDIGENOUS PLANTATIONS***	INDIGENOUS PULP**	COST OF IMPORTED PULP*
2005-06	24480	33950	28789
2010-11	32760	45430	38526
2015-16	43835	60800	51557

* Cost of imported pulp has been taken at current price of US\$ 425/MT and inflation of 6% per year, US\$ 1=42.50

** Cost of Wood assumed at Rs. 5800, Conversion cost at Rs. 8000, Capital related costs at Rs. 7500 & inflation of 6% per year.

*** Cost of pulp from indigenous plantations have been taken as per above except for wood cost which is taken from Table-2.

Source: India Vs. Indonesia: A Case Study- Document prepared for Development Council For Pulp, Paper & Allied Industries (1997).

For import of finished paper and newsprint, the foreign exchange outflow in the future could be much more owing to cost escalation and further devaluation of the rupee. Imports of pulp, paper and raw materials into India are an avoidable luxury considering that there is adequate land for raising pulpwood plantations in 10-15 years.

MEASURES TO AUGMENT FOREST BASED RAW MATERIALS

INDUSTRIAL PLANTATIONS

It is evident that the current requirement and growing demand cannot be met by our existing sources. Wood fiber production on degraded forest lands by the industry offers a promising prospect in India. India has abundant degraded forest lands (31.85 million ha.) which need to be developed, it also has a comparative advantage in establishing quick growing high yielding plantations due to the abundance of sunlight, labour and prolonged growing season. Besides, Govt. resources are limited to take up management of these lands on a sustainable basis, considering that Rs. 1,28,000 crores is required for the restoration of degraded forest land @ Rs. 40,000/ha.). According to the State of the Forest Report, 1997, by the Forest Survey of India, the country has lost 1.77 million ha. of dense forest cover as compared to the 1995 assessment.

The cost of indigenous raw material at present ranges from Rs. 2,250-Rs. 2,750/ADT depending on the source. To satisfy demand in the year 2005-06 we would require 1.05 lac ha. of plantations assuming a likely yield of 80 tonnes of pulpwood/ha. The cost of raising plantations (at current cost with 6% inflation) is projected at Rs. 934 crores for the year 2005-06 (Refer Table 2). The foreign exchange outflow for the import of 1.8 lac tonnes of paper and paperboards, 5.47 lac tonnes of newsprint and 6.14 lac tonnes of pulp and wastepaper was Rs. 2,650 crores during 1996-97.

Industry has the requisite managerial, financial and technological means for the development of industrial plantations. Therefore it is imperative that we plan and develop large-scale plantations on a scientific basis. Intensively managed plantations based on genetically improved planting stock and sound silvicultural practices can achieve productivity levels of 20-40 cubic metres/ha./year even on marginal lands. Thus 1 ha. of such plantation can save 20 ha. of natural forests, considering the future incremental

growth in natural forests. The future requirement of land could be lesser taking into account the rotational effect and advances in technology based plantations. The number of mandays that would be generated as a result will be 450 mandays per ha. of plantation, other benefits in the form of availability of firewood, fodder, conservation of natural forests and the resultant spin-offs in terms of environmental and ecological benefits to society will be tremendous.

The industry has indicated its willingness to invest in the establishment and management of plantations if the Government allows the use of degraded forest lands either on long term lease or mutually beneficial basis, executed as joint ventures with the Government Forest Depts. Corporations. Nearly a dozen such projects covering an area of 1,50,000 Ha. have been turned down by the Government on the ground of the Forest Conservation Act.

FARM FORESTRY

Many industrial units have been left with no option but to find their own raw material and have initiated farm forestry plantations for wood fiber development by motivating farmers to plant high yielding species and providing assured market for the produce. They will continue to encourage the same in the future through supply of high quality planting material and effective technical and extension services. However, this source can only meet a part of the demand for pulpwood and timber. It is not a captive and dependable source because of changing land use patterns based on cost/benefit aspects and precedence of food crops over wood production, the credit facilities available are further curbed due to rural indebtedness and the small size of holdings. Besides, the fairly long gestation period is beyond the economic sustenance of most farmers. The average area planted with trees by farmers does not exceed 2 ha. and not more than 5-6 farmers per village opt for it. For industrial units extensive areas in small blocks and groups of trees are not conducive to economic and scientific management, harvest and transport of raw material.

CONSTRAINTS

AVAILABILITY OF LAND FOR RAISING PULPWOOD

The Wastelands Development Board has indicated that out of a total of 329 million hectares of land,

TABLE-2 COST OF TECHNOLOGY BASED PLANTATIONS

Plantation Particulars	YEAR OF PLANTATIONS																	TOTAL # Re. Crores	
	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16		
Requirement of land (lac ha.)	1.05	1.11	1.16	1.22	1.28	1.34	1.41	1.48	1.55	1.62	1.70								
Yearly input Cost (in Rs. Crores)	228.4	94.8	115.1	110.4	113.6	136.9	135.1	150.8											934.3
Inclusive of Interest @ 15%	255.0	283.6	105.9	128.4	123.2	126.8	152.8	167.7	186.5	210.1	207.3	230.6	256.4	285.1	317.1	352.6	392.1		1042.9
			283.6	117.7	142.8	137.0	141.0	169.9	186.5	210.1	207.3	230.6	256.4	285.1	317.1	352.6	392.1		1159.7
			315.3	130.9	158.8	152.4	156.8	186.5	210.1	207.3	230.6	256.4	285.1	317.1	352.6	392.1			1289.6
				350.7	389.9	161.9	196.4	188.4	193.9	233.6	230.6	256.4	285.1	317.1	352.6	392.1			1434.1
					433.6	482.2	200.2	242.8	222.6	270.1	259.1	266.7	285.1	317.1	352.6	392.1			1594.7
									596.3	663.1	663.1	663.1	663.1	663.1	663.1	663.1			1773.4
Total Cost (in Rs.)	228.4	349.9	504.5	671.9	861.2	1095.0	1353.4	1505.6	1674.2	1861.7	2070.3	1564.8	1434.0	1223.3	1004.1	749.8	392.1		18544.00

Denotes Total Cost of Plantations as per area planted

Year of Yield	Pulpwood requirement to be met (in lac tonnes)
2005-06	84.12
2006-07	88.58
2007-08	92.93
2008-09	97.49
2009-10	102.27
2010-11	107.29
2011-12	112.55
2012-13	118.08
2013-14	123.87
2014-15	129.95
2015-16	136.33

* Species considered : All fast growing pulpwood species like Eucalyptus, Casuarina, Subabool, Acacia etc.

** Through a likely yield of 120 MT/ha. from 1st crop i.e. 80ADT/ha.

*** Forest based raw materials meet 45% of the demand between 2004-05 to 2015-16.

**** 1 MT of Paper & paperboards require 2.8 ADT of pulpwood.

175 million ha comprises of wastelands with the following distribution -40 million ha. of agricultural wastelands, 40 million ha. of degraded Forest & scrub lands and another 95 million ha. of pastures and culturable wastes. Most of this land excepting the degraded forest lands are burdened with rights of grazing etc. and are not available in large compact blocks near existing paper mills. Thus getting hold of land for sustained development of industrial wood plantations is very difficult.

GOVERNMENT POLICY & LEGISLATION

Existing Government legislation like the Land Reforms Acts of various states, the Forest Conservation Act, 1980 and the National Forest Policy, 1988 prohibit the leasing of land to individuals, Corporate bodies and Joint Sector Corporation. The Corporate sector has been kept out of taking an active part in afforestation of fear that such land may be ceded for good.

LACK OF INCENTIVES

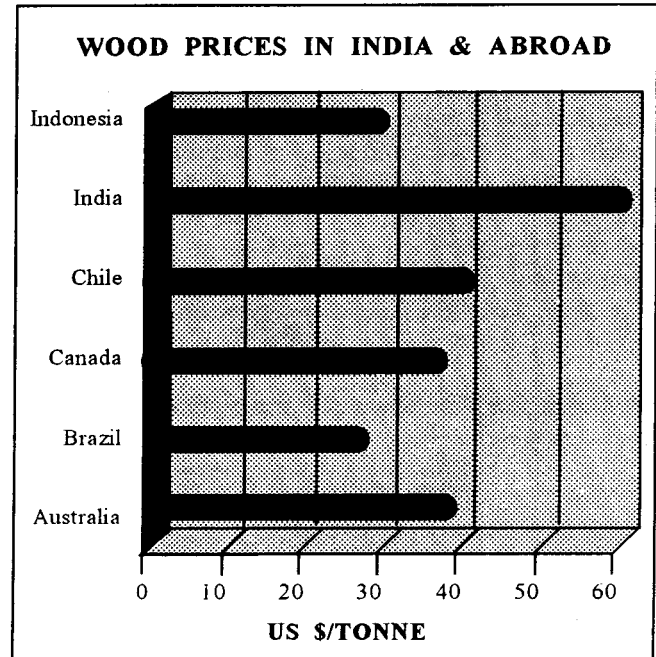
Raising of large-scale industrial plantations on degraded forest lands is not considered an attractive financial proposition, primarily because of the huge financial outlay involved, which industry with the prevailing interest rate structures cannot afford. Incentives in the form of planting grants, tax concessions, concessional credit and secured land tenure are required if significant amounts of industrial plantations are to be raised.

TECHNOLOGY & MANAGEMENT KNOW - HOW

To harness high productivity - diffusion of high quality genetic material and silvicultural practices efficient wood harvesting and transportation systems and training and development of personnel is required, which not very many companies have initiated.

ENVIRONMENTAL CONSIDERATIONS

The product is based on a renewable resource yet it has strong environmental boundaries. Today, total competitiveness weaves economic and environmental competitiveness into an inseparable strategy. While small units may serve as a useful complement to fulfill needs, it is the large units that have the resources to improve the environmental performance and the total performance of the industry as a whole.



Source: Report on Constraints & Status of Infrastructure, Vol. III, (1996).

COMPARISON WITH OTHER COUNTRIES

India has lost 22 valuable years debating the issue of degradation of lands and policies to restore them. Many developing countries like China, Indonesia, Brazil, Argentina and Chile have gone ahead in promoting large-scale technology based plantations through innovative policy, financial/fiscal incentives. These countries are fast emerging as major global players in international competition for high quality and cost effective pulp/paper and other wood based products having made rapid strides in creating large and cost effective raw material base for their sustained growth and development.

In Indonesia in order to encourage domestic private sector and foreign Joint sector investment in expansion as well as establishment of new capacity in the pulp and paper sector, the Govt. launched a policy encouraging industrial plantations, called Hutan Tanaman Industri (HTI). The objective was to establish 6 million ha. of industrial plantations in 15 year. Under HTI the private sector is being granted forest lands (mostly degraded and cut-over) to raise industrial plantations with their own resources (supported by Govt. equity and institutional credit), the concession is valid for 43 years and is limited to 3 lac ha. for each company. By 1996, 17 HTI concessions covering 6.3 million ha. of degraded lands had been granted, resulting in 2.17 million ha. of plantation. Another

22 HTI concessions were granted in 1997 covering another 3 million ha. Govt. policy encourages industry to shift towards plantation wood, currently 1.6 ha. area is being planted every year, and by the year 2008 it is expected all pulp would be from plantation wood.

The average plantation wood costs range between US \$ 25 - US \$ 30/ MT at factory and pulp costs US \$ 230/MT, as compared to cost of pulpwood in India which is US \$ 60-65 MT at factory and US \$360/MT for pulp. Export earnings from Paper & Pulp by Indonesia have risen from US \$300 million in 1991 to US \$1389 million in 1996, during the same period India was a net importer of Paper & Pulp.

CONCLUSION

The Indian Paper Industry is at cross roads due to the ongoing economic liberalisation in the country. Imported newsprint is available at cheaper rates and most domestic manufacturers are in doldrums. The survival of the large forest based mills is at stake due to the shortages in supplies of pulpwood and bamboo. Further, additional capacities to meet the projected demand of various grades of paper cannot be created with agro-based raw materials alone as these have to be substituted with other fiber furnisher by way of waste paper and market pulp. Besides, the availability of agricultural residues on a large-scale is in doubt. However, if the Indian Paper & Pulp Industry has to sustain itself and grow in this environment. Unless industrial plantations are raised on a large-scale, paper production in the country cannot keep pace with increasing demand and the only option would be imports.

National priorities demand that we re-orient our landuse policies and conservation strategies to achieve the full potential of our natural resources on a sustainable basis. Innovative policy changes to encourage active participation of all possible agencies including the corporate sector to restore green cover through plantations are the need of the hour. Raising large-scale industrial plantations through technology on degraded forest lands in the vicinity of the existing

mills would not only help in maintaining the viability of forest based units, but also bring in additional capacities by creating a secure and cost-effective raw material base to meet the projected demands. The requirement of land for industrial plantations constitutes only a fraction of land awaiting action on the afforestation front. In case of failure to develop such plantations, the nation will pay a heavy price not only by way of imports and further degradation of forests but also lose other advantages in terms of tree cover, employment opportunities and other direct/indirect benefits as regards competition.

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