

New Approaches to Forestry Vis-a-Vis Paper Industry in India

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Inter linked Productivity :

Paper is a valuable commodity and so are the forests. Both have profoundly affected the course of civilisation and human progress. In fact, the story of paper begins in the forests. In Indian context the paper begins its journey in the bamboo forests and mixed forests of various types, and now to some extent, in man made plantation forests. The productivity of a pulp and paper mill, therefore, is directly influenced by the productivity of forests which supply the basic cellulosic fibrous raw material to it. Several factors determine the level of productivity in a paper mill vis-a-vis the forests. These factors are—

1. Proximity of the forests to the mills
2. Terrain condition of the forests
3. Extractable tree population density and hence the total volume of pulpwood.
4. Quality of the wood available in the forests
5. Forest management and working methods employed
6. Product cost policies of the government in respect of the pulpwood.

1. Proximity of the forests to the mills is obviously a major factor that determines the cost of pulpwood at the mills. Many of the larger paper mills in India, at the time of their inception, were planned to draw their raw material supplies from within an average radius of 100 kilometres. Today these mills have been forced to widen their supply base area to nearly five times of the originally projected radius. Natural forest resources are shrinking at an alarming rate and the current wood supply trends indicate that further widening of the supply base area will become inevi-

table in foreseeable future. At a certain point the pulpwood costs are bound to become prohibitive resulting in very low productivity of the concerned paper mill. Average transportation costs of pulpwood today constitute 40-50 percent of landed cost at many a mills in India. With rising energy costs the transportation factor alone may become a major constraint on paper mill productivity.

2. The terrain conditions of most forest areas in the country are favourable for undertaking normal silvicultural and logging operations within economic limits.

3. Density of extractable trees varies considerably from forests as most of Indian forests are not under even aged management system. Composition of natural forests in the country does not allow for this type of management. It, consequently, poses some restraints in the economic working of the forests.

4. Quality of pulpwood available in our forests varies greatly due to multiplicity of species and the variable wood quality. Indian forests can claim a wealth of about 800 tree species and in any given tract of natural forests it is normal to identify 50-60 species with woods of different characteristics. This quality variation affects the economics of pulp production as well as the quality of paper.

5. Management and working methods employed in forests affect the cost of pulpwood. The prevalent labour intensive working is still a economically favourable proposition for the paper industry. Management of bamboo forests, however, is a grave matter of concern. Due to improper felling and poor protection against

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damage to regeneration bamboo forests and illicit felling the supply is gradually dwindling. In M. P. the annual availability of bamboo is estimated at 8 lac tons by a FICCI studies in Seventies. Even after allowing for 40 percent utilisation for non-industrial purposes, there should be available surplus of 4-5 lacs tons for paper industry. Yet, paper mills in M. P. have been buying bamboo from Maharashtra, Assam and West Bengal in the absence of assured supplies by the State Government. Recently the government has expressed its inability to maintain sustained supplies of even 1.5 lac MT of bamboo in the coming decade.

6. Great variability exists in the pricing structure of bamboo and hardwoods from state to state, while the prices of all other inputs are determined at national level and hence are remarkably uniform. The prices of paper is also determined at the national level. Taking the example of bamboo again, the royalties charged by various state governments show remarkable variation. For example, during 1984-85 royalties on per metric tons of bamboo were Rs. 30.00 in Tamil Nadu, Rs. 105.00 in Kerala, Rs. 115.00 in Orissa, Rs. 180.00 in Karnataka and Rs. 201.00 in M. P. In Andhra Pradesh the government, during the same year, sought to revise the royalty to Rs 318.00. It is obvious that if a national productivity scale is to be framed for the paper industry then a nationally uniform pricing structure must be evolved for the basic inputs. At present the forest raw material is the only basic input which is not covered by a national pricing policy.

The raw material supply picture that emerges from above considerations has produced retrograde effect on the productivity of pulp and paper mills throughout India. Permanent or intermittent closure of many small and larger units has been largely assisted by the uneconomic raw material supply. The productivity scale of a paper mill in above discussed context can be expressed as balanced only if optimum quality wood is made available to it at reasonable rates on a sustained basis.

Inadequacy of present frame work :

Radical changes in national and industrial outlook and approach to forestry are, therefore, urgently required if the productivity of existing mills is to be increased. The new approach must consider the following points—

1. The national forest area is getting reduced at alarming rate each year. The true "forests" cover hardly 12 percent of the land and "in the record forest area" of 23 percent also includes scrub and grass forests and barren lands classified under forest category. The National Forest Policy aims at forest cover over 33 percent of the land mass. To achieve this objective alone forests must be created in additional 35-40 million hectare to add to the 70 million hectares of already present "classified forests" in the country. If, however, only true forests are aimed at, then the area required to be put under new forests comes to 65-70 million hectares.

2. The exploitation pressure and consequent forest area diminution is not only due to industrial activity but also because of illegal fellings, poor management, rapid urbanisation increasing population. On an average one percent of the forest area goes to non-forestry sector every year. States with highly developed agriculture have the poorest percentage of land under forests (Punjab 1.96 percent, Haryana 3.3 percent).

3. Overall productivity of Indian forests is much below the accepted norms. It is estimated that Indian forests have an average growing stock of about 4) cubic metres per hectare. Swedish forests, in comparison, have a growing stock of nearly 90 cubic metres per hectare. In tropical conditions the tree growth is much faster than in colder climatic conditions. The figures of stocking for Indian forests are, therefore, all the more surprising. Lack of application in the matter of silvicultural management is largely responsible for this. Per hectare productivity of mixed species forests can not be raised immediately to any perceptible level. However, concrete steps if taken, can assist in raising the productivity of bamboo forests within a short span of period. These steps include protection of bamboo forests from grazing, intensive management of regeneration forests, strict adherence to silvicultural felling rules and proper management of bamboo stands which should include periodical application of fertilisers and cleaning the clump to allow vigorous new shoot growth

4. Indian pulp and paper industry relies exclusively on bamboo for its long fibre requirements. Other long fibred class of plants, the conifers, are located in mountainous Himalayan regions with a growing stock of 400 million cubic metres but which is now an ecologically protected commodity and hence not available to the industry. Bamboo forests, scattered through out the

country, are estimated to have a supply potential of only 4 million tons. Hardwoods are the main component of Indian forests with a growing stock of about 2500 million cubic metres. Hardwoods, however, pose many utilisation problems like suitability of multitude of species as exclusive furnish for paper. This is probably one area where nothing much can be done by the government or the industry.

5. Growth of forest based industries is bound to accelerate with increasing demands on forest products, mainly paper, whereas the current trends of forest development and supply do not appear to be ready to support this expected industrial growth. In 1984 the total production of paper was 1.4 million tons. By 1991 the country will require annual production of paper to the tune of 2.8 million tons and by the year 2000 about 4.5 million tons to meet the demands of ever increasing population and literacy. To fully meet the demand of paper by year 2000 the paper industry in India will require nearly 9 million tons of bamboo and about 5 million tons of wood.

Present raw material supply frame-work has contributed significantly to the poor 1984 capacity utilisation of only 65 percent by the paper industry. To increase the level of capacity utilisation and meet the challenge of year 2000 it is essential to develop a new frame-work of forestry in the country with special reference to pulp and paper industry and its productivity.

Plantation forestry. the only solution, but

Augmentation of existing forest supplies with those from man made pulp wood forests seems to be the only practical solution. Estimates suggest that about 8 million hectares of plantations have been raised in the country so far. Most of these plantations are of Eucalyptus followed by teak, shisham, bamboos and other wood species. In fifties and sixties when Eucalyptus was extensively planted, it was expected that the wood produced from these plantations will be made available to the pulp and paper industry. Ironically, in recent years Eucalyptus wood has found many other uses like transmission line poles, construction material, tool handles, furniture and carved goods. This has raised the price of Eucalyptus wood to an extent where pulp and paper mills find it at least 50

percent costlier than the hardwood billets from natural forests. In some states, thus, the 'pulp wood-oriented' Eucalyptus is finding all sorts of utilisation sans pulp and paper manufacture.

The plantation forestry in the country and its supply pattern in its present frame-work is, therefore, not likely to be of any comfort to the paper industry in coming years.

New plantation policy required—

In the interest of maintaining high levels of productivity in the pulp and paper industry, the government has to consider framing of a plantation policy which ensures sustained raw material supplies a decade from now. The new policy must aim at—

(a) Raising exclusive pulpwood plantations in the proximity of the existing or proposed mills in sufficient area so that raw material supplies are assured in perpetuity.

(b) Supplying the plantation wood to the mills at a reasonable royalty. It has to be remembered that pulpwood costs can never compete with furniture or construction wood costs. A tiered costing policy has to be devised and implemented at national level to safeguard the interests of the industry.

In last two or three years some state governments have taken steps to encourage industrial plantations. Seeing the state of raw material supplies to paper mills it has been decided to allot forest lands for exclusive development of pulpwood plantations. In the absence of a national policy, however, radically different approaches are emerging out of this decision. In some states (like Orissa) the paper mills are being made licencees of forest land where they can develop their own plantations. In some states, however, (like M.P.) the paper mills are being invited to form joint sector companies with the government undertakings to take up the plantation activities. There are advantages and disadvantages with both the systems but the balance tilts strongly in favour of free enterprise which allows for a constraint free working and consequent rapid progress. Terms and conditions of many of the proposed plantation agreements are not clear in respect of financing, working and marketing

principles which may become a cause of discord and resultant failure of the projects. In either case, what is important is to have a uniform national policy which allows for even distribution and application of working principles.

In some of the above state policy decisions it has been stated that only eroded forest tracts will be made available for pulpwood plantations. Obvious implications of this decision are —

- (1) Low productivity of pulpwood in these areas under normal and economical silvicultural practices;
- (2) Very high costs in the form of additional inputs if higher productivity is aimed at in these eroded forests;
- (3) A recent survey undertaken by the Institute in M.P. also suggest that the eroded forest areas which can be given to the industry are quite small and far flung. The management of such areas under plantations is likely to involve high costs.

As a result, the ultimate cost of the pulpwood will become uneconomical, thus affecting inevitably the prices of paper and paper products.

It is, therefore, essential to allocate productive and contiguous areas only for pulpwood plantations. The eroded forests have continued to remain so since long because the plantation agencies themselves have failed to make them productive and have had to concentrate their efforts mostly in rehabilitating clear felled areas. Yield pattern data available from various plantation areas indicate that productivity of eroded forests can go down by as much as 100 percent in comparison to clear felled areas which were recently well stocked. In eroded forests long exposure to atmospheric agencies has resulted in removal of fertile upper crusts and exposure of more or less sterile substrata.

If at all the industrial plantations are required to be developed in eroded forests or wastelands then it is a reasonable expectation from the government to facilitate the plantation activity by way of low interest loans and lower rates of royalty on the plantation produce. In early seventies Brazil had encouraged plantation development by offering loans on interest

rate which was considerably less than the prevailing lending rate.

In the context of proposed plantation policy it can be pointed out that the eroded forests and wastelands are in a 'zero-return' state and hence are a liability—economical, environmental as well as social. However when the matter of their transfer to the industry is being contemplated, it is also being proposed that normal land rent should be levied as well as the full royalty on the produce. A reasonably balanced view has to be adopted in this matter lest the industry suspects a policy of squeeze and not encouragement.

In a recently concluded meeting of the National Land Use and Waste Land Development Council, it has been decided that forest based industries will be encouraged to grow their own plantations in waste lands. The council noted that there are about 123 million hectares of waste lands in the country and that by the year 2000, about 2.4 millions hectares will need to be leased to the industries. The terms and conditions of the lease for these proposed allocations have not yet been spelled out. It is to be hoped that favourable conditions on above suggested lines will be created for the paper industry to take up the challenge of wasteland development.

Plantation and pollution control can go together—

Importance of proximity of catchment forest areas to the paper mills has been stressed earlier in this paper. It is a determining factor of the raw material costs to the mill. Under the new policy if the plantations are encouraged and allowed to be established in close proximity to the mills where it is geographically possible then the mills can use this opportunity in abatement of water pollution. Pollution of rivers and reservoirs by the liquid effluents coming out of the mills is an embarrassing but unavoidable fact. In a recently concluded 8 year long research project by our Institute and Orient Paper Mills, it has been established that most noxious of the effluent, the kraft pulp mill alkaline effluent, can be successfully used to irrigate Eucalyptus plantations (result under publication). The studies have shown the effluent irrigation can result in wood yield 50 percent higher than unirrigated plantations. There was no detrimental effect on the soil physico chemical properties or wood characteristics. The economics

of irrigational use of effluents has been found to be much favourable in comparison to conventional treatment of effluents.

The government has voiced grave concern over the role of paper industry in river water pollution. It can, therefore, give active consideration to locating plantations close to existing mills wherever possible so that the mills can discharge their entire effluents advantageously in the plantation area. The above studies have shown that 3600 acres of Eucalyptus plantations can beneficially use an entire volume of 3.5 million gallons brown kraft pulp mill effluent waters produced daily.

Social forestry has big potential —

The role of social or farm forestry in supplementing the existing raw material supplies cannot be undermined. If properly planned and implemented this approach can provide substantial fibrous raw material. Concerted efforts by the government and paper industry will be required in persuading the land owners to take up the scheme, to provide plantation technology as applicable to them, give seedlings and other inputs, assist them in the rotation long management of the farm forests and finally, providing them assured and profitable market.

Small and marginal farmers can increase the level of their income by adopting farm forestry. Experiments in various parts of the country have shown that cultivation of agricultural crops can be coupled with growing of tree species on bunds or in widely spaced rows which do not interfere with normal agricultural practices. The paper mills have to identify the catchment area for taking up farm forestry, initiate the steps for farmers education and provide necessary inputs to the farmers. It is important to create a social forestry cell in each paper mill with full time and committed personnel, who must take up the job of implementing and monitoring the farm forestry operations.

In some states the government have also offered to allocate forest lands to individuals or cooperatives for taking up plantations. Individuals can get upto 10 hectares and cooperatives upto 100 hectares under this scheme. Paper mills can take advantage of this scheme by encouraging individuals or cooperatives by contracting to buy off the raw material from such

plantation holdings. The government should liberalise their policies in this respect by reducing the rates of land rent and royalty on wood produced on these land allotments.

The government of M.P. is preparing to launch a novel forestry scheme which paper mills may find interesting. Under this scheme, the forest department will raise plantations of bamboo and Eucalyptus in 5 hectare blocks and then give this area to selected poorest and landless of the area for protection and maintenance. During the rotation period the beneficiary will receive a honorarium of Rs. 150/- per month and the beneficiary will be entitled to the produce from this area. In Shahdol district 60 such beneficiaries have been selected for the year 1986. It is planned to cover 600 landless people and 3000 hectares of wastelands in next 10 years. If this scheme is carried through successfully as planned, then the neighbourhood paper mills can look forward to pulpwood supply from 300 ha. of plantations each year after 10 years. Many aspects of the scheme are still to be worked out by government. The Indian paper industry, on its part, can think of participating in the scheme in an appropriate manner and encourage these schemes in their neighbourhood by offering to join hands with the state governments.

The social or farm forestry can generate additional employment in community or Panchayat forests as well as additional income for small and marginal farmers. For the paper industry involvement in social forestry in its neighbourhood villages can mean economic supply of wood as well as satisfaction of fulfilling its social responsibilities.

Improving the current management —

The measures and new approaches discussed above can have profound effect on raw material supply and hence productivity in a paper mill only after a decade. In the meantime, to tide over the period, steps have to be taken to prop up the supply line by improving the management of present forest resources.

The most important need is improving the supply of bamboo which is the mainstay of paper industry in India. Factors responsible for decreasing supplies of

bamboo have already been discussed. It is suggested that the governments identify and demarcate adequate bamboo forest areas which are steadily falling in to the category of eroded and unproductive forests (which, nevertheless, have not flowered and have good potential) and give these areas to paper mills for improvement and working to meet their own requirements. The industry, in the interest of increasing productivity, shall be able to take up the challenge. An area of 30,000 to 40,000 hectares of bamboo forest can meet the whole annual demand of a large paper mill. It would be rational to join this allocation with the proposed allocation of waste lands for industrial plantations to the industry or joint sector companies being formed for the purpose.

Role of forestry operations does not end with the felling and procurement of raw material from the forests. Management of felled material in the forests and mill yard is part of the forestry exercising considerable influence on productivity. Paper mills have to play significant role in proper stacking of bamboo and wood, prevention of fungal rots, insect damage and deterioration due to age. All these affect the pulp yield and net returns from per unit area forest. 10 to 15 percent losses in pulp yield can be attributed to poor quality bamboo and wood. Quality of the pulp is also known to suffer. The causative factors are such which can be easily amended if proper care is taken by the mills. In a tropical climate the occurrence of rots, insects and rapid ageing is inevitable. Only proper stacking and timely utilisation can prevent these damages.

Concept of full tree utilisation is gaining popularity in many advanced countries. This means fuller

utilisation of forest resources: If small diameter wood and side branches of bamboo are also recovered for pulp manufacture, then a net gain of 15-20 percent can be insured. Felling agencies and the mills should jointly take effective steps in this direction.

To conclude

The productivity in a paper mill is intrinsically linked with the productivity of the forests which fulfill its demand for woody raw material and forestry operations which ensure efficiency of utilisation. Time is gradually slipping by when natural forest resources were considered sufficient to meet the demands of the ever expanding pulp and paper industry. A few years from now the plantation forestry and social or farm forestry may be the only answers to the problem of economic raw material supply. The frame-work of present day plantation forestry may not be found suitable at that juncture. New and radical approaches are required to modify it appropriately. Some serious thinking is going on at present at various levels and it should be hoped that this thinking today results in a radically different and dynamic policy which the Indian Pulp and Paper Industry can adopt and implement for a better and productive tomorrow.

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