

"Greening of the earth - necessity and role of pulp and paper industry" with particular reference to the Andhra Pradesh paper mills limited.

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According to norms, 33% of the land should be under forest cover though the present percentage in India is only 22. Due to over exploitation, the forest cover in the country has shrunk alarmingly. The environmental angle has come in. There is an increasing ecological imbalance that threatens to bring with it natural calamities.

The most important and sophisticated sector in forest-based industries is PULP AND PAPER INDUSTRY. The importance is both in respect of capital investment and technology adopted. Till recent past the INDUSTRY depended on forests in the public sector for its raw material requirements, both BAMBOO AND HARDWOOD.

As a first step towards combating the problem the Govt, of India has issued the National Forest Policy which says "the practice of supply of forest produce to the Industry should cease". It is planned to stop extraction of major forest produce like Bamboo and Hardwood by the end of the Eighth Five Year Plan. No forest-based enterprise, except at the village or cottage level, will be permitted in future unless its raw material requirements are tied up.

In accordance with the National Forest Policy, Pulp and Paper Mills in India have, perforce, to turn to sources other than natural forests for their raw material requirements. It is worthwhile examining the steps taken/contemplated by the Indian Pulp and Paper Industry in this quest. An attempt is made in this Paper to present the experience of The Andhra Pradesh Mills Ltd., (APPM) and the experiments in Andhra Pradesh in this regard, the case of the Pulp and Paper Industry in India as a whole cannot be very different.

The raw material originally assured for the APPM located at Rajahmundry in East Godavari District of Andhra Pradesh State, by the Forest Department is one Lakh tonnes of BAMBOO and 75,000 tonnes of HARDWOOD per year. Till 1975, due to easy availability, the Mill was using only BAMBOO PULP for the manufacture of paper. With the coming in to being of two more PAPER MILLS, one in Khammam District and the other in KURNOOL District of this STATE, it was found that the production of BAMBOO in A.P. State was not enough to meet the requirements of the four Mills i.e. the two old Mills, viz., APPM and the Sirpur Paper Mills, and the two new Mills, the Bhadrachalam Paper Boards and the Sree Rayalaseema Paper Mills. Faced with this contingency, APPM developed technology rendering use of short fibre yielding mixed hardwoods possible alongwith BAMBOO.

The enactment of THE A.P. FOREST PRODUCE (FIXATION OF SELLING PRICES) Act in 1989 by the State Government, the existing Agreement running upto the year 1995 assuring supply of one lakh tonnes of BAMBOO annually, was abrogated and a new agreement was executed with the Government of A.P. for a Period of six years commencing from 1991 stipulating annual supply of 75,000 tonnes of Bamboo, with the initial selling price (earlier termed as Royalty) of Rs. 662/-per tonne which increased by 11% per year for the next three years at the end of which this would again be revised. An additional 7.5% price increase per year was also provided in the said Agreement tow-

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ards compensation for loss of moisture during the grace period of six months allowed, beyond the lease period, for lifting the material.

Supplies of Hardwood have been stopped from the year 1989-90 for environmental reasons.

Faced with this critical situation, arising out of the short supply of Bamboo by the State Forest Department and stoppage of supply of mixed hardwood, APPM had to resort to some quick technological innovations to reduce the consumption of bamboo considerably and increase proportionately the usage of HARDWOODS.

APPM normally needs about 1.35 lakh tonnes of Bamboo (as such basis) and about 1.25 lakh tonnes of Hardwood (as such basis) annually in the proportion of 60 : 40. However, due to the peculiar circumstances brought about by chronic shortfall in supply of BAMBOO, the company had to cut down the usage of bamboo and had to go for mixed hardwood in greater proportion. Now the Mill is being fed Bamboo and Hardwood in the ratio of 30:70. As such, the present requirement of bamboo is 75,000 tonnes and Hardwood requirement has gone upto 2,50,000 tonnes (as such basis). At this stage, it is relevant to point out that the actual receipts from the coupes allotted by the Forest Department do not exceed 50,000 tonnes of Bamboo per year although 75,000 tonnes have been promised. The enhanced requirement of hardwood is being met mostly by purchasing CASUARINA wood from the open market, undergoing considerable difficulties and facing stiff competition from other Industries.

Having realized that the supply of CASUARINA WOOD from the open market is not inexhaustible and it would not be possible to secure such large quantities of wood on a sustained basis in the coming years, APPM has embarked upon FARM FORESTRY PROGRAMME.

Farm Forestry Activities :

Having realised the need to support the farming community interested in growing tree crops in marginal lands with two fold objective of (i) increasing the potential of cellulosic raw material in its catch-

ment and (ii) giving an uplift to the economic status of weaker sections among them, APPM undertook a unique FARM FORESTRY PROGRAMME way back in 1977. Under this scheme, till the year 1985, more than 86 lakh polypot seedlings of EUCALYPT and SUBABUL were raised and distributed free of cost, incurring an expenditure of about Rs. 16 lakhs.

Realizing, again, that dependence upon the above two species is not safe, as these species are not favoured by the farming community in our catchment due to various reasons like the adverse propaganda EUCALYPT was subject to and the grazing susceptibility of SUBABUL necessitating high planting costs, intensive research was taken up in our laboratories, resulting in finding that CASUARINA species, locally known as SARUGUDU/CHOWKA, is quite suitable as pulpwood for product mix along with BAMBOO. Another advantage with this specie is that this could be cooked with bark on, unlike species like EUCALYPT and other hardwoods which need debarking before use.

Till recently, CASUARINA was being used mainly for scaffolding purposes, small timber and for firewood in the domestic front. This specie got a big boost now as it has been found suitable for making paper.

In order to encourage Casuarina cultivation during the year 1988-89 the Mill raised 10 lakh polypot seedlings of Casuarina and because of the good response from the farmers, during 1989-90 the number of Casuarina bag plants raised went up to 51 lakhs which were distributed free of cost to the farmers. Seeing the tremendous response and the encouraging trend during the year 1989-90, the Mill has taken up a massive programme of raising 100 lakhs polypot seedlings of CASUARINA for distribution during 1990-91 and this programme is continuing with the same vigour during 1991-92 and will continue in future also, notwithstanding the fairly, huge expenditure of nearly Rs. 40 lakhs on this every year. Apart from distribution of seedlings, technical assistance is also being rendered by APPM by closely monitoring the plantations of farmers.

Research Activity :

With a view to boosting up the per unit yield of CASUARINA, from the existing 50 to 75 tonnes per hectare when harvested in 5 to 6 years, by atleast 20 to 30%, with the multiple objectives of increasing the potential of this wood in our catchment and adding to the income of the CASUARINA growing farmers, who are mostly small and marginal farmers belonging to weaker sections of the society, the Mill has embarked upon the scheme for production of clonally propagated seedlings of selected PLUS trees of CASUARINA in the MIST CHAMBER erected in the Mill premises at Rajahmundry. It is programmed to produce 50,000 superior clonal CASUARINA seedlings and plant them for seed production purposes in about 10 hectares for securing quality seed required by the Mill to produce one CRORE polypot seedlings per year for distribution to the farmers.

A programme for raising clonal seedlings of CASUARINA for supply to farmers on a limited scale for raising their own plantations is also proposed; improvised MIST CHAMBER will be used to produce these clonal seedlings at various dispersed nursery centres of the Mill.

It is also proposed to collaborate with the RESEARCH WING of the A.P. State Forest Department in their research programme, including TISSUE CULTURE, to produce improved planting material of the species suitable for production of pulpwood for our Industry.

Adopting these different methods, it is hoped to increase the availability of CASUARINA wood in the immediate catchment comprising of East Godavari, West Godavari and Visakhapatnam Districts by atleast 50% within next years.

OTHER SCHEMES :

Industrial Plantations :

Realizing that the safest way to ensure supplies of raw material is to have CAPTIVE PLANTATIONS as close to the Mills as possible, APPM is collaborating with the Andhra Pradesh Forest Development Corporation, in locating areas in our catchment

in the degraded forest blocks, for the scheme of planting such areas with EUCALYPT, CASUARINA, etc. It is expected that this scheme would be grounded latest by 1993. Unfortunately, degraded forest lands in the catchment of the Mills are limited amounting to about 3,000 hectares only whereas Mill requirements for planting, for a sustained supply of raw materials through such schemes, are in the order of 30,000 hectares.

Farm Forestry Scheme :

APPM is also shortly commencing a FARM FORESTRY programme, to be implemented with refinancing by NABARD and the local nationalised Banks. This scheme, which is styled as AREA DEVELOPMENT SCHEME FOR FINANCING CASUARINA PLANTATIONS is proposed to be taken up by way of a PILOT PROJECT, over about 400 hectares during 1992 and 1993, to start with in EAST GODAVARI DISTRICT. The salient features of the SCHEME are;

Scheme Area: Fourteen coastal villages located at a distance of upto 10 Kms from the sea coast are selected. More than 70% of the farmers in these villages are small and marginal farmers. The soils are sandy/sandy loams suitable for growing CASUARINA. The average rain fall is 1,000 mm spread over 4 to 5 months from mid-June. The lands proposed under the SCHEME are mostly lying fallow or under marginal rain-fed agriculture.

Scheme Objectives: To bring fallow and other waste lands under tree crops, to provide additional income to the farmers mostly belonging to weaker sections while making available to the Paper Mill the wood grown on such lands, thereby reducing the dependence of the Mill for supply from other sources and to improve the ecology of the area by increasing the tree cover, to serve as wind breaks by reducing wind velocity during cyclones to which these areas are periodically subject to and to meet the local requirements of fire-wood and small timber.

Target Group: All small and marginal farmers with cultivable rights over their lands, inclined to take up tree farming, are brought under the SCHEME. The

average land holding of these farmers ranges between 0.5 to 1.0 hectare.

Phasing Of The Programme : The scheme is proposed to be implemented over TWO YEARS, covering an area of over 400 hectares. The loan component to be distributed is expected to be Rs. 33 lakhs and the number of farmers who would be covered under the SCHEME is around 800.

Technical Aspects: The suitability of the plots selected under the SCHEME for raising CASUARINA Plantations is determined, firstly, by virtue of their location along the sea coast, with soils mostly sandy or sandy loams, with annual rainfall of about 1,000 MMs CASUARINA is also seen growing well in such lands. The PAPER MILL, in addition to supplying the required number of CASUARINA polytops seedlings from their own nurseries, will provide all necessary guidance to the farmers through their field staff. The spacing proposed to be adopted is 1.5 mts. x 1mt or 1.0 mt. x 1.0 mt. This will give about, 6,600 to 10,000 planting points per hectare. This number is considered suitable taking in to account the short felling cycle of 5 to 6 years adopted by which time the crop yield is expected to be about 80 tonnes per hectare. The Mill will also supply the fertilizers required on a no-profit no-loss basis as part of the loan component.

Financial Aspects : The gross return to the farmers at the end of 5th year is expected to be atleast Rs. 40,000/-per hectare against the investment of only Rs. 12,500/- per hectare (including the interest for 5 years on loans taken). The income generation to farmers from such lands, without this project, is very low and thus they get substantial additional income through this scheme. This incremental income from such lands on account of this project, can be as high as 100%.

Repayment Of Loans : The loan is to repaid in lumpsum at the end of 5/6 years after harvesting the tree crop through the Paper Mill which would purchase the entire produce from such plantations. A tripartite agreement will be entered involving the farmers, the Mill and the participating BANK.

Project Management : The responsibility for implementation of the SCHEME rests with the BANK

which has the required expertise and infrastructural facilities for supervision from time to time and for monitoring the SCHEME. Further, the field staff of the Paper Mill also assist the Bank staff in this regard by providing extension and technical support. The Forest Department will also be requested to provide the necessary support by way of guidance at various stages. Depending upon the progress of this pilot scheme, it is proposed to enlarge the scope of this scheme by extending it, in future, to larger areas in the adjoining districts also. Keeping in view the annual requirement of mixed hardwood by the A.P. Paper Mills at 2,50,000 tonnes, for a sustained supply of this quantity about 18,000 hectares of plantations are to be harvested in a 5 to 6 year cycle, assuming a yield of 80 tonnes per hectare. Even assuming that half the required quantity of wood can be from other sources, the aim of this scheme is to create CAPTIVE PLANTATIONS of CASUARINA in our catchment areas comprising of East Godavari, West Godavari, Visakhapatnam, Vizianagaram and Srikakulam Districts, over about 9,000 hectares, within the next four to five years.

Quite apart from the above, the Mill is also examining the possibility of getting CASUARINA wood through CAPTIVE Plantations under the following SCHEMES :

Leave & Licence Scheme :

Under this SCHEME plantations will be raised on the lands of the farmers through an agreement. The farmers will be paid an agreed amount on annualised basis or in lumpsum at the commencement of the agreement period. The farmers will sign a power of attorney in favour of the Mill for carrying out the planting operations by the Mill.

Planting on Railway Line Sides :

Extensive stretches of land are available on both sides of Railway lines in the State of Andhra Pradesh, especially in the jurisdiction of South Central Railway. The wood based industries within A.P. State would be interested in associating themselves with the planting programme along the Railway line sides. Though steps in this direction have already

been taken by the Government Organizations, much more remains to be done. The length of railway lines running through A.P. State is about 4,700 KMs and the area available for planting would be more than 9,000 hectares. The wood-based industries would like to grow pulpwood species in their respective catchment area. The A.P. Forest Development Corporation has already been requested for arranging meetings with the concerned Railway Authorities so that a project report can be prepared for grounding this work.

Planting on Road Margins :

There are over one lakh kilo-metres of roads in Andhra Pradesh. These roads have strips of public-owned land on either side with an average width of 10 to 12 metres which will work out to 2.4 hectares of land per kilometre. These lands are a valuable source where plantations could be raised. The Wood-Based Industries within this State would be interested in associating themselves with the planting programme on road margins for growing pulpwood species. In this connection, the A.P. Forest Development Corporation has already been requested to consult the concerned authorities for arranging meeting so that a PROJECT REPORT could be got ready for grounding this work.

Planting on Canal Banks

The banks of irrigation canals provide long stretches of public land where plantations could be successfully established. These strips, with a width of 2 to 20 metres and with an average width of 11 metres on each side, will provide about 2.2 hectares of land per kilometre for this purpose. Again, the Wood-based Industries would be interested in associating themselves with the planting programme on canal banks for growing pulpwood plantations. The A.P. Forest Development, Corporation has been requested to consult the concerned authorities.

Integrated Tribal Development Agencies :

FODU, which means SHIFTING CULTIVATION, is an age old practice adopted by the HILL TRIBES of Andhra Pradesh because of their constantly moving nature: Vast areas with luxuriant forest growth were denuded in the recent years due to the influx of tri-

bals from neighbouring STATES : The efforts made by the Government to discourage the tribals from shifting from one place to another and to make them permanently settle down at one place, did not yield any positive results. The WOOD-BASED INDUSTRIES would be interested in growing pulpwood species in such areas which were used for raising agricultural crops and then deserted. They will provide the technical know-how for site preparation, planting and maintaining in addition to securing the required finances. The industries will also supply polypot seedlings of suitable species free of cost. Besides, the Industries will guarantee purchase of the produce when it is harvested and arrange for payment of net proceeds to the tribals.

District Rural Development Agencies : (DRDA)

It is learnt that the DRDA will extend necessary help for taking up FARM FORESTRY PROGRAMMES in collaboration with the villagers, Under this method, plantations could be raised along the river bunds and in blocks in farm lands.

It is suggested that a meeting could be arranged with the DRDA, Superintending Engineers, Conservators of Forests and BANKING authorities to formulate PROJECT REPORTS.

Field Bund Planting :

Another viable sector for planting Pulpwood species is the field bunds both in the DELTA and non-DELTA areas. The reluctance of the farmers to plant pulpwood species on the field bunds appears to be due to their apprehension that these would affect the agricultural crops. Efforts to remove the apprehensions of the farmers appear necessary. The AGRICULTURAL AND HORTICULTURAL WINGS of the Government could make a study of the aspect in collaboration with the SOCIAL FORESTRY WING. If the farmers, especially those in the dry farming zones, are convinced that the trees grown on the field bunds will not adversely affect the agricultural crops, vast potential for pulpwood could be created.

Unconventional Raw Material :

Although this aspect will not come directly under

the subject of 'GREENING OF THE EARTH' this would indirectly help in welfare of the tree community, in that to the extent non-tree raw material is utilised the tree cover would remain untouched. Keeping this aspect in mind, the Industry is exploring the possibility of using BAGASSE by persuading the Sugar Factory owners to release the Bagasse using some alternative material as inhouse fuel. APPM is also contemplating setting up of a 2,500TPD Sugar Mill for this purpose; the Sugar Mill would produce about 90,000 tonnes of wet bagasse.

Rejuvenation of Bamboo Growth :

Even with the use of hardwood and alternative unconventional raw material like BAGASSE, APPM would need a minimum of about 75,000 tonnes (as such basis) BAMBOO, which is a long fibre species, for the paper furnish to maintain quality of paper produced. As already mentioned earlier in this PAPER, the annual supply of BAMBOO from Government sources is not expected to cross, in the case of APPM, the 50,000 tonnes mark. No serious attempts have been made so far by the Governments departments to boost up the growth of bamboo in the Bamboo Coupes by taking up rejuvenation operations like gap filling, soil working and fertilization etc. or by creating new plantations, inspite of the fact that considerable amounts have been collected from the Industries by way of additional royalties to constitute the so-called Industrial Plantation Fund. However, an attempt was made by the Government of Andhra Pradesh in the year 1981 to induce the Industry to take up rejuvenation operations in the allotted Bamboo Coupes but the Government Order was not implemented as the Government could not agree with certain suggestions made by the Industry in respect of payment of revised royalty. If only a method could be found to persuade the Government to permit the Industry to take up rejuvenation operations in the bamboo coupes allotted, with a guarantee that the same coupes will be available to the Industry for a long period, say, three to four decades, there is a possibility of rejuvenating the bamboo growth.

Suggestions Regarding Efforts to be Made by Industries :

The guidelines issued under the Forest (Conservation) Amendment Act, prohibit raising forest plantations in any forest land, by any other agency except

Forest Department or the State-owned Corporations. Unless this difficulty is overcome by prevailing upon the concerned authorities in the Ministry of Environment and Forests, Government of India through the good offices of the concerned State Government Departments, it will not be possible for the Industry to involve itself directly in the planting operations so essential for the survival of the Industry.

The establishment of INDUSTRIAL PLANTATIONS, both in the degraded forest lands and in the devastated PODU (shifting cultivation) areas, involving considerable amounts, may not take off in the foreseeable future, if the Government Departments or the Government-owned Corporations are to tackle these areas.

To Summarize the Industry is to be allowed to directly involve itself in the SCHEMES relating to :

1. Industrial Plantation projects.
2. RECLOTHING PODU (shifting cultivation devastated hilly tracts.
3. Planting on railway line margins, road sides and canal banks.
4. Rejuvenations operations in the BAMBOO COUPES under working, assuring allotment of the same COUPES to the INDUSTRY for long periods of, say, three to four decades.
5. Reclamation and rejuvenation of Bamboo Plantation areas by placing them at the disposal of the Industry and
6. Allowing the INDUSTRY to receive the lops and tops of over-mature trees in the SELECTION WORKING areas and, if necessary, permitting the INDUSTRY to assist the Forest Department to extract such trees.

Publications Brought Out by APPM :

For use of the staff engaged in the Farm Forestry programmes, APPM has brought out a publication in English entitled "GENERAL PURPOSE AND TRAINING MANUAL-CUM-FIELD GUIDE FOR RAISING AND MAINTAINING NURSERIES AND PLANT-

ATIONS OF CASUARINA EQUISETIFOLIA". A 'Teluga' version of the above publication has also been brought out by the Company for use of the farmers engaged in CASUARINA Cultivation.

Thus, APPM has contributed its mits to the preservation of greenery in the State-owned forest areas by reducing its dependence on such areas for its raw material requirements. Further, establishment of captive plantations of pulpwood species outside the forest

areas like private holdings, railway line sides, road margins, canal banks, etc. will also contribute to the objective of greening the earth as, at no point of time, the entire growth would be exploited and prompt steps would be taken to regenerate the exploited areas either by planting or protecting and maintaining the coppice growth. This will also serve the dual purposes of establishing green cover in places where such cover does not exist now and improving the economic status of the weaker sections of the society.

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