

Raw material conservation in paper production and greening of the earth

KACHOLIA R. S.*

The Green coverage of the earth i.e. 'Forest'-one among the natural resources-suffered the maximum with growth of population when the natural products became scarce. About 3000 years ago, 2800 million hectare (m.ha.) area of earth was covered with forests which has diminished by more than 50% (1). In our own country, 80% of land was under forest cover at that time, which gradually depleted and today it is estimated to be about 75 m ha. or 22.8% of the total land mass. Almost half of it is found to be degraded leaving hardly 11.4% (2) under actual forest cover. The green forest area is, of course, much less.

The main reasons for diminishing forests are :

1. Population pressure on land for cultivation and habitation.
2. Developmental projects such as rails, roads, dams, irrigational projects etc.
3. Indiscriminate extraction of forest products for domestic as well as commercial consumption without much efforts of regeneration.
4. Slashing and burning of forests, shifting cultivation, over grazing, mining, industrialisation etc.
5. Pollution due to industries and automobiles.

The resultant impact is :

- i) Tropical forests are vanishing at a rate of 11 m.ha per year all over the world (3). In our own country too, it is lost at a rate of about 1.5 m ha per year whereas hardly 0.4 m.ha. are afforested each year (4). The destruction of forests if continued at this rate, all the forests are bound to disappear very soon and an unimaginable scenario would emerge where the survival of human race would be at stake. There are no better example of disappearing forests than the beautiful hills in the western Maharashtra-once known as "Forest Canopy"

and rain forests of south America termed as "Lungs of the planet".

- ii) Forests, besides being the greatest source of genetic diversity, also play a pivotal role in controlling the cycles of oxygen, nitrogen and carbon and these cycles are adversely affected due to deforestation. Oxygen, the main food of animal kingdom is lost at a rate of nearly one billion cubic meter per year (4) and an equivalent amount of carbon dioxide is added into the earth's atmosphere resulting in heat trapping. The phenomenon is known as "Green House Effect" which experts say, could trigger radical changes in the world's climate and may contribute to rising sea level that may threaten low lying areas.
- iii) More than 3 billion hectares of range land and rainfed as well as irrigated lands, a quarter of the earth's total land area are subjected to some sort of desertification (3).
- iv) Due to increase in population and consequent pressure on land, environment and resources waste lands are being created at a very fast pace.
- v) A rich variety of flora and fauna found in the forests have been endangered. In fact, most of the species are facing extinction and some have become extinct.
- vi) Out of 329 m. ha land mass of the country, 175m. ha has lost its ecological and economic function due to denudation. Nearly 12000 M.T. of top soil is washed away every year creating various

*Managing Director,
Star Paper Mills Ltd., Saharanpur-247001

problems like siltation in river basin and converting the forest land into waste land (2).

- vii) Floods and draughts, are occurring very frequently as the rain water is drained away in absence of green barrier. This also causes depletion in water table causing serious problem of irrigation as well as drinking water in many parts of the country.
- viii) Short supply of fibrous raw materials to wood based industries such as pulp and paper has threatened the very existence of these industries.

Apart from the above, there are many other ill effects of diminishing green coverage of the earth and hence all efforts are to be made for greening the earth because :—

- i) It is essential for the health of a nation.
- ii) It is the regulator of all of our basic resources—the air, the water and the soil.
- iii) It gives five important 'F' commodity - food, fuel, fodder; fertilizer and fiber.
- iv) It plays an important role in keeping the qualities of environment upto desired level.
- v) Forest is the factory for producing oxygen using Carbon di-oxide as a raw material, thus saving the earth from global warming and supplying most needed commodity 'Oxygen'. Under Indian Climatic conditions, one hectare of active forest releases about 866 kgs. of Oxygen per day and consumes approximately 1200 Kgs of Carbon di-oxide (4).

Role of Paper Industry

Greening of earth is an important issue which is very much concerned to us both for our own survival as human beings and as an industry. The industry therefore shall have to contribute in this noble cause to the best of its ability.

Let us have a look on the share of wood the paper industry is consuming, which is hardly 2.9% of total wood consumption (5). The figure is arrived at taking estimated total production of paper in our country. About 50% of the total paper production comes from the small units where non-conventional raw materials

are used. Thus, the wood consumption for pulp, paper and rayon manufacture could be hardly around 2%. Taking the use of recycled fibre and imported pulp this share may further decrease. Whatsoever the share is, we as paper industry are seriously concerned to try our best in the field of greening the earth, which could be affected in following ways :-

- a) By checking indiscriminate clearing of forests.
- b) By massive afforestation.

As the maintenance of forest is a state subject, paper industry of its own cannot do much in this regard. However, it can certainly take the following steps to reduce consumption of wood for paper making which in turn can save equivalent amount of forest and help in greening the earth to that extent:-

Recycling of Waste Paper

To conserve the precious forest, waste paper recycling can be increased from present level of 15% to 20-25% or more - one tonne of fiber recycled is equivalent to 2.5 tonnes of wood saved.

High Yield Pulping :

Almost all the chemical pulps are produced in the range of 42-45% yield. The remaining portion of the wood is not used for pulp making. By adopting high yield pulping process and exploring the possibility of using high yield pulp for making normal grades of papers the industry can meet the paper demand with lesser use of wood and consequently more forest can be saved from felling.

Paper of low brightness :

Mostly chemical pulps are bleached to a high brightness level by adopting a process where residual lignin is dissolved which reduces the pulp yield further by 2-3%. If lignin bleaching process is adopted for making paper of common use, where high brightness is not the need but luxury, 2-3% more paper can be produced with the same amount of wood. This will not only save the tree from felling but help in tackling the much talked AOX (Total Organic halide) problem to some extent and other pollutants generated at bleaching section.

Light weight coating to increase paper brightness and printability may also help in this direction.

Paper of lower substances :

Subject to market acceptance, if substance can be reduced to some extent without affecting the required characteristics, equivalent amount of wood can be saved in producing the given surface area for use.

Industrial Plantation

The paper industry, if provided with a part of the degraded land, on lease, to grow, maintain and use the wood, it will employ latest technology and appropriate silvicultural methods to get the best output from the captive plantation. This will not only supply the raw material to the industry but keep the environment clean by increasing green coverage. However, industry of its own cannot do anything unless the Government gives a serious thought on the subject and amend the existing Forest Policy to facilitate leasing of land for Industrial plantation.

Existing Forest Policy of 1988 Provides that "No forest area should be allotted to Industries for undertaking plantation or for any other activities". It however directs "The forest based industries should raise the raw material needed for meeting its own requirement, preferably by establishment of a direct relationship between the factory and the individuals who can grow the raw material by supporting the individuals with inputs including credit, constant technical advice and finally harvesting and transport services" (6) But the paper industry cannot depend wholly and solely for its raw material requirement on plantation raised by the farmers on their agricultural land for the following reasons :—

- a) The farmers normally plant trees on the boundaries of their fields. To meet the demand of a 100 TPD Paper Mill minimum One lakh tonne wood is required per year which needs about 15,000 ha. land involving several thousand farmers covering a number of districts around the industry.
- b) It will be uneconomical to collect the wood on door to door basis. The plantation being scattered on vast areas, supervision and monitoring will become difficult.
- c) The felling of trees by farmers are done preferably when their crops are not in the fields. This is bound to upset the regular flow of wood to the paper industry.

- d) There are some mis-givings for planting eucalyptus on farm lands. Consequently farmers are reluctant to grow the same. If this attitude persists, the farm forestry programme is likely to suffer adversely.
- e) The procedure for securing loan for farmers from nationalised bank is very cumbersome and time consuming which results in delayed release of loan and consequently in different results.

Hence, farm forestry programme on private holdings should be sponsored by the Government and Industry should be allowed to raise industrial plantations on degraded forest lands/waste lands for the following reasons :

- i) Such lands under the control of the Government are lying either vacant or they produce very little wood. If such lands are leased for industrial plantations to paper industry, sustained supply of wood can be ensured.
- ii) The areas will be available in compact blocks facilitating thereby the use of mechanical means and advanced technology for increasing production. In past, paper mills in some States were accorded lease of forest areas for extraction of raw materials. Such areas were regenerated with success and increased production.
- iii) Sustained supply of fire wood and fodder to the local population will be available from unused portions of such trees.

Plantation project on waste land will be need-based, time-bound and in conformity to the principles laid down in the Forest Policy. The paper industry by itself, or in joint venture with the Government on mutually agreed terms and conditions can develop the degraded forest for their own use which in turn will increase the green coverage.

Use of Bagasse :

The large Integrated Pulp and Paper Units which depend mainly on wood can save a considerable quantity of wood if they use bagasse. The availability of bagasse, however, in required quantity on regular basis

si a constraint. This can be solved if paper units are favoured with licence to setup Sugar Mills, wherever possible.

Corrugated Packaging :

One of the major causes of deforestation is the use of wood in fruits packing being used extensively in our country. With the increase in fruits production, consumption of wood in packaging is going to be increased further. The Corrugated Board Boxes shall have to be used for fruits packaging, which would reduce pressure on wood to a greater extent. Kraft Paper required for Corrugated Board Boxes is also being made from agricultural residues or other non-conventional raw materials. Therefore, it can help in further reducing the use of wood for packaging. Apart from many other advantages of corrugated packaging such as sturdy and light weight, better cushioning, protection from fungal and bacterial infection, attractive printing, pilfer evidence etc., it has got a unique feature of recycling for reuse.

Corrugated packaging industry in our country can expand their production substantially which will help in drastically cutting down the use of wood for packaging. Paper Industry can ensure sustained supply of kraft Paper and Duplex Board etc. to Corrugated Packaging Industry and help the nation in saving the much needed forest.

Pollution Control :

It is a well known fact that pollution destroys the forest and paper industry is also creating pollution. The industry must take effective steps in abating the pollution.

Conclusion :

Greening the earth is the only way to save this planet from the hands of pollution. This is very much essential from the survival point of view of mankind and the ecosystem of the earth. Hence, all the efforts should be made to grow more forest and conserve the forest. Paper Industry, in its own way, can join the move provided it is given necessary support from the Government as well as common mass.

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