

Greening of India - productivity and prosperity through plantations

PIARE LAL

ABSTRACT

We have already lost considerable time and delayed the important task of replanting the degraded forest lands and such wastelands which are amenable to reclamation. Firewood famine for meeting the domestic energy requirements of the rural folk and closure of many wood based industrial units on account of non-availability of raw materials is looming large. If we have to reverse this trend and secure the future of the wood-based industries and sustain agricultural productivity and life support systems, we must take up massive afforestation and tree planting programmes without losing any further time. Mere planting of saplings is not going to help. Highest genetic quality of planting stock, scientific management and strict protection will have to be ensured for deriving maximum benefits through improved land productivity. Contemporary technological inputs, well planned result-oriented investments scientific management combined with improved package of practices for raising and maintenance of plantations will all play a vital role in achieving the optimum production and land productivity.

Gestation period for returns from plantations being quite long (minimum 7 to 10 years) and heavy investments being absolutely essential for successful re-planting of degraded forest areas/wastelands; financial assistance through NABARD and other nationalised banks at concessional rates of interest for supporting the plantation activity will be of great help. The Government of India should also consider suitable changes in land use policies and offer liberal fiscal incentives for encouraging investments in the plantation programmes in view of immense tangible and indirect benefits from plantations, which will also contribute to the environmental amelioration and maintenance of the ecological balance.

Introduction

Increase in agricultural production on a sustainable basis is not possible without well planned investments, technological innovations, and above all, maintenance of soil fertility, and optimum utilisation of our soil and water resources. Preservation of the environment and maintenance of ecological balance are essential to sustain land productivity and momentum of green revolution. However, the country has been losing the green cover at a rapid rate. Increasing biotic pressures because of growing population and over-grazing by cattle, far beyond the carrying capacity of the areas under forests, interfere adversely with the successful

regeneration operations and deplete the growing stock. Continuing degradation of forests and depletion of tree cover is posing a serious threat to the life support systems.

Valuable fertile top soil is being lost through erosion accelerated by depletion of tree cover. River beds and reservoirs are getting clogged with heavy silt loads.

*Vice President (Plantations)

ITC Bhadrachalam Paperboards Limited

106 Sardar Patel Road

Secunderabad 500-003

Andhra Pradesh

Lac Tonnes

Year	Demand	Production	Shortfall
1995	31.61	20.96	10.65
2000	41.12	25.60	15.52
2005	50.45	27.62	22.83
2010	62.97	31.53	31.44
2015	79.81	33.25	46.56

In view of the serious crises of balance of payments, the country can ill-afford to import huge quantities of pulp or paper products to the tune of 15.52 lac tonnes in the year 2000 and 46.56 lac tonnes in the year 2015, to bridge the gap between demand and supply.

The foreign exchange outflow for import of pulp to cover the aforesaid shortfall at current price of US \$ 600 or Rs. 18000/per tonne will be a staggering amount of rupees 2794 crores during 2000 AD and 8381 crores during 2015 AD. Actual outflow will be much higher because of cost escalation and possible further devaluation of the rupee. Even if we somehow manage foreign exchange for importing pulp or paper, we would have lost the opportunities of providing gainful employment to millions of rural folk in the remote villages where opportunities exist for converting reclaimable wastelands and degraded forest areas in to labour intensive productive plantations. But how and from where are we going to import firewood for meeting the domestic energy requirements of the rural areas ?

Strategies

A large part of wastelands, comprising of 175 million ha including degraded forest lands, should be reclaimed to the extent possible through appropriate technology and planned investments. These degraded wastelands, after reclamation, should be restored to productive usages like pastures, woodlands, crop production, etc, whichever may be most productive and sustainable. All vacant lands along canals, roads, and railway lines, and surplus lands with various schools/colleges, universities, institutions and government departments, including lands under the control of Defence Ministry, should be planted up with suitable species of trees.

The national priorities demand that we reorient our land use policies and conservation strategies so as to achieve the full potential of our rich natural resources on a sustainable basis. No time should be lost in initiating innovative policy changes which should encourage active participation of all possible agencies including the corporate sector for restoring the green cover through plantations based on selection of proper species suiting the sites, backed-up with technological thrust, scientific management and well planned investments.

There is tremendous scope for substantial increase in production and land productivity through usage of genetically superior planting stock, including fast growing, disease resistant clonal planting stock of suitable species amenable to vegetative propagation. If we can devote adequate attention for upgrading the genetic quality of the tree seeds used for raising nursery seedlings through well-known methods like collection of seeds from selected plus trees or established seed orchards or we use clonal planting stock of elite trees after field testing different clones, manifold increase in productivity of manmade plantations is a certain possibility. Astounding results have been obtained in many countries including Brazil where productivity of clonal Eucalyptus plantations is as high as 114 M³/ha/yr with an average productivity of 55 M³/ha/yr.

Plantation of selected clones of poplars (*Populus deltoides*) raised under a NABARD re-financed farm forestry project are already changing the skyline in the irrigated northern plains of Uttar Pradesh, Haryana and Punjab. ITC Bhadrachalam Paperboards Limited have selected 32 promising, high yielding and disease resistant clones of *Eucalyptus tereticornis* and Mysore gum (*Eucalyptus hybrid*) after field testing clonal stock of more than 200 Candidate Plus Trees. These promising clones are now being further multiplied for raising clonal planting stock to plant 1,500 ha/yr under a clonal farm forestry programme. Expected yield from such clonal plantations at 7 years rotation and 3 × 1.5 M spacing will be 150 tonnes freshly cut debarked pulpwood.

Considerable employment opportunities for the rural poor will be generated through plantations in the remote areas, as each hectare of plantation will generate 150 mandays of employment in planting and maintenance operations per year. On the maturity of plantations of

Heavy floods in some parts of the country every year cause extensive soil erosion and damage to life and property. Underground aquifers have been over exploited in many states for short term gains in agricultural production. Recharging of the aquifers is slowing down as most of the rain water is lost through flash floods rather than percolating down to recharge the depleted aquifers. Extensive wind erosion is helping the spread of the desert, resulting in loss of fertile fields.

Forest Cover And Productivity

Nearly 37 million ha, out of the 75 million ha recorded forest area in the country, are seriously degraded, with crown cover density of less than 40%. The forest cover, with crown density of more than 40% is only 37.8 million ha, which is around 11% of the total geographical area of the country. Thus, the well stocked forest area is far short of the desirable level of 33.3% considered optimum for maintaining the ecological balance, preservation of the environment and sustaining agricultural production and life support systems.

While there has been considerable increase in agricultural production and productivity, there are serious problems in sustaining the momentum ushered in through the green revolution. Productivity of land under forests however, has been altogether a different story, as no worthwhile gains either in production or productivity, have been possible. On account of depletion of the growing stock, continuing heavy biotic pressures, lack of sound and scientific management and inadequate attention to genetic quality of the planting stock; productivity of our forests and plantations is far below the potential and international standards. Annual increment of our natural forests is just around 0.7 M³/ha/yr compared to the world average of 2.15 M³/ha/yr. Productivity of plantations is ranging between 4 to 10 M³/ha/yr compared to 55 M³/ha/yr productivity of clonal Eucalyptus plantations in Brazil.

Trees being long duration crops, the sites planted with substandard and genetically inferior planting stock suffer continuing loss of productivity potential for the entire rotation, which may vary from 10 to

100 years depending upon the species planted. As such, planting saplings or sowing seeds of inferior genetic quality is a huge waste of limited land resources and tremendous loss of production potential for several years. No wonder that actual yields, even from plantations of fast growing species have been far below expectations. Results and benefits from Social Forestry plantations have not been commensurate with expectations.

Demand And Supply Of Forest Produce

Gap between demand and supply of timber, pulpwood and firewood is continuously increasing. The Food & Agriculture Organization of the United Nations have estimated the projected requirements of India for major forest products for 2010 AD as follows:

Firewood & charcoal	344.5 million M ³
Industrial roundwood	24.3 million M ³
Sawn timber	33.4 million M ³
Paper and paperboards	5.7 million tonnes

Assuming 70% furnish of wood-based fibre, pulpwood requirement for production of 5.7 million tonnes paper and paperboards will be of the order of 9.97 million tonnes (bone dry) or 16.62 million tonnes freshly felled debarked pulpwood per annum.

The annual cut from our forests on sustainable basis, estimated at 32 million M³ of wood, is thus far short of the country's requirements. Acute shortage of firewood for meeting the domestic energy requirements in the rural areas is a matter of serious concern. Large quantities of cowdung are diverted for use as domestic fuel instead of using the same as valuable farmyard manure so vitally needed for sustaining soil fertility.

All major wood-based industries, like paper and pulp, matches, plywood and veneers, are facing serious threat on account of acute shortage of timber and forest based cellulosic fibre. Take for example the paper industry. The Development Council for Pulp, Paper and Allied Industries has forecast increasingly large gaps between demand indigenous production of paper, paperboards and newsprint as follows :

fast growing species from the 8th year onwards, each hectare will contribute 750 mandays of employment for harvesting, logging and transport operations of wood @ 5 mandays per tonne of wood with estimated yield of 150 tonnes/ha. Gap between demand and availability of forest based raw material for the pulp and paper industry has been estimated at 40 36 lac tonnes (air dry) during 2000 AD by the Development Council for Pulp, Paper & Allied Industries. Plantations @ 38438 ha/yr will be required assuming 150 tonnes freshly cut or 105 air dry tonnes pulpwood yield per ha at 7 years rotation. Therefore, total employment potential of captive industrial plantations to be raised by paper and pulp industry alone will be of the order of 57.6 lac mandays/yr for plantations and 288 lac mandays/yr on harvesting and logging operations from the 8th year onwards. Likewise, captive industrial plantations to be raised by other wood-based industries like plywood and veneers, matches, etc, should also contribute handsomely to gainful employment opportunities for the rural poor for regeneration of renewable resources through plantations,

Apart from direct and tangible benefits from such plantations in meeting future raw material requirements of essential forest wood-based industries; indirect benefits will be tremendous. These plantations will contribute immensely to the greening of India, minimise losses of valuable top soil and precious water, prevent silting and choking of reservoirs and river beds, minimise flash floods and increase potential of irrigation through regulated stream-flow and better replenishment of the underground aquifers. Large quantities of firewood will be available from lops and tops on harvest of plantations to meet rural domestic energy requirements.

The current National Forest Policy, provisions of the Forest (Conservation) Act, 1988 and ceilings on agricultural land holdings virtually preclude the corporate sector from meaningful participation in the all important task of greening the country and improving land productivity. The corporate sector can contribute immensely to greening the country and restoration of degraded lands to productivity through plantations backed up with technological innovations, including clonal planting stocks, sound management of scientific lines and well planned investments with accountability

for results. Rather than throttling the industry's government should give fiscal and tax incentives to industries for raising captive industrial plantations on degraded forest lands/wastelands.

From the current situation of shortages and net imports, the country can become self-sufficient in paper, newsprint and products of other wood-based industries through self-reliance and plantations. In due course, the wood-based industries can contribute handsomely to earning valuable foreign exchange through exports of high quality products, competing in the international markets.

References :

Anon; (1989). The State of Forest Report, 1989. Forest Survey of India, Ministry of Environment and Forests, Government of India.

Anon; (1991). Forestry Statistics Today for Tomorrow : Wood and Woodbased Products. Food and Agriculture Organization of the United Nations, Rome.

Barnes, R.D. & J. Burley, (1987). Vegetative Propagation for Improved Tropical Forest Trees, In : Improving Vegetatively Propagated Crops (A.J. Abbott and R.K. Atkin eds.), pp 211-227 Academic Press Limited, London.

Chaturvedi, A.N. (1983). Eucalyptus for farming, U.P. Forest Bulletin. No. 18. Research & Development Circle, U. P. Forest Department, Lucknow.

Jones, N. and P. Lal, (1989). Commercial Poplar Planting in India under Agroforestry System. Commonwealth Forestry Review, 68 (1) : 19-26.

Piari Lal and H.D. Kulkarni, (1991). Sustainable Development Through Application of Clonal Technology in Forestry / Agroforestry. Paper prepared for Workshop on "Genetic Resources for Sustainable Agriculture" organized by M.S. Swaminathan Research Foundation at Madras between November 22-23, 1991.

Singhania, H., (1990). Paper Industry Raw Material Scenario (1990-2015). Document prepared for Development Council for Pulp, Paper & Allied Industries.