

SOCIAL FORESTRY FOR INDIA

Y. M. L. Sharma, IFS (Retd)



FORUM OF FREE ENTERPRISE

PIRAMAL MANSION, 235 DR. D. N. ROAD,
BOMBAY 400 001.

**"Free Enterprise was born with man and
shall survive as long as man survives."**

—A. D. Shroff

1899-1965

**Founder-President
Forum of Free Enterprise**

INTRODUCTION

The Forum of Free Enterprise publications over the years have emphasised the need and importance of conservation of natural resources for India's economic growth and prosperity. It is gratifying to note that today conservation of natural resources is universally accepted as a key element in economic policy. In consonance with its practice of publishing for public education informative material, this booklet **SOCIAL FORESTRY FOR INDIA** by Y.M.L. Sharma is now published. The Author is a retired chief conservator of Forests (Karnataka State) and at present an international forestry consultant as also a visiting Professor of Farm Forestry, University of Agricultural Sciences, Bangalore.

SOCIAL FORESTRY FOR INDIA

Y. M. L. Sharma, I.F.S. (Retd.)

The extent of economic development of a country depends on how well she has preserved, exploited and developed her renewable natural assets. Forest wealth is one such important natural asset which we possess in this country. The climatic, topographic and edaphic factors in India are very varied. Rainfall is the most predominant factor which determines the type of forest in a locality, though topography and occurrence of snow in the mountainous regions of the Himalayas play an equally important part. Sixteen major types of forests have been distinguished in this country. These vary from the scrub forests characteristic of the arid tracts to the climatic climax forests of the Western Ghats and Eastern India and the temperate and alpine forests of the Himalayas, not to speak of the desert areas of Western India.

Importance of Forests : Forests are useful to man in many ways. They play a notable role in the protection of catchments of streams, rivers and reservoirs. They prevent erosion and floods and mitigate adverse climatic conditions. They conserve water, and provide a home for wild life. Forests are the basis for raw materials for a large number of wood-based industries like plywood, match, rayon, pulp and paper, packing cases, small timber, fodder and fertilizer to the rural folk. It is time that we realise this and develop our forests. During the last 25 years the extent of forests lost on account of extension of agriculture, submersion due

to irrigation and power projects, rehabilitation of expropriated and displaced persons, clearance for electric transmission lines, opening of new communications and a host of other causes is over 2 million hectares in India. This is a serious challenge to Forestry. Being a long-term enterprise, forestry cannot be practised effectively unless there is stability of its limits and extent. This process of loss of forest area causes considerable concern in all progressive quarters and in the country's interest should be put an end to. In addition, according to a rough estimate, the annual losses on account of fires, fungus, diseases and pests etc., account to Rs 100/- to 150/- crores. While the norm for forests varies according to the terrain, 33% of the land area should be covered under forests according to our 1951 Forest Policy, the suggested norm in the hilly areas being 60% and in the plains being 20% of the land area.

Some facts on forests : The geographical area of India is 328 million hectares. Out of this, 46 per cent is under various kinds of agricultural cultivation. The forest area is 22.7% and thus about half of the area is under cultivation.

Of India's forests, 93 per cent are state owned. More important than the mere area of forests what matters is the type of vegetation that our forests contain. Nearly 60% of the forest area lies in the area of scanty rainfall with very poor growth in a degraded state.

The current exploitable area of India's forests is 63.34%. This may go up to 84% by the end of 1985. Nearly one fifth of India's forests have to be maintained as protection forests which cannot be worked. M.P., Maharashtra, Gujarat and Karnataka account for about 92% of the teak forests. Bihar and Madhya Pradesh account for nearly 80% of the total area under sal forests. Coniferous forests are concentrated in Jammu and Kashmir, Himachal Pradesh and Uttar Pradesh.

Contribution of forestry : During 1972-73, which was not a good year for Indian agriculture, the contribution of agriculture to the net domestic product at 1960-61 prices was Rs 7,409 crores, while forestry contributed not more than Rs 297 crores. The contribution of agriculture and forestry accounted respectively 38.4 and 1.5 per cent of the net national product during that year. In 1968-69, this had risen to 46% and 1.6%. This is a disproportionately low return from forests, whose area is nearly 50% of the area under agriculture. A possible reason is that forests occupy the less productive and less fertile tracts. The forest revenue per hectare compared to other countries also makes a poor show as indicated below :

Country			Gross Revenue per hectare	Net Revenue per hectare
			Rs	Rs
India			21.50	11.50
Austria			336.00	80.00
U.K.			Not available	140.00
West Germany ..			565.00	130.00
Switzerland ..			494.00	190.00

The same applies also to the figures relating to investment per hectare.

Country			Gross expenditure per hectare	Net expenditure per hectare
India			—	2.40
West Germany ..			—	435.00
Japan			—	190.50
Korea			—	118.50

The general failure to industrialise the country during the alien rule has to some extent resulted in the failure to develop forestry as a basic source of national wealth and as a means to provide employment for millions of our people. The infrastructural facilities for development of forests also did not exist then. There did not also exist large industrial demand for wood and other forest produce until after the second world war. The technical and financial means to tackle large-scale raising of manmade forests and problems of protection arising out of it did not exist. Many of our timbers had no market till after the Second World War. It is only during the last three decades that a large number of secondary timbers other than teak and sal came to be used with the establishment of a large number of wood based industries.

The *per capita* land area in India is 0.61 hectare and the *per capita* forest area is 0.14 hectare. The annual increment of Indian forests is about 60 to 70 million m³ (cubic metres). The *per capita* revenue is Rs 2.33. Only 0.2% of the rural working force is engaged in forestry though 80% of the India's population live in rural areas.

Production of timber and fuel wood and utilisation : Out of an average annual production of 22 million m³ of wood the quantity of industrial wood produced (including wood for charcoal) is about 12.3 million m³. In other words only 42% of wood produced is consumed for industrial purposes. The average utilisation of wood from Indian forests is estimated at 50% and thus if 22 million m³ is extracted the total cut from forests could be double, i.e., 44 million m³ which is well below the estimated annual increment of 60 to 70 million m³. This would mean that all that is felled is not converted,

brought out of the forests and used. A sizeable quantity is allowed to deteriorate in the forest unutilised. These facts stress the need for a more intensive utilisation of the produce at the felling site. In many a case of raising manmade forests by converting poorer natural forest, the felled material below a certain size is burnt at site. This old conventional practice of burning the felled material below a certain size after extraction of all utilizable saleable timber is outmoded in the present context of increasing demand for fuel wood both in urban and rural sectors. A time has come to give a new direction to our established practices., We should put an end to this practice immediately and resort to use of fertilizers, inorganic and/or organic and even irrigation wherever possible to speed up the growth of tress. By doing this we would be saving lakhs of tonnes of fuel wood for industrial and public use.

Present employment potential in forestry : The total industrial employment in forest and forest based industries is estimated at 8.50 lakhs. Including forest extraction, supervision, management of forest and related industries, the total employment potential at present is estimated at about 30 lakhs. It reveals that the employment potential has thus been insignificant when compared to other sectors. There is great scope for increasing employment opportunities in forestry and new schemes have to be planned and implemented to increase and achieve this especially in the rural sector. It is highly desirable to do this as it would result in building up renewable assets on the countryside besides improving the environment and yielding other social benefits.

Requirements of Industrial raw material : The requirement of industrial raw materials as indicated by the National Commission on Agriculture is :

Total Industrial Raw Material Requirements by 1980 and 1990

	By 1980				By 1990			
	Conifers (in 000 m3)	Broad leaved (in 000 m3)	Total (in 000 m3)	In 000 ton- nes)	Conifers (in 000 m3)	Broad leaved (in 000 m3)	Total (in 000 m3)	In 000 ton- nes
Pulpwood	1555	3478	5033	—	4461	8271	12732	—
Sawnwood & sleepers	1819	10830	12649	—	2405	14605	17010	—
Panel products	188	755	943	—	281	1126	1407	—
Roundwood	1385	5542	6927	—	1912	7647	9559	—
Total Industrial wood excluding Bamboo	4947	20605	25552	—	9059	31649	40708	—
Bamboo for paper pulp	—	—	—	2199	—	—	—	1954
Bamboo for other uses	—	—	—	2173	—	—	—	2960
Total bamboo	—	—	—	4372	—	—	—	4914

From this table it will be clear that India's industrial forestry production programme must be geared to increase production from the present level of 8.92 million m³ to 25.55 million m³ by 1980 and 41 million m³ by 1990.

Present resources of fuel wood : The total consumption of fuel wood in India in 1973-74 was 155 million tonnes. It is expected that this would increase to 178 millions by 1980-81. It is of interest to observe here that not all this 155 million tonnes come from forests. Only 9 million tonnes comes from recorded sources, i.e., from forest exploitation. The remaining quantity of 146 million tonnes is met from unrecorded sources like private forests, tree groves, trees on cultivated lands, waste lands, panchayat lands and pilferage from forests. Even assuming that another 2 million tonnes of fuel wood is likely to be available by 1980-81 due to development programmes so far undertaken in forestry, the shortage in 1980-81 would be of the order of 21 million tonnes if we continue to get the same quantities of supplies as in 1973-74 from the increased sources.

The needs of the people for small timber fuel wood, manure leaf, fodder etc., has also increased. The average size of the Indian family is 7. Out of 78.3 million families nearly 62 million live in the rural sector. On the basis of 5 kgs of fuel wood per family, the daily requirements of fuel wood in India is 4 million tonnes. Nearly 4 million tonnes are estimated to be the requirements for cremation alone at a death rate of 18.5 per 1,000 per year. Assuming a plough for every ten families the total requirement of ploughs in the rural sector is 43.4 million of which at least 50% may be assumed as wooden ploughs. The number of carts required in India is 44 million. For purposes of estimating wood required for repairs and replacement, the number can be taken as ten million carts and ploughs per year. The timber

needed for plough is 2 cft once in three years and for a cart 20 cft once in seven years or 4 cft per year. For 10 million ploughs and carts per year we need 40 million cft of timber. Thus the demand for timber from the rural sector is colossal.

Shortage of fuel wood due to depletion of trees in the rural areas has led to the burning of valuable cowdung to the extent of 22 million tonnes in 1974-75 after converting it into cakes and drying. Its consumption is likely to increase to 26 million tonnes by 1980-81. Agricultural residues like bagasse, surplus paddy straw, groundnut husk and castor stalks which are useful industrial raw materials are burnt. In this connection, it is gratifying to note that the Karnataka Government is considering banning the use of bagasse for burning in Sugar factories and insisting on the use of coal by factories. Social forestry would provide alternative firewood and release bagasse and other agricultural residues for industry. It is increasingly appreciated that multiple cropping pattern on the existing agricultural lands would contribute towards more food production than mere extension of agriculture at the cost of forests. Organic manures are a necessity in tropical countries like India for more efficient soil conservation, nitrogen fixation and greater production than mere chemical fertilizers.

The total livestock population (1966) was 343.8 million. It should be well over 400 million now. The provision of fodder to cattle is a problem of serious importance. Cattle grazing, browsing and trampling has been a very serious problem in our forest management.

Production Forestry : The production forestry programme as proposed by the National Commission on Agriculture proposes the raising of 1 lakh hectares of manmade forests annually in the first decade with an outlay of Rs 242 crores

and an outlay of Rs 306 crores in the second decade. The Commission has recommended establishing forest corporations to avail of institutional finances to a large extent. These productive forestry programmes are envisaged in the most productive areas with good rainfall and do not come within the purview of developments of forests in the drought prone areas or in the areas with scanty rainfall. The production forestry programme is expected to provide annual direct employment of 50 million mandays or 250,000 man years mainly in the rural sector of the hilly backward regions where unexploited forests exist.

The production forestry programmes would mostly look to the needs of the industry and national requirements. Forests have been subjected to heavy exploitation for these needs. The impact of the heavy exploitation and consequent loss of vegetation cannot be prevented if our industries and developmental projects have to be supplied with raw materials. Replacements or re-afforestation have not been keeping pace with exploitation due to (1) shortage of funds allotted to forestry development, (2) inadequacy of trained personnel, (3) inherent difficulties in the techniques of regeneration of certain types of species, (4) slower rate of growth of indigenous trees, and (5) lack of proper research in tackling possible epidemics due to insects and fungi in the case of pure plantations. These factors have been responsible for the country going in a big way during the third five-year plan period to raise large-scale manmade forests of Eucalyptus Casuarina and other fast growing species.

Social Forestry : The distinction between production forestry and social forestry has been briefly explained by Jack Westoby as under :

“(a) A distinction can be drawn conceptually between *production forestry* — forestry which aims at producing wood

for industrial or household use ; *Social forestry* — forestry which aims at producing a flow of protection and recreation benefits for the community. (b) In principle, production forestry should pay. (c) The goals for social forestry should be determined by the amount of investment the community is prepared to allocate to secure the desired social benefits. (d) The fact that wood and the physical protection and social benefits are frequently joint products does not rule out this approach.”

Social Forestry thus embodies operations connected with the growing of trees for the benefit of the people in their immediate vicinity for fuel, fodder, small timber and manure leaf. The indirect benefits of forests consisting in climatic amelioration, maintenance of stream flow, soil consideration, preservation of wild life and provision of recreational facilities are also embodied in social forestry. The concept of Social Forestry is not new. There is historical evidence to show that planting up avenue trees along roads, canal banks, village groves etc., received the attention of the highest of the land.

In view of the increased demands for fuel, fertilizer and fodder resulting out of population explosion, serious deterioration of environment on the country side, social forestry has now assumed very great importance. Lack of retention of vegetation in the urban areas has resulted in increased pollution of air and water. Industrialisation and consequent development of fast traffic has resulted in air and noise pollution and attendant environmental hazards. The climatic and edaphic factors in urban areas are different from those of rural or forest areas and warrant changes in techniques in tree planting practices and also in choice of trees to be planted.

We have thus reached a stage when forestry should make *aggressive* inroads into the agricultural sector to enable

people to realise that forestry is the *foster mother* of agriculture. The farmer should be enabled and made to adopt measures to protect his land and soil and attain self-sufficiency in his requirements of wood and its products. If this is done, the village as a whole will be self-sufficient. This can only be achieved by an intensive practice of Social Forestry in the countryside. Planners, politicians, administrators and technicians connected with the improvement of the forests, environment and solving people's needs of fuel, fertilizer and fodder should attempt to create the right atmosphere for adopting a more dynamic outlook. Forestry, and in particular social forestry, should be given a rightful place in the development plan of the country similar to power, irrigation and agriculture.

The National Commission on Agriculture in its report on social forestry has recommended village forests and canal and road side plantations in social forestry. In many parts of this country, the forests are far away from centres of population. The supply of firewood, fodder for the cattle, manure leaf, and small timber to the villagers is very important if cowdung is to be saved from being burnt and used as manure for the fields. Social forestry, however, does not always pay its way and part of the bill for it must be footed by the State for the sake of the benefits derived by the country.

It would even warrant the creation of an independent department of Social Forestry and Environment in each state to tackle this problem. The forest departments have enough on their hands to develop the areas in their charge. The social forestry practices could briefly be enunciated as under :

Farm Forestry means creation of wind belts around each farm (both on dry farming areas and irrigated fields) to

protect top soil and preserve moisture and to create fuel wood, manure leaf and fodder potential. The area under dry farming in India is 136.1 million hectares. We can assume about 100 million hectares as having no trees on them or where more trees could be grown. The following pattern of planting is suggested. The species mentioned are indicative for central and south India but can be suitably modified for the northern and eastern region. 605 plants can be planted along the periphery of a hectare of land and even if 50% of these survive we would have achieved a big break through.

Species	Pattern of planting		Usage
	No. of plants per hectare of		
	Dry land	Wet land	
Tamarindus indica (Tamarind)	10	—	Usufrucht
Artocarpus integri- folia (Jack)	10	—	„
Achras sapota (Sapota)	10	—	„
Eucalyptus/Casuarina	250	250	Fuel/pulpwood/scaf- folding/leaf for oil etc.
Glyricidia macculata	200	105	Manure leaf
Pongamia glabra	75	—	Manure leaf & oil seed
Sesbania grandiflora	—	250	Pulpwood & fodder
Albizzia lebbek (Siris)	10	—	Fodder and timber
Azadriachta indica	15	—	Fodder, oil seed, tim- ber
Acacia arabica	15	—	Fodder and general utility timber
Dendrocalamus strictus/ Bambusa arundinacea	2	—	General utility
Santalum album	8	—	Heartwood for oil and carving.

This pattern of planting integrates forestry, agriculture and horticulture. It would result in the production of 3 tonnes of fuel, 10 m³ of wood, 4 tonnes of fertilizer and a tonne of fodder per hectare besides usufructs out of tamarind, jack and sapota. Additional revenue can also be obtained by oil seed and sandal wood. The total production over 100 million hectares would be 300 million tonnes of fuel wood, 1000 m³ of wood, 400 million tonnes of manure leaf, and 100 million tonnes of fodder in the course of 30 years — the time taken for small timber trees to reach the harvesting size.

The area under irrigated land is 30 million hectares. On the pattern of planting indicated above on the margins of wet lands, we would be able to produce 75 million tonnes of fuel wood, 100 million tonnes of fertilizers and 25 million tonnes of pulpwood. The practice of farm forestry on both dry and wet lands would thus produce the following over a period of 30 years :

Fuel	375 million tonnes
Timber	1,000 ..
Manure leaf	500 ..
Fodder	100 ..
Pulpwood	25 ..

This is exclusive of yield from other types of trees.

Shelter belts should be raised whenever possible, though this is only possible on large tracts of government lands as the size of individual holdings is small in India. Extensive shelter belts have been raised over vast stretches in USSR in the Steppes.

Creation of farm wood lots by farmers over a certain percentage of their farm land for fuel, timber, fodder and usufruct yielding trees should be encouraged. The farmers

around Bangalore in Karnataka State raise Casuarina or Eucalyptus in part of their farm lands which form the source of fuel wood to the growing city.

Extension Forestry means creating manmade forests of fuel, fodder, small timber and trees yielding usufructs on village common lands. There are 5,67,000 villages and 43 million hectares of cultivable waste, permanent pasture, miscellaneous tree growth in the country. Yet, there is dearth of timber, firewood, manure leaf fodder etc., in most of these villages unless they are situated in the heart of forests. Compact blocks of manmade forests yielding timber, oil seed, manure leaf, fodder and usufructs should be raised to meet the needs of the village people. They should be fenced as protection would hasten the development of tree wealth.

Afforestation along canal banks of irrigation and power projects is another area of development. Over 30 million hectares of land is irrigated in the country. The irrigation is by means of channels and lift irrigation. Where channel irrigation is adopted there are main subsidiary and feeder channels. There is considerable space between the channels and limits of cultivation. The channel banks offer excellent sites for growing miscellaneous timber and other trees. The trees protect the channel banks. Outstanding assets could be built up along channel banks. The notable examples are the canal bank plantations of Haryana, Punjab, Tamil Nadu and Karnataka. The length of main canals and branches in 1961 in India was 51,705 km. Adding 25% extra, we can safely assume the approximate length as 1,29,262 km. on both banks.

Timber-yielding Trees : Most of the dry and arid tracts are devoid of timber locally and timber for constructional purposes has to be obtained from far off markets at con-

siderable expense. Therefore, timber trees like teak under irrigated conditions should be grown by the farmers as well as Government departments of forestry and agriculture along river banks. Farmers can plant teak stumps along the margins of water courses in their irrigation fields and grow good timber required for their constructional purposes. In the command areas of major irrigation projects, compact areas of adequate size, say, not less than 200 acres in extent, should be relegated to raise irrigated teak and other trees. Irrigation every week, fortnight or month during the non-rainy season continues growth of plants and hastens growth from 40-60 years to 10-20 years.

Railway Tracks : The total length of railway lines in India is approximately 60,000 kms. In most of the States, except where the railway passes through dense forest, the vegetation is negligible. The belt on either side of railway track offers tremendous scope for raising trees. The total area that can be available would be about 10 lakh hectares. The types of trees to be grown vary with the climatic and edaphic variations. Agave (Sissal) is one of the best species that can be grown and would provide raw material for fibre, paper and hecogenin. In the alternative, if Eucalyptus is grown on either side of the railway line a potential of 25 lakh tonnes of pulp wood can be built which would produce at least 25 lakh tonnes of wood per year.

Afforestation under high tension lines of power projects : With the construction of a large number of power projects in the country, the high tension lines transmitting power pass through dense wooded areas in many states. The vegetation below them has been cleared to widths varying from 50 to 200 feet and every year the site is cleared and kept at considerable expense. The area is wasted and this has contributed towards loss of forest area. The area under

the high tension lines in forest areas could be utilised for raising low bushy crops like pruned *Eucalyptus citriodora*, *Agave*, *Oscimum kilimanchjaracum*, lemon grass and other similar essential oil yielding and medicinal plants. The exact extent of area available under this head is not readily available.

Afforestation of roadsides with both ornamental and pulpwood species : The areas on either side of the National and State Highways and major roads in the country are bare over a majority of their length. They offer great scope for tree cultivation. As one approaches cities and towns, the roadsides should be planted up with flowering and shade trees and away from the towns the road sides should be afforested with fast growing trees like *Eucalyptus* and *Acacia aurculiformis*. There is no question of replanting them now and then. These two types of trees contribute towards the fuel and pulpwood resources of the country. Tamarind trees grown on either side of roads are a great source of revenue to the state, but the only snag is their slower rate of growth. Very good work has been done by planting trees in North India along the road sides. The afforestation of roadsides is an urgent need as it would help the travellers with shade besides indirectly serving as a sort of shelter belt against wind.

Afforestation of foreshore areas of the irrigation tanks and reservoirs to prevent their silting up : There are innumerable minor and major irrigation tanks in the country, whose foreshores have been encroached resulting in disturbance of soil and subsequent silting up of these tanks. For instance, in Karnataka there are about 40,000 such tanks. In addition there are the major irrigation and power projects in the country whose foreshores and catchments are bereft of vegetation and threatened with silting up of the reservoirs in years to come. In fact, afforestation of catchment and

foreshore up to a certain limit should be part and parcel of the irrigation project and should commence with the project itself. These foreshores and catchments offer excellent scope for afforestation with small timber, usufruct and fodder trees and trees like sandalwood.

Reclamation of eroded lands, sand dunes, mined areas, accretion area along coast, saline, calcareous, clayey soils, unsuitable to agriculture : As one travels along the countryside, large extents of lands in different stages of erosion are noticed surrounded sometimes with dry agricultural lands. These are today left untouched alone. They could be conveniently reclaimed with establishment of suitable types of trees and fibre yielding plants like Agave, which incidentally binds the soil.

Sand dune afforestation in desert areas is a big problem in itself. The net area occupied by dunes is roughly estimated at 1,25,09,566 hectares in Rajasthan alone and nearly 4,30,000 hectares could be afforested in the near future to stabilise the desert. Likewise, there are sand dunes formed along the banks of streams elsewhere in the countryside which require to be clothed with vegetation.

In the same manner, mining areas offer a great potential for practice of forestry. Large extents of area are disturbed and left bare with loose soil in different stages of degradation which are invariably washed down the slopes and streams into the rivers. These mining areas need to be stabilised urgently and it should be part and parcel of the condition of the mining lease that the lessee takes adequate measures to afforest such areas. Another problem connected with mining is the stabilising of the slime or fine sand that is generally deposited near the mines after processing the ore. This is a serious problem in many areas as the fine slime gets

washed off and deposited on the nearby agricultural fields and into tanks during the rains.

New accretion areas are generally found along the coastal belts. These could be stabilised by planting casuarina and other species to reclaim the sites.

Saline, calcareous and clayey soils amidst agricultural fields and outside in the countryside pose a problem and remain unutilised. Different types of trees can grow on these types of soils and instead of reclaiming these areas at considerable expense, such areas are best utilised for growing suitable types of trees which could supply fuel, fodder and fertilizer and also gradually improve the condition of the soil.

Due to increased loss of top soil from denuded hill sides and unprotected agricultural fields the streams and rivers are gradually choked with silt and sand and become shallower. They change their course inundating agricultural fields.

Stream training and afforestation of river banks : Stream and river training works by planting suitable types of trees and grass is an important aspect of extension forestry. By doing this the streams and rivers can be made to keep to their track.

Creation of fodder banks in rural areas : Supply of fodder is a problem in rural areas. Areas not suited to agricultural practices could be relegated to grow fodder trees and given protection from grazing animals for a few years. The grass complex would also increase. These could serve as fodder banks in times of scarcity as well as normal times.

Urban Forestry involves planting avenues, groves, and amenity planting and belts of trees to reduce noise and

pollution due to dust in urban areas ; planting of school compounds, vacant places in industrial complexes, burial grounds, hospital areas etc. Planting of trees in urban areas has assumed considerable importance since the climate completely changes with the construction of massive buildings of cement and stone or brick. The gases emanated by the transport systems tend to pollute the air along with dust. Noise pollution is another serious factor to reckon with in urban areas. The climatic, edaphic and biotic factors prevailing in urban areas, the water supply, sanitary and lighting systems all play an important role in determining the proper selection of species to be planted, the technique and after care. The subject of urban forestry is highly important in the management of urban areas. People in urban areas need shade, reduction of noise, control of dust, and reduction of heat. Tree planting practices in urban areas need to be modified to achieve these ends. Growing of horticultural trees like coconuts, sapota, jackfruit and others in residential compounds and other areas would have a double advantage of growing greenery and improving the economy. In due course, these trees would pay off the investment.

Recreation forestry includes creation of recreation forests and picnic corners for urban people and rest and recreation forests at frequent intervals along national highways. Recreation forestry is a corollary to urbanisation. Urban people need places of recreation for improving the quality of life. This is more so in the case of our youth whose energies may otherwise be misdirected in many ways. The UN Conference at Stockholm in 1972 considered a declaration of Human environment which in part reads : "Economic and social development is essential for ensuring a favourable living and working environment for man and for creating conditions on earth that are necessary for the improvement of the quality of life . . . Education in environ-

mental matters, especially for the younger generation, is essential in order to broaden the basis for an enlightened opinion and responsible conduct by individuals, enterprises and communities in protecting and enhancing the environment." The farsightedness of Karnataka State in establishing the Bannerghatta National Park and of the Maharashtra Government in forming the Borivli National Park are notable examples of urban recreation forestry in the country. Recreation forestry also includes creation of green belts around towns and cities.

Implementation : (i) A time-bound programme of 10 years should be drawn up. (ii) All vacant lands not suited to agriculture should be earmarked for afforestation. (iii) No forest areas should normally be released for cultivation. (iv) Cultivators should be required to plant, replace, tend at least 605 trees per hectare on dry and wet lands, within the next ten years. Initially the Department of Social Forestry should plant these trees and farmers have to look after them. (v) Rearing and maintenance of goats should be discouraged and sheep rearing should be encouraged instead. (vi) A separate department of Social Forestry and Environment should be created in each state. This will result in a healthy competition with the department of forests. (vii) The development expenditure of this Social Forestry Department should be equal to that of the forest department in each state. (viii) The rural banks could play a notable role in financing agriculturists and rural people in growing trees. (ix) The afforestation of and protection of catchments and raising of canal bank plantations should be part and parcel of the project cost of the irrigation or power project but implementation of the planting programme should vest with the Social Forestry Department.

Personnel : Technical personnel required can be had

by running short-term courses of 3 months in Social Forestry Practices under the auspices of the Universities of Agricultural Sciences. PUC qualified candidates can be recruited, trained and employed as Social Forestry guides to execute these programmes. In addition unemployed agricultural, horticultural graduates who have had a course in Social Forestry can be used for supervisory posts. Practical training of village level workers in the art of growing trees and maintaining them is necessary. Social forestry would create massive employment opportunity in urban and rural areas. It would prevent unskilled labour drifting away to the cities.

New schemes like this are bound to be faced with initial difficulties. They need coordinated efforts of Revenue, P.W.D., Forest and Agriculture departments and people's participation. Implementation of Social Forestry Programmes is a challenge in our efforts to solve the energy, fertilizer and fodder crisis, improve the environment and thus regenerate economic life in rural areas. It will contribute to India's economic development by creation of extraordinary renewable assets.

*The views expressed in this booklet are
not necessarily the views of the Forum
of Free Enterprise*

BIBLIOGRAPHY

Those interested in the theme of this booklet may read with profit the following material :

1. Central Forestry Commission Bulletin No. 13. 1972
2. National Commission on Agriculture — Interim Report on Production Forestry — Manmade Forests. 1972
3. National Commission on Agriculture — Interim Report on Social Forestry. 1973
4. Indian Agriculture in brief — 11th Edition (Government of India)
5. Central Forestry Commission Bulletin No. 9, (Govt. of India, Ministry of Agriculture.)
6. Soni, R.C. "Afforestation in India's Economy". Economic and Scientific Research Foundation, New Delhi. 1975.
7. Thapar, S.D. "India's Forest Resources". Birla Institute of Scientific Research, Economic Research Division. 1975
8. Sharma Y.M.L. "Role of Forestry in Respect of Food, Shelter and Clothing with Reference to 20-Point Programme" — Souvenir of Business Relations Conference on Food, Employment, Shelter and Clothing. Federation of Karnataka Chamber of Commerce and Industry.
9. Sharma Y.M.L. "Social Forestry and Related Research in India". Paper contributed to the XVI Congress of the International Union of Forest Research Organisations, Oslo. 1976
10. Jack Westoby. "Changing objects of Forest Management" — IX Commonwealth Forestry Conference, India. 1968
11. C. R. Ranganathan. "Whither Forestry in the 1980s?" Paper presented to the Convention of the Institution of Agricultural Technologists, Bangalore. 1976.

“People must come to accept private enterprise not as a necessary evil, but as an affirmative good”.

—Eugene Black

Have you joined the Forum?

The Forum of Free Enterprise is a non-political and non-partisan organisation, started in 1956, to educate public opinion in India on free enterprise and its close relationship with the democratic way of life. The Forum seeks to stimulate public thinking on vital economic problems of the day through booklets and leaflets, meetings, essay competitions, and other means as befit a democratic society.

Membership is open to all who agree with the Manifesto of the Forum. Annual membership fee is Rs. 15/- (entrance fee, Rs.10/-) and Associate Membership fee, Rs. 7/- only (entrance fee, Rs. 5/-). Graduate course students can get our booklets and leaflets by becoming Student Associates on payment of Rs. 3/- only. (No entrance fee).

Write for further particulars (state whether Membership or Student Associateship) to the Secretary, Forum of Free Enterprise, 235, Dr. Dadabhai Naoroji Road, Post Box No. 48-A, Bombay-400 001.

Published by M. R. PAI for the Forum of Free Enterprise, "Piramal Mansion", 235 Dr. Dadabhai Naoroji Road, Bombay-1, and printed by B. D. Nadirshaw at Bombay Chronicle Press, Sayed Abdulla Brelvi Road, Fort, Bombay-1.