

Afforestation in India: Problems and Strategies

BY VANDANA SHIVA, J. BANDYOPADHYAY AND N. D. JAYAL

Forests are rich in benefits for man. They provide essential watershed protection, support a variety of species, and produce a wide range of products such as fruit, timber and chemicals. Government planning in many countries may only emphasize one of these functions, to the overall detriment of the forest and the people. In India, however, the popular "Chipko" movement has begun to gather momentum and may perhaps change forest-use policy.

Forests in India were always central to the evolution of her civilization. Forest-based *ashrams* (settlements) produced the best scientific research and cultural writings, and India became known as an *Aranya Samskriti*, or a forest culture. Human understanding of the fundamental ecological utility of forest ecosystems and their economic importance led to trees being treated with respect and veneration. This basic dependence on the existence of forests for human survival was the reason for the worship of trees in almost all human societies. In the *Rig Veda*, the forest is described as *Aranyani*, or mother goddess, a deity that takes care of wildlife and ensures that food is available for man. Ashrams and forests, not urban settlements, were recognized as the highest form of cultural evolution, providing society with both intellectual guidance and material sustenance.

India's forest wealth is characterized by a diversity of soil types and climate. Moist tropical evergreen and semi-evergreen forests are characteristic of the Western Ghats and the northeastern region. Tropical dry deciduous forests occur in the north and the south, with sal being the dominant species in the north. The Himalayan region has a diversity of moist and dry temperate forests that change into alpine vegetation at the highest altitudes. In each region of India, special attention was devoted to the growth of village forests that contained multi-purpose tree species providing fuel, fodder, fruits, fiber, green manure, etc. The ecological role of forests in soil and water conservation was widely recognized, and the social control of the felling of trees in ecologically sensitive areas such as riverbanks was strictly enforced.

This principle of civilization became the foundation of forest conservation as a social ethic through the millennia. However, the spread of colonial methods of management to the forests of India caused the ethic to erode. Teak from the forests of the Western Ghats, sal from central and northern India, and conifers from the Himalayas were felled to satisfy the timber needs of the British Empire. The result was not merely the destruction of forests but the destruction of a culture that conserved forests.

THE PROBLEM

The Colonial Legacy

The perception of forest ecosystems as having multiple functions for satisfying diverse and vital human needs for air, water and food was replaced by one-dimensional "scientific" forestry during the colonial period. This had as its only objective the maximization of commercially valuable timber and wood production while ignoring the other ecological and economic objectives for utilizing forest resources.

Forests in India have three major economic roles. In order of their significance to the economic development of Indian society, they may be classified as follows: 1) to regulate, through the humus in the forest soil, the supply of water for the nation's water reserves, and to build and conserve soil; 2) to satisfy basic domestic biomass needs of food, fodder, fuel, fertilizer, fiber and small timber for three-fourths of the population; 3) to satisfy industrial and commercial demands.

The first contribution of forests to the national economy is to defend against floods, droughts and soil erosion. The sec-

ond contribution is to the sustenance of about three-fourths of the population that depends on the free productivity of nature for the satisfaction of basic biomass needs. The third and last contribution is mainly to the growth of wood-based industries that must obviously have a priority lower than that of the survival and sustenance of the people.

To separate the third contribution from the first two, an artificial dichotomy is often created between "protection" and "production" forestry. Production forestry is naively identified with commercial forestry in a vain attempt to project a non-productive image of non-commercial forestry. Such a division is unscientific and dangerous on two grounds. First, it ignores the vital economic contribution of forests to the regeneration of water resources and the control of soil erosion. Secondly, it cripples the many possible options for economic development based on the utilization of non-timber biomass produced by trees. Forest management in India, as organized by the British, was intellectually incapable of conceiving the first economic contribution of forests, and politically ruthless in denying the second. Accordingly, "scientific" management under the British reduced itself to the calculation of timber yields for industrial-commercial demand. While the socio-political environment of forest management has undergone change since the colonial days, the objectives of official forest management in post-independence India have not been liberated from colonial legacies. Truly scientific management of forests in democratic India cannot remain so insular as to not recognize the first two most productive aspects of forests for social benefits.

Current Practice

The obvious result of this distorted focus has been the creation of antagonism between the people and the foresters, and enormous economic damage to the nation caused by destabilization of soil and water systems. Moreover, forest management research has made no attempt to generate systematic and viable information on these ignored but vital aspects. No systematic classification of forest resources or methods to satisfy the forest biomass requirements of local people have been initiated, though invariably forest officials have used "hotic pressure" as the justification for the rapidly disappearing green

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Small mountain village in India. Forestry, agriculture, animal husbandry and human settlements coexist in harmony. Photo: J. Bandyopadhyay.

cover of the country (1). It should be pointed out that satisfaction of local needs has been accepted as the primary objective in the 1952 Forest Policy, but in practice it has remained an open-ended question. Citizens, especially women, are threatened by forest guards while collecting biomass. As a result they are losing their natural concern for forests. On the other hand, local politicians and greedy traders are smuggling rich forest resources while forest guards are themselves seeking shelter in safer places. These social conflicts and the emphasis on the narrow economic objectives of revenue maximization by forest managers have led to the ruthless destruction of India's forests.

In post-colonial India, forestry practices have continued to sharpen conflicts over forest resources through a lack of sensitivity to the complexity and ecological diversity of forest ecosystems and multiplicity of use (2). There has been a new thrust in clear-felling natural forests to raise large-scale plantations of exotic species such as eucalyptus so as to provide wood fiber to the paper and rayon industries. Such international agencies as the Food and Agricultural Organization (FAO) even advised the government of India to improve accessibility of ecologically sensitive hill forests that had remained free of commercial exploitation (3). Both these dominant

practices have meant enhanced supplies of industrial and commercial wood and increased revenues for the government. However, they have seriously undermined the fundamental management of the forests for soil and water conservation as well as for satisfying the basic needs of the people.

Basic scientific management requires, as a starting point, exact information about existing forest resources and not merely land mapped as forest. There appears to be no clear indication of this figure in official forestry reports. Vohra (4) has drawn the attention of the nation to the devastating reality exposed by the National Remote Sensing Agency (NRSA) report that "the area under good forests today is not 33 percent (as stipulated in 1952 Forest Policy), not even 23 percent, but only around 11 percent of the country's geographical area." He cautions that in the next 15 years it is a national imperative to afforest a minimum of 70 million hectares of land. In contrast to this frightening situation, we find that there has been no management analysis of the failures or successes of the 3.7 million hectares that were supposed to have been afforested between 1950-1980. Where is the guarantee that the existing strategies of afforestation will succeed when the minimum yearly target will be 50 times greater in the ensuing 15

years? Nor has "scientific management" resulted in any scientific analysis as to why more than half of the "reserved forests" have remained "reserved" on paper while the actual forests have disappeared. A systematic analysis of the factors behind this disappearance of trees in reserved areas and the incredibly low success of official afforestation projects should be the starting point for the scientific management of Indian forests.

New programs of afforestation have to address themselves to all dimensions of forest management that have been previously ignored. Afforestation targets are too ambitious and urgent to be left to traditional project-implementing institutions. The massive financial allocation for afforestation needs an implementation strategy that will guarantee success and not merely hope. There is little doubt that the next five years are very critical for the success of afforestation because the progress in this period will determine whether India will enter the next century as a dust-bowl or as a grainbowl.

However, even afforestation programs, which should be oriented toward concentration or satisfaction of basic needs, have been distorted under conventional forestry management practices and have concentrated almost exclusively on satisfying industrial demands. Two ambitious affores-



Forest guard with illegally felled timber. Increased urban and commercial demand has led to smuggling of wood by armed gangs. Photo: J. Bandyopadhyay.

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tation strategies, social forestry and the afforestation of wastelands, are examples of programs that have been diverted from their original multi-dimensional objectives.

Social Forestry

Social forestry, an approach that was designed to correct one-dimensional forestry, uses a combination of diverse multi-purpose tree species. Since trees have to be physiologically and ecologically matched to diverse end-uses, a uniform monoculture indifferent to ecological requirements and basic needs cannot, even in theory, be a forestry model for the social objectives of conservation. Unfortunately, social forestry programs have failed to take account of this basic ecological fact. Instead of transforming forestry into a multi-dimensional tree planting, social forestry projects have mainly become mechanisms for expanding the control of one-dimensional forestry to food-growing agricultural lands. This threat of the expansion of an ecologically unstable and economically wasteful land-use model is most severe in rain-fed agricultural lands. An analysis of social forestry projects shows a quantitative expansion of this narrow concept of forestry, rather than qualitative shifts in the scientific and management basis of forestry.

The social forestry program of Karnataka is a typical example of how the management objectives of one-dimensional forestry have continued to guide social forestry programs even on agricultural lands. Under the World Bank-funded social forestry programs, the state forest department intended to carry out 60 percent of afforestation on privately owned farmlands with eucalyptus as the dominant species.

Encouraged by the free distribution of seedlings by the forest department, farmers in Karnataka have diverted large areas of land to eucalyptus plantations. Although the social forestry scheme was expected to make a variety of species available for farm forestry, very few species other than eucalyptus have in fact been planted. Eucalyptus plantations in villages have extended to private landholdings that earlier were used for food crops (5). The community (or *gomal*) lands have almost completely disappeared. Other than private lands in villages, community land is the only type not under the ownership of the forest department. It is evident that the only social forestry program in which people have voluntarily participated has been the extension of farm forestry to their private lands.

Community participation in forestry is an essential component of social forestry since, in its absence, market demands

rather than material needs and ecological considerations dictate the pattern of land use and the choice of tree species planted. Afforestation can be exploited commercially by individuals. In order to ensure improvement in community services, better satisfaction of basic needs and a stable resource base, the involvement of the community in planting, raising and using the forests is a practical necessity.

The adoption of eucalyptus at the present scale, however, makes such community involvement extremely difficult. Thus, the claim that eucalyptus is not eaten by cattle translates into a lack of responsibility on the part of the community to protect their trees. Social forestry programs that stress species such as eucalyptus tacitly accept the impossibility of community participation. Community participation is further excluded by the disproportionate success of individual plantations, which encourages individual and not community responsibility.

The successful propagation of species such as eucalyptus on farms is rooted in new and growing markets for wood fiber as well as in the decay of traditional ties that once provided the social organization essential for the production of traditional food crops. Eucalyptus plantations have provided a way for farmers to make profits from land without a corresponding de-



Small mountain village in India. Forestry, agriculture, animal husbandry and human settlements coexist in harmony. Photo: J. Bandyopadhyay.

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dependence on the community. That detachment from the community has, in turn, led to insurmountable problems in generating community participation for raising village woodlots. When richer farmers can make large profits by planting eucalyptus on their own lands and simultaneously reduce their dependence on poorer people and local resources, it is utopian to expect them to take part in community efforts to grow woodlots on the commons and degraded lands.

Social forestry has unfortunately become counter-productive because it has diverted fertile agricultural land from food production to wood production, while degraded land in need of afforestation continues to be further degraded (6).

Afforestation of Wastelands

In spite of serious controversy over the conversion of food-growing land to industrial wood-fiber plantations, the government of Karnataka is planning to convert another 120,000 acres (48,600 hectares) of village commonlands into eucalyptus plantations to supply the energy needs of a local rayon factory. A company will also produce eucalyptus wood on 75,000 acres (30,375 hectares) of class C and class D lands in four districts; 45,000 acres (18,225 hectares) of class C and class D lands within a 100-km radius of the rayon factory will be leased to agricultural laborers for cultivating eucalyptus, which they will be allowed to sell only to the rayon factory at a "reasonable rate."

Class C and class D lands are lands that, in the colonial revenue system, were not found to be useful for generating agricultural revenues. These were lands "suitable for forest crops" or lands used as common grasslands. Such lands have in fact played a critical economic role in providing fodder, fuel and fertilizer for villagers, especially the poor and landless. The conversion of these village commons to industrial plantations through "wasteland development" has generated a major popular resistance movement for the protection of the commons called "Movement for Saving the Soil." Since these so-called "wastelands" were widely used for the satisfaction of basic biomass needs, affected villagers have been left with no option but to uproot the newly planted eucalyptus seedlings from these "wastelands" in large numbers.

A survey of class C and class D lands has shown that much of the land is natural evergreen or semi-evergreen forest. Average tree populations have been found to be 50 to 200 per acre (0.405 ha) including many diverse species (7). The cultivation of eucalyptus in class C and class D lands is seen as a program more for the creation of wastelands than for their development.

SOLUTIONS

Nothing less than a revolutionary departure from the colonial strategy of forest management can arrest the alarming loss of forest cover and ensure successful and rapid afforestation in India. The present strategy of forest management seems to be insensitive to the concerns of non-foresters for the dwindling wealth of the forest.

While environmentalists are worried over the total destabilization of soil and water systems, and villagers are at loggerheads with forest guards, the pulp- and wood-based industries are only too happy to get rid of bureaucratic control over resources on which they depend. The situation clearly requires a more comprehensive approach to forest management.

A new strategy for forest management in India that could be made operational immediately, emphasizes a radical departure from the present concepts of forest afforestation and management. The forest should no longer be seen as a collection of timber-producing trees but as an ecosystem of soil/water/vegetation in which trees play a number of significant roles, of which the production of timber is only one. Similarly afforestation should not be just the regeneration of trees as such but also the reestablishment of the ecological interrelationship of the soil/water/vegetation system, lost by the destruction of the original tree cover. It is in this perspective that a new strategy for forest management in the coming years needs to be redefined, not only in principle but in operational details.

Existing forest management has given rise to an anarchistic situation in forest resource utilization. This anarchy is reflected in the fact that natural oak forests, vital for soil and water conservation in Himalayan watersheds, are entering the hearths of hill villages; that social forestry programs, meant for the rehabilitation of rural environment and satisfaction of basic biomass needs of rural people, are satisfying the pulpwood needs of industries; and that state governments are finding it difficult to meet their supply commitments to industry, even though the agreements were made in accordance with the principles of "scientific management" of forests in India (2). An outline of a new operational strategy for forest management that can ensure successful afforestation with multipurpose objectives is briefly presented here.

Multidimensional Approach

In the absence of a clear categorization of forests into various ecozones, diverse demands have played havoc with forest resources. Forests in such sensitive areas as the Himalayas or the arid regions have been the worst victims of this lack of categorization. What is left of the Himalayan forests is insufficient even to satisfy the urgent requirements of soil and water conservation, but the use of these forests for collection of biomass to meet basic needs continues. Some foresters are now pressing for the withdrawal of the official ban on commercial green felling in the ecologically sensitive central Himalayan state of Uttar Pradesh.

The time is ripe to clearly categorize forest land on the basis of its primary economic role in soil and water conservation, the satisfaction of rural needs, and the satisfaction of commercial-industrial demands. This end-use-oriented classification will help control the anarchy of forest-resource utilization that has dominated the situation thus far. It will also mean a thorough departure from colonial classifications that were determined purely from

the point of view of timber extraction and without any recognition of the larger economic role of the forest.

A new classification seems necessary. Forest land can be divided into three categories; watersheds, land to support needs of agro-ecosystems, and land to satisfy commercial-industrial demands. Watershed forests can be classified on the basis of their hydrological significance. Considering their widespread degradation, watershed forests need to be rehabilitated through minimizing surface run-off and soil erosion. Their use for other purposes can be considered only after ensuring complete hydrological rehabilitation.

Hydrologically marginal land within the zones of operation of individual villages may be set aside as commons to satisfy the fuel/fodder/green-manure needs of the people. In such ecologically sensitive regions as the Himalayas, where sufficient land with marginal hydrological significance may not be available, fuel, fodder and small timber collection may have to continue in watershed forests but should be strictly monitored for potential damage to hydrological stability. Hydrologically marginal lands outside village commons, which are by and large denuded, may be afforested to satisfy commercial industrial demands. Costs of wood produced by the afforestation of denuded land should reflect the costs of production.

Successful Implementation

Afforestation programs can be successful only when it is understood that forests are not just a source of timber. The myth that economic development can be achieved only through the commercial-industrial exploitation of forests still dominates forest planning. The mythical contradiction between the objectives of economic development and the role of forests in conservation is clearly visible from the following statement in the *Report of the Working Group in Forestry* for the Seventh Five Year Plan: "Overemphasis on eco-development and conservation should not lead to the role of forests being overlooked as one of the main repositories of raw material for a host of forest-based industries and its consequent impact on the country's economy."

The country's economy, however, is not linked only to forest-based industries. It needs to be stressed that, unless the need for conservation of forest resources is recognized as an urgent requirement of the country's economy, the present destructive trend cannot be reversed. A National Land Use Board with the prime minister as chairman has been created. This body, supported by a tightly-knit professional team, is the most appropriate agency for defining the task at the national policy-making level. Corresponding bodies at the state level need to be created or energized. The Department of Rural Development is the appropriate agency to operationalize activities related to afforestation for rural development and to ensure that forestry is integrated with the satisfaction of basic needs and development. Existing schemes for rural development and relief need to be quickly evaluated and reoriented toward afforestation. Afforestation for

watershed management requires integration with other environmental programs of the Department of Environment, since it is the natural vegetation in all its diversity that is most appropriate for soil and water conservation. Afforestation for commerce and industry should be managed by forest departments that have the technical capability and experience to meet this objective. Lands made available for this purpose should be those that are unsuitable for the other two more vital land use functions.

Since the planning commission determines the approach and strategies for successive five-year plans, it should assume responsibility for generating a national framework for afforestation strategies. For this task it could sponsor studies, convene meetings, and commission consultants to research the problems and identify feasible solutions. These inputs would prove useful to the National Land Use Board and to the various operational bodies responsible for the national afforestation programs. There is thus an urgent need to expand the base of forest management, liberating it from the colonial heritage of narrow commercialism.

Participation of the People

An important element in this process of reorganizing forest management is to make it participatory. Over the past century, forests have been managed without the participation of the people, resulting in a strong antagonism between the people and the forestry department bureaucracy. As the organized smuggling of forest resources has increased, forest guards have become less effective in guarding forests. It is only the organized power of the local people that can effectively save forests from plunder.

Success cannot be guaranteed without local participation, neither in the defense of existing forests nor in afforestation. With the dominance of government afforestation contracts with individuals, these programs have been reduced to ceremonial tree planting. Financial allocations for afforestation become redundant if planted trees do not develop into forest ecosystems. Funds need to be allocated on the basis of the regeneration of the actual tree cover. The issue of achieving the objectives of afforestation is thus not solely a matter of fulfilling the targets of tree planting. It is not solely a matter of fund allocation. Excessive funds for tree planting without committed leadership to galvanize community efforts and strong monitoring, will lead only to the ceremonial action of annual tree planting, generally on the same land. As the Chipko poet Ghanshyam Raturi said: "In the 1970s people made big money in felling of trees. Today a big opportunity to make bigger money has come through 'planting' of trees, sometimes only on paper."

The massive budget allocations for afforestation, if utilized properly, could hold great hope and promise for the people of India. However, if the serious flaws in the current approach are not removed and a new approach based on human resources is not introduced, the Indian people may lose the last opportunity for

ecological rehabilitation of this once-forested land. The fact that it is not financial resources but the deep commitment of the people that is the basic prerequisite for successful afforestation is clearly demonstrated in a large number of non-governmental efforts, as well as in the lack of success of even larger numbers of official projects.

The Chipko movement, which originated in the conflict between local and non-local demands for Himalayan forest resources, has now spread to distant corners of the country. Based on public commitment to a non-exploitable relationship between man and nature, this movement is actively encouraging afforestation through "5F" trees that give fuel, fodder, fruit, fiber and fertilizer to the local population, while strengthening the ecological role of the trees in soil and water conservation (8). At the same time, the Chipko movement is firmly opposing the reckless spread of ecologically destructive plantations of industrial wood species thrust on the people through official government projects in the name of afforestation. Over the last few decades, the experience of various afforestation programs has clearly established that afforestation of degraded commons with tree species that have limited local utility will find little local support.

It is indeed not an understatement to claim that the politics of afforestation in India are today a reflection of the politics of the entire country. The full-scale rehabilitation of the multidimensional role of forests is a long process that cannot be completed by ignoring the social problems and political complexities of contemporary Indian society. Afforestation is not a physical target-oriented technical program whose success can be guaranteed purely by monetary allocations. Afforestation has to be a social movement in the interest of society at large. The rapid spread of the Chipko movement from its base in the Himalayas to the Western Ghats, the Aravallis, and the Vindhyas is a good indicator of the peoples' concern about the greening of India.

Afforestation programs and international funding should aid the democratization of forest management and not work against it. Conservation of soil and water and the satisfaction of basic biomass needs of the poorer people cannot be ensured through projects that are based on market forces and individual profit motives. When the target population has little or no purchasing power to satisfy their needs, projects based on market forces only make the situation worse. Afforestation projects for the poor will have to be based on the entirely different motivation of minimizing social costs and maximizing social benefits. The Chipko movement struggles for this vital shift in socio-economic goals for afforestation, especially in the ecologically sensitive watershed regions of the Himalayas.

SUMMARY

Forests in India have the following three fundamental roles, in order of their importance to national economic development: 1) soil and water conservation, 2) satisfac-

tion of primary biomass needs of the rural people, and 3) supply of industrial and commercial wood.

Indian forest management needs to shed its colonial organization and reorient itself toward the three tasks mentioned above. The first task requires technologically competent ecosystem-based planning. The second task mainly concerns the involvement of people in afforestation. The third task requires financial investment by wood-based industries for the regeneration of wastelands by cropping appropriated species.

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