

# **PRODUCTION, PROTECTION AND PARTICIPATION IN FOREST MANAGEMENT: AN INDIAN PERSPECTIVE IN ACHIEVING THE BALANCE**

Dr. VK Bahuguna  
Deputy Inspector General of Forests,  
Ministry of Environment and Forests,  
Government of India, Room No.102,Paryavaran Bhawan,  
CGO Complex, Lodhi Road, New Delhi-10003.  
Tel: 0091 11 4360379 / Fax 0091 11 4360379 / email: bahugunaifs@yahoo.com

## **ABSTRACT**

Forests are the most valuable natural resources available to the mankind on planet earth. On the one hand, they are the essential source of livelihood for the poor and marginalised sections of the society; on the other hand they provide furniture and other items of desire for the rich. After years of neglect, forestry is acquiring international dimensions. The role of forests in the environmental amelioration and peoples life assumed global significance after the 1992 Rio Summit. The saga of deforestation in the developing countries on account of rising population and consequent poverty has attracted global attention of scientists, resource managers and law makers. To reverse the degradation in resources, action programmes for conservation and development of forest resources have taken shape in most of the countries. This paper present the perspective of India in achieving balance in the forest management practices with regards to protection, production and participation with a view to achieving sustainable forest management. The paper starts with a note on global forest cover vis-à-vis Indian achievements in monitoring its forest areas, and then moves on to discuss the Indian Forest Policies evolved over the last 125 years ever since scientific forestry was initiated in India in 1864 listing out the major events and initiatives in forest conservation and development efforts. The paper discusses the degradation of forests, its causes and extent and initiatives taken by the Government and people to rehabilitate the degraded forests and extend tree cover through joint efforts and to bring legal and institutional changes to secure conservation of forests. Paper discusses the role of uniquely successful Joint Forest Management programme and recent steps taken to strengthen it. Through JFM around 10 million ha of forests are being managed by the forest department jointly with around 36,000 JFM bodies at the village level. After dealing with the Indian scenario, the paper discusses management principles of sustainable forestry which encompasses the approach on protection, production and participation. Situational analysis and the National Forestry Action Programme are discussed for achieving the goals of Sustainable Forest Management. The paper concludes by seeking a balance in these efforts for the benefit of present and future generations.

**Introduction:** Forests of the world are a most valuable renewable natural resource for the mankind and have been providing goods and services since the human race appeared on the planet earth many millions years ago. Be it a living room of a citizen of a developed nation or a tribal hamlet in some developing country in the tropics forest products will find a sizeable space and use; though the level and type of use would vary significantly between the rich and the poor people. Whereas, forests are essentially source of livelihood for the poor and marginalised sections of the society, they provide luxurious items for the rich. On the ecological frontiers the protective and productive influence of forests transcends the geographic boundaries of nations and maintains the genetic basis of life and the over all environment. A good forest is a resource base for all other life sustaining resources. Forest occupied central stage in the global negotiations after the Rio summit in 1992 when the future of our environment and development was linked to the sound and efficient management of forest resources. This has given an opportunity to all the countries of the world for evolving global perspective in forest management practices and policies in order to meet the objectives of Rio summit.

Though the people since time immemorial managed forests, the modern forestry practices started only during the last 200 years or so as an enterprise in Europe and later on introduced by the colonial powers in the Asia, Africa, Latin America and other countries of the world. In fact, the science of business management found early application in forestry. Forestry as land use survived on commercial lines through the sustained yield concept for the maximization of return from timber. To ensure this legal systems were created which met these objectives. The economic growth in developed nations and the land tenure systems that were developed to sustain this proved a major reason for the success of forestry in these countries. On the contrary in developing countries the forestry

practices, notwithstanding the timber bias also perforce focussed on the larger interests of the country reflected in adopting ecologically and socially sensitive policy declarations. In the following paras, the issues in forest management are discussed with reference to Indian situation and developing world scenario.

### **Global Events in Forestry**

The United Nations Conference on Environment and Development (UNCED) provided, a formal comprehensive endorsement of the Principles of Sustainable Development. The Conference also adopted, along with Agenda 21, a statement of Principles for a Global Consensus on Management, Conservation and Sustainable Development of “forests” the Convention on Biological Diversity, and the Framework Convention on Climate Change (Anonymous, 1998). UNCED follow-up has resulted in burgeoning interest in conservation forestry stemming from the global environmental awareness and international publicity for controversial natural resource issues. Issues have been globalized, the stakeholders multiplied and long held beliefs of forest science have been questioned.

Global events in forestry will have a far reaching policy implication for all countries particularly the role of forestry in the climate change. The warming of earth is responsible for global climate inconsistencies. In India, according to one estimate by 2050, the country will be at least 3 degrees Celsius hotter, many of its rivers would have dried up, floods and droughts would be regular, cyclones more intense and there will be severe water and food shortage (Kaul, 2000). There has been intense rainfall variation in India during 90s. State like Punjab, Rajasthan and Haryana have got 40-80% more rain. The Orissa cyclone came with wind speeds of 250 km/hr. The disappearance of mangrove forests played a key role in destruction of life and property. Rapid deforestation has added to the excess heat on earth. World community especially the political leadership and intellectual class in the developing countries should act and take mitigating steps to control the global warming. The protective and productive role of forests in this regard assumes importance. After several rounds of discussions in the Inter-governmental Forum on Forests, it was decided in the year 2000 to have a separate forum on forests within the machinery of the United Nations to deal with emerging forest issues in a holistic comprehensive and integrated manner. This reflect the importance of forests in the global climate change negotiation. **In view of these changes at the global level, the management of forests in every country has to be thought of in global perspective and acted upon locally.**

## Global Forest Cover:

According to the State of World Forests 1999 published by FAO (Anonymous, 1999-a) the position of the various regions of the world regarding percentage of forest cover, per capita forests and annual loss between 1990-1995 is given below in Table-I.

**Table-I**

No.	Region/ Country	% of Forest Cover to land area	Per capite forest	Annual change between 1990-1995 (in thousand ha)
1	World	26.6	0.64	-11269
2	Asia	16.4	0.1	-2901
3	Africa	17.7	0.7	-3748
4	Europe	41.3	1.3	+519
5	China	14.3	0.1	-87
6	Pakistan	2.3	Non-significant	-55
7	Nepal	33.7	0.2	-55
8	Bangladesh	7.8	Non-significant	-9
9	Sri Lanka	27.8	Non-significant	-20
10	Indonesia	60.6	0.6	-1084
11	Malaysia	47.1	0.8	-400
12	Philippines	22.7	0.1	-262
13	Japan	66.8	0.2	-13
14	USA	23.2	0.8	+589
15	India	19.27	0.08	+7

India is one of the few developing countries, which has arrested the loss of forest cover as reflected by the above figures in the table.

**Forest Resources of India:** Physiologically, India is one of the most diverse countries. The forests cover of India is monitored by the Forest Survey of India a government of India organization, through biennial assessment using remote sensing technology. The latest assessment was done in 1999 and published in 2000 (Anonymous, 1999-b). The details of the forest cover assessment are given below in the table II:

**Table II**

Class	Area in Sq. Km	Percentage of geographic area
Dense Forests	377,358	11.48 %
Open Forests	255,064	7.76%
Mangrove	4,871	0.15%
<b>Sub- Total</b>	<b>637,293</b>	<b>19.39%</b>
Scrub	51,896	1.58%
Non- Forests	2,598,074	79.03%
<b>Total</b>	<b>3,287,263</b>	<b>100.00%</b>

The total forest cover of the country has been estimated to be 63.73 million ha. which is 19.39% of the geographic area. The dense forests (with crown density more than 40%) and open forests (crown density 10 to 40 %) occupy about 11% and 8% of the geographic area respectively. Mangrove forests occurring along the inter-tidal coastal region. occupy 0.15 % of the geographic area.

The comparative assessment of the forest cover and changes therein over a period of past 12 years is given in the

following table III

**Table III**

**COMPERATIVE FOREST COVER OF INDIA  
(1987 TO 1997 ASSESSMENTS)  
(Area in sq.km)**

Assessment Year	Period	Forest Cover	Percentage of Total geographical area
1987	1981-83	642041	19.52
1989	1985-87	640134	19.47
1991	1987-89	639182	19.44
1993	1989-91	640107	19.47
1995	1991-93	639600	19.46
1997	1993-95	633397	19.27
1999	1995-97	637297	19.39

It is seen from the table that the forest cover in India during the past 12 to 13 years has remained in the vicinity of 19% of the geographic area. As compared to 1997 assessment the forest cover as per the recent assessment has increased by 3896 Sq. Km. The dynamics of change revealed that the dense forests has increased by 10,098 Sq. Km. and Mangrove by 44 Sq. Km. On the other hand the open forest cover has decreased by 6,246 Sq. Km. *The increase in forest cover is largely attributed to inclusion of large block plantations, practice of JFM, protection efforts and natural regeneration. However, the forest cover has also declined in 12 (out of 28) States mainly due to shifting cultivation, encroachments and uncontrolled removals from the forests without adequate regeneration*

Taking into account the tree cover existing outside the Government controlled forests (around 17 million ha), the total geographical area under forest/tree cover is around 24%.

### **India's Forest Policies**

The era of scientific forest management in India began in 1864, which marked a break in the old indigenous practices. Since then in India forest policies have been enunciated in 1894, 1952 and 1988. The implementation of these policies has had a major influence on forest management strategies and methods. The *Forest Policy of 1894* subordinated forest conservation to the promotion of agricultural interest. The policy clearly stated that whenever forestland was required for agriculture it should be excised without hesitation. Forest ecology and conservation in those days though were considered inconsequential but nevertheless, did aim at soil and

moisture conservation. Further this policy stated that the consideration of forest income should be subordinated to the needs of the local people.

### Major forestry related events

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1864	Appointment of D. Brandis as Inspector General of Forests.
1865	1 <sup>st</sup> Indian Forest Act enacted
1878	2 <sup>nd</sup> Indian Forest Act was enacted
1894	First Forest Policy of India.
1927	3 <sup>rd</sup> Indian Forest Act enacted
1952	Second Forest Policy of India
1972	Wildlife Protection Act enacted
1976	Social Forestry Programme initiated
1977	Forestry transferred from the State List to the Concurrent List through 42 <sup>nd</sup> Constitutional Amendment.
1980	Forest Conservation Act enacted
1988	Present National Forest Policy enunciated
1990	Joint Forest Management instituted

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(Source: Bahuguna & Raghavan, 1999)

The *National Forest Policy 1952* was adopted after independence and was recognized as an excellent scientific policy document. It rejected the belief that forestry should be restricted to residual lands not required for any other purposes. The policy proposed that 60% of the land in the hills and 20% in the plains and over all 1/3<sup>rd</sup> of the total geographical area should be under forest/tree cover. This policy also stated the need for checking denudation on the hills, soil erosion and invasion of sand from deserts and coastal areas. The establishment of tree lands to ameliorate conditions and promote well being of the people and to maximise annual revenue in perpetuity consistent with the fulfillment of all the other conditions was also stated. Most provisions of the policy could not be implemented mainly due to the problems of increasing human and livestock population and chronic food shortages.

The *new National Forest Policy was enacted in 1988*. The primary objective is to ensure environmental stability and ecological balance. In this policy, derivation of direct economic benefits is to be subordinated to this principal aim. This policy emphasizes the need to meet the domestic demands of the tribal and rural people for forest produce and also the need to involve them in protection and management of forests. The first charge on forest produce would be the domestic requirement of the people living in and around the forests but this fulfillment should be restricted to the carrying capacity of the forests. Conservation and protection of existing forests and restoration of productivity on degraded forests has been prioritised. This policy also emphasis the need for strengthening the Protected Area Network for overall gene pool resource protection and conservation. Industrial requirements for raw material will not be met from the natural forests but from the farm forestry and agro forestry sector through tie up between farmers and industry. The objective of the 1952 policy of having 33% of the geographical area under tree cover has been reiterated and seeks the expansion by afforestation of the wastelands. ***The poor people have always been treated as liabilities by the forest managers due to their dependence but this policy through peoples' participation in forest management converted this liability into an asset for the conservation.***

The policy is based on the following principles (Anonymous, 1988)

- Maintenance of environmental stability through preservation and, where necessary, restoration of the ecological balance that has been adversely disturbed by serious depletion of the forests of the country.
- Conserving the natural heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna, which represent the remarkable biological diversity and genetic resources of the country.

- Checking soil erosion and denudation in the catchment areas of rivers, lakes, reservoirs in the interest of soil and water conservation, for mitigating floods and droughts and for the retardation of situation of reservoirs.
- Checking the extension of sand-dunes in the desert areas of Rajasthan and along the coastal tracts.
- Increasing substantially the forest/tree cover in the country through massive afforestation and social forestry programmes, especially on all denuded, degraded and unproductive lands.
- Meeting the requirements of fuelwood, fodder, minor forest produce and small timber of the rural and tribal population.
- Increasing the productivity of forests to meet essential national needs.
- Encouraging efficient utilisation of forest produce and maximising substitution of wood.
- Creating a massive people's movement with the involvement of women, for achieving these objectives and to minimise pressure on existing forests.

### Forest Degradation:

India is the second most populous and seventh largest country in the world having population over 1 billion with only 1.8% of the world's forest cover. The forests of India are sustaining the needs of 16.7% (as per latest Census of March, 2001) of the world's human and 18% of the livestock population. The degradation of forests in India and other developing countries is primarily due to following reasons:

Uncontrolled and thus unsustainable removals (due to increased pressures) without adequate and commensurate investments and other inputs leading to erosion in the growing stock and qualitative decline in the productivity of forests over time. Land-use change on account of diversion of forestland to non-forestry uses resulting in disappearance of forests in certain areas leading to quantitative decline in the forest. The unsustainable withdrawals are due to wide gap in demand and supply. In 1996, the wood budget of India was as under.

Fuelwood (million tonnes)	Demand	Supply	Gap
	201	Forest 17	86
		Non-forest 98	
Timber (million Cum)	64	Forest 12	21
		Non-Forest 31	

The gap of timber is being met largely through imports. The wide gap in demand and supply of fuelwood is causing degradation. Similarly, in the absence of adequate productive pasture lands, the forests are the major source of grazing and fodder. Out of the total 450 million cattle in the country, an estimated 270 million graze in the forests and cause damage to the regenerating seedlings. Another cause of degradation is the practice of shifting cultivation particularly in the North-Eastern States. An area of about 2 million ha is subjected annually to shifting cultivation. Over the years, due to increase in tribal population and decrease in productivity, the shifting cultivation cycle has been reduced from 20 years to about 4 to 5 years causing ecological imbalance. The bio diversity of the country is severely threatened by forest fires also. An area of about 3 million ha is annually affected by forest fires causing a loss very moderately estimated (replacement cost of the seedlings) at Rs.440 crore (US\$ 100 million) (Bahuguna, 1999).

Forests contribute 1.7 percent of GDP of the country. However, the figure does not include the non-market and vast amount of fuelwood, fodder, NTFPs and timber collected by the people for their livelihood needs. On a moderate scale the annual value of this is around Rs.400000 million(US\$10000 million) (Bahuguna,2000)

*The challenge before the foresters and political masters is therefore, to reconcile and meet the conflicting needs of the society from the limited resource base. This require an assessment of the demand and a policy to meet it through demand reduction and substitution, increase in productivity on sustainable basis and a mechanism that ensures equitable distribution of the benefits.*

### Forestry Development

#### (a) Government Initiatives

During seventies several popular movements especially the “Chipko Movement” brought awareness in the forefront for the conservation of forest and environment. Several policy and legal initiatives were taken to check deforestation and degradation of forest cover. These were: The Wildlife (Protection) Act 1972 was enacted for protecting and conserving the bio-diversity of the country. Project Tiger was launched to protect the dwindling habitat of tigers and its population. The Forest Conservation Act of 1980 was enacted to prevent diversion of forest lands for the non-forestry use. This reduced the rate of diversion per year from 150,000 ha. in 1980 to just 15,000 ha in 1999-2000. The new Ministry of Environment and Forests was created and new National Forest Policy was adopted in 1988. A major shift in the management was involvement of forest user communities through the Joint Forest Management Programme in 1990.

During the last fifty years since independence, around 31 million hectares of land has been planted during the various plan periods, considering the pressure on forests due to uncontrolled and unsustainable removals and grazing as well as forest fires, the actual plantations existing in the field would be less and are to be expected around 50 % of the originally planted i.e. 15 million ha. The survival percentage varies considerably in block planting by Forest Department in public land from 60% to 70% as per the monitoring done in the field by the National Afforestation and Eco-development Board (NEAB) of the Government of India in fifty districts every year since 1992-93. On private lands, the survival percentage is estimated to vary from 25% to 50%. The results of awareness, afforestation efforts and other actions have started showing results. The deforestation has been checked as revealed from Table-II as the forest cover during the last 10 to 12 years has remained around 19% of the geographic area. In spite of biotic pressure, the country has been able to protect its bio-diversity through rigorous protection measures in the national parks and sanctuaries. ***However, due to continuous population pressure, the depletion in the quality of forest is still continuing and is a serious cause of concern.***

**(b) Public Initiatives**

The rural community has also taken up planting of private and community lands under Social forestry/Farm forestry/Agro forestry programmes initiated in 1980s. In some areas, industry has also developed linkages with the local farmers by supplying planting material, technical advice and making buy-back arrangements. The significant contribution of farmers small and large in production of wood and other products which were earlier obtained only from forests has been a significant success in assuring forest conservation efforts in India. Today around 17 million ha of forest/tree growth exists on the farmlands. Very large volumes of wood mainly of Eucalyptus, Teak, Poplar, Acacias etc. have been produced by private farmers either as pure plantations or as trees raised on the bunds and near their houses. Forest Departments have also raised very large plantations on the community lands and non-forest Government lands outside the Government Forests.

An industry community initiative in the development of forestry resources through block plantations on private degraded lands for the mutual benefit of the stakeholders in Madhya Pradesh & U.P. has opened another possibility of accelerated afforestation of degraded lands. This needs to be critically examined and expanded. Considering the need and withdrawals, the investment made in the forestry sector are rather inadequate. On an average around 1% or less has been assigned to forestry during the various five year plan periods.

**(c) Joint efforts:**

Participatory action involving the government and local communities for regeneration of degraded forests through effective protection, sharing of produce and improving the Socio-economic conditions of these communities through employment generating forestry activities, was initiated by the Forest Department as a pilot project in Arabari, West Bengal in 1971-72. The programme covered an area of over 1,270 ha degraded forests involving 618 families in 11 villages. This joint initiative rehabilitated the forests and thus became an example. Subsequently, this has been institutionalised through the Forest Policy of 1988 and JFM Circular of June 1990. Now over 36,165 committees (and around 75 million people) in 26 states are participating with the government to manage over 10.25 million ha of forests. The launching of this Joint Forest Management (JFM) Programme has been a major breakthrough in the involvement of local communities in the management of forests and has produced very positive results in regenerating the degraded forests and grasslands. The highlights of the programme guidelines promulgated in 1990 by Ministry of Environment & Forest, Government of India are summarized as follows:-

- Developing partnership: between communities and Forest Departments, facilitated by Non-Governmental Organisations;
- Access and benefits: only to organised communities undertaking regeneration, with equal opportunity based on willing participation (based on **care and share**);
- Right to usufruct: all non-timber forest products and percentage share of final harvest to communities, subject to successful protection and conditions approved by the State;
- 10 years Working Scheme: micro-plans detailing forest management institutional and technical operations to be developed by community management organisations with local foresters and NGOs;
- Funding: From Forest Department programmes with encouragement to communities to seek funds from other agencies.

The Government of India reviewed the JFM progress in the country during 1999-2000 and after wider consultation with all the stakeholders decided to further strengthen it and on February 21, 2000 fresh guidelines were issued to all the State Governments. The circular inter alia provides:

- a. Legal backup to the JFM committees,
- b. 50% members of the General Body and 33% in the executive with at least one office bearer should be women
- c. Extension of JFM in good forests areas (crown density above 40%) with sharper focus on activities concentrating on NTFP management.

- d. Recognition to self initiated groups
- e. Conflict resolution mechanism.
- f. Integration of micro plan with the working plan.
- g. Contribution for regeneration of resources.
- h. Monitoring & evaluation.

In a new innovative policy initiative for involving the JFM Committees in integrated land development and employment generation activities, State Governments have been requested by the Government of India to constitute *Forest Development Agencies (FDAs)* as federation of these institutions at the district level. The FDAs will be registered bodies legally and will be funded for carrying out afforestation and regeneration activities in tandem with other rural development and employment generation programmes. This will not only ensure regeneration of forests but also decentralisation of administrative powers and genuine participation of people in resource management.

The extent of progress of JFM in each state is given in Table-IV below.

**Table-IV**  
Extent of Joint Forest Management Programme  
(As on 1.9.2000)

S.No.	State	No. of JFM Committees	Area under JFM (ha.)	Source
1	Andhra Pradesh	6575	16,32,190.00	SFD*
2	Arunachal Pradesh	10	5,285.00	SFD
3	Assam	101	3,060.00	SFD
4	Bihar	1675	935,065.50	SFD
5	Gujrat	706	91,071.28	SFD
6	Himachal Pradesh	203	62,000.00	SFD
7	Haryana	350	60,733.56	SFD
8	Jammu & Kashmir	1599	79,273.00	SFD
9	Karnataka	1212	12,800.00	SFD
10	Kerala	21	4,000.00	SFD
11	Madhya Pradesh	12038	58,00,000.00	SFD
12	Maharashtra	502	94,727.99	SFD
13	Manipur	35	1,400.00	SFD
14	Mizoram	103	5,870.00	SFD
15	Nagaland	55	627.00	SFD
16	Orissa	3704	4,19,306.00	SFD
17	Punjab	89	38,991.42	SFD
18	Rajasthan	2705	235,634.00	SFD
19	Sikkim	98	2,191.00	SFD
20	Tamil Nadu	599	224,382.00	SFD
21	Tripura	157	16,227.30	SFD
22	Uttar Pradesh	197	34,569.36	SFD
23	West Bengal	3431	4,90,582.00	SFD
	Total	36165	10,249,986.41	

- State Forest Department

(Source: Bahuguna,2000)

The experience of last ten years of participatory forestry has revealed that the programme has been well adopted and implemented all over the country due to the leadership provided by the foresters and well supported by NGOs and other actors. The extent of success however, differ from State to State and from place to place, depending upon the interest taken by the people and implementing agencies and types of forests. The programme has

succeeded better in those areas where the felt needs of the people made them more responsive and where the *JFM programme was linked to other rural development activities, where homogenous groups existed and where the foresters, committee members and NGOs have shown exemplary leadership, commitment and dedication.*

### **Sustainability of Management Efforts – The Principles**

Today's, forest management practices are influenced by the socio-cultural and economic realities of the society and governed by the political class based on their perceptions in meeting their administrative and political goals in the short term. It must be remembered that the foresters and other resource managers have been plying their role within this system. The expediency dominated approach has often resulted in lopsided policies leading to poor resource planning and management in the developing world. The sustainable development depends very largely upon effective management of the natural and other resources. For example, in India the exponentially growing human population is not only polluting the environment, but also degrading life sustaining systems for both human need and greed through unplanned and uncontrolled exploitation. Renewable resources like forests would become non-renewable in not too distant a future, if timely rectification measures are not taken in limiting the consumption levels to regenerating levels. In countries where the primary source of income is agriculture, only the good management of land-based resources could provide economic and ecological security to the people. It is a well-recognized ecological fact that a rational land use man-made system, Viz., agriculture and urban-industrial, should be supported by an equal extent of natural and semi-natural system. A natural forest ecosystem is more stable and resistant to disturbances due to climax and mature vegetation having greater diversity compared to immature community in a forest in an early or intermediate succession stage or a man made forests. However, immature communities are more productive and their importance to man is no less than the natural forests with a vegetation of climatic climax. A sound and pragmatic forest management regimes would strive for a stable and productive environment having an adequate mixture of mature natural forests and plantations of desired species (Lal & Bahuguna, 1992).

Society needs not only the “services” but also “goods” from the forests. To secure goods and services, forests are to be managed with certain planned management regimes. Managing forests for the multiple benefits would do no harm to the forest stability if the forester can apply four principles while managing them

- First, the closed nutrient cycling be maintained;
- Second, do not allow permanent gaps in the canopy;
- Third, harvesting to be limited to the regenerating capacity;
- Fourth, bio-diversity of species should not be reduced to a level that pests become significantly damaging.

This can only be possible if we lay adequate emphasis on protection of forests and involve the larger civil society specially the stakeholders in the management of forests. Thus, for sustainable forest management, a balance must be achieved in production, protection and participation. This has already been proved to a certain degree in India during the last 20 years of forestry programme as discussed above. The roles of forests to the society are thus founded on these three imperatives.

**a) Protection:** the protective function of forests with respect to soil, water and bio diversity are vital for the welfare of present and future generations. This means that forest sustainability is essential to environmental conservation. Indian forestry is today dominated by this dictum and considerable numbers of stakeholders are currently engaged in promoting this imperative as discussed above. Indian forests are rich in flora and fauna. The plant wealth of India is about 45,000 species constituting about 12% of all global plants. There are 81,000 species of animal found in India. At present in India nearly 4.8% of the geographic area (15 million ha) and 18% of good density forests are being managed under the protective area network through 447 sanctuaries and 89 national parks. All kinds of rights and privileges have been suspended in this area and by and large the local population supports the endeavor of government though of late, lot of conflicts have emerged.

In India, out of the total densely covered forest area of 38 million ha under category dense forest (crown density 40% and above) about 15 million ha will continue to remain under national parks and wildlife sanctuaries and thus will be totally protected as bio diversity and gene pool reserves and will not be available for bio mass production. The remaining 23.5 million ha of high forest area is required to be regenerated through appropriate

silvicultural, tree improvement and management practices for maximum sustainable productivity for meeting the local and national needs. These areas will be covered by scientific Working Plans which needs to be prepared with adequate inputs using MIS and GIS technology for sustainable management. The objective should be to maintain the richness of forest diversity and to enhance the productivity.

**b) Production:** without production of goods and services to meet the rapidly increasing needs of the society, forests can not be sustainable over a period of time. To meet the legitimate local and national needs of the society from the natural as well as plantations sustainable harvesting is permitted. No forest ecosystem can be claimed to be stable unless it is productive. This is especially true in the context of developing countries. About 15.5 ha of forest area in India require very careful treatment to get them back on forest cover. The existing root stocks have been depleted and degenerated and may not regenerate to give desired productivity. The imperative would be to use these lands for high technology based plantations of fuel, fodder, NTFP and timber species and silvi-pasture etc.

**c) Participation:** The traditional forest management systems in India with the Forest Departments having the custodial role have continue to deteriorate under the pressures of population growth, both human and livestock, leaving a widening gap between the demand and supply of various forest products and the services that the forests provide. It is now widely recognised that unless true stake holders are effectively involved in establishing sustainable forest management systems, including rehabilitation of degraded forest lands, deforestation will continue at a rapid rate much to the detriment of country's ecological stability, economic viability, conservation of bio diversity, environmental security and bio mass productivity with disastrous consequences.

The involvement of people who are heavily dependent on forests for meeting their livelihood needs, participation of NGOs and other stakeholders can provide vital inputs to the policy planners and field forest administrators for striking a balance between the ecological and economic roles of forests. There are 200,000 villages in India in the fringes of forests where a population of around 350 million lives. The involvement of these people in the management is very vital for the sustainability of forest resources.

Out of 25 million ha of degraded forests on estimated 15.5 million hectares of these degraded forest areas have natural root stocks which can regenerate if given proper protection and assistance in regeneration. These areas will require assisted natural regeneration, gap filing, conservation of soil, water and bio diversity for sustainable yield of goods and services to the community as well as partially meeting the national and regional ecological and economic needs. These areas are ideally suitable for management under Joint Forest Management (JFM) System. The 10 years experience of JFM in India as narrated above has shown the success achieved.

#### **Situation Analysis for further action:**

Forest management policies and strategies have to be viewed in the context of causes of rapid degradation of forest resources and the institutional and policy constraints being faced in accelerating the pace of rehabilitation to reverse the trend. An appropriate policy and institutional framework has to address the twin objectives of reversing the rate of degradation and the goal of achieving the desired level of forest cover which in Indian situation is targeted at 33 percent of the total geographical area. The following issues need to be kept in mind while considering policies and institutional alternatives.

- The sustainably extractable quantity of fuelwood from India's forests is far below the requirements of the population; Out of the total requirement of 201 million tonnes only 17 million tonnes is sustainably available. Around 98 million tonnes is available from non-forest sources. The gap of 86 million tonnes is met from the forests.
- The livestock population in India is greater than can be sustainably supported by the available land and forest resources; Out of the 450 million cattle, around 270 million graze in forests.
- The industrial and other wood demand, part of which is currently being met by imports, will continue to rise and the environmental concerns in exporting countries may not allow such imports in the near future which may constrain the growth of Indian wood-based industries;
- Policies which encourage unregulated and increased harvesting of non-wood forest products may result in

loss of biodiversity.

- Expansion of protected area networks will require further investment in resources for productivity increase as well as creation of additional resources in surrounding areas to meet the local needs
- Involvement of all stakeholders may be necessary in order to achieve the goals of regeneration of existing forests, community forestry, agro-forestry, rehabilitation of degraded lands etc. in reaching the target of 33 percent of land under forest cover.
- Resource mobilization from institutional and other sources may be necessary as the government forest budgetary resources are not adequate to address the tasks ahead. There is a vast scope for tapping wood growing potential in the agro-forestry & community forestry sector. As against the annual requirement of Rs.53000 million (US\$ 1180 million) only around Rs.16000 million (US\$ 360 million) are available from all the budgetary sources of Central and State Governments.
- There is a considerable potential in forestry development in 200,000 villages situated in and around forest areas under JFM and Integrated Rural Development Programs for meeting the livelihood needs.

### **National Forestry Action Plan- A Plan of Action for future to achieve the balance**

In order to achieve the goals in forest management, the Ministry of Environment and Forests have prepared National Forestry Action Programme (NFAP), a comprehensive strategic long term document for the next twenty years to address the issues underlying the major problems of the forestry sector in line with the National Fore Policy, 1988 (Anonymous, 1999-c). The NFAP is organised into following lines.

#### **I. Protect Existing Forest Resources:**

It has three main-sub programmes of (i) forest protection, (ii) soil and water conservation, and (iii) protected area and biodiversity conservation.

This would include forest survey, demarcation and mapping, protection of forest boundary, inventory of forest resources, prevention of illicit activities like thefts, pilferage and encroachment, control of deforestation, establishing legal deterrents, biodiversity conservation, protected area management, controlling shifting cultivation, tenurial issues, preventing conversion of forests for non-forest use, protection of forests from grazing, poaching, and fire, control of desertification, watershed protection, protection of fragile ecosystems like mangrove conservation strategy for genetic resources, joint forest management, eco-development for wildlife area, ecotourism, strengthening working plan and other such related issues.

#### **II. Improve Forest Productivity:**

It has four main sub-programmes: (i) rehabilitation of degraded forests, (ii) research and technology development (iii) development of NTFPs and (iv) assisting private initiatives with community participation. These involve mainly research, improvement in technology, enrichment planting, soil and water conservation, regeneration, rehabilitation and afforestation, bioprospecting, better growth and yield, effective management for wood and NTFPs, use of secondary species, improving density of species, valuation of forest services, use of unknown flora and fauna, research on short rotation, high yielding and genetically improved varieties for plantations, superior nursery technology improvement, multiple cropping, fuelwood and pasture development, establishment of GIS/MIS for efficient management etc. .

#### **III. Reduce Total Demand:**

It has three main sub programmes: (i) fuelwood and fodder, (ii) timber, and (iii) NTFPs. This includes the programmes for reduction of demand placed on forests through the technology of preservation, seasonal substitutions, and efficient utilisation of forest products, biomass plantations, waste-free harvesting of forest products, processing technology, chemical treatments, improved cooking practices and alternative fuels, rotational grazing and stall feeding, value addition, quality control, substitution of solid wood, reducing demand through market manipulation and pricing mechanism etc.

#### **IV. Strengthen Policy and Institutional Framework:**

It has three main sub programmes i.e. Strengthening of (I) central forestry administration, (ii) central forest institutions, and (iii) State forestry administration and institutions. These include the development of infrastructure like buildings, communications, etc., and strengthening of staff including HRD. This issue also covers all aspects of capacity building, forest policy and legislation, public forest administration and organisational structure research, planning and budgeting, rationalising the revenue system, safeguarding intellectual property rights relating to forestry, restructuring of sectoral institutions, sectoral and project planning, development of data systems, investment analysis, monitoring and evaluation, extension and public education, dissemination of information etc.

#### **V. Expand Forest Area:**

It has two main sub-programmes (I) tree plantation on forest and non-forest lands, and (ii) people's participation in plantations and its protection. It includes the programmes of creation of plantation forests through wasteland reclamation, afforestation and promotion of agro-forestry, desert reclamation, strip plantations along road and railway lines, canals, farm forestry, urban forestry, shelterbelts, industrial plantations, greening and landscaping.

The programme will be implemented by the States Governments. The implementation of NFAP requires huge financial resources and the total investment estimate for the State sector is Rs.1232321 millions (US\$ 26790 million) and for the Central sector is Rs.106706 millions (US\$ 2320 millions). Total requirement for the country is Rs.1339 billions (US\$32 billion) over the next twenty years. The current requirement of funds is Rs.53000 million (US\$1152 million). As against this, the funds available are only around 2000 million (US\$435 million). All out efforts, are therefore needed to achieve the targets and ensure balance in forest management.

**Conclusion:** The above narration is an illustration of forestry practices in a developing country scenario where around 350 million people are dependent on forests for their livelihood needs. It leads to the conclusion that future management policies and practices in forestry will have to integrate the social, economic and cultural realities with the scientific aspects of forestry in order to meet the emerging challenges in the 21<sup>st</sup> Century. The diversity of situation and points of debate that exists at the global level pose challenges for the foresters, planners and law makers all over the world but at the same time also provide immense opportunities for convergence of views considering the progress made by various international conventions. Equally noteworthy is the progress made by various scientific and social organisations in influencing forest management practices. What is needed is to strike a balance for the benefit of present and future generations and a commitment to ensure this.

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