

Lec.2 STATUS OF FORESTS IN INDIA

India is one of the 12 mega diversity countries having a vast variety of flora and fauna, commands 7% of world's biodiversity and supports 16 major forest types, varying from the alpine pastures in the Himalayas to temperate, sub-tropical forests, and mangroves in the coastal areas.

According to the State of Forest Report, published by the Forest Survey of India (FSI) in 1997, India has a recorded forest **area of 76.5 million hectare or 23.3%** of the total geographic area of the country. But the actual forest cover is **63.34 million ha (19.27% of the country's area)** of which **26.13 million ha are degraded**. There is another **5.72 million ha scrub** in addition to the reported forest cover of 63.34 million ha. Thus, in total, **31.85 million ha forests** in the country are degraded or open.

STATEWISE INDIA'S FOREST COVER

S. No.	State/Uts	Geographical Area (Km ²)	Total Forest area (Km ²)	% of forests area
1	Andhra Pradesh	275068	63814	23.20
2	Arunachal Pradesh	83743	51540	61.55
3	Assam	78438	30708	39.15
4	Bihar	173877	29226	16.81
5	Delhi	1483	85	5.73
6	Goa	3702	1424	38.47
7	Gujarat	196024	19393	9.89
8	Haryana	44212	1673	3.78
9	Himachal Pradesh	55673	35407	63.60
10	Jammu & Kashmir	222235	20182	9.08
11	Karnataka	191791	38724	20.19
12	Kerala	38863	11221	28.87
13	Madhya Pradesh	443446	154497	34.84
14	Maharashtra	307690	63842	20.75
15	Manipur	22327	15154	67.87
16	Meghalaya	22429	9496	42.34
17	Mizoram	21081	15935	75.59
18	Nagaland	16579	8629	52.05
19	Orissa	155707	57184	36.73
20	Punjab	50362	2901	5.76
21	Rajasthan	342239	31700	9.26
22	Sikkim	7096	2650	37.34
23	Tamil Nadu	130058	22628	17.40
24	Tripura	10486	6293	60.01
25	Uttar Pradesh	294411	51663	17.55
26	West Bengal	88752	11879	13.38
27	Andaman & Nicobar Island	8249	7171	86.93
28	Chandigarh	114	31	27.19
29	Dadra & Nagar Haveli	491	203	41.34
30	Daman & Diu	112	1	0.63
31	Lakshadweep	32	0	0.00
32	Pondicherry	493	0	0.00

Total	3287263	765253	23.28
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Comparison with other countries

The area of the world's forests, including natural forests and forest plantations, was estimated to be **3454 million hectares in 1995**, or about one-fourth of the land area of the Earth. About **55 percent of the world's forests** are located in **developing countries**, with the remaining **45 percent in developed countries** . The world's forests are almost equally divided between tropical/subtropical forests and temperate/boreal forests. Only about **3 percent of the world's forests** are forest plantations. The remaining **97 percent are natural or semi-natural forests**.

Comparison with other countries

CHANGE IN FOREST AREA, 1990-2000				
Country/area	Total forest, 1990 ('000 ha)	Total forest, 2000 ('000 ha)	Forest cover change, 1990-2000	
			Change ('000 ha)	Change (%)
Algeria	1 879	2 145	27	1.3
Angola	70 998	69 756	-124	-0.2
Benin	3 349	2 650	-70	-2.3
Botswana	13 611	12 427	-118	-0.9
Burkina Faso	7 241	7 089	-15	-0.2
Burundi	241	94	-15	-9.0
Cameroon	26 076	23 858	-222	-0.9
Cape Verde	35	85	5	9.3
Central African Republic	23 207	22 907	-30	-0.1
Chad	13 509	12 692	-82	-0.6
Comoros	12	8	n.s.	-4.3
Congo	22 235	22 060	-17	-0.1
Côte d'Ivoire	9 766	7 117	-265	-3.1
Dem. Rep. of the Congo	140 531	135 207	-532	-0.4
Djibouti	6	6	n.s.	n.s.
Egypt	52	72	2	3.3

Equatorial Guinea	1 858	1 752	-11	-0.6
Eritrea	1 639	1 585	-5	-0.3
Ethiopia	4 996	4 593	-40	-0.8
Gabon	21 927	21 826	-10	n.s.
Gambia	436	481	4	1.0
Ghana	7 535	6 335	-120	-1.7
Guinea	7 276	6 929	-35	-0.5
Guinea-Bissau	2 403	2 187	-22	-0.9
Kenya	18 027	17 096	-93	-0.5
Lesotho	14	14	n.s.	n.s.
Liberia	4 241	3 481	-76	-2.0
Libyan Arab Jamahiriya	311	358	5	1.4
Madagascar	12 901	11 727	-117	-0.9
Malawi	3 269	2 562	-71	-2.4
Mali	14 179	13 186	-99	-0.7
Mauritania	415	317	-10	-2.7
Mauritius	17	16	n.s.	-0.6
Morocco	3 037	3 025	-1	n.s.
Mozambique	31 238	30 601	-64	-0.2
Namibia	8 774	8 040	-73	-0.9
Niger	1 945	1 328	-62	-3.7
Nigeria	17 501	13 517	-398	-2.6
Réunion	76	71	-1	-0.8
Rwanda	457	307	-15	-3.9
Saint Helena	2	2	n.s.	n.s.
Sao Tome and Principe	27	27	n.s.	n.s.
Senegal	6 655	6 205	-45	-0.7
Seychelles	30	30	n.s.	n.s.
Sierra Leone	1 416	1 055	-36	-2.9
Somalia	8 284	7 515	-77	-1.0
South Africa	8 997	8 917	-8	-0.1
Sudan	71 216	61 627	-959	-1.4
Swaziland	464	522	6	1.2

Togo	719	510	-21	-3.4
Tunisia	499	510	1	0.2
Uganda	5 103	4 190	-91	-2.0
United Republic of Tanzania	39 724	38 811	-91	-0.2
Western Sahara	152	152	n.s.	n.s.
Zambia	39 755	31 246	-851	-2.4
Zimbabwe	22 239	19 040	-320	-1.5
Total Africa	702 502	649 866	-5 262	-0.8
Afghanistan	1 351	1 351	n.s.	n.s.
Armenia	309	351	4	1.3
Azerbaijan	964	1 094	13	1.3
Bahrain	n.s.	n.s.	n.s.	14.9
Bangladesh	1 169	1 334	17	1.3
Bhutan	3 016	3 016	n.s.	n.s.
Brunei Darussalam	452	442	-1	-0.2
Cambodia	9 896	9 335	-56	-0.6
China	145 417	163 480	1 806	1.2
Cyprus	119	172	5	3.7
Dem People's Rep. of Korea	8 210	8 210	n.s.	n.s.
East Timor	541	507	-3	-0.6
Gaza Strip	-	-	-	-
Georgia	2 988	2 988	n.s.	n.s.
India	63 732	64 113	38	0.1
Indonesia	118 110	104 986	-1 312	-1.2
Iran, Islamic Rep.	7 299	7 299	n.s.	n.s.
Iraq	799	799	n.s.	n.s.
Israel	82	132	5	4.9
Japan	24 047	24 081	3	n.s.
Jordan	86	86	n.s.	n.s.
Kazakhstan	9 758	12 148	239	2.2
Kuwait	3	5	n.s.	3.5
Kyrgyzstan	775	1 003	23	2.6
Lao People's Dem. Rep	13 088	12 561	-53	-0.4

Lebanon	37	36	n.s.	-0.4
Malaysia	21 661	19 292	-237	-1.2
Maldives	1	1	n.s.	n.s.
Mongolia	11 245	10 645	-60	-0.5
Myanmar	39 588	34 419	-517	-1.4
Nepal	4 683	3 900	-78	-1.8
Oman	1	1	n.s.	5.3
Pakistan	2 755	2 361	-39	-1.5
Philippines	6 676	5 789	-89	-1.4
Qatar	n.s.	1	n.s.	9.6
Republic of Korea	6 299	6 248	-5	-0.1
Saudi Arabia	1 504	1 504	n.s.	n.s.
Singapore	2	2	n.s.	n.s.
Sri Lanka	2 288	1 940	-35	-1.6
Syrian Arab Republic	461	461	n.s.	n.s.
Tajikistan	380	400	2	0.5
Thailand	15 886	14 762	-112	-0.7
Turkey	10 005	10 225	22	0.2
Turkmenistan	3 755	3 755	n.s.	n.s.
United Arab Emirates	243	321	8	2.8
Uzbekistan	1 923	1 969	5	0.2
Viet Nam	9 303	9 819	52	0.5
West Bank	-	-	-	-
Yemen	541	449	-9	-1.9
Total Asia	551 448	547 793	-364	-0.1
Albania	1 069	991	-8	-0.8
Andorra	-	-	-	-
Austria	3 809	3 886	8	0.2
Belarus	6 840	9 402	256	3.2
Belgium and Luxembourg	741	728	-1	-0.2
Bosnia and Herzegovina	2 273	2 273	n.s.	n.s.
Bulgaria	3 486	3 690	20	0.6
Croatia	1 763	1 783	2	0.1

Czech Republic	2 627	2 632	1	n.s.
Denmark	445	455	1	0.2
Estonia	1 935	2 060	13	0.6
Finland	21 855	21 935	8	n.s.
France	14 725	15 341	62	0.4
Germany	10 740	10 740	n.s.	n.s.
Greece	3 299	3 599	30	0.9
Hungary	1 768	1 840	7	0.4
Iceland	25	31	1	2.2
Ireland	489	659	17	3.0
Italy	9 708	10 003	30	0.3
Latvia	2 796	2 923	13	0.4
Liechtenstein	6	7	n.s.	1.2
Lithuania	1 946	1 994	5	0.2
Malta	n.s.	n.s.	n.s.	n.s.
Netherlands	365	375	1	0.3
Norway	8 558	8 868	31	0.4
Poland	8 872	9 047	18	0.2
Portugal	3 096	3 666	57	1.7
Republic of Moldova	318	325	1	0.2
Romania	6 301	6 448	15	0.2
Russian Federation	850 039	851 392	135	n.s.
San Marino	-	-	-	-
Slovakia	1 997	2 177	18	0.9
Slovenia	1 085	1 107	2	0.2
Spain	13 510	14 370	86	0.6
Sweden	27 128	27 134	1	n.s.
Switzerland	1 156	1 199	4	0.4
The FYR of Macedonia	906	906	n.s.	n.s.
Ukraine	9 274	9 584	31	0.3
United Kingdom	2 624	2 794	17	0.6
Yugoslavia	2 901	2 887	-1	-0.1
Total Europe	1 030 475	1 039 251	881	0.1
Antigua and Barbuda	9	9	n.s.	n.s.

Bahamas	842	842	n.s.	n.s.
Barbados	2	2	n.s.	n.s.
Belize	1 704	1 348	-36	-2.3
Bermuda	-	-	-	-
British Virgin Islands	3	3	n.s.	n.s.
Canada	244 571	244 571	n.s.	n.s.
Cayman Islands	13	13	n.s.	n.s.
Costa Rica	2 126	1 968	-16	-0.8
Cuba	2 071	2 348	28	1.3
Dominica	50	46	n.s.	-0.7
Dominican Republic	1 376	1 376	n.s.	n.s.
El Salvador	193	121	-7	-4.6
Greenland	-	-	-	-
Grenada	5	5	n.s.	0.9
Guadeloupe	67	82	2	2.1
Guatemala	3 387	2 850	-54	-1.7
Haiti	158	88	-7	-5.7
Honduras	5 972	5 383	-59	-1.0
Jamaica	379	325	-5	-1.5
Martinique	47	47	n.s.	n.s.
Mexico	61 511	55 205	-631	-1.1
Montserrat	3	3	n.s.	n.s.
Netherlands Antilles	1	1	n.s.	n.s.
Nicaragua	4 450	3 278	-117	-3.0
Panama	3 395	2 876	-52	-1.6
Puerto Rico	234	229	-1	-0.2
Saint Kitts and Nevis	4	4	n.s.	-0.6
Saint Lucia	14	9	-1	-4.9
Saint Pierre and Miquelon	-	-	-	-
Saint Vincent and Grenadines	7	6	n.s.	-1.4
Trinidad and Tobago	281	259	-2	-0.8
United States	222 113	225 993	388	0.2
United States Virgin Islands	14	14	n.s.	n.s.

Total North and Central America	555 002	549 304	-570	-0.1
American Samoa	12	12	n.s.	n.s.
Australia	157 359	154 539	-282	-0.2
Cook Islands	22	22	n.s.	n.s.
Fiji	832	815	-2	-0.2
French Polynesia	105	105	n.s.	n.s.
Guam	21	21	n.s.	n.s.
Kiribati	28	28	n.s.	n.s.
Marshall Islands	n.s.	n.s.	n.s.	n.s.
Micronesia	24	15	-1	-4.5
Nauru	n.s.	n.s.	n.s.	n.s.
New Caledonia	372	372	n.s.	n.s.
New Zealand	7 556	7 946	39	0.5
Nile	6	6	n.s.	n.s.
Northern Mariana Islands	14	14	n.s.	n.s.
Palau	35	35	n.s.	n.s.
Papua New Guinea	31 730	30 601	-113	-0.4
Samoa	130	105	-3	-2.1
Solomon Islands	2 580	2 536	-4	-0.2
Tonga	4	4	n.s.	n.s.
Vanuatu	441	447	1	0.1
Total Oceania	201 271	197 623	-365	-0.2
Argentina	37 499	34 648	-285	-0.8
Bolivia	54 679	53 068	-161	-0.3
Brazil	566 998	543 905	-2 309	-0.4
Chile	15 739	15 536	-20	-0.1
Colombia	51 506	49 601	-190	-0.4
Ecuador	11 929	10 557	-137	-1.2
Falkland Islands	-	-	-	-
French Guiana	7 926	7 926	n.s.	n.s.
Guyana	17 365	16 879	-49	-0.3
Paraguay	24 602	23 372	-123	-0.5
Peru	67 903	65 215	-269	-0.4

Suriname	14 113	14 113	n.s.	n.s.
Uruguay	791	1 292	50	5.0
Venezuela	51 681	49 506	-218	-0.4
Total South America	922 731	885 618	-3 711	-0.4
TOTAL WORLD	3 963 429	3 869 455	-9 391	-0.2

NATIONAL FOREST POLICY, 1988

BACKGROUND AND NEED

The first National Forest Policy of Independent India was promulgated in 1952. However, since then many new developments had taken place and concepts of forest management changed. It was in view of the following perspectives, the need of a new forest policy was felt.

The emphasis was gradually shifting from production forestry to conversion and protection of the forest resources. The needs and attributes of the general masses with regard to forests and forestry had undergone a massive change

1. Many new forest based industries were being set up and it was apparent that their raw material requirements could not be met from the natural forests, without upsetting the ecological balance.
2. Social community and farm forestry had gained increasing importance in the seventies and eighties
3. There was a need to address the rights and concessions of the people and recognize the symbiotic relationship between forests and tribals
4. Provisions needed to be incorporated in the forest policy for ecological security, biodiversity conservation and compensatory afforestation.

The National Forest Policy of 1988 was issued on 7th December 1988 by the Secretary, Ministry of Environment and Forests to the Government of India.

1. PREAMBLE

In Resolution No. 13/52/f, dated the 12th May, 1952, the Government of India in the erstwhile Ministry of Food and Agriculture enunciated a Forest Policy to be followed in the management of State Forests in the country. However, over the years, forests in the country have suffered serious depletion. This is attributable to relentless pressures arising from ever-increasing demand for fuel wood, fodder and timber; inadequacy of protection measures; diversion of forests lands to non-forest uses without ensuring compensatory afforestation and essential environmental safeguards; and the tendency to look upon forests as revenue earning resource. The need to review the situation and to evolve, for the future, new strategy of forest conservation has become imperative. Conservation includes preservation, maintenance, sustainable utilization, restoration and enhancement of the natural environment. It has thus become necessary to review and revise the National Forest Policy.

2. BASIC OBJECTIVES

The basic objectives that should govern the National Forest Policy are the following:

1. 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.
2. 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.
3. Checking soil erosion and denudation in the catchment areas of rivers, lakes, reservoirs in the interest of soil and water conservation, for mitigating food and droughts and for the retardation of siltation of reservoirs.
4. Checking the extension of sand dunes in the desert areas of Rajasthan and along the coastal tracts.

5. Increasingly substantially the forests/tree cover in the country through massive afforestation and social forestry programmes, especially on all denuded, degraded and unproductive lands.
6. Meeting the requirements of fuelwood, fodder, minor forest produce and small timber of the rural and tribal population.
7. Increasing the productivity of forests to meet essential national needs.
8. Encouraging efficient utilisation of forests produce and maximising substitution of wood.
9. Creating a massive people's movement with the involvement of women, for achieving these objectives and to minimise pressure on existing forests.

The principal aim of Forest Policy must be to ensure environment stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all life forms, human, animal and plant. The derivation of direct economic benefit must be subordinated to this principal aim.

3. ESSENTIAL OF FOREST MANAGEMENT

- 1) Existing forests and forest lands should be fully protected and their productivity be improved. Forest and vegetal cover should be increased rapidly on hill slopes, in catchment areas of rivers, lakes and reservoirs and ocean shores and on semi-arid, arid and desert tracts.
- 2) Diversion of good and productive agriculture lands to forestry should be discouraged in view of the need for increased food production.
- 3) For the conservation of total biological diversity, the network of national parks, sanctuaries biosphere reserves and other protected areas should be strengthened and extended adequately.
- 4) Provision of sufficient fodder, fuel and pasture, specially in areas adjoining forest, is necessary in order to prevent depletion of forests beyond the sustainable limit. Since fuel wood

continues to be the predominant source of energy in rural areas, the programme of afforestation augmenting fuelwood production to meet the requirement of the rural people.

5) Minor Forest Produce provides sustenance to tribal population and to other communities residing, in and around the forests. Such produce should be protected, improved and their production enhanced with due regard to generation of employment and income.

4. STRATEGY

i) Area Under Forests

The national goal should be to have a minimum of one-third of the total land area of the country under forest or tree cover. In the hills and in mountainous regions, the aim should be to maintain two-third of the area under such cover in order to prevent erosion and land degradation and to ensure the stability of the fragile eco-system.

ii) Afforestation, social forestry and Farm forestry

A massive needs-based and time bound programme of afforestation and tree planting, with particular emphasis on fuelwood and fodder development, on all degraded and denuded lands in the country, whether forest or non-forest land, is a national imperative.

It is necessary to encourage the planting of trees alongside of roads, railway lines, rivers and streams and canals, and on other unutilized lands under State/corporate, institutional or private ownership. Green belts should be raised in urban/industrial areas as well as in arid tracts. Such a programme will help to check erosion and desertification as well as improve the micro-climate.

Village and community lands, including those on foreshores and environs of tanks, not required for other productive uses, should be taken up for the development of tree crops and fodder resources. Technical assistance and other inputs necessary for initiating such programmes should be provided by the Government. The revenues generated through such programmes should belong to the panchayats where the lands are vested in them; in all other cases, such revenues should be shared with the local communities in order to provide an incentive to them. The vesting, in individual, particularly from the weaker sections (such as landless labour, small and

marginal farmers, scheduled castes, tribals, women) of certain ownership rights over trees, could be considered, subject to appropriate regulations; beneficiaries would be entitled to usufruct and would in turn be responsible for their security and maintenance.

Land laws should be so modified wherever necessary so as to facilitate and motivate individuals and institutions to undertake tree-farming and grow fodder plants, grasses and legumes on their own land. Wherever possible, degraded lands should be made available for this purpose either on lease or on the basis of a tree-patta scheme. Such leasing of the land ceiling laws. Steps necessary to encourage them to do so must be taken. Appropriate regulations should govern the felling of trees on private holding.

iii) MANAGEMENT OF STATE FORESTS

Schemes and projects which interfere with forests that clothe steep slopes, catchments of rivers, lakes and reservoirs, geologically unstable terrain and such other ecological sensitive areas should be severely restricted. Tropical rain/moist forests, particularly in the areas like Arunachal Pradesh, Kerala, Andaman and Nicobar Islands, should be totally safeguarded.

No forest should be permitted to be worked without the Government having approved the management plan, which should be in a prescribed format and in keeping with the National Forest Policy. The Central Government should issue necessary guidelines to the State Governments in this regard and monitor compliance.

In order to meet the growing needs for essential goods and services which the forests provide, it is necessary to enhance forest cover and productivity of the forests through the application of scientific and technical inputs. Production forestry programmes, while aiming at enhancing the forest cover in the country, and meeting national needs, should also be oriented to narrowing, by the turn of the turn of the century, the increasing gap between demand and supply of fuelwood. No such programme, however should entail clear-felling of adequately stocked natural forests. Nor should exotic species be introduced, through public or private sources, unless long-term scientific trials undertaken by specialists in ecology, forestry and agriculture have established that they are suitable and have no adverse impact on native vegetation and environment.

iv) RIGHTS AND CONCESSIONS

The rights and concessions, including grazing, should always remain related to the carrying capacity of forests. The capacity itself should be optimised by increased investment, silvicultural research and development of the area. Stall-feeding of cattle should be encouraged. The requirements of the community, which determined, should be met by development of social forestry outside the reserved forests.

The holders of customary rights and concessions in forest areas should be motivated to identify themselves with the protection and development of identify themselves with the protection and development of forests from which they derive benefits. The rights and concessions from forests should primarily be for the bonafide use of the communities living within and around forest areas, specially the tribals.

The life of tribals and other poor living within and near forests revolves around forests. The rights and concessions enjoyed by them should be fully protected. Their domestic requirements of fuelwood, fodder, minor forest produce and construction timber should be the first should be made available through conveniently located depots at reasonable prices.

Similar consideration should be given to scheduled castes and other poor living near forests. However, the area, which consideration should cover would be determined by the carrying capacity of the forests.

Wood is in short supply. The long-term solution for meeting the existing gap lied in increasing the productivity of forests, nut to relieve the existing pressure on forests for the demands of railway sleepers, construction industry (particularly in the public sector), furniture and panelling, mine-pit props, paper and paper board etc. substitution of wood needs to be taken recourse to. Similarly, on the front of domestic energy, fuelwood needs to the substituted as far as practicable with alternate sources like biogas, LPG and solar energy. Fuel-efficient be popularised in rural areas.

v) DIVERSION OF FOREST LANDS FOR NON-FOREST PURPOSES

Forest land or land with tree cover should not be treated merely as a resources readily available to be utilised for various projects and programmes, not as a national asset which requires to be properly safeguarded for providing sustained benefits to the entire community. Diversion of forestland for any non-forest purpose should be subject to the most careful examinations by specialists from the standpoint of social and environmental costs and benefits. Construction of dams and reservoirs, mining and industrial development and expansion of agriculture trees and forests. Projects which involve such diversion should at least provide in their investment budget, funds for regeneration/compensatory afforestation.

Beneficiaries who are allowed for mining and quarrying in forest land and in land covered by trees should be required to repair and re-vegetate the area in accordance with established forestry practices. No mining lease should be granted to any party, private or public, without a proper mine management plan appraised from the environmental angle and enforced by adequate machinery.

vi) Wildlife Conservation - Forest Management should take special care of the needs of wildlife conservation, and forest management plans should include prescriptions for this purpose. It is specially essential to provide for "corridors" linking the protected areas in order to maintain genetic continuity between artificially separated sub-sections if migrants wildlife.

vii) Tribal People and Forests - Having regard to symbiotic relationship between the tribal people and forests, a primary task of all agencies responsible for forest management, including the forest development corporations should be to associate the tribal people closely in the protection, regeneration and development of forests as well as to provide gainful employment to people living in and around the forest. While safeguarding the customary rights and interests of such people forestry programmes should pay special attention to the following:-

1. One of the major causes for degradation of forest is illegal cutting and removal by contractors and their labour. In order to put an end to this practice, contractors should be replaced by institutions such as tribal co-operatives, labour co-operatives, government corporations, etc. as early as possible;

2. Protection, regeneration and optimum collection of minor forest produce along with institutional arrangements for the marketing of such produce;
3. Development of forest villages on par with revenue villages;
4. Family oriented schemes of improving the status of the tribal beneficiaries; and
5. Undertaking integrated area development programmes to meet the needs of the tribal economy in and around the forest areas, including the provision of alternative sources of domestic energy on a subsidised basis, to reduce pressure on the existing forest areas.

viii) Shifting Cultivation - Shifting cultivation is affecting the environment and productivity of land adversely. Alternative avenues of income, suitably harmonised with the right land use practices, should be devised to discourage shifting cultivation. Efforts should be made to contain such cultivation within the area already affected, by propagating improved agriculture practices. Area already damaged by such cultivation should be rehabilitated through social forestry and energy plantations.

ix) Damage to Forests from Encroachments, Fires and Grazing

Encroachment on forests lands has been on the increase. This trend has to be arrested and effective action taken to prevent its continuance. There should be no regularization of existing encroachments.

The incidence of forest fires in the country is high. Standing trees and fodder are destroyed on a large scale and natural generation annihilated by such fires. Special precautions should be taken during the fire season Improved and modern management practices should be adopted to deal with forest fires.

Grazing in forest areas should be regulated with the involvement of the community. Special conservation areas, young plantations and regeneration areas should be fully protected. Grazing and browsing in forests areas need to be controlled. Adequate grazing fees should be

levied to discourage people in forests areas from maintaining large herds of non-essential livestock.

x) Forest-based Industries - The main considerations governing the establishment of forest-based industries and supply of raw material to them be as follows:

- As far as possible, a forests-based industry should raise the raw material needed for meeting its own requirements, preferably by establishment of a direct relationship between the factory and the individuals who can grow the raw material by supporting the individuals with inputs including credit, constant technical advice and finally harvesting and transport services.
- No forest-based enterprise, except that at the village or cottage level, should be permitted in the future unless it has been first cleared after a careful scrutiny with regard to assured availability of raw material. In any case, the fuel, fodder and timber requirements of the local population should not be sacrificed for this purpose.
- Forest-based industries must not only provide employment to local people on priority but also involve them fully in raising trees and raw-material.
- Natural forests serve as a gene pool resources and help to maintain ecological balance. Such forests will not, therefore, be made available to industries for undertaking plantation and for any other activities.
- **Farmers**, particularly small and marginal farmers, would be encouraged to grow, on marginal/degraded lands available with them, wood species required for industries. These may also be grown along with fuel and fodder species on community lands not required for pasture purposes, and by forest department/corporations on degraded forests, not earmarked for natural generation.
- The practice of supply of forests produce to industry at concessional prices should cease. Industry should be encouraged to use alternative raw materials. Import of wood and wood products should be liberalised.
- The above considerations will, however, be subject to the current policy relating to land ceiling and land-laws.

xi) Forest Extension - Forests conservation programme cannot succeed without the willing support and co-operation of the people. It is essential, therefore, to inculcate in the people, a direct interest in forests, their development and conservation, and to make them conscious of the value of trees, wildlife and nature in general. This can be achieved through the involvement of educational institutions, right from the primary stage. Farmers and interested people should be provided opportunities through institutions like Krishi Vigyan Kendras, Trainers' Training/centres to learn agrisilvicultural and silvicultural techniques to ensure optimum use of their land and water resources. Short term extension courses and lectures should be organised in order to educate farmers. For this purpose, it is essential that suitable programmes are propagated through mass media, audio-visual aids and the extension machinery.

xii) Forestry Education - Forestry should be recognised both as a scientific discipline as well as a profession. Agriculture universities and institutions dedicated to the development of forestry education should formulate curricula and courses for imparting academic education and promoting postgraduate research and professional excellence, keeping in view the manpower needs of the country. Academic and professional qualifications in forestry should be kept in view for recruitment to the Indian Forest Service and the State Forest Service. Specialised and orientation courses for developing better management skills by in service training need to be encouraged, taking into account the latest development in forestry and related disciplines.

xiii) Forestry Research - With the increasing recognition of the importance of forests for environmental health, energy and employment, emphasis must be laid on scientific of the research base as well as new priorities for action. Some broad priority areas of research and development needing special attention are:-

- i) Increasing the productivity of wood and other forest produce per unit of area per unit time by the application of modern scientific and technological methods.
- ii) Revegetation of barren/margin/waste/mined lands and watershed areas.

- iii) Effective conservation and management of existing forests resources (mainly natural forests eco-system).
- iv) Research related to social forestry for rural/tribal development.
- v) Development of substitutes to replace wood and wood products.
- vi) Research related to wildlife and management of national parks and sanctuaries.

xiv) Personnel Management - Government policies in personnel management for professional foresters and forest scientist should aim at enhancing their professional competence and status and attracting and retaining qualified and motivated personnel, keeping in view particularly the arduous nature of duties they have to perform, often in remote and inhospitable places.

xv) Forest Survey and Data Base - Inadequacy of data regarding forests resources is a matter of concern because this creates a false sense of complacency. Priority needs to be accorded to completing the survey of forest resources in the country on scientific lines and to updating information. For this purpose, periodical collection, collation and publication of reliable data on relevant aspects of forests to modern technology and equipment.

xvi) Legal Support and Infrastructure Development - Appropriate legislation should be undertaken, supported by adequate infrastructure, at the Centre and State levels in order to implement the Policy effectively.

xvii) Financial Support for Forestry - The objectives of this revised Policy cannot be achieved without the investment of financial and other resources on a substantial scale. Such investment is indeed fully justified considering the contribution of forests in maintaining essential ecological processes and life-support systems and in preserving genetic diversity. Forests should not be looked upon as source of revenue. Forests are renewable natural resources. They are a national asset to be protected and enhanced for the well being of the people and the Nation.