

**POLICIES AND STRATEGIES FOR ENVIRONMENTAL  
CONSERVATION IN INDIA: A STUDY OF WILD LIFE  
CONSERVATION**

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**MANISH THAKRE**



**CENTRE FOR STUDY OF REGIONAL DEVELOPMENT  
SCHOOL OF SOCIAL SCIENCES  
JAWAHARLAL NEHRU UNIVERSITY  
NEW DELHI – 110067  
2003.**




जवाहरलाल नेहरू विश्वविद्यालय  
JAWAHARLAL NEHRU UNIVERSITY  
Centre for the Study of Regional Development  
School of Social Sciences  
New Delhi-110067


CERTIFICATE

I, Manish Thakre, certify that the dissertation entitled "POLICIES AND STRATEGIES FOR ENVIRONMENTAL CONSERVATION IN INDIA: A STUDY OF WILDLIFE CONSERVATION" for the degree of MASTER OF PHILOSOPHY is my bonafide work and may be placed before the examiners for evaluation.

  
MANISH THAKRE

Forwarded by

  
(PROF. M.H. QURESHI)  
SUPERVISOR

  
(PROF. ASLAM MAHMOOD)  
CHAIRPERSON  
Chairperson  
Centre for the Study of Reg. Dev.  
School of Social Sciences,  
Jawaharlal Nehru University  
New Delhi-110 067

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## CHAPTER I

### INTRODUCTION

Environmental conservation is an indispensable issue through out the world and India is no exception. Environment is the vital surroundings which comprises the living creatures and its material contents as well as the air, water, and earth with in its compass, and the establishments set up by man.<sup>1</sup> Because of the man's rising selfish needs the environment has badly suffered for last two centuries. This exploitative and unsustainable technique of survival has led to the serious deterioration to the air, land, water and natural habitats. The destruction of environment is so immense that the survival of the human being is at stake. Man's uncontrolled exploitation of environment (Forests, Wildlife, oceanic resources, etc) has created the catastrophe, in which he himself is trapped. Therefore, now as he got threatened by the chaotic results of the environmental pollution, depleting wild life resources, desertification, loss of natural beauty etc. he started the hue and cry for the conservation of environment. Through out the world from England to United States, Norway to South Africa, there has been a tremendous exploitation and damage caused to the natural ecosystem, it has been a serious concern globally to protect and conserve the natural environment. It has resulted in the emergence of global environmental movement, focusing on the conservation, preservation and protection of the depleting environment. The Industrial revolution in the west was the beginning of the pollution and environmental problems and also the beginning of issues related to environmental conservation. Gifford Pinchot first defined the term conservation in 1908, which means, "to keep together". The man's exploitation

of nature, wild, fauna and flora, excessive deforestation, poaching, killing of games etc has led to the establishment of first National Park 'Yellow Stone National Park' in Wyoming, United States,. After the two environmentally disastrous World Wars, the global environmental movement has become more active and revolutionized the environmental concerns in developed and developing countries. The creation of UN and related organization like IUCN, WWF, etc. between 1940s to 1960s has done great job in enforcing global environmental laws. The global conference, local green parties and NGOs have started the campaign to create the environmental awareness and make the national governments and international organization to check on the anti-environmental activities.

In this global environmental campaign India is not left behind. The British India and India after independence has enforced the laws and acts related to the preservation and conservation of the environment. Nature worship and the 'conservation ethic' have been an integral part of Indian ethos and tradition from the earliest times. The environmental issues had begun in India with the launch of Forest Act 1865 and 1927. After independence the environmental issues has been taken up seriously but the action taken for the protection of environment, protection of wild flora and fauna, ameliorating pollution etc. was not effective. Although the important acts have been passed and seriously threatened natural areas have been converted into protected areas. The Factories Act of 1948, Insecticide Act of 1968, Wildlife (protection) Act of 1972, Water Act of 1974 to environment protection Act of 1986 etc: various environmental movements in the different parts of India like 'Chipko Andolan' & Apikko movement;

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<sup>1</sup> UNEP (1997), "UNEP Environmental Law Training Manual, Published by UNEP, pp.3-5.



establishment of Ministry of Environment and Forest, Pollution Control Board has contributed to a great deal in the protection and conservation of the environment.

Of all the environmental conservation issues the conservation of the wildlife (Fauna & Flora) has been the major focus of global conservation bodies and the Indian governmental and non-governmental agencies. The wildlife has been the indispensable resource of each and every country. It's the key factor in maintaining the ecological balance. Any damage to the wildlife will create chaos in the biosphere resulting into the disturbance of ecological cycle. Globally and in India, for the protection of wildlife protected areas have been created for their conservation and preservation. India is amongst the world's hotspots of biological diversity and the creation of wildlife (protection) Act of 1972, convention on the Biological Diversity, establishment of wildlife sanctuaries, National Parks and Animal specific conservation projects like Project Tiger etc. had contributed (not significantly) in their preservation. India has an extensive network of about 586 national parks and sanctuaries, covering some approximately 4.65 per cent of its territory. They are also home to some of India's most traditional communities. The tribals living in the heart of the forest are dependent on the wild resources for their livelihood. The passage of wildlife acts, creation of national parks and sanctuaries has forced these people to alienate their land. The serious damage to the environment (forest and wildlife) has been done due to the illegal trade, poaching, hunting and killing of animals, because of which certain flora and fauna species have become endangered and there is high threat of their extinction. While the government environmental bodies think in order to protect the wildlife, the local inhabitants should be pulled out of these protected areas. This leads to the conflict between the local communities and the protected area managers. A top down model of conservation, which

has ignored the dependence and rights of local communities on the resources of natural habitats as also their traditions of conservation and lead to the alienation of local inhabitants from their original land and threatened their livelihood. Both within the country and worldwide, it is therefore being realized that the major step towards protection and conservation of biodiversity is recreating a stake for the local communities and reinstalling a sense of belonging towards their resources. Such a step is, however, not easy, especially because of the extent of alienation of communities from their surroundings, changes in life styles and attitudes, the ecological and cultural erosion caused by current models of development, and the loss of responsibility and decision-making capacity amongst the majority of the population.

#### **1.1 OBJECTIVES OF THE STUDY**

1. To have a historical overview of the awareness of environmental conservation programmes in the world.
2. To review the policies of environment conservation and various strategies adopted from time to time in India.
3. To study the need for wildlife conservation and the state of wildlife conservation in India.
4. To study the status and working plans of the two protected areas and analyze the problem of displacement of communities from protected areas and issue of their resettlement and rehabilitation.

## 1.2 DATA BASE

The secondary data is the source of information and it is mainly collected from the WWF publications, IUCN and UNEP, Papers of Indian Institute of Public Administration (IIPA) dealing with environment and conservation, Ministry of Environment and Forest (MOEF) publications beside this the other data sources are;

1. Annual Report, MOEF, 2000;
2. Wild life act, 1972;
3. Survey of Environment, Hindu, 2000; and
4. Relevant periodicals and journals.

For the study area “Pin Valley National Park” secondary data has been collected from the Divisional Forest Office (DFO), Kaza, Spiti related to the number of people to be affected due to their displacement from the park.

## 1.3 METHODOLOGY

To explain the various concepts of the study clearly, cartographic and statistical techniques have been used. The methodology of research is to first critically analyze the concept of environmental conservation in a historical perspective, policies and legal frame in the Indian context has taken up for study to see the impact on wildlife conservation in the nature of defining protected areas and forming parks and sanctuaries. The impact of the legal and policy framework on human displacement from protected areas has been appraised.

The percentage growth rate change of forest cover for the years 1993, 1995 and 1997 has been calculated from the given data. The change in [percentage] growth rate of

population for the same period of time has also been calculated and correlated with the changing forest cover. For this purpose Pearson's Correlation Coefficient has been used.

The percentage area of forest cover in each state to total area of each state has been calculated and shown in a choropleth map.

#### **1.4 AREA OF STUDY**

The macro level study will be related to Pin Valley national park and Kibber wildlife sanctuaries.

##### **1.4.1 PIN VALLEY NATIONAL PARK (PVNP)**

It is situated between  $31^{\circ} 6' 40''$  and  $32^{\circ} 2' 20''$  N latitudes to  $77^{\circ} 4' 21''$  and  $78^{\circ} 6' 19''$  E longitudes. This park is located in the cold desert area of Spiti sub- division of Lahaul Spiti district of Himachal Pradesh. There are more than 20 species of animals and birds in the park. This park is especially renowned for the protection of endangered snow leopard. Alpine pasture or dry alpine scrub forest also characterizes this park.

##### **1.4.2 KIBBER WILDLIFE SANCTUARY (KWLS)**

It is situated between  $32^{\circ} 6' 50''$  and  $32^{\circ} 30''$  N latitudes to  $78^{\circ} 1' 00''$  and  $78^{\circ} 32' 00''$  E longitudes. This sanctuary is located in the Spiti sub- division of Lahaul and Spiti district of Himachal Pradesh. This is the only sanctuary in the country, which is situated in the cold desert area. The sanctuary covers an area of 1400. 50 sq. km. This sanctuary has wild animal species like ibex, red fox, snow cock etc.

## 1.5 LITERATURE REVIEW

Environmental conservation is an essential condition for the maintenance of ecological balance. It is the important issue for both the third world as well as the developed countries. In fact, environmental conservation is a comprehensive term which includes air, water, land, wildlife and natural habitat etc. Out of which wildlife conservation is the key issue in the present world as some of the important wild fauna and flora is on the verge of extinction or present system named them as a endangered species. The current legal and policy framework has lead to the conflict between the local communities and the managers of these protected areas. However, various published literatures that helped to develop the framework of study have been reviewed here. The articles and the books available broadly dealt in the perspective of these two aspects;

- A. Wildlife conservation and human conflicts.
- B. Environmental conservation and legal and policy issues.

### 1.5.1 WILDLIFE CONSERVATION AND HUMAN CONFLICTS

Dogra's (1997)<sup>2</sup> article mainly emphasised that the local people should not be displaced from their original areas rather they should be promoted for joint management of biodiversity. Laws on wildlife parks differ from country to country but in most places, these affect the life and livelihood of local village communities adversely. In India the existing laws require people to be evicted from national park areas while in sanctuary areas their rights to collect forest produce essential for their life and livelihood are seriously curtailed.

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<sup>2</sup> Dogra, B. (1997), "Protection of Wildlife- Working with People, not against them", Economic and political Weekly, July 15, pp.1584-1586.

Rangarajan's (1996)<sup>3</sup> article mainly focused on which the older preservationist agenda, which still has a lot of life left in it. The preservationists' shortcoming was their reliance on the state machinery in particular on the legislative and executive power of the union government. But neither a technocracy nor bureaucracy acting as the arbiter of conflicts, move away from free market system which may tilt towards privatization of open access resources. It would not address ecological issues adequately, whereas the assertion of peoples rights has the potential for a different kind of conservation oriented control of their lives and lands. The question then becomes one of working out a new set of relations with forest, which will be enduring both for the people and the natural system. How, this will be done at the time of demographic growth and agrarian intensification will be a major challenge and site specific approaches will play a vital role.

Pathak and Kothari (1998)<sup>4</sup> have discussed the history of conservation practices in India both official and non-official and the direct and indirect impacts on the status of biodiversity today. The authors analyse the cost benefits of official reports at conservation specifically focusing on who gains and who loses. The implications of the policy and legal framework, including the existing and proposed laws dealing with wildlife and biodiversity, are discussed.

Mahanty (2002)<sup>5</sup> directed his attention to the way internal dynamics of government agencies and the relationships between NGOs, agencies and donors could influence the conduct of conservation programmes. The issues are examined through a case study of

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<sup>3</sup> Rangarajan, M. (1996), "The Politics of Ecology, The Debate on Wildlife and people in India, 1970-95", Economic and political Weekly, September, Special Number, pp. 2391-2409.

<sup>4</sup> Pathak, G. and Kothari, A. (1998), "Sharing Benefits of Wildlife Conservation with Local Communities, Legal Implications", Economic and Political Weekly, October 3, pp. 2603-2610.

<sup>5</sup> Mahanti, S. (2002), "NGOs, Agencies and Donars in Participatory Conservation- Tales from Nagarahole", Economic and Political Weekly, September 7, pp. 3757-3765.

the India Eco-development project at Rajiv Gandhi National Park. While the emphasis in this paper is on the eco-development programme, it raises wider issues for park management in India.

Karlsson (1999)<sup>6</sup> had discussed the problem of the Rabhas who live in the Buxa tiger reserve's buffer zone. The tiger project has so far meant only curtailed employment and access to the forest for them. The concept of popular participation in conservation is still only a concept what is required is an effort to address appropriately the question of indigenous people's rights.

A paper (1999)<sup>7</sup> on the third national consultation on wildlife conservation and people's livelihood rights was a dialogue between those advocating the cause of wildlife and those struggling to uphold the human rights of communities living in and around wildlife reserves. The report suggests that there is an urgent need for a new model of conservation that involves local people in the planning, management and monitoring of wildlife habitats, including protected areas. Such a model would have to ensure the livelihood security of local communities and the conservation of natural resources and wildlife, by integrating traditional and modern ecological knowledge ensuring customary rights and responsibilities over natural resources, strengthening village level institutions and capacities, co-ordinating various government level departments and formulating enabling laws and policies.

Ashish Kothari, Neena Singh and Saloni Suri's (1996)<sup>8</sup> book is mainly concerned with the participation in conservation. It exposes possible ways of resolving conflicts that have arisen between conservationists and local communities. The general thrust of this

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<sup>6</sup> Karlsson, B.G. (1999), "Eco-development in Practice- Buxa Tiger Reserve and Forest People", Economic and Political Weekly, July 24, pp. 2087-2094.

<sup>7</sup> (1999), "Wildlife protection and People's Livelihood- Building Bridges", Economic and Political Weekly, August 14, pp.2305-2308.

book is that one possible way of involving the communities in wildlife conservation is by evolving mechanisms for joint or participatory management of protected areas.

Bokil's (1999)<sup>9</sup> paper dealt with the conservation and protection of wildlife and protection of human needs in the Koyna sanctuary in Maharashtra. The author has emphasized that environmental conservation needs to go hand in hand with social justice. In situation where these interests come into conflict with one another, appropriate solutions need to be put forward without delay.

The collaboration and partnership with local communities can help in lessening conflicts and also create stakes and involvement of local communities to preserve and conserve biodiversity.

Mukherjee, (1996)<sup>10</sup> had discussed that the serious people - sanctuary conflicts have often arisen as a result of efforts to conserve the biodiversity and wildlife by creating protected forest areas. Villages of Kushiara – Khas on the outskirts of the Kaimur wildlife sanctuary in Uttar Pradesh have shown a way of resolving such conflicts through adopting a more people friendly approach.

Dwivedi (1995)<sup>11</sup> analysed the significance and role of mass movements i.e chipko, Appico, save western Ghat etc. towards the preservation and protection of forests. Besides the internal dynamics, the external impacts of these movements and the cognizance taken by the law courts are also highlighted.

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<sup>8</sup> Ashish Kothari, Neena Singh and Saloni Suri's (1996) "conservation in India" EPW, Oct. 28, pp. 2755-2766.

<sup>9</sup> Bokil's (1999), "People in Protected Areas - ..." EPW, Jan. 30, pp. 293-299.

<sup>10</sup> Mukherjee, N. (1996), "Resulting People-Sanctuary Conflict in Protected Areas, Kushiara Village, Mirzapur", Economic and Political Weekly, January 27, pp. 197-199.

<sup>11</sup> Dwivedi, K.B., (1995), "Peoples' Participation: Forest Conservation Movements", Social Change, Vol. 25, No. 1, March, pp. 55-63.



Kothari (1995)<sup>12</sup> discussed the reasons for the fast-growing alienation of people from their natural resource base and suggests conservation strategies and methods for utilization of people's participation in the conservation of biodiversity.

Jha (2002)<sup>13</sup> emphasised that it is practically impossible to protect and manage the protected Areas in country with the help of existing infrastructure and funds available to the forest departments. Numbers of Protected Areas are increasing at rapid speed every year. India has one of the world's most extensive networks of officially protected Areas, i.e. 540 national parks and sanctuaries and covering over 4.5 per cent forest Area. Initially the Protected areas were managed by excluding the local community and laws were framed accordingly. However, the results of such management have led to many conflicts and Protected areas suffer badly. Both Protected areas managers and international conservation organizations should recognize that new management approaches are needed to build a more positive relationship and the local communities are the integral part to of the ecosystem.

#### 1.5.2 ENVIRONMENT CONSERVATION AND LEGAL AND POLICY ISSUES

Many studies have been done in India dealing with the environmental conservation and legal and policy issues related to the conservation of wildlife.

Kothari, Singh and Suri (1995)<sup>14</sup> pointed out the ongoing debate about the justification, planning and management of India's wildlife protected areas between the wildlife conservationists and human rights advocates over look the fact that both

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<sup>12</sup> Kothari, A. (1995), "Peoples Participation in the Conservation of Biodiversity", Social change, Vol. 25, No. 1, March, pp. 47-54.

<sup>13</sup> Jha, M. (2002), "Protected Areas of the New Millennium: For the Welfare of Local Community and Wildlife", The Indian Forester, Vol.128, No. 10, October, pp. 1145-1151.

<sup>14</sup> Kothari, A., Singh, N. and Suri, S. (1995), "Conservation in India: A New Direction", Economic and Political Weekly, October 28, pp. 2755-2766.

wildlife and local communities are today equally threatened and have a common adversary in elitist state policies and the urban industrial process. This attitude argues that reconciliation between the two is possible if local communities and government agencies evolve a partnership consisting of the habitants with critical support from NGOs and independent researchers.

Singh (1986)<sup>15</sup> in his book conserving India's natural heritage emphasized on conserving the natural endowments where he has briefly pointed out the world charter for nature and IUCN'S work, importance of wildlife, legal issues, management strategies and the protected areas, bio-reserves and working plans of some national parks.

Kothari (1992)<sup>16</sup> in this paper maintained that convention on Biological diversity has the potential of becoming a genuine instrument for the conservation of the earth's biological wealth. Only strong, radical public opinion can ensure this, and halt its conversion into another weapon in the hands of the rich and the elite of the world.

Upadhyay (2001)<sup>17</sup> pointed out the role of the court as interpreter of laws and a reconciler of conflicting interests assumes greater significance in the context of the large legal space that has become available through the creative interpretation of provisions by the courts. The occasional reverses in the courts should not blur the larger picture of the expanding legal space, and the due recognition of the elasticity in the existing legal provisions and the legal frame to enable interpretations consistent with fair play, equity and justice. A systematic departure and even a rupture from the existing regulatory regime may not be the only solution to the many intractable problems.

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<sup>15</sup> Singh, S, (1986), "Conserving India's Natural Heritage", Natraj Publishers, Dehradun.

<sup>16</sup> Kothari, A. (1992), "Politics of Bio-diversity Convention", Economic and Political Weekly, April 11-18, pp. 749-755.

<sup>17</sup> Upadhyay, V. (2001), "Forest, Peoples and Courts- Utilising legal space", Economic and Political Weekly, June 16, pp. 2131-2134.

Gadgil and Guha's (1995)<sup>18</sup> paper divides Indian society into three sections, the ecosystem people, primarily dependent on a natural resource survival base; the omnivores with privileged access to resources and ecological refugees, who have been rendered destitute through deprivation of tradition access to natural resources. It regards the Indian environment movement as a response by these three components to various concerns relating to environmental degradation and outlines seven strands in the movements. The paper pointed out that the internal contradictions in the ideology of these various strands have prevented the movement from emerging with a comprehensive consistent alternative agenda for an environmentally sound development.

All these articles and books have helped in developing a conceptual out look, to deal with the study, although not much work have been done in the study area (PVNP & KWLS), but still these have helped to develop and framework for the study of environment & wildlife conservation related problem and issues.

#### **1.6 ORGANIZATION OF THE MATERIAL**

The first chapter includes the identification of the research problem, review of the earlier works done in this field, objectives, database and the methodology of the study.

The second chapter deals with historical overview of the awareness of environmental conservation programmes in the world.

The third chapter deals with the reviews of the policies of environmental conservation and various strategies adopted from time to time in India.

The fourth chapter has been devoted to describe the need for wildlife conservation and to analyse the state of wildlife conservation in India.

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<sup>18</sup> Gadgi, M. and Guha, (1995), "Towards a Perspective on Environmental Movements in India", Seminar, January; pp. 451-471.

The fifth chapter deals with the analysis of the status of working plans of the two protected areas and analyse the problems of displacement of communities from protected areas and their resettlement and rehabilitation.

The sixth chapter presents the conclusion of the study.

#### **1.7 LIMITATION OF THE STUDY**

The data available for the study was not in an organized manner. The data for forest area diversion, poaching, shifting cultivation and other parameters which were available for all states were not available for over a period of time. Hence comparability was a problem. Again data available for the Pin valley National Park and Kibber Wild Life Sanctuary was available for only two periods of time. So analysis was a problem. The problem of displacement could not be discussed because of lack of data.

## CHAPTER – 2

### HISTORICAL OVERVIEW OF THE AWARENESS OF ENVIRONMENTAL CONSERVATION PROGRAMMES

Of all the political, economic and social revolutions of the last century, none has so fundamentally changed human values and behaviour as the environmental resolution. Degradation of the environment has a history almost as long as that of civilization. Nearly 3,700 years ago, Sumerian cities were being abandoned as the irrigated lands which had produced the world's first agricultural surpluses became saline and water logged.<sup>1</sup> Nearly 2,400 years ago, Plato bemoaned the deforestation and soil erosion brought to the hills of Attica by overgrazing and the cutting of trees for fuelwood. In 1<sup>st</sup> century Rome, Columella and Pliny the Elder warned that poor husbandry threatened crop failures and soil erosion.<sup>2</sup> In the 7<sup>th</sup> Century, the complex 400 year old Mesopotamian irrigation system began to break down under the strain of mismanagement. Population growth brought about the 10<sup>th</sup> century collapse of the Mayan Civilisation.<sup>3</sup> Byzantine, Venetian and Genoan shipbuilding reduced the coastal forests of the Mediterranean. Air pollution from coal burning in England was bad enough by 1661 to prompt the diarist and naturalist John Evelyn to complain about the "Hellish and dismal cloud" which made London resemble "the suburbs of hell, (rather) than an Assembly of rational creatures."

The global environmental movement had no clear beginnings. There were no landmark events which sparked mass out-rage, no specific leaders who inspired a mass movement and no sudden changes in human thinking. The global movement grew out of a series of independent responses to local issues, in different places at different times.

#### 2.1 1830-1914

The first trace of Environmental movement dates back to the beginning of industrialization, the origin of nature conservation. Alexander von Humboldt, Henry-

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<sup>1</sup> Mc Cormick, J. (1995), "The Global Environmental Movement," Wiley Publications, P. xi.

<sup>2</sup> Ibid.

<sup>3</sup> Deevey, E.S., Brenner, M. and Flannery, M.S., (1979) "Mayan Urbanism: Impact on a Tropical Karst Environment," Science, October 19, pp. 298-306.

David Thoreau. George Perkins Marsh, John Muir, Gifford Pinchot, Hugo Conwentz expressed their concern over resource depletion and despoliation and emphasized on the conservation of natural resources. Gifford Pinchot (1865-1946), a wealthy Pennsylvanian who-studied forestry in Europe, where he had learnt that forests could be both protected and managed for sustained yields. He also coined the word “conservation” in 1908 which is derived from two Latin words – con meaning “together” and severe, meaning to “keep” or “guard”. Literally, therefore, conservation means “to keep together”. The important event took place in 1872 when an area of 800,000 hectares (2 million acres) in Wyoming was designated as ‘Yellow Stone’ National Park, the world’s First-national park. In India during this time, Britain appointed the first conservator of forests in Bombay in 1847 and the second in Madras in 1856, charging both with managing forests as a source of revenue for the state. In 1864, Brandis was appointed inspector-general of Forests for India, and the First Indian Forest-Act was passed the following year.

Table 2.1  
Important Environmental Events (1863-1914)

Year	Events
1863	Passage of Alkali Act and creation of Alkali Inspectorate (Britain)
1864	Publication of “Man & Nature” by George Perkins Marsh; Yosemite Valley (California) given protection for public use and recreation.
1865	Commons, open spaces and footpaths preservation society founded (Britain); creation of Indian Forest Service.
1872	Yellow stone National Park created; Robert Angus Smith coined the term “Acid Rain”.
1879	Royal National Park created (Australia)
1881	Society for the Protection of Birds Founded (Britain)
1883	Natal Game Preservation Society Founded (South Africa)
1892	Sierra Club Founded (U.S.)
1895	National Trust Founded (Britain)
1907	Inland Waterways Commission created (U.S.)

1908	(May) White House Conference of Governors on Conservations, Washington DC.
1909	North American Conservation Congress, Washington DC. Wildlife Preservation Society Founded (Australia); International Congress for the Protection of Nature, Paris (8 Swedish Park Established)
1913	Consultative commission for the International Protection of Nature Founded (Switzerland).
1914	Swiss National Park created. (Paul Sarasin Founder)

Table 2.2

Multilateral International Wildlife treaties(1900-1911)

Year signed	Name of Convention
1900	Convention for the Preservation of Wild Animals Birds and Fish in Africa
1902	Convention for the Protection of Birds useful to Agriculture.
1911	Treaty for the Preservation and Protection of for seals.

Table 2.3

Foundation of selected private environmental organization (1843-1913)

Year	Organization	Country
1843	Manchester Association for the Prevention of Smoke	Britain
1867	Fast-Riding Association for the Protection of Sea birds	-do -
1870	Association for the Protection of British Birds	- do -
1880	Fog and smoke Committee (National Smoke statement institution form 1882)	- do -
1883	American Ornithologists Union	US
1885	Selborne league	Britain
1886	Auduban Society	US
1889	Society for the Protection of Birds	Britain

1892	Sierra Club	US
1895	National Trust	Britain
1898	Coal Smoke Abatement Society	- do -
1903	Society for the Preservation of the wild Fauna of the Empire	- do -
1909	Swiss League for the Protection of Nature Swedish society for the Protection of Nature Wildlife Preservation Society National Conservation Association	Switzerland Sweden Australia US
1912	Society for the Promotion of Nature Reserve	Britain
1913	British Ecological Society	- do -

### 2.3 1914 – 1944

During the period from the first to the second world war, there was a decline of colonialism and the spread of western civilization. Naturalist's endeavored to control hunting and prevent species extinctions mainly in Africa. These were much emphasis on wilderness preservation and the Paris International Congresses in 1923 and 1931, the London Conference in 1933 all focusing on the environmental conservation.

Leopold a graduate of the Yale Forestry School published his book, "Game Management" in 1933, which became a key text for the wildlife profession. In 1935 he helped found the Wilderness Society by 1938. Soil conservation had become a major public policy issue in South Africa. While Europe was diverted during the late 1930s by the escalating threat of war, the Americans reached two international wildlife protection agreements i.e. The 1937 Migratory Birds Treaty (signed with Mexico & Canada) and The Convention on Nature Protection and Wild Life Preservation in the Western Hemisphere. During this time in India, Indian Forest Act 1927 was passed and the first national park in Asia Jim Corbett was established in India in 1935. In 1939, Hugh Benett of the US soil conservation service and R.O. Whyte and G.V. Jacks warned of the dangers of soil erosion and the need for conservation.



Table 2.4  
Multilateral International Wildlife Treaties (1933-1940)

Year signed	Name of Convention
1933	Convention relative to the Preservation of Fauna & Flora in their Natural State (London Convention)
1940	Convention on Nature Protection and Wild life Preservation in the Western hemisphere.

Table 2.5  
Important Environmental Events (1922-1940)

Year signed	Name of Convention
1922	International Committee for Bird Protection Founded (based in London)
1933	International Conference for the protection of Fauna & Flora, London
1934	International office for the Protection of Nature Founded (based in Belgium)
1934-38	Dust-Bowl (dust storms hit the great plain – ill advised Agricultural Practices – Great Plain Committee – Conservation & Ecological balance is emphasized)
1940	Western Hemisphere Convention opened for signature.

### 2.3 1945 – 1971

Hiroshima and Nagasaki atomic explosions opened the way to “Planetisation of mankind.” The second world war transformed attitudes toward internationalism. The determination of the allied powers to avoid a repeat of the problems that had led to two devastating conflicts in 30 years encouraged to work more closely with each other ever before. The birth of global organization – like UN was enough to inspire a new interest in international cooperation, and to revive Pinchot’s idea for an international conference on the conservation of natural resources, and Van Tienhoven’s idea for the creation of an international organization for the protection of nature.

Food production and the elimination of hunger was one of the main items on the UN agenda. The UN Food and Agriculture Organization (FAO) was founded at a conference in Quebec in October 1945, with Sir John Boyd made resource conservation a central item on its agenda. Article 1 of its constitution listed “the conservation of natural resources and the adoption of improved methods of agricultural production”<sup>4</sup> as one method of achieving its goals. In 1951 FAO held a conference in Ceylon on land use in Asia and the Far East.

FAO was not the only UN agency looking into global cooperation on resource management. UNESCO (UN Educational, Scientific and Cultural Organisation, was also active. Its first Director General K. Julian Huxley was also one of the founder of wild life conservation special committee (WLCSC) and National Parks Committee (1945) in Britain.

Max Nicholson an ornithologists played a key role in the creation of IUCN and World Wild Life Fund. International Union for the Protection of Nature (IUPN) was formally created at a conference held in early October 1948 at Fontainebleau, attended by representatives from 18 governments, and international organization. His goals were to promote cooperation between governments and non-governmental organizations on nature protection, promote public education, scientific research and legislation, and collect, analyse and disseminate data and information. He also worked on a global convention for the protection of nature.

The UN Scientific Conference on the Conservation and Utilization of Resources (UNSCCUR) was held at Lake Success, New York between 17 August and 6 September 1949. Organised by FAO, UNESCO, the WHO and the ILO, it was then the biggest international conservation conference ever held, attended by more than 530 delegates from 49 countries (excluding the USSR). At 54 separate meetings, the delegates discussed the increasing pressure on global resources: the interdependence of resources; the development of new resources; shortage of food, forests, animals and fuels; education in less developed countries; and the integrated development of river basins.

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<sup>4</sup> United Nations (2000), Reference 12, p. 694.

The concurrent IUPN/UNESCO conference – the International Technical Conference on the Protection of Nature (ITC) (Lake Success, 22-29 August) was attended by representatives from 32 countries and 11 international organizations, and focused on education and human ecology. A tentative list of threatened species was compiled after ITC and State members of IUPN were encouraged to draw up national lists of threatened species, but none did so until the late 1960s.

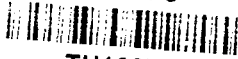
In 1958 IUPN Survival Service published a list of endangered species. This led to the publication in 1960 of the Red Data Book, a loose-leaf file of 135 endangered mammal species. ICBP and IUCN together drew upon additional list of threatened birds. Both lists grew during the 1960s and ultimately formed the basis of the current series of Red Data Books, the major reference source on the States of the world's threatened and endangered species.

The second of IUPN's major network, in addition to the Survival Service, was the Commission of Ecology. This was set up in 1954 under the Chairmanship of the American ecologist Edward Graham, to coordinate ecological research and promote contact between ecologists.

The International Zoological Congress held in London in 1958 emphasized on preserving habitats instead of individual species. The importance of conserving representative ecosystems now attracted greater attention.

IUPN's interest gradually broadened to include conservation. The change of focus was confirmed in 1956 by the union's decision to change its name to the International Union for Conservation of Nature and Natural Resources (IUCN). The new emphasis on conservation began in 1961 when IUCN launched project Mar (a name derived from the common three letters of the word for "marsh" in different languages) to underline the threats to wetlands, and convened a conference on wetlands in the French Camargue in November 1962. Then the IUCN sponsored the first world conference on National parks in Seattle, Washington, in July 1962.

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### 2.3.1 Establishment of WWF

In May 1961, IUCN issued the Morges manifesto, which outlined IUCN's belief that the ability and skill needed to tackle threats to wildlife existed, but not the "support and resources", and that money was the most essential of all needs.

Huxley broached the fundraising idea with Max Nicholson, whose involvement with IUCN during the 1950s had convinced him that the union was incapable of running its own financial affairs efficiently, and had given the idea of a twin body to IUCN which would be responsible for fund raising. The concept was discussed at the ARUSHA conference in September 1961, and the World Wildlife Fund (WWF) was launched in London.

WWF funded projects in 5 categories:

1. Individual species,
2. Wilderness areas,
3. Support for existing organizations,
4. Conservation education, and
5. "Miscellaneous" conservation matters.

At its 1956 General Assembly, IUCN noted that "Landscape Planning based on Ecological Research" should be the starting point for development in less developed countries. At its 1960 General Assembly, IUCN concluded that conservation was a particularly urgent priority in Africa and that Foreign aid "prone to overlook conservation and the value of Wild Life and habitat a continuing economic, scientific and cultural asset."

IUCN's response was to launch the African Special Project (ASP) in an attempt to encourage new African leaders to publicly identify themselves with conservation and to convince them of "the virtue of living off the income of their natural resources, not the capital."

and the effects of population and environment, and the effects of population pressure on land.

The single event of this time most frequently cited as marking the beginning of the environmental revolution was the publication in 1962 of *Silent Spring* by Rachel Carson. The book detailed the effects of the misuse of Synthetic Chemical pesticides and insecticides, generated much controversy, and heightened Public awareness of the implications of human activity on the environment and of the cost in turn to human society. Other major event such as Rise of Ecology as an applied Science conservation becomes a Utilitarian movement based on rational management of natural resources.

The disquiet created by the debate about nuclear fallout and the warnings of *Silent Spring* was compounded in the period 1966-72 by a series of environmental disasters which made headlines and dramatically drew attention to the threats faced by the environment.

### **2.3.2 Torrey Canyon “Black Tide” (1967)**

The size and number of operating oil tankers had grown dramatically since the Second World War. The first major disaster was Torrey Canyon in March 1967. When about 8,75,000 barrels (117000 tons) of crude oil were spilled after the tanker struck a reef off the Southwest tip of England, between Land’s End and the Isles of Scilly. Hundreds of kilometers of Cornish Coast Line were polluted.

### **2.3.3 Santa Barbara Oil Spill (1969)**

Two Years after Torrey Canyon, a blow out at a union oil company platform off the coast of Santa Barbara, California, brought pollution to long stretches of Californian coastline. Because the spill came from a drill hole in an unstable area of the continental shelf, it took several weeks to bring the flow fully under control.

#### 2.3.4 Minamata (1960s – 1970s)

The human costs of environmental pollution were illustrated in the late 1960s and early 1970s by events at Minamata Japan, chemical production had begun on the shores of Minamata Bay (opposite Nagasaki) in 1939, and spent catalysts containing mercury were discharged into the bay. Concentrations of mercury were discovered in fish from the bay and in local people who had died from what became known as “Minamata disease.” A second outbreak of the disease occurred at the city of Niigata, where another factory was discharging mercury into a river. Niigata victim won a civil action against the factory in 1971, and in 1973 the Minamata factory was found, guilty and had to pay reasonable compensation.

Environmentalism, during this time provided expression for the counter-culture, which was anti-industrial, rejected the work ethic, condemned consumerism and material values, and questioned the rationality of a society which harassed science to what were seen as the inhuman atrocities of the Vietnam war, and the ecological damage wrought by insecticides and industrial waste.

Rebellion of youth grew out of the obsession with success and security of the older generations; materialism, technology, power, profit and growth were seen as symbols of all that was worst about western society, and as posing a threat to the environment.

Table 2.8

Multilateral International Wildlife Treaties (1965-1970)

Year signed	Name of Convention
1968	African Convention on the conservation of nature and natural resources.

Table 2.9  
Important Environmental Events (1961-1969)

Year	Event
1961-73	Minamata (Japan)
1962	First World Conference on National parks, Seattle, Washington.
1963	Partial Nuclear Test Ban Treaty signed.
1964	International Biological Programme Created
1965	Bangkok conference on nature conservation in South-East Asia;
1966	Publication of First photographs of earth taken from space;
1968	San Carlos de Bariloche Conference on Nature Conservation in Latin America; <ul style="list-style-type: none"> <li>- Publication of The Population Bomb by Paul Hrich;</li> <li>- Formation of the Club of Rome;</li> <li>- (Sept) UNESCO's Conference and Biosphere (Paris)</li> </ul>
1969	Santa Barbara Blow out (US); Creation of friends of the earth (US)

In 1968, the African Convention for conservation of nature and natural resources was adopted by 33 OAU members states in Algiers, and it entered into force in 1969. The philosophy of the convention was founded on the “conservation, utilization and development of soil, water, flora, and faunal resources in accordance with scientific principles and with due regard to the best interests of the people.”<sup>5</sup>

The Tenth General Assembly of IUCN was held in New Delhi in 1969, where an approach based on prevention and cure was emphasized.<sup>6</sup> The Assembly defined conservation as the “Management (which includes survey, research, administration, preservation, utilization...) of air, water soil, minerals, and living species including man, so as to achieve the highest sustainable quality of life.”<sup>7</sup>

<sup>5</sup> World Wide Fund, (1968), “World Wild Life Fund Year book” pp. 46-47.

<sup>6</sup> IUCN publication (1995), p. 38 and p. 47.

<sup>7</sup> Ibid.

The first major body in Europe and the first broadly based international body anywhere to take an interest in the environment was the council of Europe (founded in 1949). In 1963, the council setup the European Committee for conservation of Nature and Natural Resources (CDSN) to draw up a plan of action on the management of Europe's natural resources. In the same year, following the success of National Nature Week in Britain, the Council declared 1970 as European Conservation Year (ECY) with the aim of promoting a communal European sense of the extent and value of Europe's natural resources, of the character of humanity's destructive abilities, and of the need for sound long-term management. ECY promoted public awareness and influenced political opinion in the period prior to Stockholm, and spawned a series of European ministerial conferences on the environment (Vienna 1973, Brussels 1976, Bern 1979, Athens 1982). ECY also provided a Focus for the debate on population, pollution and growth, accidentally drawing into the environment as debate a wider and more conservative audience.

By 1970 there had been a revolution in environmental attitudes in most industrialized countries. In the United States, for example, annual membership in the Five major US conservation groups was growing at 16-18 percent in 1969-70; membership of the Sierra Club alone had tripled since 1966.<sup>8</sup> In a cover story in February 1970, time noted that the environment "may well be the gut issue that can unify a polarized nation."

New Environmentalism peaked on 22 April 1970 when Earth Day the largest environmental demonstration in History – was held in the United States. The idea came from Senator Gaylord Nelson of Wisconsin; with Federal Funding, an organizing committee chaired by Denis Hayes orchestrated a nationwide show of concern for the environment. Rallies and teachings were held at an estimated 15000 colleges and 10000 schools. The environmental crisis was no longer a quiet crisis, it has become a mass movement. Ecology acknowledged as a fundamental and applied science and biosphere and mankind became the important issues of the Global Environment Movement.

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<sup>8</sup> Mc Cormick, J. (1995), "The Global Environmental Movement" Wiley Publications, pp. 210-212.



New Environmentalism had largely bypassed the established conservation movement. David Brower, a conservationist, established friend of the Earth in 1969, who emphasized that the solution to environmental problems lay not in temporary remedies but in fundamental social change. Friend of the Earth (FOE) adopted vigorous campaigning methods aimed at achieving maximum publicity and drawing attention to activities and ventures that threatened the environment. It has subsequently drawn its support from young, well educated, middle class discontents. The FOE formula was to find people in different countries who share our own ideas about the limits to growth... and who have a respect for biological diversity. Then these people become the Board of Directors for their own country.<sup>9</sup>

The issues FOE addressed included alternative sources of energy, wildlife issues, transport, pollution, and changes in legislation. It was pollution – specifically that created by fallout from atmospheric nuclear tests – which led to the creation of Greenpeace, founded by Mc Taggart in 1970s. Greenpeace campaigned against the nuclear test, whaling, sealing and radioactive waste disposal.

During this time, there were various congresses and conferences at all levels to discuss the environmental conservation issue. Not only has this environment become a policy issue at the national level. For example in 1970, in Britain, the world's First Cabinet-level "environment" department was created.

### **2.3.5 Ramsar Convention on Wetlands**

The wetlands convention was the first treaty to aim for truly world-wide participation, and the first to concern itself exclusively with habitat. Designed to protect a global chain of wetlands used by water fowl in their annual migrations, it was signed in February 1971 and came into force in December 1975. Unlike earlier conventions touching on habitat, which emphasized the setting aside of exclusive protected areas, the convention emphasized sustainable use; the only restriction it placed on the use of wetlands was their ecological character should not be harmed.

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<sup>9</sup> Burke, T. (1982) "Friends of the Earth and the Conservation of Resources", London, p.106.

### 2.3.6 UNESCO's Man and Biosphere (MAB) Programme

MAB was designed as an inter-governmental and interdisciplinary research programme based on 14 themes, from human interaction with ecosystems to the role of urban areas as ecological systems. MAB had a small secretariat within UNESCO, but operated in real terms through a network of 102 national committees (made up mainly of scientists from universities or national research institutions), and representatives of relevant public and private bodies. The programme had four main aims:

1. To identify and assess changes in the biosphere resulting from human activities (and the effects of those changes on humans);
2. To study the interrelationships between natural ecosystems and socioeconomic processes;
3. To develop ways of measuring quantitative and qualitative changes in the environment in order to establish scientific criteria for the rational management of natural resources and the establishment of standards of environmental quality;
4. To encourage greater global coherence in environmental research.

The MAB research and information exchange network had meanwhile helped provide a better understanding of the links between cause and effect in environmental problem at local, national and international trends alike. It was now more clearly understood, for example that the removal of forest cover on a hillside could lead to soil erosion, which could lead to siltation in rivers hundreds of kilometers downstream. The impact on food chains of environmental changes was better understood and appreciated, as were the mechanics of phenomena such as acid pollution.

Table 2.10  
Multilateral International Treaties (1970-1971)

Year signed	Name of Convention
1970	Benelux convention on Hunting and Protection of Birds.
1971	Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention)

Table 2.11  
Important Environmental Events (1970-1971)

Year	Event
1970	Earth Day (U.S.) European Conservation Year; Creation of the Department Of the Environment in Britain, and The Environmental Protection Agency in the US.
1971	Publication of The Closing Circle by Barry Commoner; MAB (Mount Biosphere programme created)

## 2.4 1972-1995

The MIT Report for the Club of Rome on The Limits to Growth opens a world wide debate on the myths of economic and population growth and their impact on the environment. It was felt that catastrophe was inevitable by the end of century, brought on by the exhaustion of resources and rising death rates from pollution and food shortages. Increased food supply, check on population, the discovery of new sources of energy, technological advances to control pollution and MDCs should help LDCs to advance their economies more rapidly, could reverse the trend.

### 2.4.1 The Stockholm Conference

The United Nations Conference on the Human Environment was held in Stockholm, Sweden from 5 to 16 June 1972. It was attended by representatives from 113 countries, 19 inter-governmental agencies, and 400 other inter-governmental and non-governmental organizations.<sup>10</sup> The conference was concerned with the characteristics of the environmental which affect the quality of human life. The true significance of Stockholm was that it was part of a process which brought the environment to the attention of governments, encouraged subsequent international agreements and conventions on key environmental issues, and resulted in the creation of the United

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<sup>10</sup> (2002) "Basic Fact about the United Nation", Published by the United Nations, Department of Public Information, December, pp. 193-194.

Nations Environment Programme (UNEP). A simultaneous (Miljo forum) Environment Forum was an important step in recognizing the key role of non-governmental organizations (NGOs), and set a precedent for future international environmental conferences.

In 1972, (UNESCO) Paris Convention on Protection of the World Cultural and Natural Heritage was signed. It aimed at protecting natural and cultural sites of global significance.

#### 2.4.2 The Convention on Trade in Endangered Species (1973)

The Convention on Trade in Endangered Species (CITES), which was signed in March 1973 in Washington and came into force in July 1975, aim to regulate or prevent trade in specified list of endangered or threatened wild animals and plant species. By 1992, more than 100 states were party to CITES, which had the benefit of a full-time paid secretariat, initially funded by UNEP but subsequently by CITE parties. Most of the major wildlife trading nations had signed CITES within a decade of its being opened for signature.

The first Oil Crisis urges western governments to shift to nuclear energy and to consider energy economies but soft energy pathways are seldom taken seriously.

Table 2.12  
Multilateral International Wild Life Treaties (1972-1973)

Year signed	Name of convention
1972	Convention for the Conservation of Antarctic Seals.
1972	Conversion concerning the Protection of the World Cultural and Natural Heritage.
1973	Convention on International Trade in Endangered Species of Wild Fauna & Flora (CITES).
1973	Agreement on the conservation of Polar Bears.

Table 2.13  
Important Environmental Events (1972-1973)

Year	Event
1972	Publication of <i>The Limits to Growth &amp; A Blueprint For Survival</i> . UN Conference on the Human Event, Stockholm Greenpeace founded.
1973	UN Environment Programme created (based in Nairobi); Publication of <i>Small is Beautiful</i> by E.F. Schumacher; Emergence of Chipko Andolan in India; British green party founded.

Ecological consequences of the energy and industrial-agricultural crisis were the growing concern for the Third World. A large number of United Nations Conference (1974-1979) based on the following themes were held:-

Bucharest	-	population (1974)
Cocycoc	-	Environment & Development
Rome	-	food
Vancouver	-	human settlements
Nairobi	-	desertification (1977)
Marde Plata	-	water
Tbilisi	-	environmental education
Geneva	-	climate

This was the golden age of nuclear energy and of the anti-nuclear movement. First European Community (EC) action programme on the environment was held during this period.

The Barcelona convention for the Protection of the Mediterranean Sea against Pollution (1976), birth of Political Ecology and "green" candidates are for the first on the ballot in local, national and European elections. Because of strong environmental movements there was a convergence of struggles, rise of Bio-regionalism, soft technologies, alternative lifestyles, organic agriculture and natural food were emphasized. Major industrial disasters which took place during this period are: (i) Serveso (1976); (ii) Amoco Cadiz (1978); and (iii) Three mile Island (1979).

A number of conventions on European Wildlife and Nature habitats were held during this period. These are listed in the table below;

Table 2.14

Multilateral International Wildlife Treaties ( 1979)

Year signed	Name of convention
1979	Bonn Convention on the conservation of migratory species of Wild Animals.
1979	Berne Convention on the conservation of European wildlife and natural Habitats.

Table 2.15

Important Environmental Events (1974-1979)

Year	Event
1974	Canberra II meeting, Geneva; UN General Assembly calls for the establishment of a new international economic order; Founex-II meeting in Cocoyoc, Mexico; death of Karen silkwood; UNEP regional Seas Programme Launched.
1977	UN conference of Desertification, Nairobi.
1978	Accident at three mile island nuclear power station, Pennsylvania.
1978-79	Evaluation of Lore Canal, Upper New York State.
1979	the Swiss elect the first national green legislator in the world; Convention on long range Trans-boundary Air pollution signed in Geneva; launch of world climate programme.

IUCN, UNEP, FAO, UNESCO and WWF were launched simultaneously in 40 countries. The World Conservation Strategy (CWCS) was enunciated in March 1980. It mainly focused on the conservation of threatened species or areas in need of special protection, and also cover species and areas of economic value which were being

misused, such as wild and semi domesticated relatives of cultivated plant and animals, species, or fisheries and their supporting coastal wetlands. It had provided for the first time a global perspective on the many problems with which conservation is concerned. During 1980s the United Nations adopted the World Charter for Nature.

#### **2.4.3 Law of the Sea**

The United Nations convention on the Law of the Sea (1982) is considered one of the most comprehensive instruments of international law. This landmark treaty provides the framework for all aspects of ocean sovereignty, jurisdiction, use, and state rights, as well as obligations. It embodies in one instrument the codification of traditional rules for the use of the oceans, as well as the development of new rules governing emerging concerns. It is a unique instrument, of ten referred to as a constitution for the oceans.<sup>11</sup> The convention covers all aspects of ocean space and its uses – navigation and over flight, resource exploration and exploitation, conservation and pollution, fishing and shipping. Its 320 articles and 9 annexures constitute a guide for behaviour by states in the world’s oceans, defining maritime zones, laying down rules for delineating sea boundaries, assigning legal rights, duties and responsibilities and producing machinery for the settlement of disputes. The major impact of this convention is the universal acceptance of 12 nautical miles as the limit of the territorial sea, as well as coastal states jurisdiction over the resources of an “exclusive economic zone” upto the limit of 200 nautical miles, and over the resources of the continental shelf extending beyond the limits of the zone. During this period there was a rise of “green” parties who became an important force by 1980s.

#### **2.4.4 Bhopal Industrial Accident (1984)**

The leakage of methyl-isocyanate (MIC) gas from a union carbide pesticide plant in Bhopal in December 1984. Estimates of death toll vary from 1300 to 10,000; the figure most often quoted now is about 2500. UNICEF estimated that about 200,000 people in all were affected, of whom 75 percent were local slum dwellers.<sup>12</sup> There were

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<sup>11</sup> “Basic Facts about the United Nations” (2002), Published by the UN Department of Public Information, December, p.265.

<sup>12</sup> CSE, Report on Environment (1990), pp. 206-226.

three particular issues which were underlined by the Bhopal accident. First, the inadequacy of regulations on pollution standards and chemical safety, and of the zoning system which allowed so many of India's poor to live so close to industrial plants;

Second, the inadequacy of the government's disaster response system. Third, the economic and political value system which allowed multi-national corporations to operate plants at standards of efficiency and safety below those they would have to meet in MDCs.

There were others environmental movement focusing on the conservation of Fauna and Flora, result of which is the International alert for the conservation of tropical rainforests and wild gene resources. In order to weaken the protests against French nuclear tests in the pacific, Greenpeace's Rainbow warrior is wrecked in July 1985 in Auckland harbour by the French intelligence service. Green peace was campaigned against the nuclear test, whaling, sealing and radioactive waste disposal.

#### **2.4.5 Vienna Convention for the Protection of the Ozone Layer (1985)**

The emissions of chlorofluorocarbons (CFCs), chlorinated compounds, carbon dioxide and nitrogen oxides could react with stratospheric ozone, depleting the ozone layer and increasing the level of harmful ultra-violet radiation reaching the surface of the earth. The effect of CFCs was outlined by two scientists of University of California Mario Molina and F.S. Rowland in 1974.<sup>13</sup>

Concerted UN action on ozone began with the launch in 1977 of the world plan of Action on the ozone Layer. Led by the Meteorological Organisation, the aim of the plan was to increase the number of monitoring stations. The meeting also set up a co-ordinating committee on the Ozone Layer (CCOL), which collected information about ongoing and planned research, publishing short annual summaries in the Ozone layer Bulletin.

In 1981, a working group of legal and technical experts had begun work on a global ozone layer convention following the pattern of UNEP's Regional Sea

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<sup>13</sup> Molina, M.J. and Rowland, F.S., "Stratospheric Sink for Chloro Fluoromethanes : Chlorine Atom catalysed Destruction of Ozone," Nature, 28 June, pp. 810-812.



programme. In March 1985, the Global Convention on the protection of the ozone layer was signed in Vienna by 28 countries.

The other important development during this period was the First African Ministerial Conference on the Environment at Cairo.

Table 2.16  
Important Environmental Events (1980-1985)

Year	Event
1980	Formation of German Green party; (March) Launch of the World Conservation Strategy; publication of <i>Global 2000</i> .
1983	German greens win their first Bundestag Seats.
1984	Creation of the 30 percent club; news break from Sahelian Famine; First meeting of Brundt land Commission; Accident at Union Carbide plant, Bhopal, India.
1985	Convention on the protection of the ozone layer signed in Vienna.

Table 2.17  
Multilateral International Wildlife Treaties (1980)

Year signed	Name of the convention
1980	Convention on the conservation of Antarctic Marine Living Resources.

#### 2.4.6 Chernobyl Accident (1986)

The environmental movement and specifically the anti-nuclear movement had often been criticized for over stating its case and for using share tactics to garner sympathy and support. Yet three mile island had shown how close catastrophic environmental disaster might be. Confirmation of the extent to which the global environment could be contaminated by human activity was finally provided on 26 April 1986 when a reactor exploded at the Chernobyl nuclear power station, 50 miles (80 kms)

from Kiev in Ukraine. The accident was caused by an experiment involving the deliberate switching off of safety systems; at least 32 deaths were ascribed to the blast, to the fire, and to radiation in the aftermath of the explosion. More than 200 people suffered severe radiation sickness, and about 135000 had to be evacuated from the Chernobyl area. The accident at Chernobyl was a spectacular example of how technology – if mismanaged or misdirected could bring sudden and extreme environmental contamination.

There was world over movement for environmental conservation and ecological consciousness leading to the international conference on conservation and development, for the implementation of WCS, in Ottawa.

After the Brandt and Global 2000 reports, the Brundtland Report (1987) “Our common future” (UN world commission on environment and development) launches a world wide debate on sustainable development. The Brundtland commission suggested that -

- a. national environmental protection agencies needed urgent strengthening particularly in LDCs;
- b. UNEP’s work needed to be reinforced and extended;
- c. monitoring & assessment needed better forces & coordination;
- d. policy makers needed to work more closely with NGOs and industry;
- e. law and international conventions needed strengthening and better implementation.
- f. The UN should work towards a universal declaration and later a convention on environmental protection and sustainable development.

[The above efforts was a result of the meeting in Geneva in October 1984 (WCED), chaired by Gro Harlem Brudtland, the Former Prime Minister of Norway. The commission had 23 members 12 from LDCs, 7 from Western MDCs and 4 from the communist block.]

There was Alert on export trade and dumping of hazardous wastes in the Third World. Moscow (UNESCO) Congress on environmental education in 1987, focusses on environmental awareness and consciousness.

### 2.4.7 Montreal Protocol (UNEP), 1987

In February 1987, representatives of the major industrialized nations met in Vienna in an attempt to reach an agreement on a freeze on CFC production levels. By April, agreement had been reached in principle following a shift by the EU away from a longer time table for the Freeze and reduction. Final agreement was reached in September 1987 at a meeting in Montreal, when 56 countries drew up an agreement to Freeze consumption of the five most common types of CFC in 1990 at 1986 levels, followed by reductions of upto 50 percent by the year 2000. There after Toronto Conference in 1988 and The Hague Summit (1989) strive to reduce depletion of the ozone layer.

On 22 April 1990, Earth day in 140 countries, around 200 million people participated in terms of thousands of peaceful actions and demonstrations for the cause of healthy & better environment.

The convention of Marine pollution by International Maritime organization signed in London in 1990. Second world climate conference held in Geneva in 1990 and the debate over the green house effect and global warning is emphasized.

Other development in this period are:-

- a. Global Assembly of Women and the Environment (Miami, 1991)
- b. 11 years after WCS, IUCN, WWF and UNEP launch “Caring for the Earth: A strategy for Sustainable Living”.
- c. Citizens involvement in environmental protection and democracy in Eastern and Central Europe.
- d. “Roots of the Future” – World NGO Conference on Environment and Development held in Paris in 1991.

Table 2.18

Important Environmental Events (1986-1987)

Year	Event
1986	accident at Chernobyl nuclear power station, Ukraine.
1987	Publication of the Brundtland commission report our common future.

During this time, the fourth world congress on national parks and protected areas was held in Caracas in 1992 organised by the IUCN. Followed by first world conference of Native peoples on land environment and development in Rio de Janeiro, in the same year.

Important event of this period is The United Nations Conference on Environment and development (UNCED) drew represent alive from 178 countries to Rio de Janeiro during two weeks in June 1992, becoming the largest international conference ever held. Rio added further substance to the debate over global environmental issues. Sustainable development was the major theme of UNCED but global warning, ozone depletion, threat to biodiversity etc. are also the matter of discussions.

The main outcome of Rio is:-

- a. Signature of the convention on Biological diversity;
- b. The convention on climate change;
- c. Agenda 21
- d. Rio declaration on environmental development
- e. The forest principles.

The convention on climate change was signed at Rio by 153 states and European Union. The major significance of this convention was that it established the principle that climate change was a serious problem that needed "Precautionary Measures" that could not await the resolution of question about scientific certainty. It also emphasized the role of MDCs in the production of greenhouse gases.

The convention on Biological Diversity (1992) was signed at Rio by 155 states and the European Union. The protection and conservation of the diverse range of species of animals and plant life and their habitat is the main aim of this convention. It obligates states to conserve biodiversity, ensure its sustainable development, and provide for the fair and equitable sharing of benefits from the use of genetic resources. [A protocol to ensure the safe use of genetically modified organizations was adopted in 2000]. The United States refused to sign the convention, President Bush arguing that it posed a threat to the US biotechnology industry and to American Jobs.

Agenda 21 – Governments took an historic step towards ensuring the future of the planet when they adopted at the Earth Summit Agenda 21, a comprehensive plan for global action in all areas of sustainable development. In this governments outlined a detailed blueprint for action which could move the world away from its present unsustainable model of economic growth towards activities that will protect and renew the environmental resources on which growth and development depend. Areas of action include protecting the atmosphere; combating deforestation, soil loss and desertification; preventing air and water pollution; halting the depletion of Fish stocks; and promoting the safe management of toxic wastes.

The Rio declaration on environment and development. This consisted of 27 principles guiding action on environment and development and building on the Stockholm declaration of 1972.

The forest principles – It emphasis that the sovereign right of individual states to exploit forest resources, but within general principles of forest protection and management. It drew unparalleled levels of public attention to the problems of environment, and represented another major step along the road to a workable resolution of the tensions between environmental management and economic development. It brought national governments yet closer together in agreeing the underlying goals of their environmental policies.

Earth summit was followed by United Nations conference on population and development in Cairo, in 1994 –

1. decline of green parties.
2. second European nature

Conservation year (1995), under the sponsorship of the council of Europe, which holds its 6<sup>th</sup> ministerial conference in Sofia in October and adopts the pan European Biological and landscape diversity strategy.

Table 2.19

## Multilateral International Wildlife Treaties and Important Environmental Events (1992)

Year	Name of convention
1992	UN convention on Biological Diversity.
Year	Event
1992	(June) UN conference on environment and development, Rio de Janeiro; (November) UN commission on sustainable development created.

Table 2.10

## Important Years and Days of Environmental Importance

2002	International Year of Mountain
2002	International Year of Ecotourism
2003	International Year of Fresh Water
Important Days	
5 June	World Environment Day.
17 June	World Day to combat desertification & drought
16 Sept.	International day for the preservation of the ozone layer
23 March	World Meteorological day.
22 May	International day for Biological diversity.

The global environmental movement has significantly contributed for the cause of the protection and conservation of environment. For this various organizations like UNEP, IUCL, WWF, etc. has been established. Besides this the various conventions and treaties have been signed for the protection of seriously affected environment elements like air, water, land and wild habitats. The organization of various conferences on the environmental issues has significantly contributed in realizing the importance of conservation. Overall the movement has forced the developed and developing countries the environmental friendly policies and technologies, so that there should be sustainable development. But there are many issues in which the global environmental movement has not been able to address. The issues of protected areas, throughout the world need to be handled carefully.

### CHAPTER -III

#### ENVIRONMENTAL CONSERVATION: LEGAL AND POLICY STRUCTURE OF WILDLIFE CONSERVATION IN INDIA.

Nature worship and the 'conservation ethic' have been an integral part of Indian tradition. The country's most important post independence law regarding conservation was the wildlife (protection) act of 1972, which significantly contributed in the conservation of wildlife.

India has a long history of conservation, at both official and people's levels. Areas were protected for their biodiversity as early as the third century (B.C) in the times of emperor Ashok. These are also numerous examples of sacred land / water scapes, especially among the hunter-gatherer, agricultural, and pastoral communities spread throughout the country. According to Gokhale (1997), up to 10 percent of India may in the past have been covered by sacred spaces, patches of forest and other ecosystems kept undisturbed by strict sanctions. The important developments in the past are-Bombay Smoke Nuisance Act (1912); Indian Forest Act (1927); Establishment of Jim Corbett National Park (1935); Factories Act (1948); Insecticides Act (1968); The Wildlife (Protection) Act, (1972); The forest Conservation Act, (1980); The Air (Prevention & Control of Pollution) Act, (1981); The Environment (protection) Act, 1986 as shown in Table 3.1. The past environmental events which have necessitated the promulgation of the above regulations through acts have been shown in table 3.2.

Table: 3.1

**INDIA : CHRONOLOGY OF ENVIRONMENTAL LAWS/ACTS**

<b>Year</b>	<b>Environmental Law</b>
1873	Northern India Canal and Drainage Act
1897	Indian Fisheries Act
1901	Indian Ports act
1905	Bengal smoke Nuisance Act
1912	Bombay smoke Nuisance Act
1917	Inland stream vessel Act
	Mysore Destructive Insects & Pests Act
1919	Poison Act
1923	Indian Boilers Act
1927	Indian Forest Act
1939	Motors Vehicles Act
1947	Mines and Minerals Act
1948	Factories ( Pollution and pesticides ) Act
1953	Maharashtra Prevention of water pollution act; Orissa river pollution and prevention Act
1954	Prevention of food adulteration Act
1956	River Boards Act
1958	Ancient monuments and Archacological sites Act
1968	Insecticides Act
1969	Maharashtra Water pollution prevention Act
1980	Department of Environment established ; forest conservation Act
1981	Air pollution Act
1986	Introduction to EIA procedures; environment protection Act
1987	Pollution control Act

Source: Gilpin, A. ( 2000) dictionary of environment law, Edward Elgar Publishing.



Table 3.2

**IMPORTANT ENVIRONMENTAL EVENTS IN INDIA (1908 TO 1998)**

1908	Koziranger National Park, established
1935	Corbett National Park and Tadoba National Park established
1965	Gir lion park established
1972	National committee on Environmental planning and coordination to examine the environmental implications of major development projects, and to set guide lines for the protection of the environment; silent valley project abandoned to protect ecological resources Chipko Andolan movement ( tree – hugging movement ) begins in Uttar Pradesh as a protest against the cutting down of trees.
1979	Social forestry program launched in Uttar Pradesh, the project being world bank financial
1984	Bhopal disaster: a catastrophic leak of methyl isocyanate at a pesticide plant results over in 2000 deaths with thousands injured.
1988	Technology impact Assessments introduced
1992	Sardar sarovar water projects initiated
1993	India decides not to seek further world bank assistance for sardar sarovar due to disagreements over conditions including environmental condition; however the project would proceed ; 100000 people to be resettled
1998	Access to saved piped water 32.3% to wells 32.2% to domestic electricity , 42.0%

Source : Annual Report of the Ministry of Environment and Forests - 2000

India was the first country to impose a constitutional obligation on the State and citizens to protect and improve the environment as one of the primary duties. Article 48A of the constitution provides:

“The state shall endeavour to protect and improve the environment and to safeguard forests and wildlife of the country.”

Article 51 A provides:

*“It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures.”*

The important laws related environment and wildlife protection since independence are.

#### The Insecticide Act, 1968

The pesticide is basically toxic chemicals and their use is inherently accompanied by hazards and ecological consequences. Being aware of the prime responsibility of protecting the health of citizens and the environment, the government of India enacted the Insecticide Act in 1968. This was enforced from 1971 to regulate import, manufacture, sale, transport, distribution and the use of insecticides with a view to preventing risk to human beings and animals. Several agencies, such as the central insecticide Board, the pesticide registration committee, the pesticide environment pollution advisory committee, the central Insecticide Laboratory, the committee to Ban/restrict the use of Pesticides, were created for effective enforcement of this Act.

#### 3.1 THE WILDLIFE (PROTECTION) ACT, 1972

Realising the importance of the wildlife resource and in order to prevent the gene erosion, our country has taken up steps by setting up an Indian Board of wildlife (1952), creation of wildlife parks and sanctuaries, enactment of an All India Wildlife Protection Act (1972), becoming a party to the convention of International Trade in Endangered species of Fauna and Flora (CITES, 1976), launching a national component of the UNESCO's Man and the Biosphere Programme (1971) and by starting conservation

projects for individual endangered species like Lion (1972), Tiger (1973), Crocodiles (1974), and Brown antlered Deer (1981).

The Wildlife (protection) Act governs wildlife conservation and protection of endangered species. The act prohibits trade in rare and endangered species.

### **3.2 THE WATER (PREVENTION AND CONTROL OF POLLUTION ACT) 1974.**

The Water Act defines water pollution, prescribes penalties and establishes an administrative machinery, called the water pollution boards, at the central and state level in order to control and prevent pollution of water. The coverage of this act, is quite comprehensive in that it includes streams, rivers, water courses, inland waters, subterranean waters, and sea and tidal waters under state jurisdiction. The state and Central Boards are widely represented and are given comprehensive powers to advise, coordinate and provide technical assistance in the prevention and control or abatement of water pollution.

The water act prohibits dumping of poisonous, noxious or polluting substances into streams and wells, as well as any activity, which impedes the proper flow of water of a stream causing aggravation of pollution due to other causes. The Boards are authorized to take Action against polluters by imposing conditions aimed at discouraging pollution and can prosecute the polluter. In practice, however, the Boards have not been as effective as was expected because of budgetary constraints, paucity of expertise, and inability to take punitive action against the big industrial polluters.

### **3.3 THE AIR (PREVENTION AND CONTROL OF POLLUTION) ACT. 1981**

The Air Act was passed in 1981 to mainly regulate and control emissions from automobiles and industrial plants. The Central Boards for the prevention and control of

water pollution is authorized to implement and enforce the Act also. This body lays down standards for the quality of air, under section 19, the Central Board is given powers mainly to coordinate the activities of the State Boards. After consultation with the State Board, the State Government may declare any area within the states as “air pollution control area,” and prohibit the use of any fuel other than approved fuel in the area causing air pollution.

### **3.4 THE ENVIRONMENT (PROTECTION) ACT 1986**

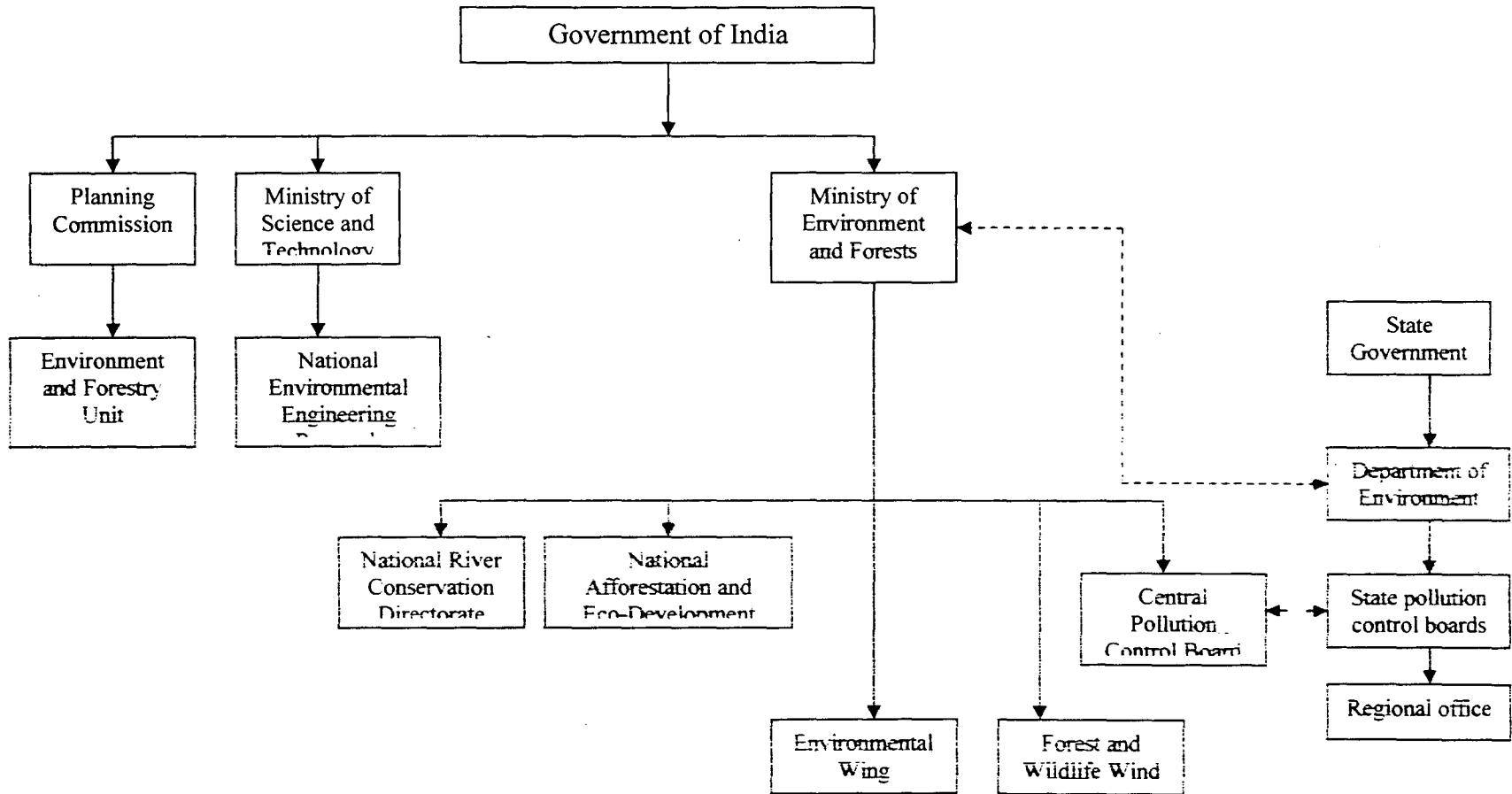
The Environment (Protection) Act was passed by the parliament in 1986. The Act refers to the Stockholm conference of 1972 and is based on Article 253 of the constitution. By virtue of this Act, the Union Government has armed itself with considerable powers deemed necessary for the prevention, control and abatement of environmental pollution. The power include, coordination of action by states, planning and execution of nationwide programmes, laying down environmental quality standards, specially those governing emission or discharge of environmental pollutants, placing restrictions on the location of industries and so on. The powers claimed are indeed comprehensive. The coverage includes handling hazardous substances, prevention of environmental accidents, research, inspection of polluting units, establishment of laboratories, dissemination of information etc. A whole set of administrative procedure and structures are envisaged under the Act.

### **3.5 INSTITUTIONAL MECHANISM AND ENVIRONMENTAL POLICY**

#### **Institutional Mechanisms**

The Ministry of Environment and Forests, constituted in 1985, is the nodal agency in the administrative structure of the Central Government responsible for the protection

**Figure 3.1**  
**INSTITUTIONAL MECHANISM FOR ENVIRONMENTAL MANAGEMENT**



Source: State of the Environment, 2001, UNEP

and management of the environment in the country. It is also entrusted with the planning, promotion, coordination and overseeing of the implementation of environmental and forestry programmes. Different ministries, boards and organizations responsible for the protection and management of environment are shown in Fig 3.1.

The MOEF, CPCB (Central Pollution Control Board), SPCBs (State Pollution Control Boards) form the regulatory and administrative core, while other ministries and bodies are also involved through various functions, policies and schemes to promote environmental management. The CPCB and SPCBs were set up under the Water Act of 1974 for controlling and monitoring environmental degradation in the country. In addition, there is a network of government and non-governmental institutions, organizations and laboratories involved in monitoring, reporting and studying environmental pollution and management. The ministry has also been designated as the nodal agency in the country for the UNEP (United Nations Environmental Programme), International centre for Integrated Mountain Development and looks after the follow up of the United Nations conference of Environment and Development. The CPCB was established for implementing the Water Act.

The Eleventh schedule of the 73<sup>rd</sup> Constitutional Amendment in 1992 empowered Panchayat bodies and bestowed them with responsibilities in the areas of soil conservation, water management, watershed development, social and farm forestry, drinking water fuel and fodder, non-conventional energy sources and maintenance of community assets. Urban local bodies are empowered under the 70<sup>th</sup> constitutional Amendment in 1992 to protect the environment and promotion of ecological effects.

The NEAA (National Environmental Appellate Authority) was set up in 1997 to act as vigilant body to deal with the representations, complaints and appeals made against

the decisions of competent authorities established under the EPA (Environment Protection Act), granting environmental clearance under the EIA (Environment Impact Assessment) notification.

### **3.6 ENVIRONMENTAL POLICY IN INDIA**

The 1972 UN conference of Human Development at Stockholm influenced the need for a well-developed legal mechanism to conserve resources, protect the environment and ensure the health and well being of the people in 1976, the 42<sup>nd</sup> constitutional amendment was made to address environmental concerns. The Indian Constitution provides for necessary directives and powers to frame and enforce environmental legislation. (The constitution classifies the various legislative subjects into three categories, namely, union list, state list and concurrent list. Subjects include in the union list are enacted by the Parliament.). As stated in the Constitution of India, it is the duty of the state (Article 484) to 'protect improve the environment and to safeguard the forests and wildlife of the country.' It imposes a duty on every citizen (Article 51A) 'to protect and improve the natural environment including forests, lakes, rivers and wildlife.' Reference to the environment has also been made in the Directive Principles of state policy as well as the fundamental rights.

Over the years, the Government of India has promulgated a number of Acts, Rules and Notifications for the preservation and protection of the environment and a list of environment related laws are presented in Table 3.3.

Table 3.3

## ENVIRONMENTAL LEGISLATION, ACTS, RULES, NOTIFICATION AND AMENDMENTS

Acts/rules/notification (General)	Year	Description
Environment (Siting for Industrial projects) Rules	1999	The Rule provides the guidelines for establishment of new units with certain conditions, and prohibits the siting up of some industries in certain locations
The National Environment Appellate Authority Ordinance	1997	Created to hear appeals with respect to restrictions of areas in which classes of industries etc. are carried out or prescribed subject to certain safeguards under the EPA (Environment Protection Act).
Environmental Impact Assessment (EIA) of Development Projects-Notification.	1994	Mandatory requirement of environmental clearance from the MoEF for 30 categories of projects.
The Environmental Standards Notification	1993	Industry specific standards adopted, for effluent discharge and emissions for 24 designated industries.
The Environmental Audit Notification	1992	Every person who is carrying out an industry or an operation which require a consent from the CPCB/SPCB under section 25 of the Water Act and, section 21 of the Air Act or both, has to submit an environmental audit report for the financial years,-ending on the 31" of March".
National Conservation Strategy and Policy Development Statement on Environment and development	1992	Statement on priorities and strategies for action, development policies from environmental perspectives, international cooperation, and support policies and systems.
The National Environment Tribunal Act	1995	Created to award compensation for damages to persons, property and the environment arising from any activity involving hazardous substances.
Policy Statement on Abatement of Pollution	1992	Government's commitments to prevent further deterioration of the environment.
The Public Liability Insurance Act Rules – 1992	1991	Provide for public liability insurance for the purpose of providing immediate relief to the persons affected by accident while handling any hazardous substance.
The Environment (Protection) Act	1986	Lays down procedures for setting standards of emission or discharge of environmental pollutants.
The Forest (Conservation) Act Rules – 1981	1980	Protection of and the conservation of the forests.
National Forest Policy	1988	Objective of the policy is to ensure environmental sustainability and maintenance of ecological balance through defined strategy.
Indian Forest Act Amended – 1984	1927	It was enacted to 'consolidate the law related to forest, the transit of forest produce and the duty leviable on timber and other forest produce.
The Coal Mines (Conservation and Development) Amendment Act	1974	An Act to provide for conservation of coal and development of coal mines and for matters connected therewith or incidental thereto
The Mines and Minerals (Regulation and Development Act Amended – 1986	1957	The Act provides for regulation of prospecting, grant of lease and for mining operations under the control of the Central Government.



Dumping and disposal of fly ash	1999	This Notification was to protect the environment, conserve topsoil and prevent the dumping and disposal of fly ash discharged from coal or lignite based thermal power plants on land. The Notification makes it obligatory that clay bricks, tiles or blocks for construction activities will not be manufactured with a radius of 50 km is from coal or lignite based thermal power plants without mixing at least 25% of ash with soil on weight to weight basis
Wildlife Protection Act Rules-1973 Amended-1991	1972	For the protection of birds and animals and for all matters that are connected to it whether it be their habitat or the waterhole or the forest that sustain them.
The Water (Prevention and control of Pollution) Act Amended – 1988 Rules – 1975	1974	Establishes an institutional structure for preventing and abating water pollution. It establishes standards for water pollution. It establishes standards for water quality and effluent. Polluting industries must seek permission to discharge waste into effluent bodies. The pollution control board (CPCB) was constituted under this act.
The Water (Prevention and Control of Pollution) Cess Act Amended – 1991	1977	For the levy and collection of cess or a fees on water consuming industries and local authorities.
The Coastal Regulation Zone Notification	1991	Puts regulations on activities such as construction. It gives some protection to the backwaters and estuaries.
The Water (Prevention and Control of Pollution) Cess Rules	1977	This act provides for the levy and collection of cess on water consumed by industries.
The Coastal Regulation Zone Notification	1991	Puts regulation on activities such as construction. It gives some protection to the backwaters and estuaries.
The Water (Prevention and Control of Pollution) Cess Rules	1977	This act provides for the levy and collection of cess on water consumed by industries.
The Merchant Shipping Act	1970	Aims to deal with waste arising from ships along the coastal areas within a specified radius.
The River Boards Act	1956	Enables the states to enroll the Central Government in setting up an Advisory River Board to resolve issues in inter state cooperation.
The Indian Fisheries Act	1897	Establishes two sets of penal offences whereby the government can sue any person who uses dynamite or other explosive substance in any way (whether coastal or inland) with intent to catch or destroy any fish or poisons fish in order to kill.
The Air (Prevention and Control of Pollution) Act Amended – 1987	1981	Provides for the control and abatement of air pollution. It entrusts the power of enforcing this act to the Central Pollution Control Board
The Factories Act and Amendment	1987	The first Act to express concern for the working environment of the workers. The amendment of 1987 has sharpened its environmental focus and expanded its application to hazardous processes.
The Motor Vehicles (Amendment) Act	1988	Clearly states that all hazardous waste is to be

		properly packaged, labeled and transported.
The Air (Prevention and Control of Pollution) Rules	1982	Defines the procedures of the meetings of the Boards and the powers entrusted to them.
The Atomic Energy Act	1982	Deals with the radioactive waste.
Noise Pollution (Regulation and Control) Rules	2000	Rules deal with ambient air quality standards in respect of noise for different areas / zones, enforcement of noise pollution control measures
Ozone Depleting Substances (Regulation) Rules	2000	Regulation on production of ODS, use and sale of ODS, export and import, and new investment on ODS
The Environment (Protection) Rules – Emission Standards for New Generator Sets	1999	Emission standards for new generator upto 19 kw capacity run on petrol and kerosene with implementation schedule.
<b>Hazardous</b>		
Bio-medical Waste (Management and Handling) Rules 1998 waste		A legal binding on the health care institutions to streamline the process of proper handling of hospital waste such as segregation, disposal, collection and treatment.
<b>Municipal waste</b>		
Manufacture, Storage and Import of Hazardous Chemical Rules	1989	Provision on disclosure of information, collection, development and dissemination of information, preparation of onsite and off site emergency plan, condition on import of hazardous chemicals
Manufacture, use Import and Storage of Hazardous Microorganisms, Genetically Engineered Organism or cells rules	1989	Introduced with a view to protect the environment, nature and health, in connection with the application of gene technology and micro organisms.
The Hazardous Wastes (Management and Handling) Rules, Amended – 1998	1989	Objective is to control generation, collection, treatment, import, storage and handling of hazardous waste.
Manufactures, Storage, and Import of Hazardous Chemicals Rules	1989	Defines the terms used in this context, and sets up an Authority to inspect, once a year, the industrial activity connected with hazardous chemicals and isolated storage facilities.
Municipal Solid Waste (Management & Handling) Rules	1999	Management of solid waste, specification of landfill sites, responsibility of municipality authority, implementation schedule.
Recycled Plastic manufacture and Usage Rules	1999	These Rules were notified to regulate the use of plastic carry bags, containers, packaging materials, etc. The Rules prohibit by vendors, for storing, carrying; dispensing or packaging of foodstuffs.

Source: State of The Environment, 2001, U.N.E.P

The Water Act, 1974, was enacted to address under 252 environmental issues at the national level. It was under this act that the CPCB and SPCBs were set up to control pollution in the country. The EPA was brought in the country. The EPA was brought out in 1986 (considered as an umbrella legislation) to address the whole range of environmental problems laying down environmental standards, etc., the National

conservation strategy and Policy statement on environment & development was brought out by the MOEF in 1992 and this recognized the role of government, NGOs, industries and public to preserve resources and protect the environment while ensuring developmental activities. In the same year, the policy statement for Abatement of pollution was declared by the MOEF to promote voluntary initiatives for the protection and improvement of the environment, through the use of incentives, in addition to the development of a regulatory and legislative framework.

In 1993, the Environment Action Programme was initiated to prepare a 'blue print' for integrating environmental concerns into the development process. Emphasis was given to the promotion of a decentralized system and organizational strengthening for better environmental management. The MOEF is in the process of developing a comprehensive national policy on environment.

EIA is the process in which environmental factors are integrated into project planning and decision making so as to achieve ecological sustainable development.

In India, the MOEF has under the EPA 1986 promulgated a notification on 27 January 1994, making environmental clearance mandatory for expansion or modernization of any activity or for setting up new projects listed in schedule I of the notification. The EIA clearance is required for 30 categories of industries from the central government as listed below.

### **3.7 LIST OF PROJECTS REQUIRING ENVIRONMENTAL CLEARANCE**

#### **No. Projects**

1. Nuclear power and related projects such as heavy water plants, nuclear fuel complexes, rare earth

2. River valley projects, including hydel power, major irrigation, and their combination including flood control
3. Ports, harbours, and airports (except minor ports and harbours)
4. Petroleum refineries including crude and product pipelines
5. Chemical fertilisers (nitrogenous and phosphatic other than single super phosphate)
6. Pesticides (technical)
7. Petrochemical complexes (both olefinic and aromatic) and petrochemical intermediates such as dimethyl terephthalate, caprolactam, LAB, etc. and production of basic plastics such as low-density polyethylene, high-density polyethylene, polypropylene, polyvinyl
8. Bulk drugs and pharmaceuticals
9. Exploration for oil and gas and their production, transportation, and storage
10. Synthetic rubber
11. Asbestos and asbestos products
12. Hydrocyanic acid and its derivatives
  - (a) Primary metallurgical industries (e.g., production of iron and steel, aluminium, copper, lead, and ferro alloys)
  - (b) Electric arc furnaces (mini-steel plants) Chlor-alkali industry
13. Integrated paint complexes including manufacture of resins and basic raw materials required in the manufacture of paints
14. Viscose staple fibre and filament yarn
15. Storage batteries integrated with manufacture of oxides of lead and lead antimony alloy

16. All tourism projects between 200 m and 500 m of high-tide line or at locations with an elevation of more than 100 m with investment of more than 50 million rupees
17. Thermal power plants
18. Mining projects (major minerals) with leases more than 5 ha
19. Highway projects
20. Tarred roads in Himalayas and /or forest areas
21. Distilleries
22. Raw skins and
23. Pulp, paper, and newsprint
24. Dyes
25. Cement
26. Foundries (individual)
27. Electroplating
28. Amino Phenol Acid

The notification states the IAA (Impact Assessment Agency) can dispense with the requirement of EIA, which at present are the MOEF.<sup>1</sup> The MOEF amended the EIA notification in 1997, making a public hearing mandatory for environmental clearance. The state pollution control boards will conduct the public hearing before the proposals are sent to MOEF for obtaining environmental clearance and, for site specific projects, it is even before the site clearance applications are forwarded to MOEF. The MOEF, in 1997, delegated the responsibilities to state government, of conducting EIA for certain categories of thermal power plants.

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1. TERI (1998) "Environmental Policy Making in India: The Process and its Pressures" (Report No. 98/EE/44). Tata Energy Research Institute, N.D.

The MOEF also functions as the nodal agency for the participation in international agreements relating to the environment such as Montreal protocol on substances that deplete the ozone layer, the Basal convention on ozone layer, the United Nations Framework convention on climate change, the convention on Biological diversity, the convention to combat desertification, the Ramsar convention on wetlands of international importance, the convention on the conservation of migratory species of wild animals etc.<sup>2</sup> The MOEF is also getting support from many bilateral and multilateral agencies in order to improve capacity building in the area of environmental management, decision making, reporting, monitoring and participation. The Commission on sustainable development was created to implement the Agenda 21 at the national, regional and International level.

The Government of India launched an eco-levelling scheme known as 'Eco mark' in 1991 for easy identification of environmentally friendly products.<sup>3</sup> The Ecomark level will be awarded to consumer goods, which meet the specified environmental criteria and the quality requirement of Indian Standards. This will influence consumers to adopt clean and eco friendly technologies and environmentally safe disposal of used products. Many new initiatives taken by the MOEF on policy, planning and implementation related to the environment in the last two years are presented in Table 3.4.

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<sup>2</sup> MOEF (2000) URL. <http://envfor.delhi.nic.in/event/policy.html> , Ministry of Environment and Forests, New Delhi.

<sup>3</sup> Ibid.

**Table 3.4**

**SOME OF THE NEW POLICY INITIATIVES UNDERTAKEN BY MOEF**

New Policy initiatives	Description
National Environmental Action Plan for Control	The Action Plan stipulates time bound schedules for controlling pollution from of Pollution <i>p</i> different sources by coordinating inter departmental initiatives
Environmental Management System (EMS)	A scheme on environmental management, to be launched very soon, will aid industry for effective legislative and regulatory compliance including effective monitoring of compliance of environmental conditions as also to actively pursue environmental performance improvement
Uniform Consent Procedure	Draft Prevention and Control of Pollution (Uniform Consent Procedure) Rules, 1999 have been gazetted on 20th December 1999
Legislation on Biodiversity	Adopting an extensive consultative process, the Ministry has developed a legislation on biodiversity. with the main aim of securing equitable sharing of benefits arising " from the use of India's biological resources and associated knowledge to the country, and the people
National Biodiversity. Strategy and Action Plan (NBSAP)	The Ministry has prepared a National Policy and Macro-level Action Strategy on. Biodiversity, in consultation with various stakeholders. For developing micro level action plans at State and regional levels, the Ministry is implementing a GEF project 4 on NBSAP.
Sustainable Development Networking (SDNP)	ENVIS has been designated as the National Centre or the Sustainable Programme (SDNP) Development Networking Programme (SDNP), a Joint project by the Ministry, UNDP and International Development Research Centre (IDRC), Canada
SFC for setting up Treatment, Storage and Disposal Facility	A scheme to set up Treatment, Storage and Disposal Facility (TSDF) for (TSDF) hazardous wastes has been formulated. It is proposed to support projects costing Rs 8.4 crores to Rs. 2.00 crores
National scheme for capacity building	A scheme on capacity building for Chemical Emergency Preparedness and Response has been drafted. The scheme has two components namely; training of the first responders and setting up of Emergency Response Centre in the country
Development of Management Tools for Preventing environmental degradation	Traditionally, EIA has been adopted as a management and decision-making tool for assessing the likely impact of a project so that adverse effects could be either prevented or atleast mitigated. A number of

	other tools have subsequently emerged like NRA, LCA and Environmental Audit which can help identify the sources contributing to pollution and, therefore, in devising remedial action
Establishment of Indian Centre for Promotion of Cleaner Technologies (ICPC)	Switch over to efficient technologies also known as Cleaner or Environmentally Sound Technologies, is a pre-requisite for preventing pollution and improving productivity. As a follow-up of UNCED, ADB, etc. are promoting ESTs through financial and technical assistance the ESTs
Eco Villages	A model village on the periphery of forests in each district, to be designated 'ECO VILLAGE' is proposed to be identified and turned into a vehicle of change for sustainable development through afforestation and eco-development, adoption of bio-energy technology, provision of safe drinking water, rural sanitation and economic empowerment of the villagers
Joint Forest Management	JFM has been initiated and re-strengthened in 22 States of India (36,000 JIM committees) where 10 million ha of forest land and is being jointly protected, managed and developed on care and share basis to afforest degraded forest land with minimum financial inputs in terms of budgetary allocations
Revision of Indian Forest Act 1927	Wider consultations with State Governments non-governmental organizations and individual environmentalists have been done to consolidate the IFA 1927 and make it more people oriented. The highlights of this Act are JFM, amelioration of shifting cultivation, constitution of apex bodies incorporates, amendments by the State Governments since 1952 and many others
National Forestry Research Plan	For the first time in India and probably in the world, forestry research need have been identified after wider consultations in 37 workshops held all over India where stakeholders have been consulted and involved.

Source: Annual Report, MoEF 2000

There is need of greater effort to adopt a decentralized approach to managing natural resources and environment. Such an approach would ensure greater participation of stakeholders in decision-making. Enforcement mechanisms need to be strengthened to ensure better performance. Greater transparency and accountability of agencies, well-



defined regulations and adoption of economic incentives in addition to a command and control approach are the determining factors in achieving better enforcement. Better monitoring and reporting system would facilitate an improvement in the enforcement mechanism.

### 3.8 LEGAL AND POLICY STRUCTURE OF WILD LIFE CONSERVATION IN INDIA

The four most important Indian Acts which deal with biological resources in the country are the Forest Act of 1997, wildlife (Protection) Act of 1972, forest conservation act of 1980, and the Environment protection act of 1986.

#### The Forest Act and Forest Conservation Act

Under the Forest Act of 1865 and 1927 the colonial government appropriated large stretches of forests. The main objective of forest Act was to control areas, where the state could carry out revenue generation through scientific forestry, which very often meant outright or gradual replacement of the indigenous forests by commercially useful species. Forests were mainly divided into two categories: protected forests (PFs), where more rights and concessions were provided to the local communities to meet their day to day requirements; and Reserved forests (RFs), where timber and Non-Timber Forest produce (NTPF) exploitation was carried out by the state and only limited concessions were allowed to some communities (especially to the people working as forest labourers for the state). The people, however, were in no way involved in the management of these areas.<sup>4</sup> Whether for conservation or for commercial exploitation, the Forest Acts provisions were at the expense of local indigenous species for local use.

The Act did provide an opportunity in the form of a third category, the village forest (VF) The Village Forest could be assigned by the government by handing over all the use and management rights and responsibilities to the villages under which such forests fell (the ownership vested with the government).

With a sea-change in the forest Policy in 1988, which gave conservation and local needs higher priority than industrial – commercial requirements, there have been programmatic changes, the most important being the move towards Joint Forest Management (JFM). Though not yet sanctified by national legislation (strangely enough, a revised draft Forest Act put out by the Ministry of environment and forests in the mid-1990s, does not even mention JFM!) a central government has resulted in 17 states issuing enabling resolutions.

In addition, though many communities appear to prefer harvesting the non-timber forest produce (and thereby indirectly also encouraging the regeneration of mixed forests rather than single – species stands), rigidity of rules which require only the benefits of timber to be shared, have hampered people's participation.

The forest conservation act, though primarily aimed at stopping the runaway diversion of forest for non-forest purposes by state governments (and considerably succeeding in this aim), has had the unintended effect of curtailing even small-scale developmental work and use of forests areas, and the fact that centralized decision making cannot be sensitive to local site specific needs.

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<sup>4</sup> Pathak and Kothari, (1998), "Sharing Benefits of Wildlife Conservation with Local Communities. Legal

### 3.10 THE WILDLIFE ACT

The Wildlife (protection) Act of 1972 (WLPA), as amended in 1991, has thus far been the most important law for protection of wildlife species and habitats. Undoubtedly, several ecosystems would have been destroyed and several more species gone extinct were it not for this Act. It has been able to halt or show down the rapid decline in ecological status of many areas, in particular forested tracts. In one sense, it has even protected local communities (many tribal) from being bulldozed by development projects and modernity.

However, in its protectionist zeal, various other issues have been completely overlooked or inadequately dealt with in the Act. The issue of local people's access to livelihood. Perhaps upto 3 million people live inside the protected areas (PAs) set up under this Act, and another several million who live outside, depend on the resources of these areas. A blanket prohibition on human activities (except tourism) as in the case of national parks, and severe restrictions on resource extraction, as in the case of sanctuaries, has been a recipe of considerable human suffering, conflicts between local people and protected area authorities and sharp decline in public support for conservation.<sup>5</sup>

As a result, ironically, the protection status of these protected areas is itself suffering, since wildlife authorities are woefully ill-equipped to handle the multiple

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Implications, Economic and Political Weekly, October, 3 pp. 2603-2610.

<sup>5</sup> Kothari, Pathak and Rangaranjan (1996), "Changing India's conservation Laws," Lokayan Bulletin, 12(6), pp. 35-40

forces of a rapacious industrial-commercial economy, illegal traders, and a hostile local population.

Current legislation on forests and wildlife does not adequately cover the aspects of access and benefit sharing that could be crucial in creating a stake for conservation amongst local people. Access to, and therefore benefit from, the resources in conservation areas were often denied to communities who were dependent on them.

Building equitable access and benefit sharing into the law will, therefore, require a re-orientation of the existing laws and perhaps some new legislation. Unfortunately, the proposed Biological Diversity Act does not also go substantially into these aspects, and the proposed amendments to the wildlife act do not go far enough.

## CHAPTER 4

### WILD LIFE CONSERVATION IN INDIA

The term wild life is commonly referred to represent the non-domestic animals and wild plants subsisting in a natural habitat. India is endowed with a rich biological diversity. But due to extinction of many species, the number of wild life (flora and fauna) has been reduced. While many species have become extinct, some are endangered and a few are threatened.

Before the introduction of sedentary agriculture, when human beings lived by hunting and gathering, people's dependence on the wild was absolute. Wild plants and animals were their only source of food, medicines, fuel and fibre.<sup>1</sup> The contribution of wild plants and animals to industrialized societies suggests that, even today a significant proportion of economic activity remains dependent on wild life. Some uses of wild life have persisted from Paleolithic times, e.g. the hunting of marine fishes. In agricultural development, wild plants provide the genes for disease resistance and wild organisms used by the pharmaceutical industry as source of valuable compounds that were once discovered in nature and were then synthesized in the laboratory.

There is an urgent need for conservation of wildlife as there is a serious threat to its existence because of the over exploitation and ignorance of the people towards it. To conserve endangered and threatened species, and thereby prevent extinction of species is a major goal of wild life conservation. First and foremost it is important to conserve the habitat of these animals which are facing a threat of extinction. The forest cover which

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<sup>1</sup> Robert And Christine, (1982), "What's wildlife worth? Economic contribution of wild plants and animals to developing Countries", International Institute for Environment and Development, London & Washington D.C.

provides shelter and food to these animals has been declining over the years because of commercial activities and expansion of human habitation. This problem is largely associated with the LDCs (less developed countries) of the world.

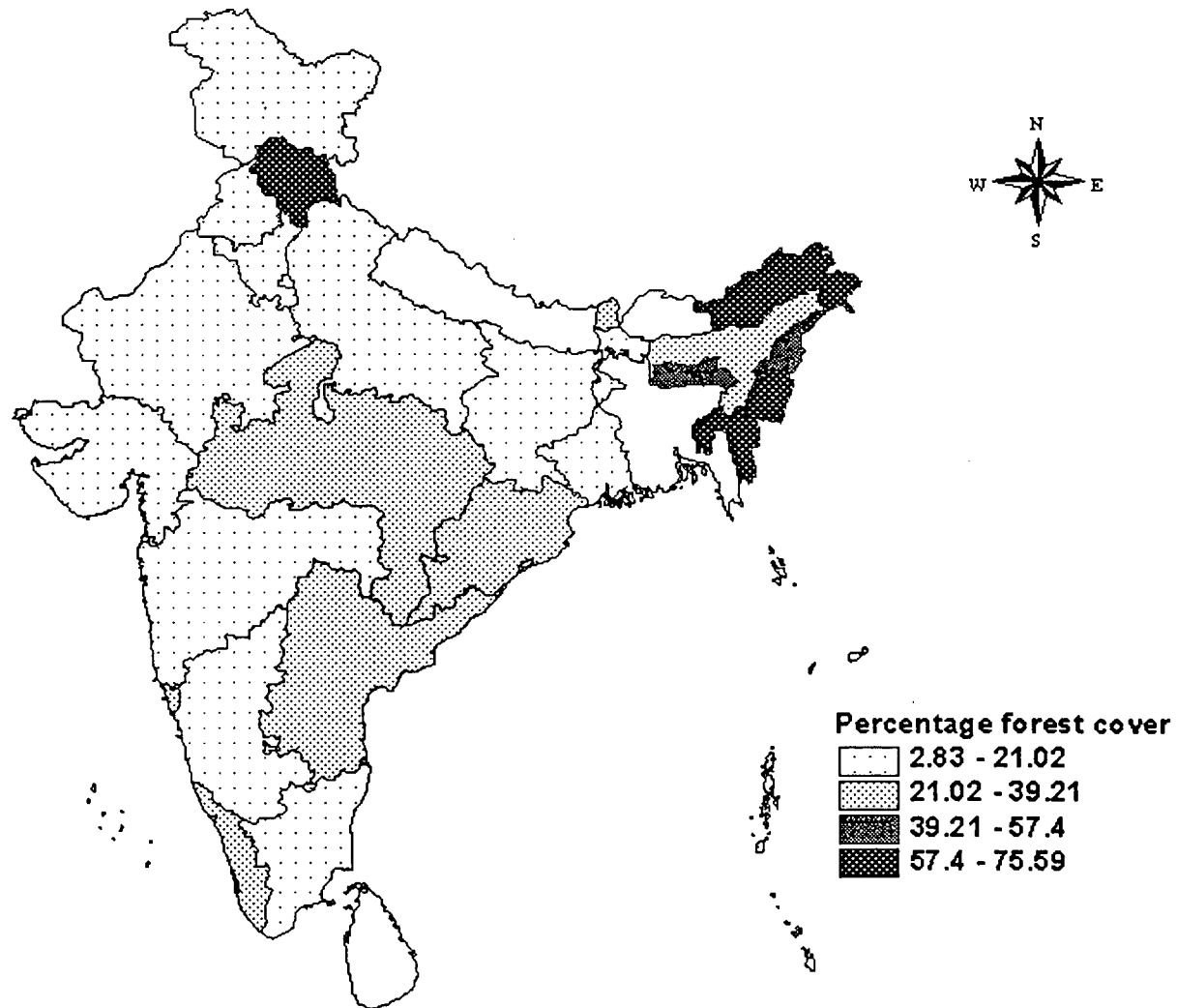
#### **4.1 DECLINING FOREST COVER IN INDIA**

The forest cover in India has been generally showing a declining trend from 1993 to 1999. The forest cover in states to the total area of each state for the year 1999-2000 has been shown in map no. 4.1. The growth rate from 1993 to 1995 is negative (-0.08 %). The growth rate between 1995 and 1997 has been negative but the percentage value is higher (-0.86 %) as compared to the previous growth rate. The growth rate between 1997 and 1999 is 0.62 % (appendix 4.1 & 4.2) which is positive and has probably been a consequence of Government policies and strategies, community efforts to improve the environment for the future of mankind.

The changing growth rates in forest cover for the individual states shows that between 1993 and 1995, Delhi has the highest growth rate of 18.18 percent. In Delhi, efforts have always been directed towards greening of the capital owing to high levels of industrial and vehicular pollution. Hence afforestation programmes have been undertaken to increase the green cover. The state of Haryana shows a positive growth rate of 17.54 percent. The other states showing positive growth rates of 2.29 percent, 1.10 percent and 1.38 percent are Gujarat, West Bengal and Rajasthan respectively. There has been no change in the forest cover of three states namely, Tripura, Kerala and Goa. Most of the other states have negative growth rates of 0 to 1 percent except Assam, which shows a negative growth rate of 1.82 percent.

MAP 4.1

STATEWISE FOREST COVER TO TOTAL AREA (IN PERCENT)  
(1999 - 2000)



The growth rates between 1995 and 1997 for the states shows that, Bihar which earlier had a negative growth rate of -0.10 percent had a negative growth rate of -81.81 percent which means that forest cover has further reduced to a considerable extent. Uttar Pradesh, Madhya Pradesh and Andhra Pradesh also show a sharp decline in forest cover, which is indicated by negative growth rates of -68.37 percent, -44.69 percent and -8.11 percent respectively between 1995 and 1997. The states of Mizoram and Punjab have showed positive growth rates of 1.07 and 3.35 percent between 1995 and 1997 respectively. In Haryana, the positive growth rate of 17.54 percent has declined to 0.17 percent during this period. The other states have more or less maintained the earlier trends of negative growth rates in forest cover.

Between 1997 and 1999, the growth rate for India as a whole is 0.62 percent. This trend has been seen for most of the states like Andhra Pradesh, Arunachal Pradesh, Kerala, Manipur and Uttar Pradesh. These states have shown positive growth rates as compared to the past years. The other states show negative growth rates of forest cover during this period. However, In Delhi and Haryana, the growth rates of 238.46 percent and 59.60 percent respectively indicates that considerable efforts have been given towards increasing the forest cover in these states. In Madhya Pradesh, the growth rate of -44.69 percent has declined to -0.11 percent.

A general cause behind a decline in forest cover in India is the growing commercial activities, which have been increasing since the increase in population. A correlation has worked out for population growth and forest cover growth for the same period of time 1995, 1997 and 1999 (appendix 4.3 and 4.4) . The results are not very satisfactory because the correlation coefficient value of 0.14 for 1995 shows a very low



positive correlation between forest cover growth and population growth. The correlation value is 0.019 in 1995-1997 and increases to 0.31. The last positive value may be a consequence of Government policies and programmes for improving the green cover in particular areas, which have undergone large-scale degradation. Delhi for example has increased the forest cover to 238 percent which may have influenced the correlation value which has increased to a value of 0.31. This means that population growth is not primarily responsible for low forest cover (characteristic of almost all states during 1993 and 1995). The different kinds of commercial activities should be considered for yielding correct results.

#### **4.2 NEED FOR WILD LIFE CONSERVATION IN INDIA**

The percentage growth rate of forest cover in India clearly shows that the past situation has only improved slightly. Earlier negative growth rates have been replaced by positive growth rates for the whole of India. Only some states have been able to increase their forest cover through afforestation programmes, community development programmes and so on. The importance of protecting endangered species is that it provides genetic resources and ecological support. The abundance of useful properties available in the wild helps in developing new and better crops. Wild life and wild ecosystems protect watersheds and coasts, providing a buffer against harmful environmental perturbations such as floods and droughts. In addition, they recycle and increase the availability of nutrients, and provide several valuable ecological services, notably critical habitat for economically, genetically and ecologically important wild species.

Forestry and fishery products are likely to be significant generators of export income for as long as they are available, even though for many countries they contribute a modest percent of the total income. Regardless of the wildlife's contribution to national economies, its contribution to local economies is – and may well continue to be – crucial. Wild plant and animal products constitute one of the few means by which many rural communities can earn money. And they provide one of the few ways in which rural communities can hope to build a modest industrial base.

Wild plants also play a central role in traditional medicine, a role likely to persist with the modernization of indigenous systems and their integration with western medicine which itself benefits from wild life as some drugs are still obtained from wild plants and wild animals. These plants and animals are important for biomedical testing and research.

Therefore further efforts have been given by the government and other organisations to restore the natural balance in the ecosystem.

#### **4.3 STATUS OF WILDLIFE CONSERVATION IN INDIA**

Indian wildlife is rich and diverse and hence deserves protection. There are 45,000 species of plants in this country, of which 7000 are endemic to India. There are about 75,000 animal species of which 850 are mammals. But with time, their number has been considerably diminishing because of man's interference with nature. The wildlife conservation strategies in India have attempted towards strategies, which could guarantee a holistic solution. This involves maintaining the habitat of animals in the forest and allowing them to increase their numbers especially those which are on the verge of

extinction and also help the survival of forest communities who depend on the forest through a sustainable growth strategy. Some of the important projects for which funds have been allocated were developing National Parks and Wildlife Sanctuaries, Afforestation Programmes, developing and maintaining of Biosphere Reserves and Joint Forest Management Programmes.

Realising the importance of the wildlife resource and in order to prevent the gene erosion, India has taken up steps by setting up an Indian Board of Wildlife (1952), creation of wild parks and sanctuaries, enactment of an All India Wildlife Protection Act (1972), becoming a party to the convention of International Trade in Endangered Species of fauna and Flora (CITES, 1976) launching a national component of the UNESCO's Man and Biosphere Programme (1971) and by starting conservation projects.

The wildlife (protection) Act governs wildlife conservation and protection of endangered species. The Act prohibits trade in rare and endangered species. The wildlife Act is adopted by all states except Jammu & Kashmir, which has its own Act. The centre provides financial assistance to states for:

- (i) Strengthening management and protection of infrastructure of national parks and sanctuaries;
- (ii) Protection of wildlife and control of poaching and illegal trade in wildlife products;
- (iii) Captive breeding programmes for endangered species of wildlife;
- (iv) Wildlife education and interpretation; and
- (v) Development of selected zoos.

#### 4.4 NATIONAL PARKS AND WILDLIFE SANCTUARIES

According to the state wise percentage distribution of National Parks and Wildlife Sanctuaries shows that the highest percentage of national parks is in Madhya Pradesh (10.11) followed by Assam, Karnataka and West Bengal. Most of the Union Territories do not have national parks except Andaman and Nicobar Islands (10.11).(Appendix – 4.5)

There is an even distribution of wildlife sanctuaries in India. Most of the states and Union Territories have atleast one wildlife sanctuaries. Maharashtra (6.64) has the highest percentage of wildlife sanctuaries in India followed by Himachal Pradesh, Madhya Pradesh, Uttar Pradesh and Rajasthan. Meghalaya and Tripura have the lowest percentage of wildlife sanctuaries.

The total protected area in India is 1,50,733.11 sq. km. Gujarat has the highest percentage of protected area of 11.43. This is followed by Madhya Pradesh, Maharashtra and Uttar Pradesh. Haryana has the lowest percentage of protected area. Among the Union Territories Andaman and Nicobar Islands has the highest percentage of protected area.

The other scheme to focus on the conservation and the management of mangroves and coral reefs. The highest percentage of funds allocated/released for the year 1999-2000, was for the state of Orissa and West Bengal, 36.2% and 35.5% respectively (Appendix – 4.6). (This scheme includes only the coastal states of India and the Andaman Nicobar Islands where the conservation and protection of endangered mangroves and coral reefs should be the important priority of these states in their environment conservation programmes) while the lowest percentage was for Goa (7.2%). In 2000-01 the highest percentage is for Maharashtra (22.1%), Gujarat (21.9%) and lowest for Goa (3.1%) and in the year 2001-02 the percentage of funds released and allocated for the conservation and management of Mangroves and coral reefs in highest for Tamil Nadu (37.2%) and Andhra Pradesh (20.6%) whereas the lowest for Goa (3.1%).

From the above analysis, the funds allocated / released by the government for the Biosphere Reserves and conservation and management of mangroves and coral reefs, under the different environmental projects / scheme is an appreciable step for the

preservation and maintenance of the wild fauna and flora. The funds have been allocated unequally while wild species are equally important in each state. Therefore, there is a need for a policy which should consider each states fauna and flora equally important and there should be equal distribution of funds on the basis of the area and the need of the state.

The state wise percentage of funds earmarked and the amount actually spent for afforestation in India from 1992-93 to 1996-97 has been analysed (Appendix – 4.7). The gap between expenditure an allocation (E-A) has been presented, which shows that the state which has positive values have spent more on afforestation programmes while the states which have shown negative values have not been able to utilize the funds. The percentage of allocation and percentage of expenditure has been calculated for each state from the total of funds allocated and spent.

In 1992-93 the states which have shown the negative values, where the funds have not been fully utilized and the gap remains high between 1 to 2 are Arunachal Pradesh, Assam and Maharashtra. The gap between allocation and expenditure for the other states has not been very high and is less than 0.5 percent. Over 15 states and 2 Union Territories have not been able to implement their afforestation schemes and not able to utilize the funds allocated to them under this scheme.

In 1993-94 the gap between expenditure and allocation (E-A) data shows that the high negative values of above 0.4 prevailed in the states of Madhya Pradesh, Meghalaya, Orissa and Rajasthan. In the other states like Andhra Pradesh, Assam, Bihar, Gujarat, Jammu & Kashmir, Karnataka, Nagaland, Tripura, and Delhi. The state like Orissa, Gujarat, Rajasthan and UP have shown lower negative gaps between expenditure and allocation. This shows that forest cover is reducing continuously and there is a lack of concern of the states for the conservation and protection of the forest area.

In 1994-95 the states which have shown higher negative values (Expenditure-Allocation) are West Bengal, Meghalaya and Bihar. The other states like Andhra Pradesh, Assam, Madhya Pradesh, Nagaland, Orissa and Rajasthan show lower negative values. In 1995-96 most of the states show low negative values which means that the Government is spending most of the funds allocated for the purpose of afforestation programmes in the states.

In 1996-97 the percentage of funds allocated and utilized for afforestation in India shows the negative value (E-A) for some states. Since 1992-93 the number of states which have shown this gap has been reduced to 9, whereas some of the states which are shown the negative values in 1992-93 also had negative values in 1996-97 like Andhra Pradesh, Assam, Bihar and Manipur.

This analysis brings forward the negative attitude of these states towards their afforestation projects. All these states which have negative values show that they are not spending the amount which have been allocated for the afforestation programmes.

The efforts for social afforestation projects by central government has involved the local inhabitant (tribal people) who are dependent on forest for their livelihood, where the community was motivated to go for afforestation and were convinced to practise the sustainable utilization of forest resources, to ensure less and less of destruction and more and more planting of trees. Table 4.8 shows the state wise percentage of funds provided under the centrally sponsored schemes of Ministry of environment and forests for social afforestation projects, from 1997-98 to 1999-2000. In 1997-98, the percentage share of funds provided to Madhya Pradesh is the highest. The other states with high share of funds for afforestation schemes are Uttar Pradesh, Rajasthan and Karnataka. In 1997-98 the total fund provided for afforestation programme was 6,609.24 lakhs which was increased to 7,197.29 lakhs in 1998-99 and further increased to 8,679.62 lakh in 1999-2000). The states which were allocated higher proportion of funds were mainly the tribal dominated and economically backward ones. In these states the tribals are dependent on the forest resources for their survival. They gather various forest products and fuelwood. The forest cover in these states has shown decline. Therefore, these states were provided funds in order to protect their forest and involve the community in the social afforestation scheme.

In 1998-99, the percentage of funds for social afforestation projects was as under in Madhya Pradesh, Uttar Pradesh, Rajasthan, Jammu & Kashmir and West Bengal between 6 to 10 percent. In 1999-2000, the percentage of allocation remained the same, as in the previous year. The highest percentage during 1999-2000 has been in the state of Madhya Pradesh followed by Uttar Pradesh, Rajasthan, Manipur and West Bengal.

The social afforestation scheme sponsored by the Central Government has been a good measure to involve the community with the forest conservation programmes. It is the local inhabitants who know the forest products and resources very well. They need to be made aware about the afforestation, sustainable use and the importance of conservation. This type of programme definitely yield the favourable result and help in developing the close relationship of man with their environment.

Statewise percentage of (targets/achievements) for afforestation during 1997-98 and 1998-99 under 20 point programme of Ninth Plan has been calculated from the total for India for each year (Appendix 4.8). In this programme, seedlings had been distributed for private lands and the area covered for afforestation are public lands including forest lands. Firstly the percentage of target and achievement for all the states for seedling distribution on private land and area covered for afforestation on public land has been calculated from all India total, separately. Achievement is deducted from the target to know the status whether the target has been achieved or not. The negative value (Achievement-Target) indicate that the states which are not able to achieve the target, for seedlings distribution on private lands and afforestation on the public land.

In 1997-98, the high negative percentage values (A-T) for seedling have been seen in the states of Bihar (-3.41), Haryana (-1.46), Karanataka (-1.10), Kerala (-1.50), Maharashtra (-1.22), while lower negative values are to be found in other states. Public land for afforestation, has been negative for states like Arunachal (-0.21), Assam (-1.9), Bihar (-2.01), Goa (-0.04), Haryana (-0.09), Karnataka (-0.2), Kerala (-1.3), Maharashtra (-1.4), Manipur (-0.5), Meghalaya (-1.15) etc. In these states the target area under afforestation on public lands was not achieved. There has been lack of constant effort from the government bodies for success of the afforestation programmes.

In 1998-99, the (A-T) for seedlings distribution on private land has been negative in the states of Bihar (-2.8), Haryana (-1.4), Kerala (-1.5), Tamilnadu (-4.5), West Bengal (-5.2), Maharashtra (-1.3) which means that these states have to achieve the target. While (A-T) for, the area increased under the afforestation programme on public land has been negative for the state Assam (-1.7), Bihar (-2.4), Haryana (-1.1), Mizoram (-1.1), West Bengal (-3.0) etc. which shows that these state are not able to achieve the afforestation target.

In order to conserve the forest there should be a continuous effort from the governmental agencies to achieve the target. Then it will be beneficial for the community and the environment where the degradation of forest is high. The target oriented afforestation programme will be able to regenerate the forest and environment.

To generate the environmental awareness programme focusing on the people and children, the MoEF has started the various awareness programmes. Besides the governmental agencies like SAIL (Steel Authority of India) etc. are financially assisted by the MoEF for environmental Awareness programmes in their site areas. The MoEF has provided financial assistance to the states for setting up eco-clubs in school, so that the children in school know the importance of environmental conservation, and protection of forest and wild life. The percentage of financial assistance provided by the MoEF for setting up of eco-clubs in school in India between 1998-99 and 1999-2000 has been computed from the available data. The high percentage of assistance is provided by MoEF for setting up eco-clubs in schools in state of Bihar (18.7%), MP (8.2%), Andhra (5.6%), West Bengal (5.13%) and Tamil Nadu (5.98%)- Appendix 4.9. These types of programmes not only help the state to overcome the environmental and sustainability problems but also help the community to know importance of conservation of forest & wildlife.



## **CHAPTER 5**

### **A STUDY OF WILDLIFE CONSERVATION PIN VALLEY NATIONAL PARK PART - I**

#### **5.1 LOCATION AND TOPOGRAPHY**

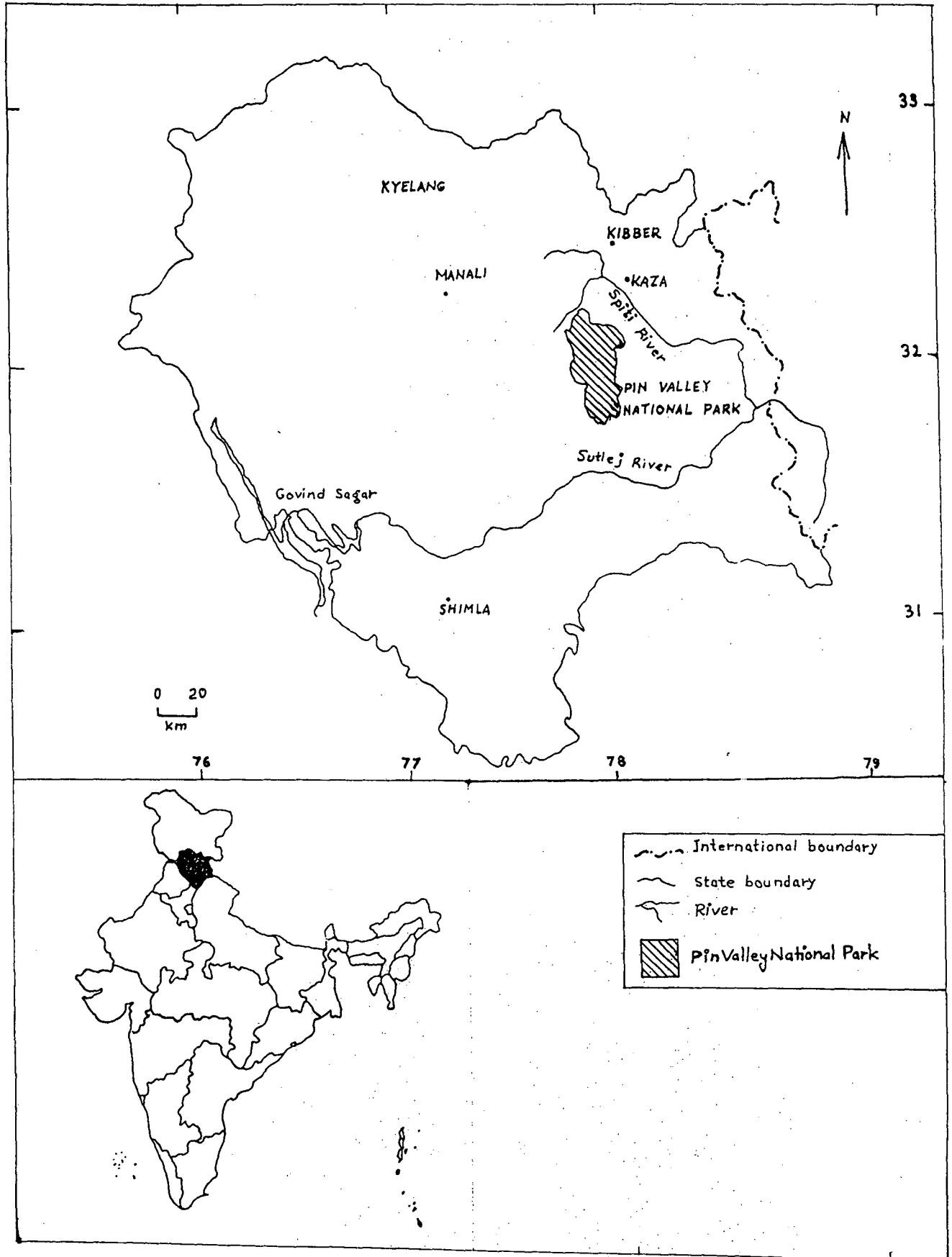
Pin valley National Park is Located in the south-east of the Lahaul and Spiti districts of Himachal Pradesh extends from  $31^{\circ} 6' 40''$  to  $32^{\circ} 2' 20''$  N latitude and  $77^{\circ} 41' 21''$  to  $78^{\circ} 6' 19''$  E longitude (Map 5.1). The Pin Valley is in the rain-shadow area of the Pir Panjal range and is part of the Trans-Himalayan zone. However, the Greater Himalaya also influences the precipitation, vegetation and terrain of the region. It is located at an altitude of approximately 6,500 mts.

The Trans- Himalayan region of Himachal Pradesh runs through the north and north eastern part of the state, and includes almost the entire Lahaul and Spiti district besides parts of Kinnaur, Kullu and Chamba districts. It shares its state boundary with the Ladakh region of Jammu & Kashmir, and an international boundary with Xizang (China). Tethyan formations of Himachal Pradesh are best developed in the Spiti area. The Spiti valley lies between the great Himalayan and Zaskar ranges.

The Himalaya receives precipitation mainly from the south while the trans-Himalayan lies in the rain shadow area of the main Himalayan mountain wall, and has a Mediterranean influence. It is a rain-deficient area, since the moisture laden south – west monsoon winds are blocked by Greater Himalayan range. Owing to its location in the temperate latitudes and the paucity of rain, the region is termed a 'cold desert'. Altitude in the area is over 3000m above the mean sea level, and lie above the tree line.

Map- 5.1

Location of Pin Valley National Park, Himachal Pradesh, India.



The Pin Valley is one of major areas of the Spiti sub – division of the Lahaul and Spiti district. The Pin river constitutes the most important right bank tributary of the Spiti river. It is 50 km long, originating in the Srikhand Range in the greater Himalaya and joins the Spiti river at Sushuna, near Dhankar. The Pin river flows in the general northerly direction until it reaches sagnam, where it is joined by one of its major tributaries the Parahio river. From here, the river flows east wards, until it joins the Spiti river. Altitudes within the park range between 3565m and 6632 m above m.s.

The Core Zone of the Pin Valley National Park :

The northern boundary starts from the highest peak of the districts boundary of Kulu and Lahaul and Spiti districts, then follows the ridge Hundungma upto the top of river Ratang ( Height 5853 mts). From the top of Kidul cho, the boundary follows river parahio. Then along the parahio river upstream upto origin of Darbang ridge upto Lavang La Khad down stream upto its confluence with Pin river, then along Pin river upstream upto top Tari Khango ( height 4865mts.) then along the ridge separating the watersheds of Khaminger Khad and Kidul Cho (835 mts) to meet the district boundary of Kinnaur and Lahaul and Spiti.

The southern boundary of the park from Tasi Kahngo follows the district boundary of Kinnaur and Kullu on the Shakrang Khango (5100mts).

The western boundary starts from Shakrang Khango district boundary of Kullu & Lahaul and Spiti district through Pin – Parvati Pass upto Bara Shigri glacier (6632 mts).

The area of the core zone of Pin Valley National Park is about 675 km.

### The eastern boundary of the **Buffer Zone**:

It starts from the confluence of Ratang and Spiti river the boundary follows the Spiti river upto Pamrang village situated on the confluence of Spiti river and Tipta Nallah. Then, along Tipta Nallah upstream upto it's top Singe Kang to meet district boundary of Kinnaur & Lahaul and Spiti.

The southern boundary starts from Singe Kang follows the district boundary of Lahaul and Spiti up to Shakrang Khango.

The northern boundary of the park starts from the top of Ratang river (5800 mts) the boundary follows the Ratang river down stream up to its confluence with Spiti river.

The western boundary starts from Shakrang Khango and it follows the district boundary of Lahaul and Spiti, and from Pin Parvati pass upto peak of Bara Shigri glacier (6632m). The area of the buffer zone of Pin Valley National Park is about 1150 sq.km.

There are many trekking routes in the Pin valley. These routes are mainly open from July to October. The main routes are Pin Parvati Pass; Nimish Khango Pass; Shakanog Pass; Bhaba Pass; Thango - Mud via Lavang la; Thango – Thawak Debsa; Thango – Bara Shigri Glacier and Thango – Rongtong Nala.

## **5.2 ESTABLISHMENT**

Pin valley National Park has been notified by the government of Himachal Pradesh on 9/01/87 under sec 35 (1) – of 14 wildlife protection Act 1972, (53 of 1972) declared intention to constitute the following area as Pin Valley National Park.

### **5.3 PHYSIOGRAPHY**

The physiography of Spiti is very interesting, owing to the almost complete sequence of exposed sediments from the pre- Cambrian era to the Cretaceous period. The area is characterized by sharp changes in a combination of quartzite, shale limestones, and conglomerates. Most of the area is rich in fossils, mainly brachiopods, trilobites' ammonites, bivalves and also certain corals and algae, indicating its Tethyan past. Altitude within the park ranges between 3,000 mt. and 6,000 mt. above mean sea level. The area is characterized by glacial landforms like Cirques, Glacial valleys, Moraines, Drumlins, Roche montanne etc. This area has folded mountains and some of the peaks remain snow covered throughout the year.

#### **5.3.1 SOIL**

The high altitude desert soils is predominantly sandy and shallow, derived mainly by mechanical disintegration due to marked diurnal and seasonal fluctuations of temperature. Avalanches and streams deposit large amounts of soil in the lower valleys and alluvial fans allowing a particularly rich plant cover. The soil is mostly silty-loam to silty-clay loam in texture with a slightly alkaline pH, poor organic matter and water holding capacity. It is low in available nitrogen, phosphorus potassium and carbon, but well supplied with calcium.

#### **5.3.2 CLIMATE AND SEASONS**

The temperature range is more than 60<sup>0</sup>C over the course of a year, varying between 30<sup>0</sup>C in summer and – 40<sup>0</sup>C in winter. The daily minimum temperature remains

sub – zero for more than seven month (October to May) in the year, and even the daily maximum temperature stays below freezing in January and February. The area experiences severe winters with heavy snow fall from December to April. The area receives an average annual rainfall of 17 cm. The rest of the precipitation in the form of snow averages 300cm per year. Pin valley has more moist summer and winter as compared to other parts of Spiti.

### 5.3.3 FLORA AND FAUNA

The vegetation in most of the trans- Himalayan region is classified under Dry alpine scrub and Dwarf Juniper scrub, consisting of xerophytic herbs such as *Kraschennenikovia ceratoides*, *cousinia thomsonii*, *Rhodia quadrifida*, *chenopodium* etc.

Except for some Salix plantations and isolated Juniper trees, which have survived fuelwood over – exploitation, there are not trees in the whole park. Woody shrubs (e.g. *Rasa* sp., *Artemisia* sp., *Salix* sp., *Lonicera* sp., *Ribes* sp.) are stunted. The vegetation in the valley consists mainly of *Ephedra geravdina* etc. Vegetation on the slopes is mostly herbaceous or grassy and the community varies with terrain, aspect, degree of slope and substrate.

The golden eagle (*Aquila chrysaetos*), Lammergier (*Gypaetus barbatus*), Himalayan Griffon (*Gyps himalayensis*), Himalayan snow cock (*Tetraogallus himalayensis*) and chukar partridge (*Alectoris chukar*) are among the 60 bird species recorded in the Pin valley national park (table 5.1).

The large mammalian Fauna in this region is less diverse than the Fauna reported for other trans-Himalayan areas. The only large wild mammals found in the national park are ibex, leopard and red fox. The Tibetan Wolf (*Canis lupus chanco*) may occur in

Table: 5.1

**WILDLIFE AS PER THE CENSUS CONDUCTED IN  
JUNE (2000) - JULY (2001)**

SL. No.	Kind of animals / Birds Physically seen direct / indirect evidence	Pin valley national park	
		05.07.01 to 07.07.01	21.06.00 to 21.06.00
1.	Ibex	487	520
2.	Tibetan Wolf	9	9
3.	Snow leopard	6	7
4.	Himalayan Chough	4100	3760
5.	Snow pigeon	488	851
6.	Snow cock	12	12
7.	Vulture	19	33
8.	Ducks	5	4
9.	Himalayan crow	8	9
10.	Picca	15	16
11.	Ravan	12	12
12.	Golden eagle	3	3
13.	Griffon	1	0
14.	Chakor	42	41
15.	Red Fox	14	17
16.	Red Start	40	51
17.	Dove	10	10
18.	Himalayan Finches	140	124
19.	Wooly Hare	4	2
	Total	5415	5481

Source: Wild Life Census Report 2001., D.F.O. Office, Kaza, Spiti, Himachal Pradesh

the region seasonally. Smaller carnivore like stone marten (*Martes Foina*), Himalayan Weasel (*Mustela Sibirica*) and pale Weasel (*Mustela altaica*) as well as several rodent species and the mouse hare are also found.

Being cold desert & high altitude area winters are severe and experiences very heavy snowfall in the park area. In general Pin valley area is much moister than Spiti valley. Hence it is very difficult and dangerous to approach the park during winter season (Dec. to Mar.) April, May, November and early December are quite good seasons for animal sightings, because during these months the animals occur at lower altitudes. For the people interested in plants and geology, July & August is the best period.

Forest Department has constructed many inspection paths, Bunkers and one transit accommodation at Mud Farka in the National Park. Bunkers are situated at an interval of 10-15 km distance. Local guides and potters are also available around the periphery of the park. Chumurti horses, the famous horses of this valley are also available for this purpose.

#### **5.4 THE PARK**

Pin valley National Park is the only national park in Himachal Pradesh, which is situated in the cold desert area. The park covering an area of 675 sq. km as core zone and 1150 sq. km buffer zone.

There are about 17 Dogharies (summer settlements) with some cultivation inside the park. These people use these Dogharies as summer residences. The local residents in the whole Pin valley consist of scheduled tribes belonging to Buddhist Community. There is a Famous Gompa (Monastery) in the Kungri village, which is situated on the



buffer zone of this park. The Chamm dance and Buchen dance by the Lamas of this Gompa are very famous dances in the valley.

#### **5.5 PEOPLE AND THEIR DEPENDENCE**

The people of Spiti are Bhotis, who are culturally similar to the Tibetans. Buddhism is the main religion, said to have been established after Guru Padmasanbhava preached his doctrine here in the ninth century A.D. Traditionally, the people are agro-pastoralists, leading a subsistence – based life style. They cultivate barley, peas, and potatoes, livestock, consisting of yaks, dzos (yak-cow hybrids) sheep and goats are raised for milk and meat, and donkeys as beasts of burden. The local breeds of ‘Chumurti’ horses are bred for sale in Ladakh. Killing of animals is not allowed in Buddhism and wild animals are there not poached. Although the human population density in the area is relatively low, change, in the social system, especially the break down of the polyandrous system, and a subsequent increase in the number of households, is likely to affect resource use in the area.

With in the study area, there are 4 dogri (summer settlements) e.g., one just inside the Eastern park boundary (Gechang), another at the confluence of the Killung and Parahio rivers (Thango), the third (Shaktan) between Gechang and Thango, and the fourth (Dewa Ringmo) near Shaktan. Most of the houses in these Dogri are occupied inhabitants of the village Sagnam, usually between April to December every year. They depend on the national park area for agriculture, fuelwood and for grazing their livestock before winter sets in. Except for horses, livestock is usually not accompanied by people in their grazing areas. Livestock herds averaged 10 to 60 animals.

Pin Valley National Park's buffer zone has 17 villages. The biggest settlement is Sagnam with 62 families, located at the junction of the Parahio and Pin rivers. The inhabitants of this village use the park, the most, and to a lesser extent by families of other villages in the vicinity of the park. Between April and September, the families living in the dogris cultivate barley (*Hordeum Vulgare*), pea (*Pisum sativum*), potato (*Solanum tuberosum*), and mustard (*Brassica juncea*). The inhabitants of Sagnam also collect most of the fuelwood from here. They uproot and dry the shrubby vegetation since there are virtually no trees. *Lonicera*, *Rosa*, *Salix* and *Ephedra Gerardiana* are some of the preferred fuelwood species. Green vegetation, especially *Cicer microphyllum* and *Saussurea* is collected as fodder and stored for winter stall-feeding of livestock. Livestock dung is also used as fuel.

Migratory livestock, from the adjoining districts of Kullu and Kinnaur, also use the area during the summers. Around 4500 sheep and goats and accompanied by (Gaddis) people and dogs used the protected area between late June and mid August every year. These herders (Gaddis) have been using this area for several generations, utilizing the highly nutritious forage of these areas, while the same time, avoiding the heavy monsoon weeks in their normal grazing areas, the lower Himalaya.

The local people spend the winter in the villages. At this time livestock care is their main activity. Women also knit socks and gloves, and weave shawls, while men make ropes from goat and yak hair. Cultural and religious activities are almost exclusively confined to this period of the year. The level of education is relatively low. Most children leave after completing secondary school, and only very few students continue with high school education. The traditional subsistence based life style and

customs of the local people are being increasingly affected by external changes. Development of the area began with rapid improvement of the road network in the 1980s followed by other major activities such as construction of irrigation canals (kuhls), walls to prevent soil erosion and trekking paths. Tourism started to increase when Spiti was opened to foreigners.

During 1990s, Pin valley national park managers were executing an eco-development plan under which schemes such as pasture development inside and around the national park, distribution of fuel efficient chulha (stoves), construction and maintenance of trails, and construction of public toilets were undertaken. The forest department had established willow and wild rose plantations within Pin valley National Park for use as fuelwood. These are no longer maintained. However, the residents, with support from the Forest Department, have established small plantations of *populus* and *salix* within the national park and near their villages.

The Pin valley National Parks Buffer Zone, is where some human interference is tolerated except specially permitted. In Buffer area wild life can visit off and on. Villagers in this area collect fuelwood, fodder, dung etc. grazing and gathering of forest products is allowed. While in the core zone all the activity prohibited. There must be no right holder activity inside the core zone of the park.

**PART - II**  
**PEOPLE VS PARK**  
**RESETTLEMENT AND REHABILITATION ISSUES WITH RESPECT TO**  
**PIN VALLEY NATIONAL PARK**

The creation of national park (protected area) declared under the Wildlife (Protection) Act of 1972, has helped to conserve a large variety of natural habitats and plant and animal species, but leading to the alienation of the local communities from the Park area, who are totally dependent on forest resources for their livelihood and they had their agricultural field in this park. This lead to the serious conflict between the local communities and the protected area managers.

In the Pin Valley National Park, the local Agro- pastoralists have summer settlement, called Dogri inside the park. They have subsistence living, cultivating barley, peas and potatoes in fields inside the park. They also have trees in and around there settlement. Their livestock yaks, dzos, sheep and goats are dependant on fodder and grass inside the national park. Gaddis from the lower areas bring their herds in summer season for grazing in this area. Beside this, locals collect fuel wood and dung from the park area. The people of this area follow Buddhism, and killing of animals is not allowed and wild animals are not poached. There has been a balanced coexistence of human and wild life in this area. The traditional Amchis (Pharmacist) have the good knowledge of medicinal plant in this area and source of local medicine to the ill people. The restriction to the park area has lead to serious set back to local pharmacists and leading to the ignorance about the important wild species which have medicinal value.

Most of the houses in these *dogri* (summer settlement) are occupied by inhabitants of the village Sagnam, usually from April to December every year. They depend on the park area for agriculture fuel wood, dung and for grazing their livestock before winter sets in livestock herds averaged 10 to 60 animals.

Pin valley National Park's buffer zone has 17 villages. The biggest settlement is Sagnam with 62 families (approximately), located at the junction of the Parahio and Pin rivers. The inhabitants of this village use the park the most, and to lesser extent by families living in the Dogris. The inhabitants of Sagnam also collect most of the fuel wood from here. They uproot and dry the shrubby vegetation since there are virtually no trees. About 4500 sheep and goats accompanied by people and dogs use the protected area between late June and mid August every year. Although poaching may be rare, there is threat to habitat loss due to degradation in some areas in the Pin valley. The locals felt that the national park area is becoming degraded and they have now to venture further into the national park to collect shrubs for fuel wood. The practice of uprooting shrubs for this purpose might be hindering regeneration and hastening degradation. This excessive intrusion of local people and livestock in park would have resulted in the reduction in the carrying capacity of this area, which leads to threat of habitat loss.

Wildlife as per the census conducted there has been a reduction of wildlife from 5,481 in 2000 to 5,415 in 2001. Although the reduction may be due to natural factors, as poaching may be rare, but degradation can be the factor of loss of wildlife. The animals and birds e.g. snow pigeon, vulture, Red start, Red fox, Ibex shows the significant reduction in their numbers, while Himalayan chough, Himalayan finches, wooly hare have shown the significant increase. Intense grazing by local livestock has created the

pressure, but this may be responsible for maintaining high level of species diversity with in grasslands that have historically been subject to such grazing pressure, as has been shown by research in the species rich chalk grass lands of northern Europe.

The Pin valley national park managers want to remove the local population from the park instead of involving the local communities who have a better idea of fauna & flora of the park, which can be extremely useful for the forest department to check on the conservation and preservation of wild life in the park. They should try to find a solution where the people should not be alienated from the land but asked to protect the area and practice such Agro- pastoralist activities that can be beneficial for the sustainability in the park.

## **5.6 Displacement**

The government in exercise of the powers U/S 26 of the wildlife (protection) Act, 1972 directed that ADC, Lahaul and Spiti and Kaza would exercise the powers and perform function of the collector specified under Sec. 19 of the Act. The notification was issued by the government U/S 18 the publication in regional language in pin valley and villages concerned specifying the situation and limits of the national park. There was an inquiry by the DFO and Wildlife managers of PVNP, to inquire into the claim and determine the existence, nature and extent of the rights of any person in or over the land comprised with in the limits of the national park.

In the statement (recorded by the DFO staff) the interested persons present on the date of inquiry conducted at Kungri on 24-6-2000 stated that they had objection to the acquisition of their rights since the proposed land was the only land where there

animals grazed and since many persons had private land there and many other had been allotted land in the national park, pin valley. They also stated that they had houses, trees and “bartandaran” rights the interested person aforesaid some files for regularization of their possession were prepared. Hence they wanted their rights of possession protected.

Perusal of inquiry report by the field revenue official and revenue record reveals that no right of possession of any person have been regularized / recorded in view of which the claim of the persons in respect of regularization of their possession on the basis of proceeding during settlement operation cannot be admitted since the revenue record prepared at the time of settlement does not support the claim. No land has been allotted nor could any land be allotted in Reserve forest. Hence claim in respect of nature land is rejected. The claim of people to leave out a part of the land is core area would be detrimental for the growth of wildlife and very purpose of acquisition would be defeated.

So far there has been no displacement but the people have been asked to vacate the park area and they will be compensated in terms of cash, as there is no alternative, because of non—availability of agriculture land in the (cold desert) Pin valley. As to houses in the PVNP, 21 houses have been found on the land.

The claim in respect of unauthorized houses is rejected and the claim in respect of 13 houses is accepted. List of trees of privately owned land along with assessment report has also been placed on record. Village wise private land that is proposed to be acquired is as under table 5.II.1.

Table 5.II.1

Classification of Land Along with Area (hectare), 2001

S. No	Name of Village	Kulahoo Awwal	Kulahoo Doyem	Arazi Darakhtan	Total
1.	Rajgaon	03-49-31	01-13-76	3-53-60	10-16-67
2.	Shaktan	-	0-36-62	0-68-79	1-5-41
3.	Thango	-	0-37-83	0-84-70	1-11-53

Source; D F O office, Kaza, Spiti, Himachal Pradesh. (2001)

As per the statement of the people they grow peas, barley, mustard etc. as cash crops. Average five – year cost of land is as under table5.II.2.

Table 5.II.2

Cost of Land Average/hectare, 2001

S. No	Name of Village	Classification of Land		Value ( Avg. / Hectare)		
		Kulahoo	Kulahoo	Banjar	Ghasni	Arazi



		(Awwal) I	(Doyem) II	Kadim (Old Fallow) III	(Pastures) IV	Darakhtan (Land under trees) V
1.	Rajgaon	17,700/-	14000/- Doam	4800/-	3600/-	4800/-
2.	Shaktan	-	12,200/-	-	36,00/-	4800/-
-	12,200/-	-	3600/-	4800/-		

Source; D F O office Kaza, Spiti, Himachal Pradesh. (2001)

### 5.7 Assessment of value of land

Only one transaction has taken place in the entire pin valley in village Takshan vide registration dated 1984 and mutation No. 806 dated 19-09-86. Two bighas of land in 1984 cultivated "Abpasi" has been sold for consideration of Rs. 2,200/- i.e. Rs. 1,100/- bighas and Rs 3700/- per Hectare. No other transaction in any one villages located in the pin valley has taken place, since 1984 which speaks of the attachment of the people with the land and high value there of from their view point. Moreover, people for the last 9 to 10 years have started growing cash crops like peas potatoes in spiti and pin valley because of which the land price potentially become much higher. Allowing five times estimated and expected price (since 1984 in view of above), per hectare. Value of land of the classification of "Abpasi" comes to Rs 5,500/ bigha i.e. Rs 68,750/- per hectare. Land revenue classification wise has been assessed as under in village Rajgaon of Pin valley (table 5.II.3).

Table 5.II.3

Cost of Land in Rajgaon, 2001

Village	Classification of Land (Rs. Per Hectare)			
	Kulahoo Awwal (1)	Kulahoo Doyem (2)	Ghasni (3)	Banjar Kadim (4)
Rajgaon	1.45	1.15	0.3	0.4

Source; D F O office Kaza, Spiti, Himachal Pradesh. (2001)

Table 5.II.4

Award of Rates for Land, 2001

Land	Classification of Land (Rs. Per Hectare)					
	Kulahoo Awwal	Kulahoo Doyem	Banjar Kadim	Ghasni	Arazi Darakhtan	Ghair Mumkin
Rates	69,000	69,000	30,000	30,000	30,000	30,000

Source: D F O office Kaza, Spiti, Himachal Pradesh. (2001)

On the aforesaid market value 30% solatium is also hereby awarded. Village wise compensations of private land therefore come as under (Table 5.II.5):

Table 5.II.5

Village wise Compensation of Land and Solatium awarded, 2001

S. NO	Name of Village	Market Value Land (in. Rs.)	Solatium @ 30% (in Rs.)	Total Amount (in. Rs.)
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1.	Rajgaon	4,75,361/-	1,42,607/-	6,17,968/-
2.	Shaktan	42,609/-	12,783/-	55,392/-
3.	Thango	48,108/-	14,432/-	62540/-

Source; D F O office Kaza, Spiti, Himachal Pradesh. (2001)

Table 5.II.6

Village wise Cost of Trees, 2001

S. No	Name of Village	Market Value of Trees (in Rs.)	Solatum 30% (in Rs.)	@ Total Compensation (in Rs.)
1.	Rajgaon	12,125/-	3637/-	15,762/-
2.	Shaktan	13,286	3985/-	17,271/-

Source; D F O office Kaza, Spiti, Himachal Pradesh. (2001)

As to compensation demanded by the people for their grazing rights collecting of manure, fuel woods etc. It is mentioned that there is no way of assessing the value of these rights since these rights cannot be quantified. Alternative common pasture in the village is not available in view of which alternative common pasture cannot be provided at present. Therefore 30% of Solatum is given to the villagers along with the compensation. The detail regarding the rehabilitation compensation is as under.

Table 5.11.7

**Rehabilitation Compensation for Houses, Land and Trees**

1	Total Houses	Cost of Houses	Solatum @30%	Total Amount (in Rs.)
	13	7,66,372	2,29,912	9,96,284
2	Total Land Owners	Cost of Land	Solatum @30%	Total Amount (in Rs.)
	6	5,66,078	1,69,822	7,35,900
3	Total Tree Owners	Cost of Trees	Solatum @30%	Total Amount (in Rs.)
	6	25,411	7,622	33,033
Grand Total		13,57,861	4,07,356	17,65,217

Source; D F O office Kaza, Spiti, Himachal Pradesh. (2001)

The total Rehabilitation Compensation for land, houses and trees will be Rs. 17,65,217. The people in the park area has been using the land as there is no official notice to vacate the park and the Rehabilitation Compensation is yet to be forwarded to the Central government

The officials of the forest department in their discussion with the members of the community decided that the community on the PVNP will be given compensation in cash as there is no alternative, because of no land is available in this cold desert area for agriculture purpose.

Instead of alienating people from their land the government should focus on such a policy or programme where the community shouldn't be consider threat to the park but as a guardian and care taker and involve them in the joint management and conservation through village to village wildlife management, sustainable co – existence and awareness programmes and motivating them to eco – friendly Agro – pastoralists activities. If the local communities recognize the benefit from the products and services provided by the forest, they would then be motivated o modify their resource and land –use patterns and invest time and efforts in management of protected areas. Symbiotic relationship between local communities and the wildlife plays a vital role in management of the protected areas<sup>1</sup>. There is the need to provide local communities with a greater role in protected area management. There should be “Joint protected area management in which local communities are seen as having greater managerial and decision making responsibility than is currently the case<sup>2</sup>.”

India is the one of pioneer countries which included the role of local community in management of forests in its National forest policy of 1998<sup>3</sup>. Then why the community cannot be included in the protected area management? Protected areas to be ‘conserved’

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<sup>1</sup> Mahanty, N. (2002) “protected areas of the new millennium: For the welfare of local community and wildlife” the Indian forester vol. 128, no 10 October, pp. 1145- 1149.

<sup>2</sup> Saberwal, V.K. ( 1998) ‘ The problem” seminar June, PP 12-15

rather than preserved that means an optimal utilization of the Protected Areas for the wildlife and local community is the best alternative for the management of Protected Areas in a county like India. If the joint management without alienating the people can be adopted, by suitably modifying it to suit the local condition and needs, Pin Valley National Park can definitely be managed for the welfare of wildlife and local communities. In a new millennium protected areas will be a boon for the society as whole and for the local community in particulars<sup>4</sup>.

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<sup>3</sup> John, M ( 2002) "protected areas of the new millennium : for the welfare of the local community and wildlife ". The Indian forester vol. 120, no 10, October pp- 1145-1149.

<sup>4</sup> Ibid

### PART - III

#### WORKING PLAN – KIBBER WILDLIFE SANCTUARY

Kibber wildlife sanctuary is situated between  $32^{\circ} 50'$  to  $32^{\circ} 30'$  N latitude and  $78^{\circ} 1'$  to  $78^{\circ} 32'$  E longitude. This sanctuary is located in the spiti sub – division of Lahaul and spiti district of Himachal Pradesh at an altitude of 14000 ft a.m. 5.1 approximately.

Kibber wildlife sanctuary has been notified by the Government of Himachal Pradesh dated Shimla the 25<sup>th</sup> April 1992. This is the only sanctuary in the country which is situated in the cold desert area. The sanctuary is covering an area of 1400. 50 sq km. there are about 13 villages namely kee, Langcha, Hikkam, Komik, Kaza, Shego. Lara, Demul, Lidang, Lingti Rama, Lalung and Chichom situated outside the periphesy of the sanctuary. Only two households in one village kibberi exist inside the sanctuary area however there are about seven *Doghris* (Summer settlements) within the sanctuary with some cultivation (Peas, Potato, Baarley etc the sanctuary. The collection of dung, wood etc has allowed & there is no deadline of core as Buffer zone human interference is tolerated in the sanctuary with certain limitations. This sanctuary is about 20 km from Kaza (distt. HQ) and is linked with road via. Lalung, Langcha and Kibber

village. One can see herds of Blue sheep ibex and panoramic view of Shilla peak, Parangla and enjoy the glimpse of famous Keop Monastery on the way to Kibber.

There are more than 20 species of animals and birds in the sanctuary area. This sanctuary is especially renowned for the protection of endangered snow leopard the estimated population of which is about 6. Other species are Ibex, Tibetan Wolf, Himalayan monal pheasant, snow cock, vulture, Picca, Red Fox, Blue sheep, Chakor etc.

Kibber Wildlife Sanctuary (KWLS) is characterized by alpine pasture or dry alpine scrub forest. Juniper & Birch trees are on the verge of extinction. Sanctuary bottoms have regenerated naturally with salix spp. Myrica shrubs are eaten by snow leopard. So far more than 400 plant species have been reported in this area. This area is very rich in medicinal/aromatic herbs, and spices. These herbs and spices are collected by local pharmacists (Amchis) for the preparations of local medicines.

Being cold desert and high altitude area winters are severe and experience very heavy snowfall in the sanctuary area. April, May, November and early December are quite good season for animal sightings. Because during these months the animals access the lower altitudes. For the people interested in Geography and Geology July and August is the best period.



Forest Department has constructed many Bunkers and one Trekker hut at Rongtong (Kaza ) in the sanctuary area.

The people in this area are Bhotis, who are Culturally similar to the Tibetans, Buddhism is the main religion said to have been established after Guru Padmasambhava preached his doctrine here in the 9<sup>th</sup> century A.D. traditionally, the people are agro – pastoralists leading a subsistence- based life style, cultivating of yaks, dzos (yak-cow hybrids), sheeps and goats, are raised for milk and meat, and donkeys as beat bred for sale in Ladakh. Killing of animals is not allowed in Buddhism and wild animals are therefore not poached. Although the human population density in the area is relatively low, changes in the social system, especially the breakdown of polyandry system, and a subsequent increase in the number of households is

likely to affect resource use in the area. People of villages situated outside the periphery of this sanctuary depend on the sanctuary area for agriculture, fuelwood and for grazing their livestock in savetuary is accompanied by people in their grazing areas. Livestock had averaged 10 to 50 animals beside this migratory livestock, from the adjoining districts of Kullu and

Kinnaur, also use to area during the summer. This excessive intrusion of local people and livestock in KWCS has lead to the reduction in the carrying capacity of this area, which lead to threat of habitat loss due to degradation in some areas from 7497 in 2000 to 7458 to 2001 (Table 5.III.1). The birds and animals like ibex, Himalayan chough, snow pigeon, Blue sheep has shown decline in the numbers. In the Kibber wild life sanctuary locals felt that the sanctuary becoming degraded and they have now to venture further into the forest to collect shrubs for fuel wood. The practice of uprooting shrubs for fuel wood. The practice of uprooting shrubs for this purpose might be hindering regeneration and hastening degradation. This has lead to an imminent threat to wild habitats in Trans–Himalayan areas in India due to increasing human activities.

Table 5.III.1

**Wildlife as per the census Census conducted June 2000 and July 2001**

<b>S. No</b>	<b>Kind of animals / Birds</b>	<b>05-07-01</b>	<b>17.06.00</b>
	<b>Physically seen by direct / indirect evidence</b>	<b>to 07-07.01</b>	<b>to 19.06.00</b>
1.	Ibex	12	16
2.	Tibetan Wolf	17	18
3.	Snow leopard	6	7
4.	Himalayan Chogh	4030	4050
5.	Snow Pigeon	314	366
6.	Snow cock	28	18
7.	Vulture	27	28
8.	Ducks	-	-
9.	Himalayna Crow	10	13
10.	Picca	10	8
11.	Ravan	10	12
12.	Golden Tagle	6	8
13.	Griffan	2	3
14.	Chakov	25	22
15.	Red Fox	10	11
16.	Red Start	15	16

17.	Dove	-	-
18.	Himalyan Finches	2140	2008
19.	Wooly Hare	18	18
20.	House Sparrow	357	407
21.	Blue Sheep	421	468
	Total	7458	7497

Source: D.F.O., Wildlife Census Report, Kaza, 2001.

There should be some management action plan which will bring the joint effort of the community and wildlife managers on the same platform where by they can safeguard and conserve this natural beauty & heritage. There should be programme which will not stop the locals from using these forest resources, and did not consider them the disturbance to the protected area but involve them in the joint management and conservation through village 10 village to village awareness programmes and motivating them to such agricultural or pastoralists activities which are sustainable for the environment. If the local communities recognize the benefit from the products and service provided by the forests, they would then be motivated to modify their resource and landuse pattern and invests time and efforts in management of protected areas. Symbolic relationship between local communities and the wild life plays a vital role in management of the

protected areas. If the above approach and ideas are adopted by suitably modifying them to suit the local conditions and needs, KWLS can definitely be managed for the welfare of wildlife and local communities. In the new millennium Parks will be a boon for the society as whole and for the local community in particular.

## CHAPTER – VI

### CONCLUSION

The man's rising needs and technological capabilities have a negative impact on the environment. The exploitative and unsustainable techniques of consumption have led to the serious deterioration of air, land, water and natural habitats. The destruction of environment is so immense that the survival of the human being is at stake. Throughout the world and in India these has been a tremendous exploitation and damage caused to the natural ecosystem. It has been a serious concern worldwide as well as in India to protect and conserve the natural environment. It has resulted in the emergence of global environmental movement, focusing on the conservation, preservation and protection of the depleting environment. Overall, the environmental movements have enforced the developed and developing countries to adopt the environment friendly technologies. But there are many issues in which global environmental movement is not able to handle them. Moreover, the developed world is imposing the restrictions on the developing countries in the matters related to environmental pollution.

In India the environmental conservation efforts have been yielding environment friendly results but there is need for changes in the laws and policies which discourage the local communities to use the forest resources, which is one of the important sources of livelihood for these poor tribal communities. Only 4.65 percent of the total geographical area of the country is the protected area. There is a need to increase the protected area so that there should be a check on poaching, hunting and illegal trade

activities. Therefore, the creation of more national parks, sanctuaries and zoo's is required for the healthy growth of wild animals and plants. The states which have good amount of forest cover like Andhra Pradesh (23.20%), Assam (39.15%), Madhya Pradesh (34.84%), Manipur (67.87%), Mizoram (75.79%), Nagaland (52.05%), Meghalaya (42.34%), Orissa (36.73%) have the lowest percentage of the Protected Area like Andhra Pradesh has only (4.97%) followed by Assam (2.95%), Madhya Pradesh (3.83%), Manipur (1.19%), Meghalaya (1.88%), Mizoram (4.60%).

For the sake of forest conservation programmes, the government environmental agencies on one hand are alienating the people from the forest area, which is their main source of livelihood and on the other hand they are diverting the forest area for various non -forest activities. This has lead to the serious conflict between the managers and the tribal communities living in the forest and protected areas.

The forest cover in India has generally shown a negative growth from 1993-1997. After 1997 the growth rate has been positive. The negative growth rates from 1993-97 may be attributed to high population growth rate. A correlation between the population growth and forest cover growth for the same period of time revealed positive rho values of 0.14, 0.019 and 0.31. This means that population growth has not directly influenced the reduction in forest cover. The commercial activities arising out of population growth have probably influenced the reduction in forest cover.

There has been an increase in the numbers of Elephants, Leopards, Tigers and Rhinos poaching. To check these, there is a need of sufficient effort by governmental agencies to stop the illegal activities and killing of animals and birds in the Protected Areas.

The funds allocated/released by the government for the Biosphere Reserves and conservation and management of mangroves and coral reefs, under the different environmental projects/scheme is a welcome step for the preservation and maintenance of the wild fauna and flora. The funds have been allocated unequally while the wild species are equally important in each state. Therefore, there is a need of a policy which should consider each state's fauna and flora equally important and these should be equal distribution of funds on the basis of the area and the need of the states environmental condition. The state like Orissa, Gujarat, Rajasthan and Uttar Pradesh showing the highest negative gap between the allocation and expenditure for afforestation schemes have recorded reducing forest cover. This shows the lack of concern of the state for the conservation and protection of the forest area in these states. It can be said that the state environmental authorities are not able to utilize the allocated funds.

The social afforestation scheme sponsored by the centre has been a good measure to involve the community with the forest conservation programmes. There is a need to make the local people aware about the afforestation, sustainable use and the importance of conservation.

In order to conserve the forest/protected area there should be a continuous effort from the governmental agencies to achieve the target which they set for different environmental conservation programmes.

There need to be an environmental awareness and educational programmes focusing on the essentiality of conservation. The financial assistance provided by the Ministry of Environment and Forest for setting up eco-clubs in schools is the vital and most needed step for the conservation and protection of the environment and forests.



The study of Pin Valley National Park shows that the people should not be alienated from their land, as it is the only source of livelihood in this cold desert area. There is no alternative land in this area where these people can be resettled or can practise agriculture. Local communities may be provided with a greater role in the protected area management. There should be joint protected area management in which local communities are seen as having greater participation. There should be a policy where the community shouldn't be considered as a threat to the parks but as a guardian and care taker and involve them in joint management and conservation through village to village wildlife management, and awareness programmes and motivate them to eco-friendly agro-pastoralists activities. Since independence, many laws and acts have been passed for the conservation and protection of environment in India. There are various schemes and programmes like Joint Forest Management Programme, Schemes like Conservation and Management of Mangroves, Integrated Afforestation and Eco-development Project, Project Tiger, Biosphere Reserves, etc. have been taken up. The government has allocated millions of rupees for these projects. But the output is the reduction in forest cover, poaching of wild animals, stagnant protected areas, threat of extinction of important species, increasing problems of tribals living in the forest areas sanctioning of infrastructure projects inside the protected area, the diversion of forest land to non-forest activities etc. There is a lack of initiative from the community for the environmental programme. The NGOs and other voluntary organizations have<sup>to</sup> come forward.

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# ***APPENDICES***

**APPENDIX 4.1**  
**STATEWISE PERCENTAGE OF FOREST TO TOTAL AREA OF THE STATE**

<b>State/UTs</b>	<b>Percentage of forest area to total geographical area</b>
Andaman & Nicobar Island	86.93
Andhra Pradesh	23.20
Arunachal Pradesh	61.55
Assam	39.15
Bihar	16.81
Chandigarh	27.19
Dadar & Nagar Haveli	41.34
Daman & Diu	-
Delhi	2.83
Goa	37.34
Gujarat	9.89
Haryana	3.78
Himachal Pradesh	63.60
Jammu & Kashmir	9.08
Karnataka	20.19
Kerala	28.87
Lakshadweep	-
Madhya Pradesh	34.84
Maharashtra	20.75
Manipur	67.87
Meghalaya	42.34
Mizoram	75.59
Nagaland	52.05
Orissa	36.73
Pondicherry	-
Punjab	5.76
Rajasthan	9.26
Sikkim	37.34
Tamil Nadu	17.40
Tripura	60.01
Uttar Pradesh	17.55
West Bengal	13.38

Source : Forestry Statistics India 2000, Indian Council of Forestry Research & Education.

APPENDIX 4.2

STATEWISE FOREST COVER (SQ. KMS)

States/UTs	1993	1995	1997	1999
Andhra Pradesh	47256	47112	43290	44229
Arunachal Pradesh	68661	68621	68602	68847
Assam	24508	24061	23824	23688
Bihar	26587	26561	4832	4830
Chhatisgarh	-	-	56435	56693
Delhi	22	26	26	88
Goa	1250	1250	1252	1251
Gujarat	12044	12320	12578	12965
Haryana	513	603	604	964
Himachal Pradesh	12502	12501	12521	13082
Jammu & Kashmir	20443	20433	20440	20441
Jharkhand	-	-	21692	21644
Karnataka	32343	32382	32403	32467
Kerala	10336	10336	10334	10323
Madhya Pradesh	135396	135164	74760	75137
Maharashtra	43859	43843	46143	46672
Manipur	17621	17558	17418	17384
Meghalaya	15769	15714	15657	15633
Mizoram	18697	18576	18775	18338
Nagaland	14348	14291	14221	14164
Orissa	47145	47107	46941	47033
Punjab	1343	1342	1387	1412
Rajasthan	13099	13280	13353	13871
Sikkim	3119	3127	3129	3118
Tamil Nadu	17005	17045	17064	17078
Tripura	5538	5538	5546	5745
Uttaranchal	-	-	23243	23260
Uttar Pradesh	33961	33986	10751	10756
West Bengal	8186	8276	8349	8362
Andaman & Nicobar Islands	7624	7615	7613	7606
Chandigarh	5	7	7	7
Dadra & Nagar Haveli	206	204	204	202
Daman & Diu	-	-	3	3
<b>India</b>	<b>639386</b>	<b>638879</b>	<b>633397</b>	<b>637293</b>

Source: Rajya Sabha Unstarred Question No. 1086, dated 26.07.2002.

**APPENDIX 4.3**

**STATEWISE MID-YEAR POPULATION**

STATES	YEARS			
	1993	1995	1997	1999
Andhra Pradesh	69086	71376	73361	75010
Arunachal Pradesh	941	1010	1087	1167
Assam	23465	24405	25275	25983
Bihar	89430	92135	95236	98734
Delhi	10339	11172	12470	13598
Goa	1272	1363	1460	1563
Gujarat	43236	44958	46421	47787
Haryana	17408	18260	19023	19641
Himachal Pradesh	5591	5964	6233	6600
Jammu & Kashmir	8338	8889	9263	9787
Karnataka	46965	48738	50291	51654
Kerala	29955	30709	31455	32075
Madhya Pradesh	69803	73064	76006	78806
Maharashtra	82419	85526	88270	90450
Manipur	1999	2143	2301	2466
Meghalaya	1931	2071	2224	2384
Mizoram	751	806	868	932
Nagaland	1318	1416	1532	1647
Orissa	32928	34055	34946	35641
Punjab	21229	22077	22809	23368
Rajasthan	46588	48921	51043	52944
Sikkim	442	474	510	547
Tamil Nadu	57508	58960	60294	61427
Tripura	3000	3217	3455	3704
Uttar Pradesh	147056	154225	160704	167656
West Bengal	71048	73696	76141	78315
Andaman & Nicobar Islands	305	328	352	378
Others	961	1031	1110	1192
<b>India</b>	<b>886250</b>	<b>921989</b>	<b>955220</b>	<b>986611</b>

Source : Statistical Abstract of India, 2000.



**APPENDIX 4.4**

**STATEWISE GROWTH RATES OF POPULATION AND FOREST COVER**

States	Growth rate(population)	Growth Rate (forest)	Growth rate(population)	Growth Rate (forest)	Growth rate(population)	Growth Rate (forest)
	1993----95	1993----95	1995---97	1995---97	1997---99	1997---99
Andhra Pradesh	3.314709203	-0.3047232	2.78104685	-8.1125828	2.247788334	2.1690922
Arunachal Pradesh	7.332624867	-0.0582572	7.62376238	-0.0276883	7.359705612	0.3571324
Assam	4.005966333	-1.8238942	3.56484327	-0.9849965	2.801186944	-0.5708529
Bihar	3.024712065	-0.0977922	3.36571336	-0.1393020	3.672980806	-0.1885085
Delhi	8.056872038	18.1818182	11.6183315	0.0000000	9.045709703	238.4615385
Goa	7.15408805	0.0000000	7.11665444	0.1600000	7.054794521	-0.0798722
Gujarat	3.982792118	2.2915975	3.25414832	2.0941558	2.942633722	3.0768008
Haryana	4.894301471	17.5438596	4.17853231	0.1658375	3.248698943	59.6026490
Himachal Pradesh	6.671436237	-0.0079987	4.51039571	0.1599872	5.888015402	4.4804728
Jammu & Kashmir	6.608299352	-0.0489165	4.20744741	0.0342583	5.656914606	-0.2212797
Karnataka	3.775151709	0.1205825	3.18642538	0.0648508	2.710226482	0.1975126
Kerala	2.517108997	0.0000000	2.42925527	-0.0193498	1.971069782	-0.1064447
Madhya Pradesh	4.671718981	-0.1713492	4.02660681	-2.9364328	3.683919691	0.4840123
Maharashtra	3.769761827	-0.0364805	3.20838108	5.2459914	2.469695253	1.1464361
Manipur	7.203601801	-0.3575279	7.37284181	-0.7973573	7.170795306	-0.1952004
Meghalaya	7.250129467	-0.3487856	7.38773539	-0.3627339	7.194244604	-0.1532861
Mizoram	7.323568575	-0.6471626	7.69230769	1.0712748	7.373271889	-2.3275632
Nagaland	7.435508346	-0.3972679	8.1920904	-0.4898188	7.506527415	-0.4008157
Orissa	3.422619048	-0.0806024	2.61635589	-0.3523892	1.988782693	0.1959907
Punjab	3.994535777	-0.0744602	3.31566789	3.3532042	2.45078697	1.8024513
Rajasthan	5.007727312	1.3817849	4.33760553	0.5496988	3.724310875	3.8792781
Sikkim	7.239819005	0.2564925	7.59493671	0.0639591	7.254901961	-0.3515500
Tamil Nadu	2.524866106	0.2352249	2.26255088	0.1114696	1.879125618	0.0820441
Tripura	7.233333333	0.0000000	7.39819708	0.1444565	7.206946454	3.5881717
Uttar Pradesh	4.8750136	0.0736139	4.20100503	0.0235391	4.325965751	-0.0647173
West Bengal	3.727057764	1.0994381	3.31768346	0.8820686	2.855229114	0.1557073
Andaman & Nicobar Islands	7.540983607	-0.1180483	7.31707317	-0.0262640	7.386363636	-0.0919480
Others	7.284079084	0.0000000	7.66246363	0.0000000	7.387387387	0.934579439
<b>India</b>	<b>4.032609309</b>	<b>0.079294823</b>	<b>3.60427294</b>	<b>-0.8580655</b>	<b>3.286258663</b>	<b>0.615096061</b>
<b>Correlation</b>	<b>0.144583177</b>		<b>0.01994681</b>			<b>0.30710456</b>

Source : Computed from data on population and forest cover from Statistical Abstract, 2000

**APPENDIX 4.5  
STATEWISE NATIONAL PARKS, SANCTUARIES, ZOOS AND PROTECTED AREA**

States/UTs	% No. of National Parks	% No. of Sanctuaries	% No. of Recognised Zoos	Percentage of Protected Area (Sq. Km.)
Andaman & Nicobar Islands	10.11	19.32	0.56	0.50
Andhra Pradesh	4.49	4.23	10.11	8.25
Arunachal Pradesh	2.25	2.21	1.69	6.13
Assam	5.62	3.02	0.56	1.53
Bihar	1.12	2.21	0.56	3.44
Chandigarh	0.00	0.40	0.00	0.02
Chhatisgarh	3.37	2.01	1.12	0.00
Dadra & Nagar Haveli	0.00	0.20	0.56	0.00
Daman & Diu	0.00	0.20	0.56	0.00
Delhi	0.00	0.40	1.12	0.01
Goa	1.12	1.21	0.56	0.29
Gujarat	4.49	4.23	5.06	11.43
Haryana	1.12	1.81	2.25	0.15
Himachal Pradesh	2.25	6.44	3.37	5.15
Jammu & Kashmir	4.49	3.22	0.00	9.27
Jharkhand	1.12	2.01	3.37	0.00
Karnataka	5.62	4.23	9.55	4.45
Kerala	3.37	2.41	3.93	1.56
Lakshadweep	0.00	0.20	0.00	0.00
Madhya Pradesh	10.11	5.03	3.37	11.27
Maharashtra	5.62	6.64	10.11	10.13
Manipur	1.12	1.01	0.56	0.18
Meghalaya	2.25	0.60	0.56	0.28
Mizoram	2.25	1.01	1.12	0.64
Nagaland	1.12	0.60	0.56	0.16
Orissa	2.25	3.62	4.49	4.90
Punjab	0.00	2.01	2.81	0.20
Rajasthan	4.49	4.83	3.93	6.34
Sikkim	1.12	1.01	1.12	0.67
Tamil Nadu	5.62	4.02	6.74	1.88
Tripura	0.00	0.80	1.12	0.40
Uttar Pradesh	1.12	4.63	8.43	8.95
Uttaranchal	6.74	1.21	2.81	0.00
West Bengal	5.62	3.02	7.30	1.83
India	100.00	100.00	100.00	100.00

**APPENDIX – 4.6**

**STATEWISE PERCENTAGE FUNS ALLOCATED/RELEASED BY THE GOVERNMENT FOR  
BIOSPHERE RESERVE SCHEMES AND FOR THE CONSERVATION AND THE  
MANAGEMENT OF MANGROVES AND CORAL REEFS IN INDIA**

States/UTs	BIOSPHERE		
	1999-00	2000-01	2001-02
Assam	3.6287104	13.98065	3.0748463
Arunachal Pradesh	0	8.6605795	0
Karnataka	7.2574207	12.199045	9.34239
Kerala	14.580158	10.652513	8.648139
Madhya Pradesh	11.611873	8.7595576	18.020528
Meghalaya	4.3544524	4.5777349	1.62849
Orissa	10.160389	8.4131344	4.251216
Sikkim		6.0624057	8.1210225
Tamil Nadu	13.789099	6.6810185	5.8732778
Uttar Pradesh	16.321939	9.8978052	13.499325
West Bengal	12.881922	6.4335734	10.032356
Andaman & Nicobar Islands	5.4140359	3.6819835	17.50841
<b>MANGROVES AND CORAL REEFS</b>			
States/UTs	1999-00	2000-01	2001-02
Andhra Pradesh	0.0	14.9	20.6
Goa	7.2	3.1	3.1
Gujarat	0.0	21.9	0.0
Karnataka	0.0	0.0	3.8
Maharashtra	8.0	22.2	0.0
Orissa	35.5	13.9	15.0
Tamil Nadu	13.1	21.1	37.2
West Bengal	36.2	0.0	16.2
Andaman & Nicobar Islands	0.0	2.9	4.0

SOURCE : Computed from Lok Sabha Unstarred Question No. 3213 dted 19.3.2001

APPENDIX - 4.7  
STATEWISE FUNDS EARMARKED AND ACTUAL AMOUNT SPENT FOR AFFORESTATION IN  
INDIA (1992-93 TO 1996-97)  
(RS. IN LAKH)

States/UTs	1992-93		1993-94		1994-95		1995-96		1996-97		Total	
	Allocation	Expenditure	Allocation	Expenditure	Allocation	Expenditure	Allocation	Expenditure	Allocation	Expenditure	Allocation	Expenditure
Andhra Pradesh	2510.5	3671.2	1051.5	913.7	579.6	463.6	810.8	735.2	1093.9	986.3	6046.2	6774.9
Arunachal Pradesh	434.6	429.2	506	489.1	620.1	583.6	699	664.8	672	672.0	2931.7	2838.7
Assam	1520	703.1	1890.2	1591.3	1861.6	1633	1832	1537.6	1671.7	1541.8	8775.5	7056.6
Bihar	2112.5	1864.7	1480.3	1310.1	1157.7	842.9	1286.8	831.7	1603.3	1142.3	7640.5	6041.6
Goa	157	128.2	217	208	254	251	259	256.6	325.3	325.9	1212.2	1169.8
Gujarat	6713.9	6663.9	4865.4	4359	4976.5	4941	6888.5	6741.3	11390	10240.1	34834	32946
Haryana	4576.6	3940.4	3717	3691.3	3650.3	3588	4229.6	4011.5	3835	3734.0	20058	18965
Himachal Pradesh	4746	4536.7	2735.4	2735.4	3055	3035	3401.4	3401.4	2429	2436.9	16367	16145
Jammu & Kashmir	1796	931.6	1734	1598.2	1647.6	1619	2056.4	2072.7	1576.1	1506.6	8810	7727.6
Karnataka	6157.9	5844.5	1734.7	1598.2	1647.6	1619	2056.4	2072.7	1576.1	1506.6	13173	12641
Kerala	1215	1261.2	170	168.2	297	316.3	360	480.5	673	688.7	2715	2914.9
Madhya Pradesh	5513	5884	5177.2	4529	5031.9	4474	4302.1	4012.3	4400.2	4304.0	24424	23204
Maharashtra	7624.1	6321.1	10661	10348	11483	10971	9647.5	9390.2	12393	12077.6	51808	49109
Manipur	573.7	308.6	232.2	231.6	315.7	331.4	391	318.3	359.3	321.0	1871.8	1510.8
Meghalaya	1164.1	1196.9	1136	801.3	1062	574.7	851.2	607.1	721.4	387.7	4934.7	3567.8
Mizoram	870	980.6	1036.1	1030.3	944.2	944.1	797	718.5	740.4	740.4	4387.7	4413.8
Nagaland	155.4	69.5	235	188.1	237	44	231	113.8	248.7	239.1	1107	654.4
Orissa	4208	3842.9	2541.8	2064.1	1677.2	1465	1484.6	1296.9	682	860.5	10694	9529.2
Punjab	1159.5	1903.2	1101.9	1055.9	903.1	889.4	985.3	975.5	977.1	774.6	5126.8	5598.6
Rajasthan	9583	9390.4	11727	10804	16289	15211	18842.7	17850	15654	14678.1	72096	67934
Sikkim	383.9	436.6	646	645.4	975	974.5	463	462.5	656	656.1	3123.9	3175.1
Tamil Nadu	4640.7	5111.1	4768	5229	5081	5341	4920	4966	5384	110.0	24794	24757
Tripura	1158	978.2	90.6	75.4	65.6	68.2	25.6	30.9	50	62.9	13894	1215.6
Uttar Pradesh	6790.2	9174.8	6060.6	6028.8	6259.6	6200	7438.7	7416.1	8762.7	8760.7	35312	37580
West Bengal	2880	3618.2	2128.3	2670.2	4437.2	3161	4306	3575.6	4953.4	4933.0	18705	17958
Andaman & Nicobar Islands	116.3	113	115.7	127.6	127.5	134.7	135.8	143.7	143	138.5	638.2	657.5
Chandigarh	30	39	50	50	45.5	54.5	22	22	17	17.0	164.5	173.5
Dadra & Nagar Haveli	97.2	138	184.2	184.2	191.2	191.2	128.3	128.3	131.1	130.6	732	772.2
Daman & Diu	13	15	13.3	13.3	17	17	17	15.6	18.3	18.3	78.5	79.2
Delhi	281	193.3	184.1	161.3	187	186.7	215.6	216.1	264.3	263.5	1131.9	1020.9
Lakshadweep	16	16	0	0	0	0	0	0	0	0.0	16	16
Pondicherry	91.3	106.8	72	72	99	99	104.5	95.5	111.3	120.0	478.1	493.3
India	79288	79812	68362	64973	75176	70219	79188.6	75261	83562	78374.9	385577	368640

Source : Lok Sabha Unstarred Question No. 3165 dated, 19.03.2001

**APPENDIX 4.8**  
**STATE-WISE PERCENTAGE OF TARGETS/ACHIEVEMENTS FOR**  
**AFFORESTATION ACTIVITIES UNDER 20 POINT PROGRAMME (DURING NINTH**  
**PLAN) (1997-1998 TO 1998-1999) Area in Ha. And Seedlings in Lakh**

States/UTs	1997-98					Achievements Seedlings*	Area **
	Targets ↓ Seedlings*	Area ** 2	A- T*** S	A-T **** A			
Andhra Pradesh	9.85	4.36	9.76	9.64	19.61	14.00	
Arunachal Pradesh	0.06	0.87	0.09	-0.22	0.15	0.65	
Assam	0.22	2.35	0.02	-1.98	0.24	0.38	
Bihar	4.48	3.49	3.41	-2.02	1.07	1.47	
Goa	0.27	0.16	0.14	-0.04	0.13	0.12	
Gujarat	17.02	5.67	1.55	0.84	18.57	6.51	
Haryana	1.79	2.79	1.47	-0.93	0.32	1.86	
Himachal Pradesh	0.18	2.62	0.11	0.28	0.29	2.90	
Jammu & Kashmir	0.54	2.09	0.04	0.20	0.58	2.29	
Karnataka	3.58	5.67	1.10	-0.24	2.48	5.43	
Kerala	1.61	1.66	1.51	-1.31	0.11	0.35	
Madhya Pradesh	4.03	13.08	0.40	1.34	4.43	14.42	
Maharashtra	10.30	10.99	1.22	-1.47	9.08	9.52	
Manipur	0.22	1.05	0.16	-0.59	0.07	0.46	
Meghalaya	0.36	1.57	0.33	-1.16	0.69	0.41	
Mizoram	0.20	1.73	0.09	-0.84	0.11	0.89	
Nagaland	0.54	0.70	0.54	-0.70	0.00	0.00	
Orissa	2.69	6.89	1.54	1.79	4.23	8.68	
Punjab	0.47	1.74	0.17	-1.22	0.64	0.52	
Rajasthan	3.58	7.24	0.00	-1.21	3.59	6.02	
Sikkim	0.20	0.96	0.02	0.07	0.22	1.03	
Tamil Nadu	9.85	7.41	1.24	2.36	11.09	9.77	
Tripura	0.36	0.87	0.40	0.02	0.76	0.90	
Uttar Pradesh	19.70	9.59	0.57	-0.47	19.13	9.12	
West Bengal	7.39	3.84	5.18	-1.94	2.21	1.89	
Andaman & Nicobar Islands	0.04	0.39	0.03	-0.03	0.01	0.36	
Chandigarh	0.00	0.04	0.00	-0.04	0.01	0.01	
Dadra & Nagar Haveli	0.14	0.09	0.08	-0.06	0.07	0.03	
Daman & Diu	0.02	0.00	0.01	0.01	0.00	0.01	
Delhi	0.22	0.09	0.19	-0.09	0.04	0.00	
Lakshadweep	0.04	0.01	0.03	0.00	0.02	0.00	
Pondicherry	0.04	0.01	0.02	0.00	0.07	0.01	
India	100.00	100.00	0.00	0.00	100.00	100.00	

Source : Computed from data -Lok Sabha Unstarred Question No. 1171, dated 31.07.2000.

Notes: 1. Seedling distribution (for planting on private land) T & A.  
2. Area (Public land including forest land) T & A  
[A-T stand for Achievements minus Target.]

**APPENDIX 4.8**  
**STATE-WISE PERCENTAGE OF TARGETS/ACHIEVEMENTS FOR**  
**AFFORESTATION ACTIVITIES UNDER 20 POINT PROGRAMME (DURING NINTH**  
**PLAN) (1997-1998 TO 1998-1999) Area in Ha. And Seedlings in Lakh**

1998-99						
States/UTs	Targets		Achievements			
	Seedlings*	Area **	Seedlings*	Area**	A-T***	A-T****
Andhra Pradesh	9.85	4.68	21.76	14.56	11.91	9.87
Arunachal Pradesh	0.06	0.85	0.04	0.07	-0.02	-0.79
Assam	0.22	2.30	0.27	0.54	0.04	-1.76
Bihar	4.48	3.40	1.58	0.92	-2.90	-2.48
Goa	0.27	0.15	0.12	0.07	-0.15	-0.08
Gujarat	17.02	5.96	20.47	6.37	3.46	0.41
Haryana	1.79	2.72	0.38	1.62	-1.41	-1.10
Himachal Pradesh	0.18	2.55	0.42	2.83	0.24	0.28
Jammu & Kashmir	0.54	2.04	0.97	1.48	0.43	-0.57
Karnataka	3.58	5.79	6.55	8.42	2.96	2.63
Kerala	1.61	1.62	0.01	1.92	-1.60	0.30
Madhya Pradesh	4.03	12.77	5.07	17.03	1.04	4.26
Maharashtra	10.30	10.72	8.94	8.35	-1.36	-2.37
Manipur	0.22	1.02	0.18	0.56	-0.05	-0.46
Meghalaya	0.36	1.53	0.42	0.21	0.06	-1.32
Mizoram	0.20	1.69	0.08	0.58	-0.12	-1.10
Nagaland	0.54	0.68	0.00	0.00	-0.54	-0.68
Orissa	2.69	7.40	2.50	5.63	-0.19	-1.77
Punjab	0.47	1.70	0.53	0.94	0.07	-0.76
Rajasthan	3.58	7.23	4.11	5.94	0.52	-1.29
Sikkim	0.20	0.94	0.16	0.57	-0.03	-0.37
Tamil Nadu	9.85	7.66	5.32	11.10	-4.54	3.44
Tripura	0.36	0.85	0.30	0.81	-0.05	-0.05
Uttar Pradesh	19.70	9.36	17.28	8.43	-2.42	-0.93
West Bengal	7.39	3.74	2.16	0.71	-5.22	-3.03
Andaman & Nicobar Islands	0.04	0.00	0.02	0.30	-0.03	0.30
Chandigarh	0.00	0.04	0.01	0.01	0.00	-0.03
Dadra & Nagar Haveli	0.14	0.09	0.03	0.03	-0.11	-0.06
Daman & Diu	0.02	0.00	0.00	0.00	-0.02	0.00
Delhi	0.22	0.09	0.22	0.00	0.00	-0.09
Lakshadweep	0.04	0.01	0.05	0.01	0.01	0.00
Pondicherry	0.04	0.01	0.05	0.01	0.01	0.00
India	100.00	100.00	100.00	100.00	0.00	0.00

Source :Computed from data- Lok Sabha Unstarred Question No. 1171, dated 31.07.2000.

**APPENDIX 4.9**

**STATEWISE FINANCIAL ASSISTANCE PROVIDED BY THE MINISTRY OF ENVIRONMENT & FORESTS FOR SETTING UP OF ECO-CLUBS IN SCHOOLS IN INDIA (1998-99 & 1999-2000)**

States	(Amount in Rs.)	
	Financial Assistance Provided	
	1998-99	1999-00
Andhra Pradesh	212400	127000
Assam	27800	27800
Bihar	48800	80600
Goa	161800	318800
Haryana	29800	-
Jammu & Kashmir	38800	49800
Karnataka	72600	104400
Kerala	50800	50300
Madhya Pradesh	127200	184000
Maharashtra	26800	66800
Manipur	-	31800
Nagaland	31800	38800
Orissa	138200	57000
Punjab	26800	-
Rajasthan	-	36800
Tripura	21800	49800
Tamil Nadu	84400	134000
Uttar Pradesh	322200	420000
West Bengal	92400	115000
Steel Authority of India Ltd. New Delhi, for its Plants in various States	248000	247000
<b>India</b>	<b>1762400</b>	<b>2239700</b>

Source : Lok Sabha Unstarred Question No. 3601, dated 17.04.2000.

