Chapter-V

Protection of Forests and Wild Life-Legal Dimension and Economic Viability
5.1 GENERAL INTRODUCTION

Existence of the green cover on the earth is the life sap of human society. Forests provide us fuel, fodder, timber and many other products which are essential for our survival. Forests are the very basis of our survival as they maintain the proper balance of organisms, chemicals in the environment\(^1\) by producing or absorbing them and preventing soil erosion, floods and droughts etc. As long as the forests remained undisturbed the forest floor absorbs most of the water received through frequent rainfall and flood of rivers and streams that followed through them and standing water of the sort. Increase of population necessitated extension of agricultural land which is also turned to large scale deforestation\(^2\) as it was necessary to clear parts of the forests and to stay in the vicinity of the growing crops to tend, protect and harvest them. In addition to it the rise of

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\(^1\) Mahalwar K.P.S 'Deforestation & Environment A Socio Legal study' Environmental Management, Law and Administration, Deep & Deep pubs. N. Delhi, 1998 p392

\(^2\) In order to take advantage of new agricultural crops and techniques
city like settlements brought about a change in the pattern of human life leading to large-scale felling of trees exploitation.

For over a century, Indian wild life has received sporadic protection through numerous, species-specific statutes such as the Elephant’s preservation Act of 1879. The primary intent of most early statutes was to preserve game animals for hunting. The Indian Forest Act of 1927 included provisions for hunting restrictions in reserved or protected forests and authorized the establishment of sanctuaries. In 1972 India adopted a comprehensive national law, the wild life (Protection) Act of 1972, intended solely to protect wildlife. The Forty-second constitutional Amendment in 1976 moved wild life along with Forests from the State list of the constitution to concurrent list subsequently, the central Government has increased its role in developing national wild life policy.³

At the end of the twentieth century, and after nearly fifty years of independence, the Indian subcontinent can be justly proud of its enormously varied flora and fauna. In India alone, 13,000 species of flowering plants and 65,000 species of fauna have been recorded,

³ Rosencranz, Diwan, Noble, 'Environmental Law and Policy in India' Tripathi Publications, New Delhi 2001 p328-329
including 2000 fish, 12 birds and 340 mammals. India now has 560 protected areas, including 80 national parks, but much remains to be done if the natural life of India is to survive human depredation.4

5.2 CAUSES FOR DEFORESTATION

Forests have been identified as a necessary resource, which play a significant role both in social and economic development of a community and can improve quality of life in general.5 The causes for destruction of this forest land can be directly attributed to industrialization, developmental activities like construction of dams, power projects, mining etc., in almost all cases there was a total loss because no complementary forests have been regenerated. In order to have clear idea for the reasons for devastation of forests the whole study can be divided into two phases.

i) Pre Independence period

ii) Pre Independence period

5.2.1 Pre Independence period

It is difficult to reconstruct the picture of the economy of 'forest dwellers' before the British intervention. Such reconstruction has to be done largely from the writings of colonial administrators themselves. Communities enjoyed untrammelled use of the forests and wastes in their vicinity. The villages practiced settled agriculture as well as those that depended more directly on their forests.

The early period of British rule was characterized by a total indifference to the needs of forest conservancy upto the middle of the nineteenth century, the Raj saw a fierce onslaught among British colonies, 'India stood pre-eminent by reason of its vastness, the density of the population, and the seeming immeasurable extent of its natural resources'. The destruction by the British of this natural wealth especially forests is to meet the military purposes and to supply the teak export trade. In addition to this the attitude prevalent among administrators that the forests represented an obstruction to the 'prosperity' of the country, as their removal would add to the class of land paying revenue. By the sixteenth century, much of Western Europe had been deforested, and Northern Europe was supplying...

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6 Shyam Diwan, Resencranz 'Environmental law and policy in India' Oxford University Press 2001, New Delhi p25-28
7 Ibid
Britain with large quantities of wood. Between 1600 and 1700, Ireland's forests were devastated to meet England's needs of timber for ship building, iron smelting and lining with oak trees vanishing in England, a permanent supply of suitable timber was required for the Royal Navy and "for the safety of the empire depended on its wooden walls". This was the period of fierce competition between the colonial powers, and Indian teak, the most durable of ship building timbers, saved England during the war with Napoleon and the later maritime expansion. Ships were built in dockyards in Goa and on the Malabar Coast, as well as from teak imported into England.

5.2.2 Railways

The crucial watershed in the history of Indian forestry is undoubtedly the building of the railway network. This was created to meet the need for rapid troop movements felt after the mutiny and for enabling the characteristic pattern of colonial trade is export of primary commodities from the colony and import of finished goods into the colony from the England. Lord Dalhousie visualized a vast market for British manufacturers in the most distant parts of India. He

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also saw that railway construction afforded an opportunity for surplus British capital seeking outlets abroad, the best opportunity for investing that capital Dominion enabled Britain to build, at Indian cost, a system of road and rail transport which linked the colonial parts to the main parts and tilted the terms of trade in favour of her own nationals who dominated India's foreign trade.

The early years of railway expansion saw an unprecedented assault on the more accessible forests. Great chunks of forests were destroyed to meet the demand for railway sleepers; no supervision was exercised over the felling operations, and a large number of trees being felled whose logs could not be utilized. Private contractors, both Indian and European, were chiefly responsible for this devastation. The importance of preservation of forests was not realized anywhere in the world.

5.2.3 The Two World wars

The world wars saw India's forests being requisitioned for the imperial war purposes. In fact, it was during the 'Great war' that enormous potential value of India's forests for the empire was fully released. Every possible effort was made to substitute indigenous
timbers for imported ones. Timber and bamboos were supplied for construction of bridges, piers, wharves, buildings, huts and lines and ships. In little over a year\(^9\) 228,076 tons of timber\(^{10}\) was supplied by the specially created 'Timber Branch' of the British Government.

The impact of the Second World War was more severely felt on the Indian forest. Early in 1940, a Timber Directorate was set up at Delhi to channel supplies of forest product from the provinces. Thus felling and sawing were extended to the remotest forests of Himalayas and into the densest jungles of the Western Ghats by the British's for their own benefits.

5.2.4 Post-Colonial Forest Policy

One important difference in the post-1947 situation has been the rapid growth of forest industries, in consonance with the greatly expanded nature of industrial development since independence India being a sharply stratified society, there are inherent compulsions towards the deterioration of environment. While the rich destroy the environment-indirectly through their resources-wasteful life styles,

\(^9\) April 1917 to October 1918
\(^{10}\) Excluding railway sleepers
and directly through exploitation of Nature for profit-the poor are often forced to fall back upon nature for their very survival, thereby using up resources in an unsustainable fashion. Indian forests are being destroyed by commercial interests in pursuit of short term goals of profit maximization and to a lesser extent by rural communities for whom the loss of control over natural resources had led to an alienation of man from forest with potentially damaging consequences. Meanwhile with the prevalent lack of accountability bureaucracy is not sufficiently motivated to manage resources. The Indian path of capitalist development, which is neither "autonomous" not "self reliant" further complicates an already precarious situation.

In addition to this India being a signatory to International agreement on convention on Biological Diversity. Convention on Biological Diversity was one of the foremost issues discussed at the Earth summit held at Rio de Janeiro (Brazil) between June 3 and 14, 1992.\textsuperscript{11} Brazil was the first country to sign the convention followed by India and 155 other Nations while major industrial powers had decided to the convention US refused to do so. The objective of

\textsuperscript{11} Agrawal K C. 'Biodiversity' AGRO Botanical Publishers (India), New Delhi. 1996 p 62
refusal was to globalize the natural resources of the developing countries while allowing its own resources not to be ruthlessly exploited on the ground that these were technology privately owned. India with its vast bio diversity is having a great chance to be exploited by the so-called developed countries.

5.3 INTERNATIONAL PERSPECTIVE

Forests, a valuable gift to man, have been the green frontiers of the mankind since the times immemorial - a seemingly limitless resource for human expansion, with their supply of timber, fuel wood, fodder, genetic material, herbal medicine, a rich variety of other products, including underground water and a crucial source of raw materials for human society. Many ancient civilizations developed only because of the availability of forests and their products and many of them disappeared after depletion of these forests.12

The striking feature highlighted by these statistics is that more than 50% of land in Bangladesh and India is used for cultivation of crops- a figure far higher than the world average. Geography, rather

than population pressure account for this difference. China, for example, uses only 10 percent of its land area for agriculture. Three of the high-income countries, Australia, UK, US, allocate more land to pasture than to crop cultivation. The countries of South Asia have much less forest cover than some of other developing countries. India, for instance, has less than half of China's forest cover and only about 20% more than what it is in Mexico. The largest spread of forests among the countries is in Russia, though Brazil, which has the second largest foliage area, probably has more valuable forests. Deforestation continues in most parts of the world, though a few of the high-income countries show an increasing forest cover. The extent of deforestation has been most rapid in 1990-95 in Brazil, Mexico, Malaysia and Indonesia all countries with substantial tropical forests. In percentage terms, the highest rate of deforestation is going on in Malaysia.\(^\text{13}\) Mining, cattle ranching lack of enforcement of law, agriculture, plantation and consumerism. Above all the most worrying aspect is the loss of biological diversity. While covering only 6% of Earth's land surface, they are estimated to contain at least 70% and possible even 90% of Earth's species.\(^\text{14}\)

\(^{13}\) "India and the World-Land and Forests" The Hindu, Survey of the Environment '98.

\(^{14}\) Erwin T.L., "The Tropical Forest Canopy The Heart of Biotic Diversity", in E.O Wilcos (ed) Bio diversity National Academy Press, Washigton
5.3.1 EFFORTS TO SAFEGUARD FORESTS

Alarming state of affairs caused by the deterioration of ecology and environmental pollution on the globe despite enactment’s by individual nations on June 16, 1972, the UN conference on human environmental adopted a declaration on human environment consisting of preamble and 26 principles so as to conserve natural resources, the conference laid down the principles that the natural resources of the earth, including the air, water, land flora and fauna and especially representative samples of natural Eco-systems were to be safeguarded for the benefit of present and feature generations through careful planning or management as appropriate. State of Himachal Predesh v. Ganesh Wood Products the Supreme Court relied upon the National Forest Policy and the State Forest Policy of Himachal Pradesh to invalidate a decision taken by the state industrial project authority.

The capacity of the earth to produce vital renewable resources was to be maintained and wherever practicable restored or improved. In spite of the fact that in 1980's states and their people through

\[15\] AIR 1996 SC 149
NGO's started making efforts to reduce forest degradation and deforestation, every state has a forest policy and to implement it there is a legal framework and efforts are made to enforce it through especially trained officials.

Withdrawal of subsidies for cattle ranching, enhancement of penal laws in Malaysia, Rehabilitation of forest-emergency in Thailand and the Philippines are some other governmental efforts. Chipko movement, silent valley campaign of India, green belt movement of Kenya and Colombia and reforestation in Malaysia are some significant efforts of NGO's. But the result was encouraging; rather deforestation in 1990's increased. This is because of lack of enforcement of law, lack of enough forest conservation programmes, lack of financial resources and lack of political will for sustainable use of forests. This attracted International efforts.

5.3.2 The Tropical Forests Action Plan

At the instance of the committee on Forest Development in the Tropics in 1983 FAO launched a study that led in 1985 to develop a tropical forestry task force, which was jointly acted upon by the UNDP, the world Bank and other Development bank's., NGO's and
representatives from more than 70 Tropical Forestry Action Plan\textsuperscript{16} the first International document for conservation of tropical forests was established the TFAP outlines five priority areas: first, forestry in land use, second forest based industrial development, third fuel and energy, fourth conservation of tropical forest eco systems, and fifth removing the institutional constraints which impede the conservation and wise utilization of tropical forest resources.\textsuperscript{17}

The main objective of TFAP was to coordinate the actions of developing countries, international government organizations and financing agencies to combat deforestation. It thus broadly aimed to foster sustainable logging, tree planting, watershed rehabilitation, research and education, species protection and enhanced forestry management.\textsuperscript{18} Thus TFAP, apart from the international institutions and NGO's by 1990 involved over 88 countries with 85\% of the Earth's tropical forest countries. Also it has helped to expand regional cooperation in terms of training, exchange of information and enforcement of action plans.

\textsuperscript{16} TFAP
\textsuperscript{17} Shyam Divan, Armin Rosencranz, Environmental law and policy in India, Second Edition, Oxford University Press 2001 pp602-603
\textsuperscript{18} Kasimbazi E, 'sustainable Development in International Tropical Timber Agreements, Journal of Energy and Natural Resources Law, 1996, p155
5.3.3 THE INTERNATIONAL TROPICAL TIMBER AGREEMENT

The International Tropical Timber Agreement, which was negotiated and adopted by 36 producing countries and 33 consuming countries, was world's first commodity agreement on tropical timber. At the instance of the International union for conservation of nature and natural resources (IUCN) which recommended to include the impact of timbering in reducing natural forests, the negative environmental effects of timbering, the need to retain positive values for a better forest management and reforestation and the used to expand the timber by developing sustainable plantations, the ITTA-83 included some elements of sustainable forest management. The ITTA was adopted by the UN conference held in Geneva in November 1983 under the auspices of the United Nations conference on Trade and Development.

It was only after the Stockholm declaration that the states started emphasizing upon the relationship of forest and environment. But the phenomenon of global warming has significantly contributed to this, because forests are sink for carbon dioxide and if
deforestation is not checked, the mean world temperature will rise at a faster rate.

The sustainable development of forests was defined by Helsinki forest meeting of June 16-17.1993 as: the stewardship and use of forests and the forest land in a way and at a rate, that maintenance their bio diversity, productivity, regeneration capacity vitality and their potential to full fill, now and in the future relevant ecological economic and social functions at local, national and global levels and does not cause damage to other ecosystems. The ITTA-83, along with facilitating trade in tropical timber contains provisions about promoting sustainable utilization and conservation of tropical forests.

5.3.4 The International Tropical Timber Organization

The idea to have an organization in the line of the International Natural Rubber Agreement was modeled by Japan, who had the maximum of voting rights on the side of the consuming countries, but while the International tropical timber organization ITTO took it's final shape with several limitations get excluded forests which comprise of a large verities of flora and fauna with immense environmental,
The arena of the ITTO along with timber extraction and trading activities included conservation of forests also. Its objectives include:

1) To expand the timber industries in the producing states, so that they could export processed timber. It may be noted here but this will require less volume of timber to be exported bringing more money and generating employment in the producing countries.

2) To regulate the international timber trade for more balanced exploitation of tropical forests and to develop ways of better forestry development.

3) To sponsor studies on tropical timber pricing utilization and forest management.

4) To encourage sustainable use and conservation of tropical forests and their genetic resources and maintaining the ecological balances.

20 The term ecological balance has a wide connotation in connection of forest, it would include soil quality, water course, both underground and surface biomass, and forest quality.
5.3.5 The Forest Principles

The 'forest principles' is not legally binding and suffers from various repetitions and contradictions. But future is it includes all types of forests. The principles may be divided into two parts: Preamble and Principles. The preamble recognizes the environmental and economic and social importance of forests and suggests that should be used in such a way that the services provided by them are not reduced by exploitation over a long period of time. The inter governmental working group on global forests in it's first meeting held at Kuala Lumpur on Apr 18 -21, 1994 stressed that in future there shall be

1. Effective participation in forest management decision-making processes by all stakeholders.
2. Full public access to essential information.
3. Comprehensive, cross-sectoral integration, including land use planning and management and influence of policies external to the traditional forest sector.
4. Protection of customary rights of indigenous people and other forest department.
5. Use of EIA etc.
Thus ‘forest principles’ are the first international consequences on all types of forests of the world. These principles are designed to fight against deforestation.

5.4 NATIONAL SPHERE

Indian environmental status cheaply employ a system of criminal sanctions to preserve natural resources and regulate their use. Civil compensation recovered through private citizen's suits play a peripheral role in the overall regulatory strategy. Pollution charges, fees, and other economic approaches discourage pollution or largely untried.

5.4.1 Indian Constitution

The Indian constitution is amongst the few in the world that contains specific provisions on environmental protection. The directive principles of state policy and the fundamental duties chapters explicitly enunciate the national commitment to protect and improve the environment. Judicial interpretation of strengthened this constitutional mandate. The constituent assembly that framed India's constitution did not specifically consider the question of whether...
parliament or the state legislatures should regulate environmental matters, instead the distribution of environmental subjects within the three Lists was influenced by the government of India act of 1935, and by the conflict between those who wished to create a strong centre and other who preferred to secure more powers for the states\(^2\). In July 1949, the drafting committee of the constituent assembly conveyed a meeting of the premiers of the Indian states and provinces and the representatives of central ministers to discuss the division of legislative powers.

At this meeting proposals from the ministry of agriculture that "forests" and "fisheries" be transferred from the state list to the concurrent list where strongly opposed by the provincial representatives. The ministry argued that forests affect the agricultural development and prosperity of the country as a whole and no province or state should even inadvertently allow a policy that could be detrimental to the rest of the country\(^2\). But the arguments failed the proposals were rejected and the topic 'forests' was


classified as a state list. This has lead to large-scale differentiation for
the purpose of so called agricultural expansion in all those
discussions afforestation was not considered.

Environmental protection and improvement were explicitly
incorporated into the constitution by the Constitution. Article 48A was
added to directive principles of state policy.\textsuperscript{23} It declares, 'the state
shall endeavor to protect and improve the environment and to
safeguard the 'forests' and the 'wild life' of the country. Article 51(g) in
a new chapter entitled 'fundamental duties' imposes a similar
responsibility on every citizen "To protect and to improve the natural
environment including forests, lakes rivers and wild life and to have
compassion for living creatures."\textsuperscript{24}

The forty-second amendment 1976 also expanded the list of
concurrent powers in the Constitution forests and protection of wild
animals and birds were moved from the state list to the concurrent
list.\textsuperscript{25}

\textsuperscript{23} Forty-Second amendment) act of 1976
\textsuperscript{24} Shyam Divan, Armin Rosencranz, Environmental law and policy in India,
\textsuperscript{25} Ibid p46
This transfer empowered the central government to act directly in managing India's forests. Since 1976, the central government has taken three major actions with regard to forests. The forest (Conservation) Act of 1980 an amendment in 1988 of the forest (Conservation) Act and the adoption of a revised national forest policy in 1988.

5.5 LEGISLATIONS RELATING TO PROTECTION OF FORESTS AND WILD LIFE

During the Ramayana, Mahabharata and other successive periods of ancient era, the forests were considered to be of great aesthetic value. There was great reverence for forests and trees. Temples and Institutions of learning were generally established in sylvan surroundings. Almost the entire country was covered with forests. The records of Chinese pilgrims (600 B.C.) indicate the existence of dense forests in India. Records relating to Alexander's invasion of northwest India (327 B.C) indicate the existence of dense forests in that region, which is now a desert. For a long time, the country was fragmented into various independent units and there was no regular management of Forests. Records indicate that during the reign of Chandragupta Maurya (300 B.C) there was a superintendent of Forests to administer the vast areas that were then under forest.
Punishments were prescribed for forest offences and for destruction of wild life. Forests were classified according to use, i.e., for their aesthetic and cultural value, for exploitation, for grazing, for hunting by the royal party and for hunting by the public. During the period of Ashoka, the planting of trees along roads and near camping sites was emphasised and cultivation of plants of medicinal value was encouraged.26

During the medieval period, which was marked by a series of invasions from the north, the local people usually fled to the forests for protection and some of them cleared the forests for agriculture and in many cases practised shifting cultivation. Some of the invaders, notably in Mughals, protected the forests for hunting, but also took a deep interest in planting trees for aesthetic value and created a number of beautiful gardens. But this period was also marked by considerable internal strife which also resulted in the local people fleeing to the more inaccessible areas and settling in the forested tracts. This led to destruction of forests. While there was no

26 Kittanna Rai M. I F S, “Forest Laws Development, Material from CEERA NLSUI, Bangalore at a refresher course conducted between 14th March and 4th April 1999
organized interest in forest maintenance; trees which were considered of value were declared as 'Royal Trees' and royalty was collected for the right to cut and extract them. Forests were otherwise open to all without any restrictions.

During the latter part of 18th and the earlier half of the 19th century, the forests were heavily exploited, particularly in accessible areas. Good timber species were removed leaving behind only the inferior species, and no attention was paid to restock the forests. It was the over-exploitation of the teak forests along the coast of Malabar in the south, to meet the requirements of the British Navy, that led to the forest serious attempts to regenerate these forests. It was feared that if this was not done teak timber would soon be exhausted in that area. In other areas also the need for conservation of timber resources came to be realised and steps were initiated to organize forest departments in several States.

5.5.1 Forest Conservancy

In the year 1800, a Commission was appointed to enquire into the availability of teak in the forests of Malabar. Regulations followed, prohibiting the felling of teak trees below 21 inches in girth. In 1805, a
Forest Committee was constituted to enquire into the capacity of forests and the status of proprietary rights in them. As a result, a proclamation was made declaring royalty rights over teak trees in the south and prohibiting unauthorised fellings. In 1806 a Conservator of Forests was appointed in Madras to organise timber supplies from the west coast. With the continued depletion of teak in malabar, serious efforts were begun to regenerate these forests, and after several attempts successful teak plantations were raised from 1842 in Nilambur in the present Kerala State. A small area of these earliest of plantations in this country has been retained as a preservation plot.

The first regular Conservator of Forests was appointed in Bombay presidency in 1847 and later in other States. In 1855, the Government of India issued a Memorandum outlining rules for the conservation of forests for the whole country.

The foundation of scientific forestry were firmly laid in 1864 when Dietrich Brandis, a fully qualified forester, was appointed as the first Inspector General of Forests. He recruited trained personnel for organising forest operations and for establishing the Forest Departments in the States.
Under the Indian Forest Act of 1865, the local Governments were empowered to draft local rules for enforcement in their respective regions. Steps were taken accordingly to prevent acts which caused injury or destruction to the forests. By 1882, all the areas then under British rule had either extended the Indian Forest Act to their territory or brought out special Forest Acts. A revised Indian Forest Act (Act VII or 1978) was passed in the year 1878 and it was extended to most of the States. The revised Act provided for the constitution of reserved and protected forests. The India Forest Act of 1927 consolidated the law relating to forests and forest produce. Some of the States have enacted their own full scale Forest Acts in line with the Central Act.

During the period 1871-1900 preparation of Working Plans commenced in different parts of the country. Treatment of forests was prescribed on scientific considerations. With inadequate equipment and poor means of communications, the forest officers took up the pioneering task of exploring the forest and demarcating them. Technical education and training in forestry was further organised. In 1885, training of forest officers for India commenced at Cooper's Hill England.
In 1878 a Forest School was opened at Dehra Dun which trained Rangers for all the States. A Provincial Forest Service was inaugurated in 1891 with a view to training India itself a suitable cadre of Forest Officers.

The first forest policy resolution was issued in 1894 laying down sound principles for preservation of forests. As a result, forests were continuously conserved over a long period. With the gradual development of forestry and forest activities, the number of conservators was increased to cope with the increased forest conservancy work, both administrative and technical. In 1905 the idea of having a Chief Conservator of Forests in each State crystallised. In 1906, the Imperial Forest Research Institute was established at Dehra Dun with six officers. To meet the timber requirements of the First World War the Institute started conducting tests on the suitability of indigenous timbers for various uses.

In 1912, the Madras Forest College was started at Coimbatore for training Forest Rangers for the southern region of the country. In 1910, a Board of Forestry, composed of the representative Conservators under the presidency of the Inspector General of Forests was set up. Meetings were held once in three years to
discuss the programme of research work as also the problems of general forest administration.

With the political changes in 1921, Forest became a State subject and their administration came to vest in the Governments of the concerned provinces. As a result, forest organisation and management also underwent a change. The Inspector General of Forests became the advisor to the Government of India. The Chief Conservators of Forests became independent heads of the respective State Forest Departments responsible to their respective provincial administrations.

During this period, major silvicultural problems like natural regeneration of deodar (Cedrus deodara) in the western Himalayas and the artificial regeneration of teak (Tectona grandis) in south India were successfully tackled and standard procedures evolved. The natural regeneration of al (Shorea robusta) continued to receive adequate attention. Notable advances in Working plan work were achieved in most of the States and in particular in the coniferous forests of the western Himalayas. Interest was evinced in wild life preservation and some sanctuaries were established for the preservation of important species. Soil conservation work was also
organised. The present site at Dehra Dun for the Forest Research Institute was chosen with ample space for future expansion and field experimentation. The Forest Colleges were also situated in the same Institute, which later came to be known as the Forest Research Institute and Colleges. Thus scientific forestry was developed on sound lines.

The Second World War intervened resulting in the over-exploitation of the forests but many forest-based industries developed, particularly the plywood industry in eastern India. The demand for tea chests was considerable and a large number of plywood units sprang up in Assam and in Calcutta. Sawmills of various capacities were also setup to cope with the demand for timber for construction. A few paper factories were also established.

With the merger of the princely States all the forests owned by them came under the control of the respective state Governments. The States also acquired private forests and as a result the forest estate under public ownership was almost doubled. For several years the State Forest Departments were busy in the consolidation of the forests, unification of forest laws and extension of scientific management to the newly acquired forests on a unified basis.
To encourage public enthusiasm for the protection of trees and to develop farm forestry a tree planting festival 'Vanamahotsava' was inaugurated as a national festival to be observed annually. During this festival, which is held in the first week of July every year throughout the country, a large number of trees are planted in urban and rural areas. People are urged to protect not only the newly planted trees, but also all trees. In 1954 the Fourth World Forestry Congress was held at Dehra Dun. In 1961 celebrations were held to mark completion of 100 years of scientific Forestry.

In 1952, Government of India enunciated the new forest policy to replace the 1894 policy. While the fundamental principles underlying the 1894 policy are ever true and were therefore reiterated, Government of India thought it fit to lay greater emphasis on a number of other points. It proposed the classification of forests on a functional basis into protection forests, national forests, and village forests. It emphasized the need for evolving a system of balanced and complementary land use, under which each type of land was to be allotted to that form of use under which it would produce, most and deteriorate least. The policy considered it desirable to establish tree lands wherever possible for the
amelioration of the physical and the climatic conditions, and for promoting the general well being of the people. It also laid down that it should be the aim to have one third of the country under forests. It made provision for ensuring progressively increasing supplies of grazing, timber for agricultural implements and firewood to release cattle dung for use as manure. The national policy also apposed the indiscriminate extension of agriculture by the excision of forests, as this not only deprives the local population of wood, grass, etc., but also deprives the land of its natural defences against dust storms, hot winds and erosion. It emphasised that the notion widely entertained that forestry has no intrinsic right to land but may be permitted on sufferance on residual land not required for any other purpose has to be combated.

The role of forests, productive, protective and bio-aesthetic, entitles them to an adequate share of land to promote public well-being and ensure balanced economy. The policy also laid down that it would be the duty of the forester to awaken interest of the people in the development, extension and establishment of tree lands wherever possible and to make them tree-minded. The national forests were to be managed on the principle of progressively increasing and eventually the highest, sustained yield to meet the requirements of
defences, communications and industry. It also emphasised the need for affording protection to wildlife by its proper management for scientific study and for recreational purposes. The policy further laid stress on (1) weaning the local people by persuasion of the baneful practice of shifting cultivation; (2) increasing the efficiency of forest administration by having adequate forest laws; (3) giving requisite training to the staff of all ranks; (4) providing adequate facilities for the management of forests and for conducting research in forestry and forest products utilization; (5) controlling grazing in the forests; and (6) the need for promoting the welfare of the people was evolved in 1927, 1980, 1988 + wildlife.

5.5.2 THE INDIAN FOREST ACT, 1927

This legislation is aimed to consolidate the law relating to forest, the transit of forest produce and levy of taxes of timber. The Forest Act of 1927 classified forests into 3 categories namely.

(1) Reserved Forests (2) Protected Forests (3) Village Forests.27

The State Government can constitute such Forestland as the wasteland and make it into a reserved forest. The state government

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Forest settlement officer is authorised to enquire into all claims relating to the existence of the nature and extent of the rights of private persons in or over the notified land of such claim is admitted the F.S.O shall exclude such land from the limits of the proposed forests or come to an agreement with the owner thereof for the surrender of his rights.

After the stage of enquiry and decisions are complete the State Government shall publish a notification in the official gazette specifying definitely the limits of forests which are to be reserved and declaring the same as reserved forest from the date fixed in the notification thus the Government shall have virtually exclusive control the reserved forest. It has absolute discretion to constitute any land as a reserved forest or declare any land as protected forest. This gives a type of monopoly to the state government to notify a land as reserved forests whether or not they possess the tree cover.
Thus forest Act of 1927 came into existence in recognition of the fact that forests are national wealth, the protection of which is of paramount importance to the community and to the nation, as a whole since forests are located in remote areas inhabited by simple tribal people, the provision of Indian penal code was thought to be unduly harsh on one hand, it is the desire of the government that the beneficiaries of forest should not be treated with harshness on the other hand, it was felt that the gravity of forest offences should not be underrated. The position is rendered more difficult by the fact that some of the most pernicious forest offences are trivial if taken individually but assume dangerous propositions if considered in the aggregate.

5.5.3 NATIONAL FOREST POLICY OF 1952

After Independence the government of India adopted the National forest policy resolution on May 12, 1952. It was stated that the National Forest policy should be based on paramount national needs that were listed as follows:

i). Need for evolving a system of balance and complementary land use
ii). Need for checking
   a) Denudation in mountainous regions.
   b) Erosion on the riverbanks and invasion of sea sands on coastal tracts.

iii). Need for amelioration of physical and climatic conditions.

iv). Need for ensuring increase in supplies of grazing, small wood and firewood.

v). Need for sustained supply of timber and other forest produce for defence, communications and industries and

vi). Need for the realization of the maximum actual revenue in perpetuity consistent with the above need.28

Thus there was not much mention of people's rights over forests on the contrary it was stated [in the National Forest Policy of 1952 that, if undue weight was given to the consideration of entitlement of neighbouring areas to a prior claim over forest and its produce and a preferential claim of agricultural requirements over forests lands, it would lead to loss of natural well-being in the long run.

28 Chopra, Forest and other Sectors, Critical role of Government policy, Economic and political weekly 24th June 1995 p 1480
It was also stated that the use of forest produce by the village communities in the neighborhood of a forest should in no event be permitted at the cost of the National interest and that the scientific conservation of a forest necessitated the regulation of the rights and privileges of the user, however irksome such restraints may be.

5.5.4 THE FOREST (CONSERVATION) ACT, 1980

The policy behind statutes relating to forest had been moulded with a commercial orientation. Hence neither, the Indian Forest Act, 1927 nor the state forest laws could effectively check overexploitation of forests as it was meant only for revenue, there was a felt need to shift the policy from revenue to conservation.

Forest (conservation) Act, 1980 is a notable milestone in this path the law provides that prior approval of the central Government is necessary when any state government or other authority proceeds to deserve a reserved forest or to use the forest for non-forest purposes.
Section 2 of Forest (Conservation) Act 1980\(^{29}\) empowered the central government to appoint an advisory committee to advise on the grant of approval under the above-mentioned provision and to make rules.

In Yaswant Vs State of UP\(^{30}\) the question was whether this law was applicable to reserved forests only it was argued that the expression 'forest lands' of section 2 of the Act relates to lands in reserved forest and not to other forest lands. The Apex court did not accept this contention and held that according to the provisions in the Act even for use of any forest land for non-forest purposes prior permission is necessary. It observed "It appears to us to be clear that for applying the 1980 Act it is not necessary that there should have been a reserved forest. It applies to 'any forest land' which is used

\(^{29}\)Restriction on the dereservation of forest or use of forest land for non-forest purpose not with standing anything contained in any other law for the time being in force in a state, no state government or other authority shall make, except with the prior approval of the central Government any order directing
i). That any reserved forest........ or any portion thereof, shall cease to be reserved.
ii). That any forest land or any portion thereof may by used for any non-forest purposes.
iii). That any forest land or any portion thereof may be assigned by way of lease or other wise to any authority, corporation, agency or any other organisation not owned managed or controlled by the Government.
That any forest land or any portion may be cleared of trees which have grown naturally in that land or portion, for the purpose of using it for reforestation.

\(^{30}\)AIR 1988 All 121
for non forest purpose. 'Any' is a word of a very wide meaning and prima-facie the use of this word excludes limitation or qualification. If the word 'any' is also kept into account, there would be no difficulty in finding the term 'forest' has not been confined to 'reserved forests' only section 2 imposing restriction in the use of forest land for non forest purposes will apply to all the forests.

Another aspect debated is whether the Act extends its protection to forests from the date of commencement only and that the current law ant policy governing forests allows whole sale destruction of forests for mega-projects but does not encourage or facilitate potentially less harmful uses of forest products by local people is supported by the example of Banvasi Seva Ashram Vs State of Uttar Pradesh31 The case was initiated as a public interest writ petition under Article 32 of the constitution on behalf of local people protesting reservation of forest land by the state people in 433 villages had lived in or near the forest for generations and relied on the forest products fruits, vegetables, fodder, flowers, timber, animals and fuel wood for their daily needs. The petitioners alleged that the state had ignored the claims of these people over the forest and that

31 AIR 1987 SC 374.
steps were being taken for the eviction of many of the forest dwellers.

The petitioners further asserted that this curtailment of access to the forest violated the fundamental right to life of the local people guaranteed by Article 21\textsuperscript{32} of the constitution.

In 1983, the Supreme Court prohibited eviction of the forest dwellers pending investigation of their claims over the forest. It also ordered the formation of a high powered committee to investigate the claims of the people over the forest. The state responded that it had already formed such committee. The state committee was chaired by the chairman of the State Board of Revenue and included the up collector, Mirzapur and the local conservators of forests. These three state officials had a strong interest in reserving the forest to the state to ensure that the forest generates revenue for the state. The Supreme court disapproved this biased committee and ordered that a new committee and ordered that a new committee of retired High court judges and two other officials be appointed to adjudicate the customary rights of the people to use of the forests. The court, failed to make the actual appointments and so a more objective committee was never formed.

\textsuperscript{32} Article – 21 of Indian Constitution
In the meantime, the government informed the court that it wanted to sit the proposed Rihand Supper Thermal plant of National Thermal Power Corporation. The NTPC intervened in the case, requesting that the court lift its order prohibiting evictions of local people and allow the NTPC to take possession of land for the project. The court responded with an immediate lifting of the prohibition of evictions on all 1800 acres of forest requested by the NTPC for the project. Although the court noted that the forests are a "much wanted National asset" it determined that a scheme to generate electricity is equally of national importance and cannot be deferred.

The court did not treat the claims of those dispossessed by the forest reservation with such dispatch and difference. First, the court dropped from the action entirely claims over land, which the state had notified as reserved under section 20 of the Indian forest Act. Although the court noted that claimants to this land court attempt to establish their rights "in any other appropriate proceeding" the court gave no indication of what other proceedings are available to these claimants. As to the remaining reserved forestland, the court appointed a commission to oversee administration of claims over that

33 NTPC
34 Such notification is given when a state determines that it has disposed of all claims or that the time period for bringing claims has elapsed
land and ordered that legal assistance to be given to the claimants. The court, however did not address the primary issue in the petitioners claim—whether the local people could assert a claim to the forest arising from their dependence on the forest, based on the right to life guaranteed by Article 21 of the constitution. The established an elaborate administrative machinery for protecting rights already legally established, but begged the most important question for local people, viz., the question of the legal basis for establishing rights over the forest.

Thus implementation of the Nation's afforestation policy has proven as controversial as the policies for conservation of existing forests the afforestation policy has failed in its attempt to balance tribal people's need with environmental preservation. Indeed, only commercial interests have been winners. On the whole, the afforestation programmes have been most popular with already successful farmers who switch from crop farming to more lucrative tree farming. In addition, states have leased large portions of degraded state forest land to industrial firms for afforestation with fast growing species. These changes in crop production and land use have negative effects on the poor and landless. Landless farm labourers lose their jobs when less labour intensive tree farming
operations replace crop production. The tree species chosen for afforestation are generally not sources of non-timber products that can be harvested by the poor on a sustainable basis. Mass eucalyptus planting is particularly controversial.

Rural litigation and entitlement Kendra, Dehradun Vs State of Utter Pradesh\textsuperscript{35} This is a significant as the first case requiring the Supreme court to balance environmental and ecological integrity against industrial demands on forest resources.

The case arise from haphazard and dangerous limestone quarrying practices in the Mussoorie hill Range of the Himalayas. Miners blasted out the hills with dynamite, extracting limestone from thousands of acres. The miners also dug deep into the hill sides, an illegal practice which resulted in cave-ins and slumping. As a result, the hill sides were stripped of vegetation and slides killed villagers and destroyed their homes, cattle and agricultural lands. Mining operations upset the hydrological system of the Dehradun valley. Springs dried up and severe water shortages. Occurred in the valley an area formerly blessed with abundant water supplies. At the same

\textsuperscript{35} AIR 1985 SC 652.
time, mining debris clogged river channels and during the monsoon season severe flooding occurred.

The state of Uttar Pradesh failed to regulate the mining as required by existing mining laws. In 1961 the state minister of mines did shapely curtail mining in the area in less than a year, however, quarry operations successfully lobbied with the chief minister of the state to reopen mining operations mining leases were granted for 20 years. Illegal and destructive practices continued and existing mining safety rules were floated with no enforcement by corrupt and effective State officials.

In 1982, eighteen leases came up for renewal the state, finally recognizing the dimensions of the ecological devastation in the valley, rejected all the renewal applications. The Allahabad High Court however issued an injunction allowing the applicants to continue mining, presumably in the belief that economic consideration outweighed ecological factors.

At this point, in 1983 the Supreme court treated a letter received from the Rural litigation and entitlement kendra, complaining against the environmental degradation, as an Article 32 petition. The
case developed into complex litigation as lessees of more than 100 mines joined the action, engaging an impressive array of the nation's top lawyers to argue for continuing mining in the region.

The Supreme court played an activist role in this litigation, essentially conducting a comprehensive environmental review and analyses of the national need for mining operations located in the Dehradun valley. In addition, the court provided for funding and administrative oversight of reforestation of the region.

The court concluded in 1988 that continued mining in the valley violated the forest (Conservation) Act. Moreover the court went beyond the requirements of the Act to merely conserve forest and issued orders to ensure that the valley be reforested. 36

The court noted that although the State of Uttar Pradesh had a reforestation programme, the record of reforestation was not encouraging the court established a monitoring committee comprised of central, state, local officials and two 'public spirited' citizens to oversee reforestation, mining activities and "all other aspects necessary to bring about normalcy in the Doon valley". The court also

36 AIR 1988 SC 2187, 2195.
provided the monitoring committee with funding by ordering that 25% of the gross profit of the remaining mines be deposited in a fund controlled by the committee.

5.5.5 NATIONAL FOREST POLICY, 1988

The Government in 1988 made some drastic amendments to the forest conservation Act of 1980. Under this amendment the State governments cannot without previous sanction (of the central government) assign by way of lease or otherwise any forest land or any portion thereof to any private person or to any authority, corporation, agency or any other organisation, not owned managed or controlled by the Government.\(^\text{37}\) A provision in the amendment (section 21 (iv)) lays down that the state government cannot, except with a the prior approval of the Central Government, direct that any forest land or any portion thereof be cleared treed which have grown naturally on that land for purpose of using it for reforestation.

Thus National Forest policy enunciated in 1988 has taken due care in announcing the intention of associating the tribal population

\(^{37}\) Section 2a, iii
in forest development. The concern for the tribal population is reflected in every word of the policy statement.

5.6 WILD LIFE PROTECTION LAWS & POLICIES

The Wild Life (Protection) Act of 1972 was promulgated out of a felt need to have a central legislation dealing not only with hunting but also with the creation of protected areas, and the control of trade in wild life products. This Act also provides for the establishment of wild life Advisory Boards and the appointment of wild life preservation staff. It further contains certain categories of wildlife, listed in schedules, according to which several specified animals are completely protected throughout India, others which are permitted to be hunted only under certain restrictions and a few which are declared vermin and allowed to be hunted.

The 1972 Act has been accepted by all the states and union territories of India except Jamu and Kashmir. This state has its own wildlife protection Act. One most significant steps towards wildlife

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38 Schedule-1
conservation in India was the farming of the National wildlife Action plan in 1982 prime Minister Indira Gandhi outlined a broad frame work for wildlife conservation at a meeting of the Indian Board for wildlife, which consisted of the following:

i). The establishment of a network of protected areas such as national parks, sanctuaries and biosphere reserves to cover representative samples of all major wild life ecosystems and with adequate geographic distribution.

ii). The restoration of degraded habitats to their natural state, within these protected areas.

iii). The rehabilitation of endangered and threatened species and their restoration to protected portions of their former habitats, in a manner which provides some reflection of their original distribution.

iv). The provision of adequate protection to wildlife in multiple use area\textsuperscript{40} so as to form 'corridors' linking up the protected areas and providing for genetic continuity between them.

\textsuperscript{40} Such as production forests and pasture lands
v). Support for the management of botanical gardens and zoological parks and undertaking captive breeding programmes for threatened species of plants and animals.

vi). The development of appropriate management systems for protected areas, including a professional cadre of personnel fully trained in all aspects of wildlife and sanctuary management, as well as the provision of proper orientation to all officers concerned with wildlife.

vii). The development of research and monitoring facilities which will provide a scientific understanding of wildlife populations and habitats essential to their proper management.

viii). Support of wildlife education and interpretation aimed at wider public appreciation of the importance of wildlife to human betterment.

ix). The review and updating of statutory provisions, providing protection to wildlife and regulating all forms of trade, so as to ensure their current effectiveness.

x). Assistance in the formulation and adoption of a National conservation strategy for all living natural resources on the lines of the world conservation strategy launched in 1980.
xi). Participation in International conventions designed to prevent the depletion of the wildlife resources and to provide protection to migratory species.

xii). Long term conservation of wild life based on the scientific principles of evolution and genetics.

The National Action plan was formulated consisting mainly of the following objectives:

a) Establishment of a Representative Network of protected areas.
b) Management of protected areas and habitat restoration.
c) Wild life protection in multiple use areas.
d) Rehabilitation of endangered and threatened species.
e) Captive breeding programmes.
f) Wild life education and interpretation.
g) Research and monitoring.
h) Domestic legislation and International conventions.
i) National Conservation strategy.
j) Collaboration with voluntary bodies / Non government organizations.
Apart from efforts at protecting wildlife generally throughout India, by the promulgation of the Wildlife (Protection) Act and the creation of National parks and sanctuaries the central and state government have also initiated some special programmes aimed at preserving certain endangered species. The best known of these is project tiger, project Hangual, Crocodile Breeding project, Gir Lion sanctuary project, Himalayan Musk Deer project, and Manipur Brow-Antlered Deer conservation project.

At International sphere, India is only one of two countries \(^{41}\) to ratify all the major International conventions governing wildlife, including the convention on international trade in endangered species of wild fauna and flora \(^{42}\), the Ramsar convention on wetlands of International importance, the Migratory species of wild animals convention, and the whaling convention.

The wildlife protection Act of 1972, amended and made more stringent in 1991, and the creation of a vast network of strictly protected parks and sanctuaries are the welcome steps taken by the

\(^{41}\) Apart from Denmark
\(^{42}\) 1973 (CITES)
Government of India in an urge to protect the forests as well as wildlife there in.43

5.6.1 AMENDMENTS TO WILD LIFE PROTECTION ACT 1972

The Indian Wild Life Protection Act, 1972 was amended in the year 1986, 1991 and 2003. these amendments in fact added new dimensions to the protection of wild life. The 1986 amendment aimed at prevention of over exploitation of endangered species of wild fauna and flora through international trade. Dealing in ivory was banned. International trade through private channels of wild animals and animal articles was also disallowed. It could be done only through government of India agencies. The 1991 amendment went ahead. Import of ivory was banned in order to help international attempts to protect the elephants in other parts of the planet. The amendment also prohibited killing of snakes and destruction of specified plants. Collection of snake venom was regulated and use of specified plants controlled. The role of tribal people in this respect was emphasized. Thus the amendment recognized an essential facet of environment, namely the relationship between human beings with other living

43 Ramachandra Guha "Forest Debate and Draft forest Act. Who wins loses?" Economic and Political Weekly. August 20, 1994
human beings and plants for the first time there was an initiative for harmonization of the needs of the tribal people and other forest dwellers with the protection and conservation of wild life. The recent amendment in 2003 brought radical changes for the protection of ecology in wild life. It makes a declaration hereafter the wild life law is to protect wild life, birds, and plants and for taking up matters connected therewith with a view to ensuring ecological and environmental security of the country for carrying out these purposes, the 2003 amendment envisaged new institutions and mechanisms. Constitution of a national wild life board and state boards, permit system for exploitation of wild life resources within a sanctuary, conservation reserves for protecting landscape and habitat and independent code for forfeiture of property derived from illegal hunting and trade and some of them.44

As a developing country, India has had to experience a rapid rise in industrialization. But until recently not much though had been given to the problem of industrial pollution. This rapid industrialization has given a deathblow to the forest the living habitat in it.

The comprehensive legislation which is called the Environment (Protection) Act, 1986 has included in its definition of environment\textsuperscript{45}, water, air and land and the inter-relationship which exists among and between water, air and human beings, other living creatures, plants, micro organisms and property even though this comprehensive legislation does not include the words forests and wild life explicitly, it implicitly means the total ecosystem and its interrelation.

The Government of India in the Ministry of Environment and forest issued a notification under sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (protection) Act 1986 read with clause (d) of sub-rule (3) of Rule 1986, empowering the Central Government to impose certain restrictions and prohibitions on the expansion and modernization of any activity or the undertaking of any project, unless environment clearance has been granted by the government. Whenever it appears to the Central Government that it is in public interest to dispense with the requirements of notice will be issued. The impact Assessment Agency shall prepare a set of recommendations based on the technical assessment of documents.

\textsuperscript{45} 2(a) of Environment (protection) Act - 1986. In this Act, Unless the context otherwise requires-environment includes water, air and land
and data furnished by the project authorities and supplemented by data collected during visits of sites of factories, if undertaken and details of public hearing. The assessment shall be completed within a period of ninety days from receipt of the requisite documents and data from the project authorities and completion of public hearing and decision conveyed within 30 days thereafter.

The State pollution control Board shall cause a notice for environmental public hearing, which shall be published in at least two news, papers widely circulated in the region around the project. Suggestions, views, comments and objections of the provision any public spirited individual, environmental groups can represent it the construction of a project is detrimental to forests and wildlife. This provision is very useful for the protection of the Eco system and its bio diversity.

5.7 ECONOMICS OF FOREST CONSERVATION

Environmental economics considers the environment as an integral part of economic growth. Development is not genuine if it is not sustainable. Sustainable development requires that government must take appropriate steps to correct market failures and reform
policies proper valuation of resources is crucial in planning process. The ultimate source of environmental degradation and unsustainability is lack of commitment in our macro-economic and environmental policies as also market purpose.\textsuperscript{46}

Environmental economics looks at Environment as an integral part of genuine growth. The words ecology and economics stem from the same Greek root 'OIKOS' which means House Hold. Thus there is fundamental relationship between these disciplines given the changes that occur between complex communities of producers and consumers. At the beginning of this century, supply of most environmental resources like clear Air, pure drinking water, etc., exceeded demand at zero prices. But over years, the increasing pressure on these resources and further due to their abuse, they have become scarce goods now nothing is available free. Every thing is sold.

Until recently, natural capital was not treated as a conventional form of capital. Its depreciation and maintenance requirements were not included in economic calculations. All environmental functions or

\textsuperscript{46} Dr. Madhu Verma. 'Economics of Sustainable Forest Management', Kurukshetra, Vol XLV, Jan-1997.
services as water and nutrient cycling or climate regulation were not accounted for. Since there were no markets for them, they fell outside the price system and were essentially priced zero.

But now due to increasing pressure of population and technological advancements, the environmental resources have become scarce goods in both developing and developed economics. Thus there is a reversal in the demand and supply equation of quality environmental for environmental quality has registered a sharp increase and supply of clean air, water and other environmental functions have declined. While the former is a product of affluence the latter is a product of effluence.

5.7.1 Concept of Total Economic Value

The Economist's approach to the issue of measuring importance is based on people's preference. Preferences, in twin are measured by the individual's willingness to pay\(^{47}\) for some thing valuation process is thus Anthropocentric. The resulting valuation is in money terms because the way in which preference revelation is

\(^{47}\) WTP
sought ie., by asking what people are willing to pay, or by interfering
their WTP by other means for example.

<table>
<thead>
<tr>
<th>Cost of the Commodity</th>
<th>Degree of Pollution</th>
<th>Quality of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Low</td>
<td>Better</td>
</tr>
<tr>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

More over using money as a measuring rod permits the
comparison that is required between 'Environmental values' and
'development values'. Thus Economic valuation is a two-part process
in which it is necessary to demonstrate and measure the Economic
value or environmental assets, ie., the demonstration process and to
find ways to capture the value, ie., the appropriation process.48

The economic value of environmental assets can be broken
down into a set of component parts. According to a Benefit Cost
Rule, Decision to 'convert' a tropical forest for Agricultural
development, would have to be justified by showing that the net
benefits from agriculture exceed the net benefits from 'conservation'
similarly the implications of using forest lands should be fully reflected

48 Prof.(Mrs) Hemalatha Devi V, 'Pollution control, Quality of life; an
Economic perspective, Gitam, Visakha Patnam, 1996
in the cost benefit analysis of development projects. The components that ought to be considered are illustrated in:

<table>
<thead>
<tr>
<th>Costs</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of value of Timber, Fire wood and minor forest produce on an annual basis (including loss of person hours per annum of people who derived livelihood and wages from the harvest of these commodities)</td>
<td>Increased productivity and benefits to the economy</td>
</tr>
<tr>
<td>Loss of animal husbandry productivity (including loss of fodder)</td>
<td>Employment potential.</td>
</tr>
<tr>
<td>Cost of Human resettlement</td>
<td>Access to transport communication and other facilities for the local people</td>
</tr>
<tr>
<td>Loss of public facilities and administrative infrastructure (Roads, buildings, schools, hospitals, railways, electric lines etc.)</td>
<td></td>
</tr>
<tr>
<td>Environmental losses (soil erosion, effect on hydrological cycle, wild life habitat, micro climate, etc.,) by adopting a thumb rule.</td>
<td></td>
</tr>
</tbody>
</table>

Typically the benefits and costs accruing to the converted land use can be easily calculated because there are attendant cash flows. Timber production e.g. has observable market price. This economics of its production can easily be worked out.

Conservation benefits, on the other hand are a mix of associated cash flows and 'non-market' benefits sustainable Forest
Management thus has a Total Economic value (TEV). TEV comprises use and non-use values. For example TEV for a tropical forests is explained in this table.

**TABLE-2**

**TOTAL ECONOMIC VALUE**

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct value +</td>
<td>Indirect Value +</td>
<td>Option Value +</td>
<td>Existence Value</td>
</tr>
<tr>
<td>Sustainable timber</td>
<td>Nulment cycling</td>
<td>Future uses as per (1)+(2)</td>
<td>Forests as of intrinsic value, as a gift to others, as responsibility and stewardship</td>
</tr>
<tr>
<td>Non-timber</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Recreation</td>
<td>Watershed protection</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Medicine</td>
<td>Air pollution reduction</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Plant genics education Human habitat</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Direct use values:**

Direct use values are those where the output or product can be used or consumed directly. They are fairly straightforward in concept but are not necessarily easy to measure in economic terms.

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49 e.g., fire wood, animal skins, ivory, medicinal plants, construction materials, non-timber products and forest based recreation
Indirect use Values

In direct use values correspond to the ecologist concept of ecological functions or functional benefits. A tropical forest might help in protecting watersheds, so that removing such forest cover may result in salutation, floods, droughts, depending in the alternative use to which the forest land is put to.

Option values

Option values relate to the amount that an individual would be willing to pay\textsuperscript{50} to conserve a tropical forest for possible future, i.e., keeping options open for future use. Option value is like an insurance premium to ensure the supply of something the availability of which would otherwise be uncertain, e.g. genetic diversity. While there can be no presumption that option value is positive, it is likely to be so in the context where the resource is demand for its environmental qualities and its supply is threatened by deforestation. They cover the potential future direct and indirect values.

\textsuperscript{50} WTP
Existence values

Existence values relate to valuation of the environmental asset, unrelated either to current or optional use. They are those that are provided by the continued existence of the resource, independent of any use and current option. Investment or contributions to conservation efforts provide an empirical measure of existence value such values are specifically important in context where the forests have unique characteristics of cultural significance e.g.-Amazon Rain Forest thus total economic value can be expressed as $\text{TEV} = \text{Direct use Values} + \text{Indirect use Value} + \text{Option Value} + \text{Existence Value}$.

Another method which can be used for assessing the value of forest resources in an integrated manner is the concept of marginal opportunity cost\(^5\). MOC comprises direct and indirect costs for exploiting resources, forgone current benefits for keeping the resource for future and external costs. External costs means costs imposed on the society by the action of others. But the draw back of this method is shown in the table below.
## DIRECT AND INDIRECT COSTS

<table>
<thead>
<tr>
<th><strong>Direct costs</strong></th>
<th><strong>Indirect costs</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Standing trees are valued at their present market value since there is a market price-size relationship, young trees are undervalued at or excluded altogether.</td>
<td>i). Intangible benefits and costs are difficult to quantify</td>
</tr>
<tr>
<td>2. Value of climbers creepers and medicinal plants is overlooked</td>
<td>ii). Under valuation of goods consumed by the poor are undervalued.</td>
</tr>
<tr>
<td>3. Price of forest land is not taken into account and compensatory afforestation costs are misleading because a mixed forest cannot always be created within the 50 year accounting period</td>
<td>iii). Costs of extinction of species are disregarded</td>
</tr>
</tbody>
</table>

Thus for obtaining True economic value\(^\text{52}\) for forest resource it is very essential to assess the value of all goods and services of the sector by using direct and indirect valuation methods like market pricing, contingent valuation (willing to pay) hedonic pricing\(^\text{53}\) and travel cost method\(^\text{54}\).

\(^\text{52}\) TEV  
\(^\text{53}\) Value of resource in relation to other neighbourhood variables  
\(^\text{54}\) Total cost incurred in traveling up to forest recreation site
The impact assessment should be made by an independent agency. It is after making an objective assessment of the impact of a project that the best practicable means popularly known as 'bpm' has to be applied. In an industrial society a pollution free environment may perhaps be only an ideal dream. The only thing which can be done is to reduce the hazards of air pollution to the minimum, taking into account the benefits accruing to society from industrial activity. The concept of bpm is a method of controlling air pollution on the basis of a cost-benefit components to be considered in the cost benefit analysis of projects having impact on people in and around an industry causing air pollution.55

The cost on an industry can be viewed as tangible and intangible costs. The tangible costs are clear and one can easily estimate using the market values. In the same way when an industry is taking steps to combat and control pollution like installation of treatment plants, maintenance and manner and periods of operations of plant and machinery, construction and maintenance et, they can be calculated as they are tangible. By careful analysis between the

damages and the cost of control the tangible costs can be calculated. 56

Table 3

<table>
<thead>
<tr>
<th>Costs</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tangible</strong></td>
<td><strong>Intangible</strong></td>
</tr>
<tr>
<td>Land, labour, capital, technology</td>
<td>Health death substandard</td>
</tr>
<tr>
<td>Cost on public facilities like electricity charges, water costs including costs for installation of pollution control equipment or treatment plants</td>
<td>Growth &amp; yield intangible costs of Trees &amp; Crops low rental values and land values deformities in human growth etc.,</td>
</tr>
<tr>
<td>Human settlement</td>
<td></td>
</tr>
</tbody>
</table>

Intangible costs are difficult to estimate in effect. The loss due to death of people in a particular area because of pollution, decrease in rental values, land values, health of the people because of

56 ProfHemalatha Devi. V., Pollution Control-Quality of life, an economic perspective, Gitam, Vishakhapatnam, 1996
pollution cannot be monitory estimated i.e., the social cost caused if pollution is uncontrolled has also to be taken into consideration is assessing the cost factor. It is at this juncture; bpm' approach has to be taken in to account as it takes into consideration practicable having regard among other things to the local conditions and circumstances, to the current state of technical knowledge and to the financial implications, and the means which is adopted should not only include method of treatment but also design, installation, maintenance and manner of operation of machinery.

There is no dearth of laws relating to protection and conservation of forests and habitat in it. But the problem lies on implementation machinery forests and wild life protection has always been given least priority in budgetary allocation. And also the laws do not directly attack the actual destruction of it. Generally the under valuation of forest resources makes them not to get reflected in India's National Accounts. The National Accounts have so far considered mainly commercial wood and small amount of firewood. There is no provision for taking depreciation and degradation of forest capital into account and further loss of some valuable functions of forestry sector are ignored totally. The laws should consider this
aspect as well as the intangible losses causing and suitable the prevailing laws have to be amended.

5.8 Conclusion

Any forest or wildlife law, to be take care of the conservation of Bio diversity and the livelihood security of local communities unfortunately policies and laws regarding forests and wildlife have not been sensitive to the special relations of such communities with natural habitats. Overburdened with head-loads of lows, enacted un mind fully, ignoring basic needs of masses, people feel hostile instead of cooperating in their enforcement also the forest policy till recently ignored the genuine needs of the local population, which as a consequence have had to be met by haphazard cutting from natural forests.

Any bio diversity conservation strategy based on a centralized, bureaucratic and policing system is doomed to be failure apart from being profoundly unjust. This is as much true of reserved and protected forests declared under the Forest Act of 1927, as it is of National parks and Sanctuaries declared under the wild life (Protection) Act-1972. The protection offered to our last natural
Habitats, especially under the latter, has been substantial and significant, there is no doubt that even these areas would have been gobbled up by commercial forces it were not for the operation of wild life Act. However, the protection is likely to be fragile and short-lived given sufficient economic motive and political support it can be easily taken away.

The other reason for environmental degradation especially forests is faulty planning and policy making. For any policy or legal machinery, the main object is to promote sustainable development. For putting principles of sustainable development into practice requires knowledge and proper interaction of ecology, economics, law and sociology. Though sustainable development has often been interpreted as a dynamic interaction among the production system, natural system and social system, planners have tended to focus on the production system as an easy and practical way of planning economic development in its initial stages. Forest ecosystem is the worse sufferer of this approach of planning process. So there should be proper laws backed by economics and the government policy should provide for adequate budgetary allocations.

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