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Impact of Human Activities on Forest Cover

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Abstract: *Forest cover is one of the most valuable natural resources that supports biodiversity, ecological balance, climate regulation and human survival. In recent decades, rapid industrialization, urbanization, population growth and excessive exploitation of natural resources have caused severe depletion of forest cover in India. Deforestation, forest fires, shifting cultivation, mining, overgrazing and developmental activities have resulted in soil erosion, floods, droughts, loss of biodiversity and ecological imbalance. The destruction of forests also affects tribal communities, agricultural productivity and the overall economy of the country. This article discusses the major threats to forest cover in India and highlights their environmental and socio-economic consequences. It further emphasizes the importance of conservation strategies such as afforestation, agroforestry, social forestry, environmental awareness programmes and sustainable resource management. The study also focuses on environmental ethics, public participation and eco-regeneration measures including green belts and protected forest areas. Conservation of forest resources is essential for achieving sustainable development and ensuring ecological security for future generations.*

Keywords: Forest Cover, Deforestation, Biodiversity, Environmental Degradation, Conservation Strategies, Sustainable Development, Afforestation, Agroforestry, Forest Fires, Ecological Imbalance, Natural Resources, Environmental Awareness, Green Belts, Eco-Regeneration, India

I. INTRODUCTION

In the present decade, we have reached an alarming position where deterioration of environment may prove fatal to our life. The environment crisis needs much attention to create awareness and strategies to combat adversity. Deterioration of resources has reached a stage where it is difficult to replenish it in near future. There are many natural resources which are vanishing at a distressing rate. Among these are our valuable forest covers. These forest covers are repositories of an innumerable wealth of biodiversity. There are invaluable possessions which have evolved and formed over millions of years and we are constantly losing it in short span. Human life is dependent on vegetation in myriad ways and these are considered as the vital source of sustainability for the human. Indian environment is bestowed with rich biodiversity and varied environmental regions such as mountainous, great plain, peninsular upland, western desert complex and coastal plains. The forest cover is continuously under threat of over exploitation creating various environmental problems which are concerned with ecological imbalance, frequent and discriminate uses of natural resources, a threat to wildlife, encroachment of reserve forest poverty, pollution, population explosion, fresh water, people's interference and related aspects of science and technology. The depletion of forest cover may attribute to population explosion which further leads to ecological imbalance and is a foremost threat to environmental sustainability.

It's now a high time where we must dedicate ourselves to the protection and management of our life-sustaining environment. We all must join hands to ensure that barren lands, denuded hillsides and eroded watersheds are covered with trees and plants. However re-establishment of vegetation in devastated parts itself is a crucial and challenging task and moreover, environmental resources are being depleted at a faster rate than they are replenished.

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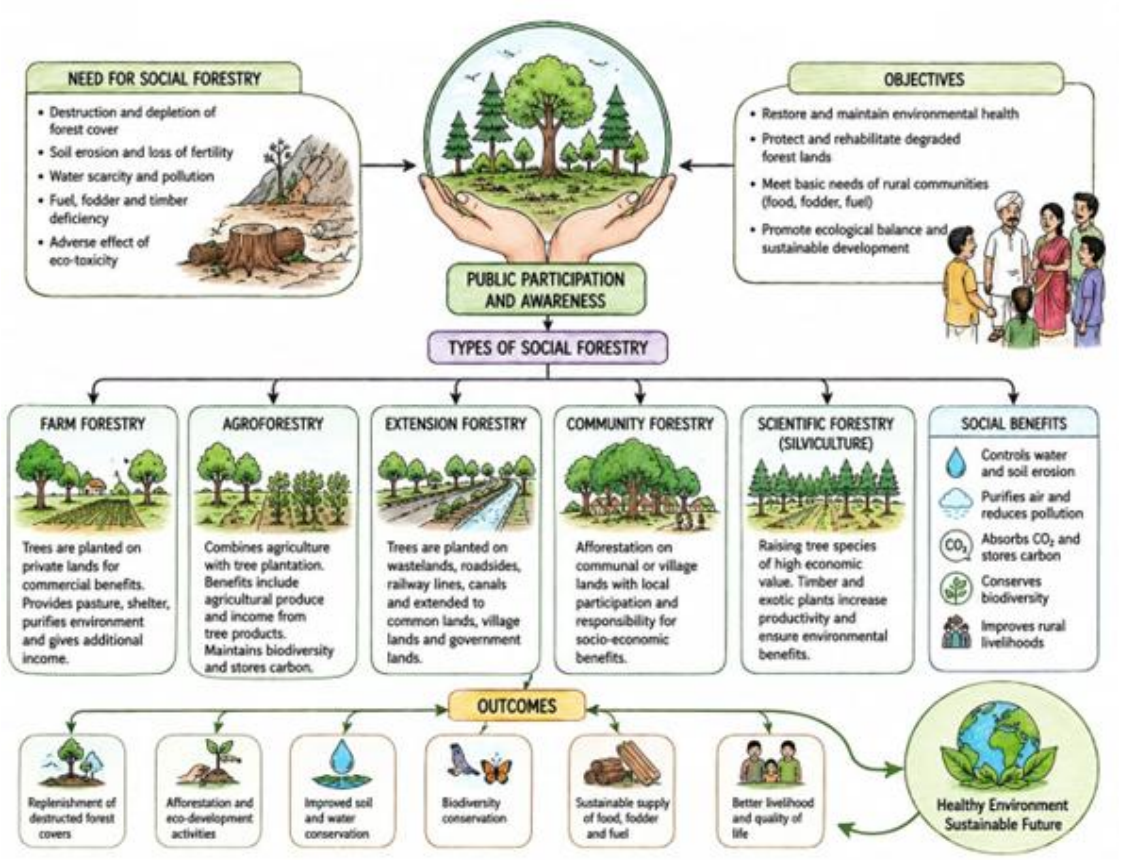

Figure 1

II. SOCIAL FORESTRY: RESTORING NATURE, IMPROVING LIFE

Exploitation of the Environment

Progress in science and technology has contributed significantly to degradation of the environment and in process of urbanization man has destroyed plant cover wealth which is built in over millions years. Most of the forest cover had been exploited without any provision for sustained yield management. The whole ecosystem is being disturbed because of haphazard exploitation of natural resources.

With development, a large area of forest cover has been destructed to meet the demand and has become one of the major contributors in the destruction of the environment. Due to the increase in population, the demand for settlement and to full-fill the need to feed the overgrowing population, forest covers are rapidly transformed into agricultural land. A large fraction of tribal and rural people are dependent on forest for their livelihood. About 300 million people are dependent on shifting cultivation where a large area of forest is cleared annually for cultivation and after burning, the land is left barren. Overgrazing by cattle for a long period restricted the replenishment of vegetation due to which a large vegetation cover is used up by the livestock. Besides this, there are many other causes too which enhanced the practice of denudation of forest cover. Forest trees are destroyed for commercial use like timber, fire wood, fodder etc. for the establishment of mines, the adjoining areas are cleared by forest logging which causes various problems in the vicinity of mines.

The forests are also prone to fires that result in tremendous loss of forest area. Approximately 33% - 90% forest areas are under threat of forest fires. The major cause of forest fires is due to human activities. These forest fires have many consequences and cause soil erosion by removal of leaf litter from the surface. According to the Forest Survey of India,

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out of 63 million ha. of forests, about 3.73 are annually affected by fires and causes forest loss. A large fraction of forest cover is removed for the construction of dams that cause floods, droughts, land-slides in the area.

On one hand, deforestation has fulfilled the requirement of humans and made it convenient to adjust with the developmental change with time. On the other hand, unfortunately, it has led to many negative consequences because of depletion of forest cover. The destructed lands are deprived of fertility and are no longer in use for the agricultural purpose. The exposed soil after denudation undergoes damage due to heavy rainfall and sunlight. The vegetation not only absorbs water but it also channelizes water flow.

The soil also gets eroded through water flow and leads to floods. The soil erosion of top soil also causes siltation of rivers and affects coastal fisheries and coral reefs. Deforestation has led rampant flooding of rivers and devastation of a vast area of cultivated lands and in due course loss of human habitation. Due to the destruction of one, other calamity is caused resulting in climate change and many other consequences and eventually causing loss of biodiversity. As per documentation, the extinction of species is attributed to the destruction caused by human, depletion of original forest which is home to various rare and valuable species, draining of wetlands, ploughing of grasslands at an extensive level etc. The tribal populations are displaced from their place due to denudation of forest area and suffer for their life. Because of tremendous loss in natural resources, country's economy and people's health is also at stake.

In developing countries, poverty is the main concern which is also attributed to land distribution pattern. The land resources are constantly degrading and a large area of land is in severe deterioration. Some of these are in form of salt affected usar & kaller lands, water logged sites, deserts, mine spoiled lands, shifting cultivation tracts, ravines, areas affected by floods & droughts, riverine lands, torrents, streams, industrial and urban settlements.

Because of such deterioration, around 1/3rd of our total land resources remain unproductive and another one-third is degraded and its fertility is lost to a greater or lesser extent so it remains partially productive. In this way, a large portion of fertile land is lost and only a few good natural forests have remained to us. The loss of tree cover has resulted in the shortage of fuel. The continued denudation of water sheds has stripped top soil and excessive run off which ultimately results in premature siltation of reservoirs as well as recurring floods and droughts in increased frequency and severity.

According to India State of Forest Report (ISFR)-2015, total forest cover has been recorded as 697898 km² in 2013 to 701,673 km² in 2015. Total change in forest cover area is 0.54 %.

Below is the table showing decline in Forest Cover (Km²) and probable causes of the change in States/UTs as per India State of Forest Report (ISFR)-2015

Sl.No.	States/UTs	Change (km²)	Reasons for decline
1.	Mizoram	-306	Shifting cultivation and other Biotic pressure
2.	Uttarakhand	-268	Rotational felling and diversion of forest lands for developmental activities
3.	Telangana	-168	Shifting cultivation and other Biotic pressure
4.	Nagaland	-78	Shifting cultivation and other biotic pressure
5.	Arunachal Pradesh	-73	Shifting cultivation and diversion of forest lands for development activities
6.	Meghalaya	-71	Shifting cultivation and other Biotic pressure
7.	Madhya Pradesh	-60	Rotational felling, submergence of forest cover encroachment etc
8.	Tripura	-55	Shifting cultivation and encroachment on forest lands
9.	Assam	-48	Rotational felling, shifting cultivation, biotic pressure etc.
10.	Chhattisgarh	-35	Rotational felling, diversion of forest land for other activities etc.
11.	Dadra & Nagar Haveli	-7	Heavy biotic pressure
12.	Maharashtra	-4	Rotational felling, diversion of forest land, encroachment etc

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13.	Others (4)	-7	—
Total		**-1180**	

Conservation Strategies And Sustainable Development

The most important element in environmental protection is the proper management of our natural resources. Environment management is a global issue both in developed and developing countries. For proper management, it is the utmost requirement to realize that environmental crisis varies from place to place therefore useful strategies should be made accordingly. The accomplishment of such strategies may take a long time and tremendous effort. Our forest wealth had already depleted at an alarming rate, therefore, need of the hour is to take resource management in a holistic manner as environmental conservation is the basis of economic development and industrialization. For conservation of the environment, exploitation of natural resources should be reduced, natural forest ecosystem must be restored. So, restoration of forest resources in our country should be included in our strategies which may vary depending upon the requirement. Programmes including afforestation, social forestry, agroforestry, plantation of trees having quick growth can be implemented to achieve goals of sustainable development of the environment. Thus, the main concern of all strategies is that use of natural resources should not jeopardize needs of future generation.

Environment Sensitivity & Awareness

Environmental awareness programmes have been an integral part of environment protection strategies but the issues are not properly focused. The movement related to the environment in India began in 1972 with the environmental objective of preservation of threatened species and to control destruction to natural resources of the country. Mass awareness programme is necessary for conserving and protecting forest and environment. There is need to manage socio-cultural systems along with conservational strategies to encourage people's participation. The local or tribal people should be included in the programme to make them aware of the economic benefit gained from the resources and local controls on resource use should be promoted. The basic needs of local people with clean drinking water and proper sanitation should be fulfilled.

The environmental movements are now shaped by legislative and are now more significantly taken up by policy makers.

Environmental Ethics For Sustainability

Environmental ethics play important role in conservation of our natural resources and it existed in our native tradition since a long time. The environmental ethics for sustainability of resources anticipate that human beings share earth's resources with other creatures and it's their duty to conserve those resources. The ethics emphasize on creating the balance between preservation and conservation for two long term approaches. Some ethical values to nurture natural resources includes human values and morals, care for resources which are shared by other living beings also, the resources should be available to those on priority basis who are deprived.

Our Indian culture also believes in holding values of natural resources for the benefit of humankind. The religious beliefs support that exploitation of nature is injustice and irreligious. These moral beliefs existed in our system from a long time and practised by the man and knitted to their descendants and these ethics provide guidelines to preserve and conserve the environment. There are several ethics quoted in Tattariya Aranyak, Vagyavalkya Smiriti, CharakSamhita and other scriptures to advocate protection of natural resources. In past few decades, all religious ethics have been ignored but these traditional cultures provide us with several beliefs were knowingly or unknowingly natural resources are conserved.

III. FOREST COVER, GREEN BELTS & ECO-REGENERATION

Destruction of plants has taken place from the earliest time. The use of forests, grasslands, wildlife and other resources has been most violent in last few decades. The plants are sensitive and are more prone to damage due to environmental hazards. The lower plants are more susceptible to damage. These lower plants are used as bio-monitors of pollution.

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The biodiversity of India is rich and the plants are capable of removing significant quantities of pollutants from the environment. There are about 17926 species of flowering plants distributed over 2991 genera and 251 families in India. About 5000 woody plants of which nearly 2500 are trees and 150 species yields valuable timber and wood. The forest cover in our country is in form of reserve forests and production forests. The reserve forest cover is spread in great mountain chains of Himalayas, Western Ghats, Vindhyas and Satpura ranges, Eastern Ghats, Khasi, Jaintia hills of Meghalaya support about 95% of known Indian wild species including rich endemic floras comprising 5725 species. Endemic species are concentrated in the Himalayas and in Peninsular India. Along with these, there are catchment area, Sacred groves, ecologically fragile areas and over 300 National Parks, Sanctuaries and Biosphere Reserves for wildlife conservation. These areas require eco-development programmes to meet the conservational strategy. There are some productive forests which are managed for commercial purpose. The forest cover is significant for carbon storage and sequestration. Consequently, the harmony between natural environment and long term ecological security can be attained through emphasizing on the conservation of forest cover.

Green belt concept is to link forest preserve district with the central community recreational facility. The concept of green belt is efficient to be used as the sink to many environmental hazards. According to A. C. Hill 1977, alfalfa can remove 0.2 tonnes of NO_2 or SO_2 per square mile per day. Also planting of Pithecellobium dulce is important as it is a quick growing There are governing bodies which are engaged in Ecological restoration and development programmes. Regeneration and restoration of environment can be achieved by public participation and awareness in tribal communities. Through this programme, emphasis is given to replenishment of destructed forest covers along with adjacent area. Afforestation, tree planting, eco-development activities are promoted to meet the need of rural communities.

IV. SOCIAL FORESTRY

For the sustainable benefit, Social forestry is a new approach for restoring and maintaining environmental health. The major objective of this was to encourage people for protection and plantation of the devastated land or forest area to meet their basic needs of food, fodder and fuel. Local people are engaged in plantation activities and fast growing tree saplings are raised. For this purpose, growing of fodder grass, Arjun, Babool, Kanji, Mahua, Neem, Sisso, Sirsa, Sesbania aegyptica are some of the economically important plants. The chief emphasis should be on conservation along with utilization. It includes strip plantation along road sides, wasteland, rail lines, canal banks etc. The social forestry controls water and soil erosion, purification of polluted air and absorption of CO_2.

Social forestry is categorized into different types according to purpose and utility. In Farm forestry, trees are planted on private lands for commercial benefits. This meets diversified utility like pasture, shelter, environment purification and trees are mainly used for additional earning. Another popular type is Agroforestry wherein agriculture is combined with plantation of the tree in order to meet both agricultural benefits along with earning from tree products. This system is suited for landholders to take advantage of agricultural and forest produce in a single venture. This system is better than conventional agricultural practices and maintains biodiversity by creating a complex habitat to support animal, insects & birds along with vegetation. It also aids in carbon storage by trees. In the case of Extension Forestry, the trees are planted on wastelands like roadsides, railway lines, canals etc. The plantation under this is also extended to common lands in villages, panchayat lands, government lands and other left out lands. Thus, the degraded lands outside forests or near villages are covered by some avenue and shade trees. The community forestry aims at afforestation activity on communal land or at the village level. The local participation and responsibility are more, therefore, socio-economic benefits are used for community. The Scientific Forestry or Silviculture is used in broader concept for raising tree species having high economic values. Timber plants or exotics are raised to increase productivity along with environmental benefits. This emphasizes on replenishment of lands and ensuring soil conservation.

The governments have initiated a number of socially significant and environmentally friendly activities to conserve forest and increase forest canopy such as Agroforestry, Social forestry, Farm forestry, Community forestry, Extension forestry etc. Farmers in India also grow agricultural crops, rear animals, plants and certain trees on their land, often on

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the boundary area and contribute significantly in the replenishment of environment. Thus, all these conservational strategies collectively may halt the depletion of forest cover and contribute to the recovery of the degraded environment.Figure1

V. CONCLUSION

Forest cover plays a vital role in maintaining ecological balance, conserving biodiversity and supporting human life. However, rapid urbanization, industrialization, population growth and overexploitation of natural resources have led to continuous depletion of forests in India. Deforestation has resulted in serious environmental problems such as soil erosion, floods, droughts, climate change and loss of biodiversity. It has also adversely affected the livelihood of tribal and rural communities and disturbed the sustainability of natural ecosystems.

Therefore, effective conservation and sustainable management of forest resources have become the need of the hour. Measures such as afforestation, agroforestry, social forestry, environmental awareness programmes, eco-regeneration and public participation must be promoted on a large scale. Protection of forests through proper legislation, ethical values and scientific management can help restore ecological stability and ensure sustainable development. Conservation of forest cover is not only essential for the present generation but also for securing a healthy and balanced environment for future generations.

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