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A STUDY ON DEFORESTATION AND IT'S CONSEQUENCES

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Abstract

The loss of forest cover is now one of the most critical problems that the world must address in terms of its impact on the environment. It refers to the process through which people change wooded land into land that is not forested. When an area of land that is naturally dominated by trees is altered to supply specific services in response to the demand placed on the land by humans, this is an example of deforestation. Between the years 1990 and 2015, the worldwide forest cover suffered a decline of 3.16 percentage points as a direct consequence of careless tree cutting. In spite of the fact that there has been almost a 1% increase in the total forest cover in India, there are still specific parts within the country that have desired a decrease in the forest cover. The most significant contributors to the loss of forest cover are thought to be shifting agriculture, rotational felling, other biotic stresses, and the diversion of forest areas for developmental operations and other such things. The persistent and illegal felling of trees has had an effect on the microclimatic conditions, hydrological cycle, soil quality, biodiversity, and other aspects of the nation, which has resulted in the country becoming more susceptible to the occurrence of any unforeseen catastrophe. Some of the actions that may be taken to slow down the rate of deforestation include the adoption of sustainable forest management techniques, the development of alternatives to shifting cultivation, the encouragement of plantation outside of forested areas, and the use of forest products that have been independently certified.

keywords: *Deforestation, Consequences*

Introduction

Loss of habitat is caused by deforestation, but the preservation and maintenance of natural forests leads to an increase in the variety of living things. The biological variety of the natural forest provides the foundation for life on earth, including human existence, and it is a sure way to secure the plenty of the land for people who will live in the future. In essence, if we preserve the forest, we will not only ensure the continuation of the existence of a number of different ecosystems, but we will also ensure the continuation of the human environment. In the long run, we may have food security, improved agriculture, recreational pursuits, and other draw advantages via different the kinds of life that the forest houses if we preserve the many distinctive components of the forest as well as the biological diversity of the forest. These benefits can be derived through different the types of life that the forest houses. Because the full breadth of the unusually rich and varied biological inheritance of tropical places is currently under danger, biological variety is the guarantee we need for healthy living both now and in the future. Biological diversity is the assurance we need for healthy living both now and in the future. The issue of deforestation and the loss of habitat should be seen as a global concern and urgent attention should be given to it because there are so many reasons why it should be seen as a global concern and why it should be given urgent attention. Some of these reasons include the ever-increasing human

population, the persistent scientific advancement of new uses for biological diversity, and the current extinction or gradual disappearance of some rare plants and animals. Even in the face of such worrisome conditions, there are still nations throughout the globe that are cutting down the trees in their immediate vicinity, particularly the countries that have a high standard of living. The impoverished nations of the globe have relatively low rates of deforestation due to the fact that their available income is restricted in carrying out large-scale exploitation in their environment. However, as the incomes of these countries continue to grow, more and more areas are being deforested for the sake of development. The vast bulk of the world's protective cover against harmful gases from the atmosphere has been eradicated as a result of human activity in the course of building up the surface of the planet and altering the general environment. This cycle has been going on for a very long time; in fact, it has not stopped for centuries. However, during the course of the past two centuries, and especially over the period of the most recent few years, it has accelerated significantly. Cutting tools have decimated, damaged, and felled the world's forest ecosystem to the point that only insignificant remnants of the forest's original degree of diversity remain. Particularly hard-affected are the world's wooded regions, which have, on average, lost around half their area over the period of the last few hundred years. wooded areas have been hammered especially hard by human activity. One of the primary causes of environmental degradation is the clearing of land for agricultural and development purposes. The amount of land that has been employed for agricultural purposes has nearly increased by a factor of 100 during the course of the last century. The amount of land that is used to graze cattle has skyrocketed in recent years. The agricultural industry in the United States is responsible for the loss of almost all of the country's tall grass grasslands and almost half of the country's wetland areas. Researchers have focused their attention on tropical rainforests for two primary reasons. To begin, despite the fact that these habitats comprise just 7% of the surface area of the Earth's territory, they contain the higher percentage of the species that make up the entire world biota. This is because these habitats have remained relatively untouched by humans. Second, it is expected that the majority of the forest will disappear during the next century, carrying with it a large number of animal groups that will become extinct. Many people have speculated that the rate of extinction in the twenty-first century may even be higher than it was in the nineteenth century. How depressing will it be for everyone on earth to witness the death of the very last individual of a certain species? At the rate at which trees are being cut down right now, that scenario is rapidly becoming a reality. To ensure humanity's continued existence on this planet, not only the animals that reside in the woods but also the forests themselves must be preserved. This study focuses on the affects that human activities have on our forest, the impact that deforestation has on our ecosystem, and the various remedies to avoid deforestation and the loss of habitat. Secondary data sources such as academic papers, newsletters, documentaries, and other materials connected to this topic were used for this research.

Conceptual Clarifications

Deforestation

It is possible to provide a complete definition of deforestation, which would include the alteration or conversion of a natural forest to an area that is not forest for the purposes of agricultural services and development. In a nutshell, we may come to the conclusion that deforestation is nothing more than the irreversible conversion of forested area to other types of land. Because of human activity, over half (47 percent) of the Earth's forest cover that existed more than 8,000 years ago has been lost to extinction. In spite of the sad event described above, forests continue to span more than 25 percent of the earth's surface, which is equivalent to 3.5 million hectares (ha). 55 percent are located in developing nations, the majority of which are found in tropical areas of the planet. According to Angelsen, between 1980 and 1995, poor nations saw a decline of around 200 million hectares (or

10 percent) of their total forest cover, whilst affluent nations saw their forest cover increase to approximately 20 million hectares.

Forest Degradation

Degradation of a forest is a process that has a detrimental impact on the structural and functional aspects of a forest. Degradation of forests is typically caused by human activities, which in turn are heavily impacted by a wide range of socioeconomic, demographic, technical, institutional, and political issues. The deterioration of the forest does not occur abruptly (like an earthquake), but rather it is a slow process that might take a lengthy amount of time before it is visually ascertained. This suggests that the forest deteriorates over the course of time. The gradual deterioration of the forest can also be caused by an increase in disturbance, which can result in a loss of forest products or a reduction in the quality of the forest. This quality can be measured by the thickness and structure of the trees, the biological administrations that provided the biomass of plants and animals, the species variety, and the hereditary variety. When the quality of the forest declines, it is possible that the biotic components of the forest will also be impacted. This can result in a decrease in the quality of the soil and water, as well as interactions between the individual components. This can, in turn, have an impact on the way the forest functions and the amount of goods and services that are provided by the ecosystem. The sole cause of forest degradation is human activity, including irresponsible use of forest resources (such as overharvesting of forest products and overgrazing), uncontrolled wildfires, and the introduction of alien species and pests.

Figure 1. Massive clearing of the forest for developmental purposes.

2. Impacts of deforestation

The value of forests is quite high, and they serve a wide variety of purposes. In a similar vein, the effects of deforestation are felt all over the world and across the whole forest community. The insufficiency of data as well as its inaccurate shape is one of the primary obstacles that prevents researchers from fully comprehending the effect that desertification has on forests.

Impacts on global climate

The influence of deforestation on a broad scale is felt all over the world, but in order to have a complete grasp of the process behind it, it is required to evaluate how it affects the climate on a local, regional, and global scale.

Changes in climate at both the local and global levels are possible as a consequence of the link between deforestation and higher levels of carbon dioxide in the atmosphere, as well as shifts in the mass and energy balances of the earth's surface. Because carbon dioxide quickly absorbs infrared radiation, the shift in land use patterns, particularly the removal of forest cover, has an effect not only on hydrometeorological but also on global CO2 concentrations, which in turn leads to further warming. The removal of tree cover and vegetation results in an increase in the albedo of the region. This is because bare soil reflects more solar radiation than vegetation does, and this, in turn, is a factor that changes the radiation flux in the region. Cloud formation moves to higher altitudes, away from lowland plains, as a result of deforestation in the lower area, which is one of the notable changes that happens in regional climates. Deforestation in the lower area contributes to climate change. On a global scale, deforestation leads to warmer and drier weather owing to the synergistic impact of lower evapotranspiration, higher albedo, and CO2 concentration. This in turn drives desertification, a loss in biodiversity, and melting of the polar ice caps, which eventually leads to food insecurity. All of these consequences are the successors of extremes in climatic fluctuation that are induced by the large-scale decline in forest cover. These extremes in climate variation are caused by deforestation. It is estimated that around two billion tonnes of carbon dioxide have been added to the atmosphere as a result of deforestation in tropical regions. It is noteworthy to note that the CO2 emissions that will be caused by the clearance of forest will practically be comparable to 25% of what is emitted to the atmosphere owing to what is considered to be human emissions. The change in climate is connected, in some way, to the diminishing amount of forest cover. The processes and methods by which these transitions are happening, as well as the ways in which they might be alleviated, can be more clearly defined with more research.

Impact on hydrology and soil quality

Evapotranspiration is one of the elements that can have an effect on the volume and distribution of precipitation, which is one of the factors that determines the global water cycle. There is a direct impact on drinking water quality and quantity, fisheries and aquatic ecosystems, the incidence of floods and droughts, the life of dams as a result of increased siltation, and agriculture as a result of poor irrigation quality and crop production. It is necessary to acknowledge that the protective function of forests is active and has a significant influence on the water resources of metropolitan areas. The upkeep of the watersheds is significantly aided by the presence of forests.

The watersheds that have been damaged or are in the process of being damaged can be restored by reforesting them; but, as soon as the forest or plant cover is removed, the watershed is left exposed to erosion. This erosion leads to siltation in the places that are farther downstream, and as a result, the depth of the river bed is reduced, which increases the likelihood of floods occurring. There are two primary impacts of deforestation that contribute to an increased probability of floods. One way this happens is by diminishing what is known as the "tree fountain effect," in which the interception and absorption of moisture by trees ceases after deforestation, resulting in a decrease in the soil's capacity to absorb moisture and an increase in runoff and erosion. And another way is through the process of soil compaction, which, combined with a weak soil structure, will lead to a lower organic matter content in bare soil that has not been covered by plants. As a result of cutting down trees, the soil might suffer serious damage over the course of several years. The practice of slash-and-burn agriculture, also known as shifting cultivation, involves clearing an area of forests and exposing the bare soil to the adverse effects of climatic extremes such as strong solar insolation and heavy rainfall. Because there was no forest cover and little organic matter in the soil, it was unable to absorb heavy precipitation. As a result, the fertile layers of soil were readily washed away, which ultimately led to a decline in the area's long-term production. The effect

on the soil is based on the interrelation and synergistic effect of evapotranspiration and infiltration, both of which are immediately affected as a result of the reduction in the amount of plant cover. The rates of erosion and siltation are both increased directly by deforestation. The Yangtze River basin in China, along with the major river basins in East Asia and the Amazonian basin, face a heightened threat of flooding as a result of climate change. Slopes and terrains are particularly susceptible to the effects of circumstances like this. The concentrated flow of runoff that predominates may be accounted for by the establishment of shallow gullies as a result of long-term erosion. In locations where there is little plant cover, fast erosion is caused by activities such as cultivating and ploughing along the slopes. As a result of the farming operations that took place on the Loess Plateau, the slopes with a steepness more than 15 degrees exhibited shallow gully erosion. The presence of dead vegetation in an area can help to prevent soil erosion and lessen surface runoff caused by rain that falls early in the season. It is essential to preserve the forest and the cover of vegetation in order to keep the productivity of the soil and the quality of the water coming from both the surface and the subsurface sources.

Impact on biological diversity

The bulk of the world's species may be found in tropical forests, which are home to an extremely diverse array of flora and fauna as well as an extensive gene pool. It contains two-thirds of all known species and sixty-five percent of the 10,000 species that the International Union for the Conservation of Nature (IUCN) identifies as being on the verge of extinction. It is possible that biodiversity should be considered a valuable resource that has to be protected so that it may be used in the future. According to the World Health Organization, traditional people rely on the biodiversity of their surrounding areas for the majority of their medical needs. This number is close to 80 percent. A decline in biodiversity may have an indirect influence on their health care and overall quality of life. One of the most obvious effects of deforestation is the rise in incidences of conflict between humans and wild animals. The loss of forest cover is putting a strain on the habitats of many species, which in turn is causing those species to become more intrusive with regard to human wellbeing [36]. There has been a rise in the number of cases of animal extinction and human invasion. A sizeable chunk of the Himalaya Biodiversity Hotspot may be found along the state's northern border, in the Indian state of West Bengal. The region has experienced significant fragmentation over the course of the past decade, and as a direct consequence of this, there has been a significant reduction in the agricultural yield, as well as a loss of life among both humans and elephants. There are allegations that this region is responsible for the deaths of twenty elephants and fifty people each year. It is also anticipated that if deforestation in the Himalayas continues at the current rate, by the year 2100, the amount of land area in the Indian Himalayas that is covered by thick forest (coverage of more than 40 percent of the canopy) will be reduced to 10%. There is a possibility that this may result in the substantial extinction of 366 unique plant species and 35 endemic animal species. Regardless matter how important something is on a regional or local scale, the loss of biodiversity is a problem that affects the entire planet. There is no question that protecting the forest and increasing the amount of land covered by forests have a favorable association with the expansion and maintenance of biodiversity. In the not-too-distant future, the clearing of forestland to make way for agricultural fields and other uses of land may pose a significant risk to the loss of biological diversity.

Impact on economic and social welfare

Forests provide a contribution to the economy of the globe through the production of lumber and other products derived from forests. The forest provides a variety of benefits, including direct job opportunities in forestry services as well as additional value-added benefits such as recreational opportunities and improved aesthetics.

It is estimated that the annual loss of tropical forest cover costs roughly 45 billion dollars in the United States. When a forest is cut down, not only are the potential sources of economic gain that may be directly gained lost, but also the sources of economic benefit that can be directly received from the resources that the forest maintains, such as biodiversity, soil, and water. Additionally, the cutting down of forests raises the chance of human-animal conflict, which in turn raises the concentration of carbon dioxide in the atmosphere and increases the likelihood of flooding. The close proximity of human populations to wildlife preserves significantly increases the likelihood of human-wildlife conflict (HWC). It has been observed that established families in Central India's near vicinity to Kanha National Park are at a high risk of HWC. The park is located in the Indian subcontinent. Long-term effects are the medium via which deforestation exerts its influence on society. For indigenous communities, development poses a significant threat to their way of life since it invariably results in the modification or abandonment of long-held cultural practices and customs. In the midst of the development of infrastructure, which frequently results in property disputes and interpersonal tensions, the community's religious and cultural traditions are rarely preserved. According to the results of a household survey conducted in rural parts of the states of Madhya Pradesh and Chhattisgarh in India, it was discovered that the poorest members of the local community obtained almost thirty percent of their livelihood from forest produce, a figure that was said to be even greater than the returns from agriculture. In addition, during times of crisis in rural regions, forests offer a possible solution that acts as a safety net. As a result of deforestation, several ecological functions that the forests provide have been compromised, which has direct repercussions for the local populations who were previously reliant on these services to meet their day-to-day requirements. The inclusive approach to the sustainable management of forest resource is a critical factor that recognizes the economy as a subset of society, which is itself a subset of the environment. This is a vital consideration for the inclusive approach to the sustainable management of forest resource. These kinds of considerations have the potential to assist in maintaining the ever-shrinking forest cover and the effects it has over the long run.

Role of Indian government in forest conservation

The Government of India has been making substantial efforts on an ongoing basis to preserve the country's natural resources, particularly its forests. They have not only taken steps to preserve the existing forest cover, but they have also launched a number of initiatives to increase the amount of land that is covered by forests and trees across the country. In India, the sustainable management of the country's forest resources is a shared responsibility shared by the national government and the individual state governments. In order to preserve India's extensive forest cover, a number of measures, regulations, and laws have been enacted and put into effect. There are some of these regulations and legislation that are:

- The Indian Forest Act, 1927: This act is an amalgamation of legislation dealing to forests, the transit of forest produce, and the duty leviable on lumber and other forest produces. The act was passed in India in 1927. It outlines the processes that must be followed before the state government may designate a certain area as a village forest, a protected forest, or a reserved forest. It was not until 2012 that the Act was amended to include a provision that made it illegal to conduct fresh clearances in forests and to light fires within a reserved forest.
- The Forest Conservation Act of 1980 (with a modification in 1988): The major goal of the proposition of this act was to protect the woods and to look into the things that were related therewith or auxiliary or incidental to those conservation efforts. This legislation was amended in 1988. After the passing of this legislation, any kind of repurposing of forest land for uses other than forestry would require the prior authorization of the Central Government. This authorization must be obtained in advance.

- The Government of India took a number of efforts to guarantee that there would be compensatory afforestation, important environmental safeguards, sustainable exploitation, maintenance, restoration, and augmentation of forest areas. One of these actions was the formation of a National Forest Policy, which was also among one of the initiatives done by the Government of India.
- The Wildlife preservation Act, which was passed in 1972: The Wildlife Protection Act was passed in order to preserve wild animals, birds, and plants, as well as for items that were related with, ancillary to, or incidental to the preservation of these things, with the goal of ensuring the ecological and environmental security of the country.
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006: This act was enacted with the intention of recognizing and vesting the forest rights and occupation in forest land in forest dwelling scheduled tribes and other traditional forest dwellers who have been living in such forests for generations but whose rights could not be recorded. The purpose of this act was to recognize and vest the forest rights and occupation in forest land in forest dwelling scheduled tribes and other traditional forest dwellers. These recognized rights of the forest dwelling scheduled tribes and other traditional forest dwellers include the responsibilities and authority for sustainable use, conservation of biodiversity, and maintenance of ecological balance. These rights, in turn, help to strengthen the conservation regime of the forests while also ensuring the livelihood and food security of the forest dwelling scheduled tribes and other traditional forest dwellers.

In addition to these laws, the government of India has also established the Forest Survey of India (FSI), which is an organization that operates under the Ministry of Environment, Forest, and Climate Change. The primary mission of the FSI is to gather and evaluate the forest resources of the country by conducting a survey across the country to determine the size of the country's forests. This, in turn, helps in the process of establishing the sources and drivers behind the decline or increase in forest cover of any given location in India. In 2009, the government of India established another council, known as the Compensatory Afforestation Fund Management and Planning Authority (CAMPA), as a National Advisory Council. This council is responsible for monitoring, providing technical assistance for, and evaluating activities related to compensatory afforestation. It is chaired by the Union Minister of Environment, Forest, and Climate Change. This was done specifically to encourage reforestation and other activities that promote forest regeneration as a means of making up for the loss of forested land that was converted to other uses. The government was working on creating a number of different plans, such as the Integrated Forest Protection Scheme (IFPS), in order to protect the woods from being burned down. The strategy was developed by integrating the forest fire prevention and management approach with forest conservation in the process of designing the scheme. The government of India launched a number of other missions and programs at the same time, including the National Mission for a Green India (NMGI) and the National Afforestation Programme (NAP). The primary objective of the NMGI was to improve the quality of five million hectares of degraded forests and to bring another five million hectares of non-forest areas under forest cover through social and farm forestry. On the other side, the NAP was initiated with the purpose of developing the forest resources with the participation of the people, with the primary focus being on improving the standard of living of the communities that are located on the forest's periphery, particularly the disadvantaged.

Since a very long time ago, the Ministry of Environment, Forest, and Climate Change has held out hope that it would soon be possible to increase the role that women play in the protection of forests on the level of individual communities. The National Forest Policy] made history by recognizing for the first time that it is essential to

have female participants in forestry programs and initiatives. The Joint Forest Management Policy from 1990 required that there be at least 40% female representation in the general body of local forestry organizations like the JFM committee, and that there be 50% female representatives in the executive body. In the latter part of the year 2002, the Biodiversity Authority of India reframed the structure of the local biodiversity management committee and ordered that one-third of its members be reserved for female members. As a result, a better knowledge of the role that women play in the execution of local conservation measures and associated laws has contributed to an improvement in forest management in rural areas of the nation.

The Ministry of Environment, Forest and Climate Change has been optimistic in strengthening the role of women in conservation of forest at local community levels since long. The National Forest Policy], for the first time, acknowledged the necessity of including woman members in forestry schemes. The Joint Forest Management Policy of 1990 mandated woman representatives not less than 40% in general body and 50% in executive body of the local forestry institutions like the JFM committee. Later in 2002, the Biodiversity Authority of India reframing the local biodiversity management committee structure mandated the reservation of one-third of its members as women. Thus, this understanding of the role of women in the local-level conservation measures and implementation of related rules has aided in improving the management of forest in rural regions of the country.

Water and soil resources loss and flooding

According to Bruijnzeel (2004), deforestation also causes disruptions in the global water cycle. Because a portion of the forest has been cut down, the region is unable to store as much water, which results in a drier environment. Drinking water, fisheries and aquatic habitats, flood and drought control, waterways and dams affected by siltation, less appealing water-related recreation, and damage to crops and irrigation systems from erosion and turbidity are some of the water resources that can be negatively impacted by deforestation (Anon., 1994a; Bruijnzeel et al., 2005). According to Chomitz et al. (2007), protecting the water supply of urban areas is one of the most potentially valuable functions that forests do. The cost of water filtration and treatment may be rather high. According to Dudley and Stolton (2003), forests have the potential to lower the costs associated with doing so either actively by filtering runoff or passively by substituting for houses or agriculture that create runoff. Deforestation can also lead to watersheds that are no longer able to support and control the flow of water from rivers and streams. This can be a very serious problem. Once they are gone, too much water may cause downstream floods, many of which have caused tragedies in many places of the world. Once they are gone, too much water can result in downstream flooding. This downstream flow is responsible for soil erosion, which in turn contributes to the silting of waterways, lakes, and dams. Flooding is likely to become more severe as a result of deforestation for primarily two reasons. First, since there is less of an impact known as a "tree fountain," the soil is more likely to be completely soaked with water. The'sponge' begins to fill up sooner during the rainy season, which results in an increase in the amount of extra precipitation that runs off and increases the danger of flooding. Second, the process of deforestation frequently leads to the compaction of soil, which makes it difficult to absorb precipitation. In the immediate area, this results in a more rapid response of stream flows to rainfall, which increases the risk of flash floods (Chomitz et al., 2007). In addition, deforestation causes a reduction in flows during the dry season. It is possible that deforestation will have a negative impact on the soil resource over the long run. When the vegetative cover is removed in order to practice slash-and-burn agriculture, the soil is left vulnerable to the ferocity of the tropical heat and the downpours. The leaf litter and permeable soils that cover forest floors are able to quickly absorb significant amounts of rainwater. the impacts of deforestation on water availability, flash floods, and dry season flows rely on what happens to the opposing

forces of infiltration and evapotranspiration, sometimes known as the sponge and the fountain. The fraction of the basin that is susceptible to erosion has grown as a result of deforestation and other changes to land use, which have, over the long term, led to siltation. The river bed has been elevated due to heavy siltation, which has increased the likelihood of floods, particularly in the Yangtze river basin in China, the major river basins of humid tropics in East Asia, and the Amazonian basin.

Conclusion

The complexity of potential future routes for land use change is increased as a result of both economic globalization and the impending shortage of land around the globe. It is possible that agricultural intensification may result in a greater extension of farmland in a world that is becoming more linked. The apparent conflict between agriculture and forestry can be reduced by practicing spatial management and making use of lands that have been degraded or have low levels of competition. Community-based forest management, which is built on political goodwill and strong community institutions, is one method that may be utilized to further solve this issue. Because of the new problems posed by climate change, immediate action is required to investigate and safeguard the local importance of forests for maintaining a living. According to Butler (2019), the destruction of forests and other natural habitats threatens not just the lives of individual plants and animals but also the very existence of human beings. The process of deforestation contributes to the mechanism that is changing the already vulnerable planet earth, which makes it more difficult for plants and animals to exist. The pursuit of additional land for agricultural operations and the increase of human populations has already resulted in the elimination of all wooded land from the surface of the globe.

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