Short Review on: Deforestation and Its Consequences on Environment

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Abstract:

Deforestation is one of the main causes of biodiversity loss in the world. The factors contributing in this could be human or natural. Natural factors can include forest fire, droughts, floods, over population whereas human factors consist of urbanization, resource farming, agriculture, mining, timber extortion and much more. All of this contributes to the harmful process of deforestation. In this paper, the goal is to cover the already alarming issue of deforestation and its causes which lead to such adverse effects causing harm to all the species across the world. Educating the people on such an issue is important for the revival of our nature. During the years 2010 and 2020, the deforestation rates were higher than the net loss of forests in global reports. According to the UN FAO, 10 million hectares of forest was lost due to deforestation.(6)

About 50,000 species known to us are on the brink of extinction due to deforestation. 137 species of plants and insects known to us are actively being lost to deforestation.(5)

Keywords:

Deforestation, Biodiversity loss, Forest, Urbanization, Afforestation, Economic impact.

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Introduction

Deforestation destroys the rainforests that survive everything. Deforestation undeniably is the elephant in the room of climate change. It leads to habitat loss and biodiversity loss of the planet. These two factors which ensure the life on the planet should be conserved by any means possible. Just by protecting and conserving our trees, our forests, we can ensure the survival of not just us but many other species that contribute to the nature itself. Trees, one of the most important things in the nature, withhold the soil to avoid flooding of areas, give oxygen and store carbon while also providing food, shelter and material to the living beings, have to be preserved for the long run of biome. Tropical jungles cover about7% of the earth's surface but have the greater percentage of species in the whole world.

The motives for recognition of deforestation as a global issue and concern, requiring attention are infinite. Some of the reasons are increasing human population, advancement made in various sectors etc. Despite the alarming rate of deforestation, various countries have not stopped with the land expansion activities.

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Amazon rainforests account for 2.1 million square miles of planet's rainforest, unfortunately these forests are vanishing. During the years of 1991 and 2004, Amazon lost about 10 mammal species, 20 bird species and 8 amphibian species to deforestation. The remaining 20% of the species are also being threatened because of deforestation. (5)

This paper emphasizes on the human actions causing the deterioration of our forests and the impact of deforestation using newspapers, secondary data and other related articles.

Terminology of forest

1. Deforestation

Deforestation can be defined as purposeful removal of forest, turning it into a non-forest for use of agricultural services and development.

The global deforestation peaked in the 1980s. Unfortunately, there is no data providing a constant and consistent data for deforestation that occurred. According to the UN FAO report from the year 1990, the estimated deforestation in

the developing countries was 154 million hectares. Approx. 47% of the forest has been destroyed over 8000 years due to human actions. Only 25% of forest covers the earth. (1)

2. Forest degradation

Forest degradation is referred to as when the ecosystem loses its fundamental capacity to produce and provide due to human activities. This does not happen in a blink of an eye but gradually over the years due to rigorous mutilation of the environment for one's own benefit. This can result in decrease of forest quality like the thickness of the trees, reduction in soil and water quality. Human beings are the only reason for such unfortunate events because of their exploitation for the need of development without any measure for conserving the forests have led to such unfortunate turn of events.

3. Reforestation

The reinforcement in planting trees with various motives in an area is known as reforestation. Mainly the motive being restoration of the lost forest after exploitation for industrial or agricultural use. When the forests are a victim of deforestation, the soil loses its minerals and nutrients which can be a factor for soil erosion but with reforestation, we aim to bring back the trees to prevent this from happening. Forest restoration helps in recovery of damaged forests and it also contributes in ecological, economical factors.

4. Afforestation

Afforestation is known as the process of turning the non-forest land coming in use for development purposes back into a forest. It consists of a process of bringing back the essential properties of a soil to plant trees and create a forest from an abandoned area. It is important to look for a suitable species of plant for the land after inspecting it and carefully keeping factors like water management, soil moisture etc. in mind.

Causes of Deforestation and Biodiversity Loss

Multiple factors contribute in deforestation, be it natural or human factors. Natural factors such as forest fires, floods, drought, and climate change contribute towards deforestation and biodiversity loss. Meanwhile human contributions towards deforestation and biodiversity loss are cattle breeding, mining, dam construction, infrastructure development etc.

1. Land use change

The report from IPBES Global Assessment Report indicates that the main reason for degradation of biomes is transformation of lands into industrial

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productions. Roughly 420 million hectares of forest has been turned into agricultural lands contributing into deforestation.

The increasing human population demands for more intensive farming practices which results in biodiversity loss and destruction of land from excessive farming. A global assessment conducted by Newbold shows that agriculture is a key factor in biodiversity loss and land destruction of more than 80% of land.

One of the agricultural practices in Nigeria, called bush burning is infamous for burning forests to clear space for agricultural space causing the nutrients of the soil to die, thus making it infertile. This demand for more forest to be cleared as the soil becomes unsuitable for agriculture thus becoming a vicious chain causing harm to the nature. The available land becomes unsuitable for growing crops because of such bad agricultural practices. (2)

2. Urbanization

Urbanization has always demanded almost everything it has. From wood, timber, herbs to animals to fruits, the forest has given it all for the human civilization. Demand for medicines, furniture, animal products leads to requirement of more land for cultivation of crops and livestock. Development of a country requires infrastructures which in turn requires the forest in that particular area of construction to be cleared for buildings like, park, school, roads, hospitals, industries etc. (11) Urbanization leads to the direct conversion of forested areas for urban development and agriculture and produces additional indirect pressures to deforest or intensify land use where people are displaced, and the demand for new resources drives people. In an example, farmers displaced by urban development may be pushed to clear forests to acquire more acres to produce crops as land value increases in urban areas. (4)

3. Mining

The industry of mining has contributed to deforestation around the world. Mineral extraction requires a huge amount of land to be cleared resulting in destruction of forests. Metallic ores being important for the development of the human civilization require clearing of land which leaves the forest devastated. This causes soil erosion, sinkholes, loss of biodiversity, chemicals in the soil: making it lose its potential. (10) Toxic wastes from mining tend to heavily impact the people living near the mining sites. Symptoms like nausea, vomiting, diarrhea, headaches, skin rashes start to appear from prolonged dumping of toxic wastes from mining near the residential area. Not only does it affect the land, it affects the aquatic life too. (7) About 10 to 33% of the forest has been affected by mining globally.

4. Intensive crop cultivation

Intensive crop cultivation is an agricultural method used for cultivation of crops on a large scale. It is also one of the leading factors contributing in deforestation.

The process itself involves use of fertilizers, pesticides and other soil harming chemical products. The crops grown by this method are soybeans and palm oil. These crops are high demand crops required for animal food, food industry and other industries. Vast amount of land gets cleared because of the high demand for these crops to establish soy and palm plantations. As the world advances, various new methods of farming have been used by the farmers. However, these new methods have also greatly contributed to deforestation. To raise crops, a farmer must clear a large amount of land, physically or mechanically. (4)

5. Logging and wood harvesting

North America and Russia are infamous for logging and wood harvesting among the world. Valuable goods like timber are provided by the forest which is used to make furniture, papers, and construction materials. Unsustainable practice of logging is the process of mindlessly harvesting trees without allowing the forest to regrow. The degraded forest after logging becomes more susceptible to mining usage of that land, agriculture and settlement. Once the trees are lost, the sunlight becomes way harsh and reaches the ground which might cause an increase in growth rate of unwanted invasive species that could cause harm to the flora. To prevent this from happening, illegal logging of wood should be stopped. Protected areas such as national parks, wildlife reserves are made to keep the forest safe. The locals should be educated about this and encouraged to keep the forest safe. (4)

Consequences of Deforestation

1. Loss of habitat

The forest is a home for many animals and plant species. Deforestation is a danger to those species known and unknown to us. The web of connectivity emerges from the forest. Trees provide shelter to those who may not survive the harsh climate, food for those who cannot fend for themselves. Deforestation not only ruins the land but also takes away the homes of those who reside there. With the absence of trees, the temperature rises and the flora and fauna might not survive. (3) The habitat of 80% of the terrestrial plant and animal species that depend on forests for food, cover, and safety are also most immediately impacted by deforestation. In building agriculture or human-made habitats, we take away the shelter of animals quickly eliminating their homes, usually resulting in species extinction because they may not survive without their natural habitat.

Some of the species like Mountain gorilla found in mountains of Rwanda in Central Africa remain only 900 in numbers.

The Javan Rhinoceros found in Ujung Kulon National Park, Indonesia have reduced to 60 and are categorized as critically endangered.

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The Golden Lion Tamarian living in the Amazon forest has witnessed its house being destroyed due to soy farming and timber extraction and currently made its way to IUCN's list of critically endangered animals. (5)

2. Soil erosion and flooding

Deforestation is responsible for soil erosion and flooding. Trees are also responsible for withholding the soil and preventing the removal of the top layer of the soil. (4) Trees are also responsible for preventing floods in an area by absorbing the water actively. Deforestation tend to reduce the quality of the soil and make it loose its nutrients, despite being resistant to harsh weathers, the forest soil cannot compete against absence of trees in the area. Huge amount of soil can clog the waterways and cause problems in the infrastructures. Farmers are forced to find new land for cultivation as the topsoil gets washed away making it hard for the crops to grow. The barren land left is vulnerable to flooding. (3) Heavy rain can sometimes cause loose soil to slide down hills and cause landslides. Erosion takes soil away that would usually absorb rain, so more rainwater will flow across the surface increasing flooding. Considered together they make the land more susceptible to these hazards.

3. Climate changes

Carbon dioxide is one of the most harmful gases found in the atmosphere. Trees possess the ability to trap carbon dioxide and absorb it. 24% of greenhouse gas emission is done by agriculture making the extra carbon dioxide trapped to escape in the environment. Methane and carbon dioxide being the gases of greenhouse trap the heat in the atmosphere which causes changes in the climate. Global climate change can decrease the survival rates of animals, plants and in fact humans. (3) Deforestation is a big contributing factor for climatic changes accounting for about 12 to 20% of greenhouse gas emission. When deforestation disrupted the carbon cycle, there was decreased absorption and increased retention of carbon in the atmosphere which impacts how the Earth regulates its climate. An example of this is the way tropical rainforests like the Amazon rainforests would absorb moisture and then release that moisture which helps to regulate global rainfall patterns, cools the atmosphere, and helps to stabilize temperatures.

Social impacts

1. Because of deforestation, indigenous people living in the forests are heavily impacted. Due to their deep connection with the forests, they rely on it for their identity, culture, tradition and spiritual practices.
2. Poisoning from mining and oil waste impact the forest soil.
3. Forests are a great source of medicinal plants and have been used as medicinal resources for generations by indigenous people in their traditional medicines.

Access to useful medicinal plants is reduced through deforestation, which limits traditional healthcare practice and traditional options for healing practices.

4. The destruction of forests is an impediment to the rights of indigenous people and local communities, including rights to land, resources entitlement, and self-determination. Conflicts develop when rights are ignored or subordinated, for example in favor of economic development. (8)

Ecological Impact

1. Deforestation makes up about 10% of all global greenhouse gas emissions, which of course contributes to global climate change. Forests could be able to absorb about one-third of this annual atmospheric CO2 production if they are protected, restored or rejuvenated.
2. Forests can help prevent soil erosion by holding soil with their roots and creating a canopy that lessens the effect of the rain when it hits. When trees are cleared, the soil is left exposed to erosion, which leads to sediment loaded rivers and loss of fertile topsoil.
3. Forests are responsible for regulating water cycles. They absorb rain and release it gradually. Deforestation brings hindrance to this process and causes water scarcity, increases flood risks. (8)

Economic Impact

1. Short term effects

Forest has a chain of nutrient recycling that it follows. Organisms breakdown the leaves and debris on the ground, recycling the nutrients right back into the soil. Trees are responsible for holding the soil together and absorbing the minerals. Deforestation ruins this process making the land infertile and susceptible to flooding and soil erosion (9). Loss of forest affects those who live around the forest. About an estimate of 250 million people reside in the forests relying on the forest for food, shelter and resources.

2. Long term effects

The Amazon Rainforest has an estimated USD $8.2 billion annual economic value. This includes profit obtained through sustainable forest-based industries such as timber production from rubber trees. Also, it accounts for profits obtained from the environmental benefits that the Amazon provides, such as influencing prevailing weather conditions in the region and creating new carbon sinks for sequestered carbon. In fact, when it rains less because of dethroned rainforest, the repercussions may affect rainforest dependent agriculture by about USD $422 million a year loss. (9)

Conclusion

Drivers of biodiversity loss can be complex - this paper has considered the major drivers of biodiversity loss, which include land use change, climate change, and urbanization. It becomes clear when we consider the many drivers of biodiversity loss that agricultural expansion, and land use differentiates itself neck-and-neck with other clear cause of losses for approximately 85% of at-risk species. Forest disruption creates ecological disruptions that cause threats to biodiversity loss. Urbanization, as a result of developments lead to biodiversity losses and threatened habitats with resources depending on the growth of urban plans and using ecosystems. The focus is urgency to interject stronger policies allowing development without losing ground from ongoing impacts. Educating the people about environment and biodiversity can help us preserve our forests and reverse the damage done to them.

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