

DEFORESTATION AND ITS IMPACT ON ENVIRONMENT

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Deforestation is caused by the growing demand for forest products and the conversion of forest to agriculture as the human population continues to expand. In 1750 cropland and pastureland occupied 6-7% of the global land surface; by 1990 cropland and pastureland occupied 35-39% of the global land surface. It is estimated that the world is currently losing over 9 million hectares per year which is an area the size of Portugal.

Deforestation not only affects the climate by increasing the atmospheric level of carbon dioxide but also affects the environment by inhibiting water recycling, triggering severe flooding, aquifer depletion, soil degradation and the extinction of plant and animal species.

INTRODUCTION

Deforestation is considered to be one of the contributing factors to global climate change. According to Michael Daley, associate professor of environmental science at Lasell College in Newton, Massachusetts, the No. 1 problem caused by deforestation is the impact on the global carbon cycle. Gas molecules that absorb thermal infrared radiation are called greenhouse gases. If greenhouse gases are in large enough quantity, they can force climate change, according to Daley. While oxygen (O₂) is the second most abundant gas in our atmosphere, it does not absorb thermal infrared radiation, as greenhouse gases do. Carbon dioxide (CO₂) is the most prevalent greenhouse gas. In 2012, CO₂ accounted for about 82 percent of all U.S. greenhouse gas, according to the Environmental Protection Agency (EPA). Trees can help, though. 300 billion tons of carbon, 40 times the annual greenhouse gas emissions from fossil fuels, is stored in trees, according to Greenpeace.

The deforestation of trees not only lessens the amount of carbon stored, it also releases carbon dioxide into the air. This is because when trees die, they release the stored carbon. According to the 2010 Global Forest Resources Assessment, deforestation releases nearly a billion tons of carbon into the atmosphere per year, though the numbers are not as high as the ones recorded in the previous decade. Deforestation is the second largest anthropogenic (human-caused) source of carbon dioxide to the atmosphere, ranging between 6 percent and 17 percent. (Van Der Werf, G. R. et al., 2009)

Carbon isn't the only greenhouse gas that is affected by deforestation. Water vapor is also considered a greenhouse gas. "The impact of deforestation on the exchange of water vapor and carbon dioxide between the atmosphere and the terrestrial land surface is the biggest concern with regard to the climate system," said Daley. Changes in their atmospheric concentration will have a direct effect on climate.

II.DEFORESTATION AND ITS IMPACT ON ENVIRONMENT

This is when a large number of trees are cleared from areas of land for various reasons. The impact on the environment is extremely adverse, and there will be terrible consequences for future generations due to us cutting down, burning, or otherwise damaging the forests. In my essay, I am going to investigate the reasons as to why deforestation occurs and its impact on the environment. I will also look at any measures taken to minimise deforestation to prevent global destruction of rainforests, and ensure resources are available for future generations.

There are many reasons accounting for deforestation despite its harmful effect on the environment. People need timber and wood from the trees to make paper, houses, and buildings due to urbanisation in some areas. It is used for commercial as well as industrial use.

Trees may also have aesthetic, recreational, economical, historical, cultural and religious values to humans. Timber and other products of the forest are important economically both locally and as exports. Deforestation also provides employment to the people who harvest the wood. There are also many other products of the forest apart from wood as a result of deforestation which Herbalists, rubber tappers, hunters and collectors of fungi, nuts, bamboo and berries can utilise. Other non-wood forest products come in the form of medicinal compounds, dyes and fabrics. There are many people who are dependent on forestlands for their livelihoods. One-third of the world's people depend on wood for fuel as a significant energy source.

A competitive global economy forces the need for money in poorer tropical countries. At the national level, the governments sell logging concessions to raise money for projects, to pay international debt, or to develop industry. Brazil had an international debt of \$159 billion in 1995, on which it must make payments each year. The logging companies seek to harvest the forest and make profit from the sales of valuable hardwoods (such as mahogany) and pulp.

Peasant farmers often deforest to rise crops for self-subsistence, and are driven by the basic human need for food. Most tropical countries are very poor and farming is a basic way of life for a large part of the population. Farmers in these countries do not have the money to buy necessities and must raise crops for food and to sell.

One main cause of deforestation in the Amazon is the spread of highways. Recent development of regions in the Amazon resulted in a need for new roads and highways. The opening of highways over the last 20 years promoted new and easy access to forested areas. This expansion combined with government incentives for development of the region, made it possible for activities which causes rapid deforestation, such as land

speculation, cattle ranching, timber extraction, clearing for cash crops like rubber, cocoa and sugar cane and exploration for oil and minerals.

Unsuccessful farmers tend to be unstable, selling out and moving on to new frontiers where they will deforest again, which is very evident in satellite images of the Amazon. The issue is no longer how to prevent migration to the Amazon from the rest of the country but how to ensure that the farmers already in the Amazon remain on the deforested land. This would in turn reduce migration and further deforestation inland.

The poor farmers in the Amazon depend on the resources from the forest for their very survival. Land is needed for crops; trees are burned and used for fuel, and fodder for their animals. The Amazonians do not have very much experience with agriculture and they do not have very much technology. They simply use slash and burn farming, with the belief that setting fire on the forest will rejuvenate the land (which holds true for some forests). In some pine forests, fire can help spread seeds and the heat helps release nutrients in the soil, however, this does not happen in a rain forest. Last year, there were 20,469 forests set in the Amazon, a 28% increase since 1996. The land becomes very dry and useless and the farmers move on to another area and deforest again.

Another cause of deforestation is not the result of farmers but overseas companies looking for more rare and exotic woods which have increased in the last few years by 28%. Many Asian companies buy into logging companies in the Amazon with permits and begin to deforest in numerous amounts.

There are various harmful consequences of deforestation. Hundreds of thousands of species are killed as they lose their habitats due to forest fires, cutting down of trees etc. deforestation also accelerates global warming because when the tree decomposes it releases the CO₂ it absorbed when growing to make carbohydrates, fats and proteins. When a large number of trees are removed from an area, it causes soil erosion because there is no vegetation to reduce the impact of hard rain on the soil and there are no roots to hold the soil in place. It causes desertification (arable land is transformed to desert).

Deforestation could also result in landslides and avalanches. Trees sustain freshwater supplies, so if they are cut down, it affects the availability of one of life's basic needs. Climate changes occur if forests are cut down, and the oxygen levels are also affected. Fewer trees also mean the loss of jobs for forest workers and there is a loss of future markets for ecotourism. Heavy rainfall and high sunlight damages the topsoil once the trees are gone and the forest takes much longer to regenerate and the land is unsuitable for agriculture.

Some indigenous peoples' way of life and survival are threatened by the loss of forests. Among these groups are the Waorani of the Amazon's tropical rainforest, the Sami of Lapland's taiga and the Kiyuquot of Vancouver Island's temperate rainforest. Often, the stakeholders associated with forest areas are not always consulted before clear cutting occurs. This has sometimes led to non-violent and violent confrontation and fuelled bitter rivalries between area residents, the forest sector and environmentalists.

The climate becomes more extreme due to deforestation. The occurrence and strength of floods and droughts increases. Forests store large amounts of carbon which are released once the trees are cut down or burnt. Deforestation and burning of biomass will be responsible for 15% of the greenhouse effect between 1990 and 2025. The stress of such environmental change may cause some species to be more susceptible to the effects of insects, pollution, disease and fire.

Rising sea levels brought on by global warming have the potential to threaten the locations of many major cities, much fertile agricultural land, the purity of freshwater supplies and the survival of some nations. The clearing of forestland results in increased erosion and landslides. Soil from areas of reduced forest cover can fill reservoirs created by dams. Thus a dam's ability and future capacity to generate hydroelectricity and provide irrigation would be significantly reduced. Forests play a crucial role in the management of fisheries. Logging has directly and indirectly damaged spawning grounds, blocked river channels, raised water temperatures and caused water levels in streams to fluctuate dangerously.

The loss of fuel wood means depriving soil of nutrition which leads to a receding forest. This causes an increase in rainfall and risk of flooding and soil erosion. A loss of trees also emits a higher concentration of CO₂ and other greenhouse gases that in effect increase the temperature. Deforestation also leads to a drier atmosphere that increases the risk of forest fires. As trees continue to get cut down, the watershed protection of the forest diminishes, leading to excess flooding and billions of dollars worth of damage. Deforestation affects the earth tremendously; leaving us with pollution due to an excessive amount of carbon dioxide in the air, soil erosion, stream erosion, loss of fisheries and water supply, as well as the loss of recreation.

Trees protect the soil from the rain and wind. When they are cut down, the rain leaches out the nutrients from the soil and the wind blows the soil away. Even if the trees are replanted, they may not be able to grow in the impoverished soil. IN rainforests, half of the rainfall is evaporated from the surfaces of soils and leaves or transpired by plants. The other half runs into streams and rivers and eventually reaching the ocean. When trees have been cut down, the recycling of water becomes inefficient leading to lower rainfall in the region.

III.MAIN REASONS WHICH ARE RESPONSIBLE FOR DEFORESTATION

It is hard to think that there was a time when 90% of the earth was covered by trees, but this was once the case. If so, one asks, naturally, what happened to all these trees? Why do people cut down trees? The following are probable reasons:

a) Demand for land for cultivation.

This has been seen both in Kenya and other parts of the world especially countries that have Agriculture as the backbone of their economy. Trees have been cut down to obtain land for cultivation of both subsistence and cash crops, both by governments and individuals.

b) Need for firewood

People, especially those who live in rural areas where electricity and gas are unavailable, resort to use of firewood as a source of heat. Here, wood is cut down and burnt.

c) Need for land to build industries

Industries require a lot of land and while industrialization is important for every country, it is the bane of large tracts of forest. People need jobs in order to provide for their daily needs.

d) Need for land to build houses

With the worldwide increase in population, land to build houses for people to live in is very much required.

e) Need for wood for furniture, pencils, paper etc

Whereas the above needs are important and have to be satisfied, cutting down trees is not the most probable solution to these problems. Why? This is because, most people who cut down trees do not plant others in their place. Also, if all the above needs are to be met by cutting down of trees, even planting two for every tree cut will not prevent desertification. This is because trees take so long to grow and mature, especially so for hard wood trees. Deforestation has the following dangers:

•Destruction of carbon sinks:

Carbon sinks are huge stores of carbon, e.g. Swamps and forests

•Soil Erosion:

Deforestation makes soil prone to erosion by agents such as wind and water. The roots of trees hold the particles of soil together thus, preventing the fertile top soil from being carried away. Soil erosion leads to loss of productivity of the land due to loss of mineral nutrients and soil microorganisms

•Destruction of animal habitats:

Apart from domesticated animals and marine and fresh water animals, all other animals need forests as their habitats. These forests do not only provide a place for the animals to roam day but also provide their food and act as a source of protection from predators through camouflage. Destruction of the animals' habitats literally kills the animals.

•Medicinal Plants:

Some trees are used as herbs. Trees such as the Cinchona have been used as treatment against Malaria since time immemorial. Destruction of these forests leads to destruction of medicinal plants that could be used as treatment for various ailments.

•Trees act as windbreakers:

Absence of these trees enables strong winds and or storms e.g. Hurricanes and Tornados. I write this in the wake of a Tsunami at the Indonesian coast where about 150 people have just lost their lives. Hurricanes like Katrina are still fresh in our memories. I cannot over emphasize this point.

•Greenhouse effect and global warming:

Nature balances the flow of energy and nutrients. Forests play a very vital role in these cycles e.g. the carbon cycle where deforestation causes carbon dioxide to remain in the atmosphere. Accumulation of carbon dioxide

in the atmosphere acts as a blanket that traps long wave radiation of heat and prevents it from escaping the surface of the earth back into the atmosphere. This phenomenon is known as the greenhouse effect. The trapped radiation is converted into heat. This heat causes global warming.

Destruction of forests also causes modification of climate of an area mostly leading to desertification and aridity.

IV.SOLUTIONS TO CONTROL THE DEFORESTATION

- a) For every tree that is cut, three, not two should be planted in its case. We have reached such a critical point that to prevent the desertification of the world that many more trees need to be planted.
- b) Unless it is necessary, water catchments areas should strictly be left alone
- c) Quick growing varieties of soft wood trees should be grown for commercial uses e.g. making of furniture, pencils and paper.
- d) We should carry out consistent mass education on a worldwide scale, on the importance of reforestation and the dangers of deforestation
- e) We need to enact and enforce strict laws against deforestation, worldwide.
- f) It is high time that we reduced our dependence on charcoal as a source of fuel and make use of wind and solar energy.

Nature works as a whole cycle. This is seen not only in animals where predator and prey work together but also in the different energy and nutrient cycles. As already explained earlier, forests play a crucial role in this equation. The knowledge of how to conserve

V.CONCLUSION

Deforestation can have a negative impact on the environment. The most dramatic impact is a loss of habitat for millions of species. Eighty percent of Earth's land animals and plants live in forests, and many cannot survive the deforestation that destroys their homes. Deforestation also drives climate change

Thus, deforestation is an important issue to be discussed. It has adverse effects on each living beings' life. Deforestation has become a huge concern in today's life as there has been a rise in the decline of forests. Trees are cut down in order to manufacture paper products as well as for livestock farming and so on.

In order to feed the ever increasing population of the Earth, trees and forests are converted to farm lands. This has become a threat to the world and it has been seen that rates of decline in the forests are increasing at a rapid rate. This has led the planet to warm up and leading to high temperatures. This cycle would continue for the following years to come unless necessary steps are taken to prevent deforestation. Deforestation has caused fewer trees to grow. It has also gone a long way in eliminating valuable ecosystems in the planet.

If major steps towards afforestation are not taken, then even the great adaptability of human beings may not be enough to cope up with the harsh climate of the future. Deforestation does have solutions. It's just that the

people must step forward. The safe keeping of our precious planet lies with each and every member of its human population. We are the ones accountable for our actions even though it is ourselves we are accountable too.

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