



CLIMATE CHANGE AND ITS IMPACT ON FOREST AND WILDLIFE.

Kranti Ukey

Lala Lajpat Rai College of Commerce and Economics, Mumbai

ABSTRACT:

Growth in population is leading to heavy industrial development and urbanization, which in turn is leading to emission of green-house gases. Green-house gases are prime reason for global warming and climate change. This climate change has triggered tremendous effects on man, environment and biodiversity. The current paper focuses on the major impacts of climate change on forest and wildlife. Threats like forest fires, growth of invasive species, storms and cyclone, loss of productivity are very common these days. Alternatively, it's leading to huge impact on wildlife. Less availability of food, water, unfavorable climatic conditions, high temperature, etc. are some major problems faced by wild animals and birds in the forest. In addition to infrastructural development, roads, highways, railways, dams, fragmentation of forests, wild animals are subjected to adverse effect of climate change. This is a big threat to the animals and plants which are threatened and endangered, hence biodiversity is at risk. Population control, reduction in green-house gases emission, controlling vehicular pollution and regulating modern lifestyle are key factors which can combat the problem of global warming and climate change. Strict and stringent laws and implementation of environmental ethics by people are essential elements. Improving and maintaining adequate forest cover is not only required for conservation of wildlife but also for better maintenance of ecological balance.

Key words: Global warming, climate change, forest ecosystem, wildlife, conservation.

INTRODUCTION:

Many environmental problems are being faced by mankind in modern times. The ultimate reason for this is not the need but the greed of humans. Today, we are roaming in the universe, we are going deep in the oceans, we are reaching deep in the forest and trying to cover the peak of a mountain and anywhere we go we try to find something useful for man. Of course, development is required but not at the cost of environment. In the name of economic development, all countries are in the race. People are running behind physical comforts, modern lifestyle requires huge number of resources and all this is ending up in tremendous pressure on resources and ecosystems. Huge increase in green-house gases in the earth's envelope is leading to global warming. Adverse effect of global warming are well known to humans, as its

being already experienced globally. High temperature, melting of polar ice caps and glaciers, sea level rise, changed weather conditions, erratic monsoon patterns, adverse impact on humans, loss of biodiversity and many more are in the list.

The current paper is attempting to focus more on the climatic changes and its impact on forest ecosystems and on wildlife. Few important factors leading to adverse impacts on forest and wildlife and also its conservational measures are discussed.

Climate Change:

Climate change is the global phenomenon which is characterized by the changes in the usual climatic conditions and having adverse impact on man and environment. Emission of green-house gases in the atmosphere due to burning of fossil fuels and industrial activities

is leading to trapping of more heat. Subsequently, this is resulting in increased average temperature of the earth, called as global warming. When one factor of the atmosphere changes, it triggers changes in other factors too. Change in temperature or increase in temperature is causing alterations in other factors of the environment. Humidity, wind currents, ocean currents, rate of evaporation, monsoon patterns, weather conditions and many other climatic factors are changing and that is called as climate change.

Forest Fires:

Due to increasing temperature, there are high chances of forest fires. These forest fires are also termed as wildfire. When there is a friction between two dried branches or trees that leads to fire. Sometime lightening can cause fire in the forest. Some forest fires are human induced. So, whenever there is a fire in the wild, it spreads fast due to dried trees and leaf matter in the forest because of high temperatures. These fires can be controlled if checked in time, otherwise it spreads fast and becomes uncontrollable and the increasing temperatures are adding to the agony. Many instances are there in the world, when some forests keep burning for so many days, leading to huge loss of biodiversity. Forest fires have been one of the major loss of wild plants and animals in different parts of the world. Alternatively, these forest fires add to the heat and tremendous amount of carbon is emitted and that adds to the process of global warming and climate change. Also the forest fires can cause damage to property and life of forest dwellers. Smoke causes air pollution and may lead to respiratory and eye issues to the people exposed to it. These are some social issues other than damage to forest and wildlife.

Invasive species:

Invasive species are those which can cause ecological damage to the environment where it is introduced and it's not native. Invasive species are plants, animals or other organisms which are introduced to a new area, outside their natural range, negatively impacting the new area, its biodiversity and ecosystems. The introduction of these species could be intentional or accidental, it could be manual or natural. These invasive species could be one of the reasons for biodiversity loss and species extinction and not only that, it could be a major threat to agricultural production and food security. Climate change is closely associated with invasive species. Climate change facilitates the spread of various alien species and can create the opportunity or right environment for their growth. Climate change can reduce the resilience of natural habitats to biological invasion. Some climatic events resulting from the climate change like, storms, cyclones, floods etc. can transport new and alien species to some areas and also reduce the resistance of habitats to invasion. Geographical ranges of species are primarily set by the climatic conditions, which are influenced greatly by increasing temperature and climate change. Climate change is changing the important aspects of environment like temperature, precipitation, frequency of extreme weather events, etc. which are prime factors in survival and distribution of species. It is believed that, due to resource scarcity and increased competition among native flora and fauna, climate change can alter destination habitat and increase vulnerability to invasion.

Storms and cyclones:

Global warming and climate change are intensifying the occurrence of storms and

cyclones. Warming of Surface Ocean due to climate change are leading to powerful tropical cyclones. Higher sea surface temperatures can cyclonic wind speed, leading to more damage. Recent examples of cyclones like Nisarga, Amphan and Tauktae shows the damage done to life, property and also effect on forest and wildlife. Wind speed affect the forest when trees are uprooted and branches are broken down. This can lead to damage to wildlife too. Changing the original forest environment and ecological space and resources for both flora and fauna, is one of the important impact of storms and cyclones. Speed, magnitude and intensity of winds decides the response by individual trees and entire forest ecosystem. More intense and powerful storms and cyclones are causing a huge damage to marshlands. Mangrove forests and ecosystems of Sundarbans delta is one such example. In addition to storms and cyclones, sea level rise in another very important effect of climate change affecting the marshy lands ecosystems. Due to sea level rise the land is getting submerged under water and total landmass of that ecosystem is reducing drastically. This is a major setback for many deltas and mangrove ecosystems in the world.

Outbreak of Diseases:

There are chances of tree diseases anywhere in the forest. Infectious diseases in trees caused by biotic pathogens can develop by interaction of these pathogens with a favorable environment and susceptible host trees. It will be more difficult to predict the outbreak of diseases in terms of rapidly changing climatic conditions and sometimes unstable weather conditions. Most of the diseases are strongly influenced by environmental conditions and so are the plant diseases. Changing climatic conditions will influence the pathogen, the

host and the interaction between them, resulting in changes in the impact and severity of the disease. Change in temperature or increase in temperature may allow certain pathogens to expand their latitudinal or elevational ranges. Changes in abiotic factors like temperature, humidity, moisture, etc. can considerably affect susceptibility of hosts to pathogens and the spread of diseases could be more aggressive. The rate of evolution of pathogens could be faster than the host's resistance, in the changing climatic conditions. In many instances, forest trees are already weakened by climatic changes and conditions like shortage of water, droughts, higher temperatures, etc. and same climatic conditions can improve the reproduction and evolution of some pathogens. These conditions are collectively leading to spread of new diseases in the forest areas.

Wildlife Disruption:

Wildlife habitat gets disrupted badly due to climate change. Several animals find it difficult to cope up with the increase in temperature and changing climatic conditions. As discussed above, invasion of species of plants can badly disrupt the forest composition, leading to growth of non-native species. This could be harmful not only to trees but also to the animals and birds of that forest ecosystem. This leads to less availability of food for herbivores which in turn affects the higher level carnivores.

Tremendous increase in temperature is leading to less availability of water in forest areas. Natural ponds and lakes are drying up fast and also the soil moisture is decreasing to great extent. This affects the forest ecosystem and its productivity. Wildlife is affected badly due to shortage of water in the forest. Drought

and drought like conditions are impacting wildlife species. Changing patterns in rainfall and temperature influence habitat composition and also distribution of wildlife species. Erratic rainfall sometimes leading to floods is another calamity leading affect wildlife. Climate change has a potential to wildlife through shifts in onset and duration of rainy seasons and droughts. The key climatic factors like temperature and rainfall determine the forest productivity and hence animal food availability. Large number of herbivores are dependent on this, which in turn decides the prey base for the the large carnivores of the forest. It's recorded in many forests, that large herbivores like elephants have to walk long distances to search water source and also for better feeding options. These kind of climatic factors many times force these animals to migrate. In addition to changing climatic conditions, anthropogenic and developmental activities like urbanization, construction of roads and railways, construction of dams, etc. are leading to fragmentation of forests. This is leading to several problems for wild animals, including better living conditions, reproductive conditions, availability of food, etc.

Conservation of Forest and Wildlife:

Climate change is one of the major threats to biodiversity. Devastating effects of global warming and climate change are already being experienced by human societies and natural ecosystems.

Conservation of natural habitats and wildlife requires greater understanding of theses climate induced threats. Climatic changes like rise in temperature, erratic rains, prolonged droughts, occurrence of floods, etc. should be studied from human activities point of view. Mitigation activities for the impacts of these

calamities must be formulated. As said, human activities are responsible for this menace, it's possible to control and reduce this. Reduction in green -house gases emission is one of the key solutions here. Burning of fossil fuels in factories and other industrial activities needs to be controlled. The concept of sustainable development is required in its real sense. Here, when we say sustainable development, it's the strategy for current population and also for the coming generations. When we achieve this, not only humans are benefited but also the environmental conservation is achieved and ultimately everything connected to this is benefited. Wildlife conservation will get positive push when we implement the concept of sustainable development. Long term conservation of forest, its ecosystems and wildlife is need of the day. This constitute a huge biodiversity which is not only required for ecological balance but also for human survival. Controlling the rate of deforestation is another major factor in combating climate change. Carbon dioxide being one of the major culprits to global warming, need to be controlled. So, in addition to cutting the emission of green -house gases, it's immensely important to protect our green cover which acts as a sink for carbon dioxide.

CONCLUSION:

Increasing population, urbanization, industrialization and materialism is leading to various environmental problems today. With tremendous rise in standard of living, we are running behind physical comforts today. This modern lifestyle is consuming so much of resources and leading to generation of waste. Gaseous waste in particular we are concerned in this discussion. To reduce these gaseous pollutants in the atmosphere due to

anthropogenic activities like industrial pollution, factory release of gases and also vehicular pollution, we need to regulate our lifestyle. Controlling materialism in our lives and regulating our activities is key to success for combating issues of climate change and its adverse effects. Forest and wildlife conservation and overall environmental conservation would be ultimately achieved by this. Controlling deforestation and protecting forest ecosystems would lead to long term conservation of wildlife and biodiversity.

REFERENCES:

- Hennon P.E, Frankel S.J, Woods A.J, 2020. A Framework to evaluate climate effects forest tree diseases. Forest Pathology, Wiley.
- Sturrock, R.N, Frankel S.J, Brown A.V, et.al; 2011. Climate Change and Forest Diseases. Plant Pathology, USDA-Forest Service, 133-149.
- Weimin Xi, 2015. Synergistic effects of tropical cyclones on forest ecosystems: a global synthesis. Journal of Forestry Research, Springer.
- <https://climate.org/archive/topics/ecosystems/invasivespecies.htm>
- https://climatechange.lta.org/western_forest_pathogens/
- <https://defenders.org/issues/combating-climate-change>
- https://en.m.wikipedia.org/wiki/Invasive_species
- <https://www.climate.gov/news-features/understanding-climate/climate-change-probably-increasing-intensity-tropical-cyclones>
- <https://www.fs.usda.gov/ccrc/topics/forest-disease>
- <https://www.google.com/amp/s/www.newindianexpress.com/nation/2020/jun/03/climate-change-making-cyclones-fiercer-more-frequent-researchers-2151411.amp>
- <https://www.intechopen.com/books/selected-studies-in-biodiversity/impacts-of-climate-change-and-climate-variability-on-wildlife-resources-in-southern-africa-experience>
- <https://www.iucn.org/resources/issues-briefs/invasive-alien-species-and-climate-change>
- <https://www.thoughtco.com/how-wildlife-affected-by-global-warming-1203849>
- <https://www.worldwildlife.org/initiatives/wildlife-and-climate-change>