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Impact of Climate Change on Changing Dynamics of Biodiversity

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Abstract
Significant alterations in flora and fauna as a consequence of climate change. Humans have abandoned the practice of natural pleasure and due to which, gases like carbon dioxide, methane, chlorofluorocarbons, nitrous oxides etc. produce a greenhouse effect. Through which solar radiation comes to the Earth, but these gases do not allow them to go back into space that leads to global warming and leading to 30C rise in global temperature by 2050 reducing up to 25-30% of plant as well as animal species and crops yield could decreases by 30% in developing countries. Flood and drought will increase endemic morbidity and mortality due to diarrheas and spread of cholera. Global warming is the main cause of unusual draught which has already started showing fingerprints on the protected areas in India.

I. Introduction

Biodiversity is derived from two Latin words-bios means life and diversitas means variety/ forms. It is in fact, the shortened form of biological diversity. Biodiversity is thus defined as the 'Full variety of Life on Earth', in other words it is the "variety of life on earth" or variability among the living organisms of the ecosystem.

Biodiversity refers to vast array of species of micro-organisms, algae, fungi, plants and animals occurring on the earth. It includes habitat diversity, species diversity, diversity between species and genetic biodiversity. Biodiversity is often used as a measure of health of biological systems i.e. ecosystem, biome, or an entire planet. Biodiversity is the 'foundation of human life' on earth because each organism plays an important role in producing more productive and stable ecosystem. Biodiversity is of our lives and livelihood and constitute the resources upon which families, communities, nations and future generation depend. Human depend on biological resources for food, energy, construction materials and medicine etc. so proper management of utilization of these resourc-es is necessary to ensuring their use for the future generations.

Plant and animals are now becoming extinct at an alarm- ing rate almost entirely as a direct result of human activities. The Global Biodiversity Assessment warns, unless actions are taken to protect biodiversity, we will lose forever to opportunity of reaping its full potential benefit to human kind. India represents biodiversity of mountain, desert, marine, island, coral reef, forest and wetland ecosystem. To protect the Indian biodiversity various laws came to know like more known Biological Diversity Act,2002 that comes after the Convention on Biological Diversity signed by the members of United Nations Conference on Environment and Development, 1982. The biological diversity act mainly deals with access to ge- netic resources by foreign companies, individuals or organizations and maintained by National Biodiversity Authority (NBA). This act covers all aspects regarding the conservation of biodiversity includ- ing conserve and sustainable use of biodiversity etc. If do all things according to law, India can proved itself as a role model to other countries in field of protection of biodiversity. Today it is a need and responsibility to all people to give their small contribution in conservation of traditional heritage of Indian biodiversity.

The distribution and magnitude of the biodiversity that exists to-day is a product of over 3.5 billion years of evolution, involving spe-

ciation, migration, extinction and more recently, human influences. The total number of species in the world is estimated to be around 5 to 30 million out of which about 1.7 to 1.8 million species have been described. About 61% of these species are insects.

Thus biodiversity is essential to the healthy functioning of eco- systems. Habitat loss and overexploitation, driven by our rapid population growth, are the primary causes of biodiversity loss which is now happening up to ten thousand times faster than for millions of years before.

Impact of Climate change on Ecosystem and Biodiversity

Climate refers to the average weather conditions in a certain place over many years. Climate is directly affected the air, water, and land which in turn are related to one another. Recent reports reveal that the average temperature of the Earth has been increasing for many years. This results in an increase in global temperature. Its

effect canalso be global or may be visible in a particular region. With increasing the concentration carbon dioxide global average temperatures increased by 0.20C per decade since the 1070s, global average precipitation increased by 2% in the last 100 years. IPCC (Intergovernmental Panel on Climate Change) stated that the increase in globally average temperature is very likely due to anthropogenic greenhouse gas concentration. The concentration of solar/ volcanic eruption is small. The IPCC concluded in 2007 that a sea level rise resulting from a global temperature increase 40C would completely submerge low-lying islands. The IPCC also predicted that yields from rain-fedagriculture in Africa could be reduced by as much as 50% by 2020.

Rising global temperatures (Global warming) leads to the dramatic climatic changes around the world, such as melting glaciers, stronger hurricanes, and loss of wildlife habitats. Warming of ocean water has caused the melting of sea ice, shifting of many species from their natural habitats and extinction of species incapable of doing so. Therefore, a change in one place can lead to changes at somewhere else. Human actions have been a primary cause of climate changes observed today. Thus climate change has brought about serious and possibly everlasting modifications to our planet's geological, biological and ecological systems. The IPCC reported in 2003 that "there is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities". These changes are ultimately affecting human life in various ways such as extreme weather, ozone depletion, loss of biodiversity, stresses to food-producing systems and the spread of chronic diseases and the natural world.

In the future, the biggest impact of climate change is going to be on the biology, the seaside tidal forests and the marshes found in the marshes will be eliminated, which will eradicate various organisms, which will increase the intensity of sea storms, which can be increased by the marine organisms. Simultaneously the human community will be affected. The present need is that we should be aware of our environment and use natural resources to see the future, by controlling the indiscriminate culture and blind use of resources, due to various reasons for which climate is changing. Considering that, not only India, the entire world community should make global efforts to deal with it, only then can the future generation be created from the crisis of soil, water and biodiversity.

Climate change is having wide spread impact on biodiversity including gene, species and ecosystem. Climate will continue to change rapidly cheap energy and other resources, including fresh water, will diminish and disappear at an accelerating rate; agricultural and farm communities will deteriorate further while we loss more genetic diversity among crops and farm animals; biodiversity will decline faster as terrestrial and aquatic ecosystems are dam- aged. Thus climate change poses major threats to biodiversity. Out of the 3831 breeds of ass, water buffalo, cattle, goat, hours, pig, and sheep recorded in the twentieth century, at least 618 had become extinct by the century's end, and 475 of the reminder were rare. The 2007 FAO reports on animal genetic resources indicates that 20% of reported breeds are now classified as at risk, and that almost one breed per month is becoming extinct for developing regions, the proportion of mammalians species at risk is lower (7-10%), but 60-70% of mammals are classified as being of unknown risk status. It is estimated that about 27000 species become extinct every year. If these go on 30% of world species may be gone by the year 2050.

Due to climate change, rise in population and mismanagement of water resource such as over exploitation, pollution etc. water shortage, problems increasing day by day (Dutta, 2009). Of the total water resource of the earth, 97.3% is salt water and the rest fresh water. Out of these, about 77.2% is frozen/ice, 22.4% ground water, o.35% is lakes and ponds and 0.01% in rivers and streams. Agri- culture uses maximum amount of water in the world and puts lot of pressure on ground water. It has been estimated that the drinking water needs 2.7% L/ capita/day or (1M3/year/capita) (Das,2009). In tropical countries a rise in temperature 10C, the production of crop especially wheat and maize certainly low. If temperature increases 30C the loss of yield of Asia, Africa and Central America would decrease by 30% to 40% (Katiyar,2010).

Forest ecosystem are great resources, since they provide habitat for wild animals, fuel wood, fodder, timber, herbal medicine including raw materials for paper and pulp industries. In India 23% land area are occupied by forests (Das, 2009) .It has been estimated that India has lost about 45 million hectare of wealth forests, of which only 6 million hectares have been replaced (Sharma,1987). The cause of destruction of forests is an increase in human population and livestock. Urbanization and industrialization are also important factor which cause deforestation. Other important causes are the construction of national high way roads and mining activities.

Biodiversity is the number and or evenness of genes, species and ecosystem in a region. It is fact that biodiversity is indeed important for both manmade and natural ecosystem. If current human growth and resource management pattern do not change, will most likely lose many important species of plants and animals and the ecosystems of the globe may never recover.

The combination of climate change and associated disturbances like flooding, drought, wildfire, infestation and ocean acidification, in addition to other contributors to climate change such as land use change, pollution and overexploitation of resources will exceed re- silience of many ecosystems. Increasing ocean acidification due to higher atmospheric carbon dioxide concentration will harm corals, shelled organisms and

dependent species.

Beyond 2050, terrestrial ecosystems, which play an important role as carbon sinks, may reach the upper limit of the absorptive capacity or even, decrease their net carbon uptake. It increases the global average temperature exceed 1.5-2.50C that adversely affected the food and water supply to species. Thus major changes in ecosystem structure & function, species' ecological interaction and geographic ranges decrease the 20-30% plant and animal species.

Impact of climate change on human health:

Due to their geographical structure, Asia will be most affect- ed by changes in climatic conditions. Within the next 2-3 decades, the melting of glacier in the Himalayas will imply more floods and less water resources, progressively decreasing river flows. Climate changes effects, along with increasing populations and higher demands due to improving standards of living, will decrease freshwater availability , adversely affecting over one billion people in all but North Asia, and particularly so those living in large river basins where large populations are concentrated. Increased flooding from sea and rivers will affect coastal areas, greatly affecting South, East and Southeast Asia's densely-populated mega-delta regions. Hot climate makes insect pests in general and vectors and pathogens in particular to spread over a wider range and enhances their survival rate. An increase of 10C in surface temperature is estimated to cor- respond 10% increase in incidence of insects as pests and insurgence of vector borne diseases.

Global climate changes have major implications on human health. It is obvious that effect on ecosystem will change the distribution and burden of vector borne infectious diseases including bacterial diseases. Changes in epidemiology may already be underway, Complex biological changes are associated with change in ecosystem. Water and food borne pathogens create havoc in developing countries that too when conditions are conducive for spread of pathogens and compromise with the hygiene conditions. Green house gases play their role, with lot of carbon emission the disease curve is going high. Carbon emission is increasing to a dangerous level this making animal lives vulnerable to pathogens and diseases.

By the middle of the century, crop yields could decreases by 30% in Central and South Asia, while increasing by 20% in East and Southeast Asia. Overall, however, very high risks of hunger are pro- jected for the developing countries in the area. Floods and droughts will increase endemic morbidity due to diarrheal diseases, as well as the spread of cholera. In absolute terms, a rise of 3-50C temperature translates to about an extra 50-80 million cases of malaria per year in India, and 290 million more cases of malaria worldwide. About 30 new diseases associated with insect species have been flared up during last two decades throughout the Globe. Anthropogenic pres- sure on water bodies, forests have resulted in change of ecosystem and rise in temperature. Water shortages and the shrinking of land suitable for agriculture would cause other social and political disruptions, including forced migration and conflict. Our infrastructures are not built to combat the growing threats due to rising temperature.

II. Conclusion

Food and medicine are an important aspects of life, is mainly provided by natural plant resources all over the world. The natural region of the world harbours specific type of plants vegetation with their specific characteristics on the basis of plant type, habitat and climatic condition of particular regions. The specificity of the region is directly or indirectly governed by plant vegetation, local specific region and climatic conditions. The cumulative loss of glacier mass is currently occurring ubiquitously and uncharacteristically rapidly with increasing rates of ice loss since mid 1980's in India. The Himalayan mountain ranges are known as the towers of Asia since the glacier fed rivers originating from the mountains comprise the largest river runoff from any single location in the world. Changes in these influence water resources, agriculture, infrastructure, livelihood, biodiversity and cultures and world affect the lives of about 40% of world's population (UNEP,2007a). Other affects due to climatic change would be:

- Global average sea level will rise.
- Higher ocean levels will contaminated underground water sources particularly in smaller island states including Indianoceans is the Caribbean Sea and some of the most productivedeltas.
- Arid and semiarid regions are becoming drier which willresult prolonged droughts.
- On the other hand atmosphere water content is increasingglobally and mid to high altitudes are becoming wetter.
- Possibilities of extreme weather events such as heat waves,wild fire, stromes, and flash, flood etc.

Thus there is urgent need of environmental management plan focus on land environment, water environment, flora and fauna, air environment, aesthetic and socio-economic aspects etc. Anthropogenic global warming affects all the nations and humans populations. The integrated approach is essential to solve the problem by public awareness and primary education of pollution, importance of biodiversity conservation and

the effects of climate change on biodiversity.

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