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Climate Changes : Overview of Causes and Consequences

Dr. Manju Giri, Dr. Ravindra Kumar, Dr. Vinay Kumar Singh
Department of Physics, D. S. College, Aligarh. U. P., India

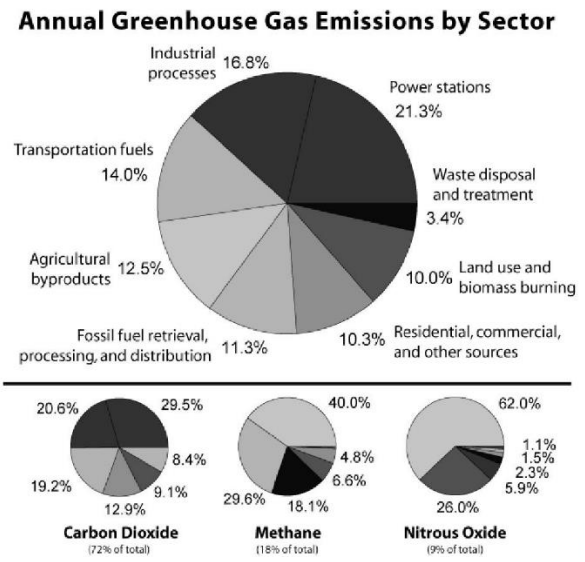
ABSTRACT

The environment for any living organism has never been constant and static. It has always been changing sometimes slowly and sometimes rapidly. These changes in environment may benefit or harm on the living organisms. After scientific and industrial revolution in the recent past, there has been immense impact of man on his environment. Climate change is one the main environment challenges facing the world today. Climate change is associated with various adverse impacts on agriculture, water resources, forest and biodiversity, health, coastal management and increase in temperature. This paper analyzes the impact of climate change and its various aspects in the Indian context.

Keywords: Environment, Climate Change, Greenhouse Gas Pollution

I. INTRODUCTION

Climate change is one of the most important global environmental challenges facing humanity with implications for food production, natural ecosystems, freshwater supply, health, etc. According to the latest scientific assessment, the earth's climate system has demonstrably changed on both global and regional scales since the pre-industrial era. Further, evidence shows that most of the warming (of 0.1 ^{0}C per decade), observed over the last 50 years is attributable to human activities [1,2]. Earth may become warmer during the 21st century than it has been for hundreds of thousands of year. World in continually warming, we can't say how rapidly the warming will proceed and how sever it will be. The major cause of global warming is the greenhouse gases. These gases include carbon dioxide, methane, nitrous oxides and in some cases chlorine and bromine containing compounds, injected in to the atmosphere due to different human activities. Given figure shows pictorially the distribution of greenhouse gases [3].



II. Causes and Consequences

Now it became evident that the main culprit is carbon dioxide emission produced by the burning of fossil fuels. In burning fossil fuels, we inject 23 billion tons of carbon dioxide years into the atmosphere. Half of it is absorbed in the seas and vegetation, but half remains in the atmosphere. This is significantly altering the ecological equilibrium, seriously affecting

the climate of our planet. Basic activities like cattle rearing, paddy planting, automobile exhausts, industrial, thermal power plants, also emit carbon dioxide, nitrous oxide, sulfur dioxide, methane and other GHG into the atmosphere. As a result of this continuous increase in levels of GHG earth has been suffering from fever, and we have to act sincerely to cure it. Climate change has become one of the prime issues threatening the sustainability of world's environment. Besides environment, climate change also has impacts on livability, health and economy of the globe. A rise in global temperature causes sea levels to rise as polar ice caps and glaciers begin to melt, along with thermal expansion of water [4]. If the current warming rates are maintained, Himalaya glaciers could decay at extremely rapid rates, shrinking from the present 5,00,000 km^2 to 1,00,000 km^2 by the 2030s. A rise in ambient temperatures also leading to significant impact on cropping patterns and agricultural productivity [5]. Impact on ecosystem would change the crop production potential of a region, especially in Asia. The general impacts of climate change on water resources have been brought out by be third assessment report of the IPCC [6]. It indicates an intersection of the global hydrological cycle affecting both ground and surface water supply. According to a World Bank report, India's water economy makes the point that India as fast running out of water and by 2020 it will be under severe stress, and forecasts that by 2050 demand outstrips supply. In a fast growing way the various principal pollutants which pollute our air, water, and land are also responsible for climate changes. In UNEP documents, the order of priority of different pollutants has been indicated as:-

Order of priority Medium

- So_2+ suspended particles - Air

Strontium, caesium - Food

- Ozone - Air

DDT and other organochlorine Compounds - Biota, Man

- NO_3 NO_2 - Drinking water

Nitrogen oxides - Air

- Mercury compounds - Food, Water

Lead and cobalt - Food, Air

- Petroleum hydrocarbons - Sea

Carbon monoxide - Air

- Fluorides - Water (fresh water)
- Asbestos - Air Arsenic
  - Drinking Water Mycotoxins and microbial
  - Food Contaminants

Thus, climate change could cause irreversible damage to unique forest ecosystem and biodiversity, rendering several species extinct locally and globally. Climate change affect human health directly (e.g., impacts of thermal stress, death/injury in floods and storms) and indirectly through changes in the ranges of disease vectors (e.g., mosquitoes), waterborne pathogens, water quality, air quality, and food availability and quality. Global climate change is, therefore, a newer challenge to ongoing efforts to protect human health [1,2].

Global Efforts

In the Late 1980's scientists began to suggest that the earth's energy flux was no longer in balance. Erath's surface was getting warmer affecting the elements of the climate. Since then global efforts have been in practice to save our environment and to protect the climate. The first world climate conference in Geneva organized by the world meteorological organization conclude that anthropogenic Co_2 emission could have a long term impact on climate [7]. U.N. intergovernmental panel on climate change (IPCC) reported that human produced air pollutants have a major role in recent climate change [8]. This report, compiled by a group of climate expects, is the most definitive scientific statement about global warming released to date. Based on studies, the IPCC projected a 1^0 to 3-5 ^{0}C increase in global temperature by the year 2100. Sustainable Development Goal 13 established by the United Nation in 2015, to take urgent action to combat climate change and to create

a better world by 2030. Guided by the goals, it is now up to all of us, governments, businesses, civil society and general public to work together to build a better future for everyone.

III. CONCLUSION

Climate change presents a serious challenge to sustainable development of the word. Climate change is affecting the basic elements of life for people around the world. Even if we were to immediately stop polluting the atmosphere there would still be some climate changes because of the greenhouse gases that have accumulated during the past 100 years. Scientists suggest to reduce carbon emission into the atmosphere. There are three basic ways to manage climate changes prevention, mitigation and adaptation. We are at turning point in our climate crises right now. This situation is alarming. This is the night time to think seriously about this problem, and to do in the favor of our environment.

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