



Climate Change: Its Impact and Sustainable Development

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Introduction:

Climate change is a normal part of the Earth's natural variability and also human induced. Earth's natural variability is due to interactions among the atmosphere, ocean, and land, as well as changes in the amount of solar radiation reaching the earth and human induced changes leading to increased greenhouse gases, certain naturally occurring gases, such as carbon dioxide (CO_2) and water vapor (H_2O), trap heat in the atmosphere causing a greenhouse effect. Human induced climate change is due to burning of fossil fuels, like oil, coal, natural gas and industrial pollution adding CO_2 to the atmosphere.

Objectives of the study:

An attempt is made in this paper to explain climate change, its impacts, adaptation to climate change and sustainable development.

Methodology:

The study is purely based on secondary data. The relevant data for the study are collected from the different authorized websites, journals, reports, books, periodicals, etc.

Present scenario of climate change:

The Intergovernmental Panel on Climate Change(IPCC) reviews and assesses the most recent scientific, technical, and socio-economic information produced worldwide relevant to climate change. The IPCC in its recent report -Fifth Assessment Report(AR5)-published in 2014 has observed that there has been an increasing trend in the anthropogenic emissions of greenhouse gases(GHG) since the advent of industrial revolution, with about half of the anthropogenic CO_2 emissions during this period occurring in the last forty years. The period 1983-2012 is likely to have been the warmest thirty-year period of the last 1400 years. CO_2



emissions from fossil fuel combustion and industrial processes have contributed a major portion of total GHG emissions during the period 1970-2010.

IPCC AR5 has estimated that for temperature increase to remain below 2°C of pre-industrial levels the world can emit only about 2,900 Giga tonnes (Gt) of CO₂ from all sources from industrial revolution till 2010. Till 2011, the world has emitted 1900Gt of CO₂. Out of the budget 2,900Gt only 1000Gt remain to be used between now and 2100. The World Resource Institute estimates that if emissions continue unabated, the remaining budget will last only 30m more years.

Scientists have made major advances in the observations, theory, and modelling of Earth's climate system; and these advances have enabled them to project future climate change with increasing confidence. If there were no technological or policy changes to reduce emission trends from their current trajectory, then further warming of 2.6 to 4.8 °C (4.7 to 8.6 °F) in addition to that which has already occurred would be expected during the 21st century.

Impact of Climate Change on the following:

Agriculture and Food Security:

- Agricultural production decreases due to loss of land.
- Seasonal variation.
- Agricultural lands are likely to subject to desertification and salinization in some areas.
- Worsening of food security.
- Depletion of live stocks.
- Depletion of fish stocks due to rising water temperature.

Human Health:

- Impact on health like heat wave deaths, coronary diseases and stroke.
- Heat strokes.
- Risk of life due increase in tropical cyclones.

Coastal Zones:

- Degradation of marine echo systems and coral reefs.
- Coastal erosion.
- Impact on low lying areas such as coastal cities, location of fish stocks and tourism due to sea level rise.



Water Resources:

- Severe water shortages.
- Increased water problems around the globe.
- Increase in the number and severity of glacier melt-related floods.
- Decrease in fresh water availability.

Weather Conditions:

- Change in weather patterns.
- Acid rains.
- Ocean acidification.
- Melting of snow and ice of arctic region.

Adaptation measures to Climate Change and Sustainable Development:

Agriculture and Food Security:

- Soil conservation
- Erosion control
- Changes in planting and harvesting time.
- Agricultural extension programs.
- Improving irrigation facilities.
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Human Health:

- Improve infrastructure.
- Improve environmental quality.
- Health awareness camps.
- Improve public health services.

Coastal Zones:

- Public awareness to protect coastal areas.
- Conservation of coral reefs.
- Protection of economic infrastructure.
- Coastal planning and zoning.
- Legislations for coastal protections



Water Resources:

- Protection of ground water sources.
- Protection of water catchment areas.
- Water management.
- Improved ground water and rain water harvesting.
- Recycling of water.

Conclusion:

Climate change is one of the major challenges of our time and adds considerable stress to our societies and to the environment. From shifting weather patterns that threaten food production, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale. Without drastic action today, adapting to these impacts in the future will be more difficult and costly.

Adaptation to climate change in developing countries is vital and has urgent priority. In many developing economies, there is significant knowledge and information available on strategies and plans to implement adaptation activities. However, developing countries have limitations like human capacity and financial resources.

References:

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