
CLIMATE CHANGE AND AGRICULTURE

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Climate Change

Climate Change is the biggest challenge facing the world today, and the very existence of man depends on how effectively this change is tackled. All governments have come together on a common forum to devise with this phenomenon. Our health, agriculture, habitation, everything depends on how effectively we are able to tackle this problem'. People in India, especially the poorest, vulnerable to the impact of climate change, because the nation's economy is so tied to the natural resources. For example, more than 56% of workers are engaged in agriculture and allied sectors. Agriculture is highly sensitive to climate variability and weather extremes, such as droughts, floods and severe storms. Most of Indian's poorest people live in rural areas and totally depend on natural resources for their food, shelter and income. Agriculture in many countries, including India will be impacted by climate variability.

Climate change is a change in the statistical distribution of weather over period of time that range from decades to millions of years. It can be change in the distribution of weather and events around an average (for example, greater and fewer extreme weather events). Climate change may be limited to a specific region or may occur across the whole earth.

In Earth's history before the Industrial Revolution, Earth's climate changed due to natural causes unrelated to human activity. These natural causes are still in play today, but their influence is very hazardeous.

We all understand that climate is not static, it is dynamic, always changing. Earlier the Changing Climate always followed a pattern, which is being broken now. Now the climate is not following its regular changing pattern. It has become erratic.

Climate Change means the change in Earth's Weather pattern. Warming of the earth and its atmosphere is just because of the trapping of Sun's heat by Green House Gasses (CO₂, CH₄, N₂O, HFCs, H₂O etc.). But gradually it was seen that it is not just a mere warming of the globe that is happening but this warming is also causing other phenomenon.

Causes of climate change

There are some causes of climate change shown below:

Natural forces:

1. Natural fluctuations in the sun's intensity.
2. The complex motion of the earth around the sun.
3. Volcanic eruptions.
4. Shorter-term cycles like El Nino.
5. Changes in Naturally occurring carbon Dioxide concentrations
6. Ocean currents.

Human Factors

1. Increases in green house gases.
2. Deforestation.
3. Industrialization
4. Agriculture

Impact of Agriculture on climate every stage of food production releases substantial amounts of greenhouse gases. Agriculture is one of the most common human causes of climate change through emissions of gases and the conversion of forests to agricultural land. Besides its contribution to global warming, farming has other detrimental effects on the environment. Agriculture is often the reason for deforestation and a change in land use, from natural ecosystems that take up and store carbon dioxide (CO₂) from the atmosphere to farm land. These activities cannot be viewed independently.

Green house gases (GHGS) have different sources within agriculture. The livestock sector alone is responsible for about 44% of human induced methane (CH₄) emissions, 53% nitrous oxide (N₂O) and 5% carbon dioxide (CO₂). In addition to generating GHG emissions, agriculture is also responsible for a long list of negative impacts on the environment. Fertilisers rich in nitrogen can pollute water and threaten aquatic ecosystems. Pesticides, herbicides and monocultures can lead to a loss in biodiversity. Clearing uncultivated land for farming can lead to the destruction of natural ecosystems, which may have a devastating effect on the local wildlife and biodiversity. Many sectors

need large amounts of water, which may cause water scarcity and drought. Constant exploitation of soils cause erosion and compaction, leaving them useless for future generations.

Agriculture

Agriculture typically plays a larger role in developing economies than in the developed world. For example, agriculture in India makes up roughly 20% of GDP and provides nearly 52% of employment (as compared to 1% of GDP and 2% of employment for the US), with the majority of agricultural workers drawn from poorer segments of the population (FAO, 2006). Furthermore, it is reasonable to expect that farmers in developing countries may be less able to adapt to climate change due to credit constraints or less access to adaptation technology. However, the majority of the economics literature on the impact of climate change has focused on developed countries, in particular the US, presumably for reasons of data availability. Climate change and agriculture are interrelated processes, both of which take place on a global scale. Indian agriculture is dependent on Monsoon and a result, there have been fluctuations in food production over the years. It still remains the oldest and the most crowded occupation of the country as over three — fourth of its population of 1.14 billion (July 2009) is dependent on agriculture for their livelihood.

Impact of climate on agriculture

According to world Meteorological Organization, climate change can adversely impact global environment, agricultural productivity and the quality of human life. In developing countries, it will be difficult for farmers to carry on farming in the high temperatures. It affects everyone, but the worst suffers would be hundreds of millions of small and marginal farmers and people depending upon agriculture. The monsoon accounting for 75% of India's rainfall significantly impacts country's agriculture and livelihood of tens of millions of small farmers.

Climate change will affect the health, growth and productivity of crops, livestock, fish, forest and pasture in different ways. It will also have an impact on the incidence of pests and diseases, biodiversity and ecosystems.

Climate change would force farmers and pastoralists, who depend on rainfall to raise their crops and livestock, to migrate to areas in search of land and water. This migration/displacement of people would result in direct conflict and competition between migrants and established communities for access to land and water.

Climate change will have an impact on the predictability and variability in the availability of water and also increase in frequencies of droughts and floods. Worst sufferers would be farmers of the rainfed agriculture, which covers 60% of all cultivated land in the country.

According to the 2005 Millennium Ecosystem Assessment, “The climate change will cause loss of biodiversity by the end of this century. The significance and utility value of biodiversity for food and agricultural purpose will increase as when climate change. A World Bank report on climate change impact based on case studies :-

Drought — prone regions of Andhra Pradesh and Maharashtra

Flood - prone districts in Orissa.

Conclusion

Agriculture development in India needs to focus on reducing greenhouse gas emissions through measures such as significant reduction of deforestation, improving forest conservation and management, effective control of wildfires, promotion of agro forestry for food or energy, soil carbon sequestration, improving nutrition for ruminant livestock and developing strategies that conserve soil and water resources by improving their quality, availability and efficiency of use. It is necessary to make sufficient investments to support climate change to adaptation, mitigation, technology development, transfer and dissemination among farmers.

References

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