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Change and its Impact on Indian Agricultural

Dr. Vandana Tyagi[1]* Gafoor Ahmed[2]

[1] Associate Professor, HOD of Department, S.D. (PG) College, Department of Geography, Muzaffarnagar, UP

[2] Research Scholar (Department of Geography), S.D. (PG) College, Muzaffarnagar, UP

Abstract – Climate change is one of the major environmental challenges that adversely impact the agriculture. This paper makes a meaningful attempt to assess the effect of climate change on Indian agricultural. The temperature of The earth increases in carbon dioxide concentration, a greenhouse (GHG), are due primarily to fossil fuel use such as coal, oil and natural gases and land use change, while those of methane and nitrous oxide are primarily due to agriculture. Many manmade activities such as industrialization, urbanization, deforestation increase GHGs. Indian agriculture depends on high monsoon about, 2/3rd area, close link between climate and water resources and agriculture increases greenhouse gases and change climate. Then emerging many issues: increasing population, high demand for food, increasing urbanization, increasing competition for recourses, increasing globalization, removal of trade barriers and new technology. Negative impacts on Indian agriculture are high rainfall, erosion top soil, rise sea level and loss of farm land due to overburden. Increasing temperature decreases crop productivity and other issues. Positive impact of Indian culture agriculture: reduced frequency of frost damage, less damage to potato, peas and mustard and crops form new flood areas may become available for aquaculture regions.

Keywords – Climate Change, Greenhouse Gases and Urbanization.

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1. STATEMENT OF PROBLEM:

Weather is a short-term condition of the atmosphere while climate is the long-term condition of atmosphere at a certain region. Weather changes from minute to minute, hour to hour, day to day, and season to season. Climate is the average of weather which indicates the typical weather conditions in an entire region for a very long time 30 years or above. In simple words, it is the long time condition of any large area. Climate has an important element and it recommends the atmospheric condition of heat, humidity and circulation. It plays an important role in growing natural vegetation and building soil and it ultimately affects all forms of life. Climate takes into account the heat, humidity and circulation which determine the agriculture type of that particular region. Climatology is the study of climatic change.

Human activity is the major cause of climate change, although natural factors also contribute albeit only minutely. Indian climate is categorized as Tropical Climate which is further divided into two sub types: Tropical Wet or Tropical Monsoon Climate and Tropical Dry and Wet Climate. Indian climate is changing day by day by natural and manmade activities natural and manmade activates: It is primarily caused by the building up of greenhouse gases (GHG) in the atmosphere. The composition of GHGs is water vapor H2O, CO2, CH4, N2O, O3, CFCs, HCFCs and HFCs which absorb and emit radiant energy within the thermal infrared range and contribute to warming.

2. LITERATURE REVIEW:

The term “climate” is a long-term weather pattern about thirty years that characterize the regions of the world. The term "weather" refers to the short-term (day by day) changes in temperature, wind, and rain of a region (Mahato, A., April, 2014)1. In current years, with the growing recognition of the possibility of earth climate change, an increasing force on world food security in common and its geographical impacts in particular have come to forefront of the scientific world. The climate of the particular area largely influences the crop type and its growth and development, development. Besides, the irrigation, yield and produce also depend on the climate (Mall, 1.R. K., ET. AL. 2006)2. Climate changes have been pushed by natural processes, and these mechanisms pursue to cause change. “Climate change” as a word in common usage all over the world, is now taken to mean manmade and natural way pushed change in climate. After that climate change may influence agriculture in a positive way or

negative: like manmade and natural, (Nicholas, M., ET. AL. March, 2006)3.

3. STUDY AREA:

India is a democratic country in South Asia. It is the most populous country after China. India's Geographical Coordinates are 21°N 78°E it boasts of 7,517 km of coastline.

4. AIMS AND OBJECTIVES:

In this paper we will discuss:

- An assessment of climate changing factors;
- An assessment of climatic changing impact of agriculture and its allied and;
- An assessment of climatic policies.

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6. DATABASE AND METHODOLOGY:

This data is mainly based on secondary sources and data is obtained from books, journals, on climate change, its impacts, causes, consequences and repercussions of climate change on agriculture.

The data related to climate change and its impact on agricultural land has been collected from government bulletins, weather related papers, newspapers and various articles related to climate change in Google related websites.

7. CLIMATE CHANGE EFFECT OF INDIAN AGRICULTURE

- **Indian Framework on Climate:**

Change The temperature may be more effective in the northern parts of India. The extremes in highest and lowest temperature are expected to increase under changing climate; few places are expected to get high rain while some parts may remain dry.

Barring the two states of Punjab and Tamil Nadu, all states in India exhibit an average twenty percent increase in rainfall. Although there observed a decline in the number of rainy days, however, the amount of rainfall is expected to very high. The global warming projections indicate a 1.40C to 5.80C potential increase in average global temperature by the end of this century.

- **Increasing temperature of earth atmosphere, there is many impact of Indian climate**

Feature of Indian agriculture: High monsoon dependency, 2/3rd area rain dependency, Close link between climate and water resources, Agriculture emission greenhouse gasses and increase climate change. Emerging many issues: increasing population, population depend on food, increasing urbanization, Increasing competition for resources, increasing globalization, removal trade barriers and, New technology.

- **About temperature and rain fall**

Average yearly temperatures have risen by about 0.48 degrees (between 1970 and 2016), and average monsoon rainfall has declined by 26 mm (between 1970 and 2016).

Another disturbing weather phenomenon is the constant rise in temperature extremities. That is every year there is a rise in the number of "very hot" and dry days.

- **Positive impact of climate change in increasing temperature**

Positive impact: Reduced frequency of frost damage: less damage to potato, peas and mustard and, New flooded areas may become available for fisheries in coastal regions.

- **Negative impact of climate change in increasing temperature**

Negative impact: High rain fall- loss of top soils, increase temperature – duration many crops decreases- yield of crop reduces, crop evapotranspiration effected, changes in precipitation-depleting water resources lowering of ground water table, cereal productivity to decrease, and great loss expected toRabi crop. One degree increase in temperature reduces wheat production by 4-5 million tones.

- **Impact of climate change on agriculture**

Agriculture is an important sector of the Indian economy. The crops, livestock, and seafood produced in the India contribute more than 17% to the economy each year. When food-service and other agriculture-related industries are included, the agricultural and food sectors contribute more than 70% to the gross domestic product. Agriculture highly dependent on the climate. Even if high temperature and CO2 concentration may have positive impact on crop yields in some areas, however, for this to happen other conditions such as nutrient level, soil moisture, water must also be fulfilled.

Over the past half-a-century, or so, India has experienced changing patterns of frequency as well as intensity of droughts and floods. These irregular trends create a lot of difficulties for the farmers and are a great threat to national food security. Increase in ocean temperature may force fish and other aquatic animals to move away from their natural habitats and settle down at safer places. This migration severely upsets the entire ecosystem. In the nutshell we can safely argue that this extraordinary rise in global temperatures has causes a lot of troubles in agricultural activities, livestock management, fishing and other related activities.

Apart from changing farming practices, agricultural technologies and use fertilizers and pesticides another major factor that negatively impacts the agriculture in India is climate change. Some of the factors that may influence agricultural production are, but not limited to, increase in temperature; increase CO2, and variations in extreme weather conditions. An increase in the atmospheric temperature may lead to a substantial drop in crop yield in most of the cases.

Although in a few cases, increasing the temperature, definitely leads to better yields. But other aspects like temperature variations, depleting ozone layer, sparse water for irrigation and low soil nutrient levels are a major threat to higher agricultural produce. There is a direct relation between temperature and crop's optimal level. In case the temperature surpasses the crop's optimal level and the farm suffers from insufficient water supply and nutrient level then the produce is bound to fall.

If the grain and forage quality falls below the threshold then it becomes unsuitable for grazing of animals. If the temperature and precipitation rise above critical mark than the agriculture produce goes down. Floods, droughts, delayed rainy season and long spells of dry seasons constraint crop production.

During summers when the temperature hovers above 450C in large parts of India the agricultural dries and cracks up it becomes extremely difficult to control drought. Thus, water is supplied in insufficient quantities which may damage the crop. The ranges and distribution of weeds and pests are likely to increase with climate change. This could cause new problems for farmers' crops previously unexposed to these species. Though rising CO2 can stimulate plant growth, it also reduces the nutritional value of most food crops. Rising levels of atmospheric carbon dioxide reduce the concentrations of protein and essential minerals in most plant species, including wheat, soybeans, and rice. This direct effect of rising CO2 on the nutritional value of crops represents a potential threat to human health. Human health is also threatened by increased pesticide use due to increased pest pressures and reductions in the efficacy of pesticides.

8. CONCLUSION AND SUGGESTION:

Climate change is a serious global environment issue. It is primarily caused by the building up of greenhouse gases in the atmosphere. We should many steps to reduce for climate change: Power your home with renewable energy, invest in energy-efficient appliances, reduce water waste, actually eat the food you buy and make less of it meat, buy better bulbs and drive a fuel-efficient vehicle.

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Corresponding Author

Dr. Vandana Tyagi*

Associate Professor, HOD of Department, S.D. (PG) College, Department of Geography, Muzaffarnagar, UP