ISSN–0974–0759 | ●●● Article ●●● |Visit us : *www.researchjournal.co.in*|

Impact of climate change on Agriculture in India

Yuvaraj Singh Dhruw

Department of Agricultural Extension (I.G.K.V.) Raipur (C.G.) India
(Email : yuvrajdhruw.igkv@gmail.com)

Climate change is any significant long-term change in the expected patterns of average weather of region (or the whole Earth) over a significant period of time. It is about non-normal variations to the climate, and the effects of these variations on other parts of the Earth. These changes may take tens, hundreds or perhaps millions of year. But increased in anthropogenic activities such as industrialization, urbanization, deforestation, agriculture, change in land use pattern etc. leads to emission of green house gases due to which the rate of climate change is much faster. Climate change scenarios include higher temperatures, changes in precipitation and higher atmospheric CO_2 concentrations. There are three ways in which the Greenhouse Effect may be important for agriculture. First, increased atmospheric CO_2 concentrations can have a direct effect on the growth rate of crop plants and weeds. Secondly, CO_2-induced changes of climate may alter levels of temperature, rainfall and sunshine that can influence plant and animal productivity. Finally, rises in sea level may lead to loss of farmland by inundation and increasing salinity of groundwater in coastal areas.

What is climate change? Climate change is the subject of how weather patterns change over decades or longer. Climate change takes place due to natural and human influences. Since the Industrial Revolution (*i.e.*, 1750), humans have contributed to climate change through the emissions of GHGs and aerosols, and through changes in land use, resulting in a rise in global temperatures. Increases in global temperatures may have different impacts, such as an increase in storms, floods, droughts, and sea levels and the decline of ice sheets, sea ice and glaciers.

Causes of climate change: Human activities are the main reasons of climate change. Observations made in the last 50 years indicate that about 0.1^0C per decade increase in atmospheric temperature has taken place. Industries, transportation, generation of electricity are the main reasons for the increase in temperature.

Weather and climate: Weather is the set of meteorological conditions such as wind, rain, snow, sunshine, temperature, etc. at a particular time and place. By contrast, the term climate describes the overall long-term characteristics of the weather experienced at a place. The ecosystems, agriculture, livelihoods and settlements of a region are very dependent on its climate. The climate, therefore, can be thought of as a long-term summary of weather conditions, taking account of the average conditions as well as the variability of these conditions. The fluctuations that occur from year to year and the statistics of extreme conditions such as severe storms or unusually hot seasons are part of the climatic variability.

Impacts on water resources: Changes in key climate variables, namely temperature, precipitation and humidity, may have significant long-term implications for the quality and quantity of water. River systems of the Brahmaputra, the Ganga and the Indus, which benefit from melting snow in the lean season, are likely to be particularly affected by the decrease in snow cover. A decline in total run-off for all river basins, except Narmada and Tapti, is projected in India's NATCOM. A decline in run-off by more than two thirds is also anticipated for Sabarmati and Luni basins. Due to sea level rise, the fresh water sources near the coastal regions will suffer salt intrusion.

Impact on soil : The global climate change will have adverse effect on soil processes and properties important for restoring soil fertility and productivity. Increase in temperature, will reduce the soil carbon storage due to increased decomposition of soil organic matter by carbon dioxide emission, and ultimately leading to low water holding and nutrient supplying capacity. All these effects

are highly region specific, depending on the magnitude of the climate change, soil properties and climate condition.

Impacts on biodiversity: The Intergovernmental Panel on Climate Change has projected that global average temperature increase during 21st century will range from 1.4° to 4° Celsius.

Research by the Consultative Group on International Agricultural Research based on distribution models of wild relatives of three staple crops of the poor *i.e.* Peanuts, cowpea and potato suggests that 16-22 per cent of wild species will be threatened by extinction by 2055. Loss of genetic diversity can have serious long-term consequences globally.

Impacts on coastal areas: A mean Sea Level Rise (SLR) of 15-38 cm is projected along India's coast by the mid 21st century and of 46-59 cm by 2100. In addition, a projected increase in the intensity of tropical cyclones poses a threat to the heavily populated coastal zones in the country.

Impacts on agriculture and food production: Obvious climate change impacts on terrestrial food production can already be observed in some sectors around the globe. In the past few years, climate extremes such as droughts have occurred in major producing areas, resulting in many episodes of price hikes for food and cereals. Although these effects are beneficial in certain areas, adverse consequences are more frequent than favourable ones, especially, because key production areas (e.g. California) are located in historically favourable areas which will become unfavourable. Many climate change impacts will increasingly affect food security-particularly in low-latitude regions-and will be exacerbated by escalating food demand. Forecasted ocean-level rise will threaten crucial food-producing areas along the coasts, such as India and Bangladesh, which are major rice producers. Climate change is also a key political issue and its consequences, such as food insecurity, are already generating conflict in vulnerable regions around the globe. For example in northern Africa, there is increasing evidence that even though climate change impacts such as food insecurity are not the "cause" of the 2011 Arab spring, they may have precipitated the uprisings. The expected impacts of climate change-such as extreme temperatures, flooding, droughts, rising ocean levels, and ocean acidification-will not only exacerbate existing tensions but will also be a major challenge for homeland security

Received : *22.09.2018* ***Revised :*** *10.11.2018* ***Accepted :*** *19.11.2018*