



CLIMATE CHANGE WILL IMPACT AGRICULTURE AND FOOD PRODUCTION

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ABSTRACT Climate change is a major crisis of the future and will have a huge impact on human society and other biodiversity. Negative impact of global warming includes reduced crop quantity and quality due to the reduced growth period following high levels of temperature rise. The Consensus of the intergovernmental panel on climate change (IPCC) is that substantial climate change has already occurred since the 1950s, and that it's likely the global mean surface air temperature will increase by 0.4 to 2.60°C in the second half of this century.

KEYWORDS : Agriculture, climate change, IPCC, greenhouse, food production.

INTRODUCTION:-

Agriculture is a major source of GHGs which contribute to the greenhouse effect and climate change. However, the changing climate is having a far-reaching impact on agricultural production, which is likely to challenge food security in the future. The principal barrier to food security is a currently food access sufficient food is produced globally to feed the current world population, yet more than 10% are undernourished. Climate change is likely to contribute substantially to food insecurity in the future, by increasing food prices and reducing food production. Food may become more expensive as climate change mitigation efforts increase energy prices. Water required for food production may become more scarce due to increased crop water use and drought. Competition for land may increase as certain areas become climatically unstable for production (Chatterjee. A- 1998).

IMPACT OF CLIMATE CHANGE:-

Climate change refers to changes beyond the average atmospheric condition that are caused both by natural factors such as the orbit of earth's revolution, volcanic activities and crustal movements and artificial factors such as the increase in the concentration of greenhouse gases and aerosol. Climate change by global warming. Which refers to the average increase in global temperature, has become a megatrend that will lead to significant global changes in the future. Concerning its impact, the UN intergovernmental panel on climate change (IPCC) presented considerable scientific evidences in its. Fourth report on climate change (2007) and they have become clearly recognized worldwide (Chattopadhyay R.-2000).

In addition, people have become more aware for the fact that global warming cannot be avoided due to the country continued increase in greenhouse gas emissions and the change in the climate system. The club of Rome report 1972 officially raised global warming as an international issue and in 1985, World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) officially declared carbon dioxide as the principal cause of global warming. In order to effectively cope with the global warming issue, intergovernmental panel on climate change (IPCC) was organized in 1988 and has carried out systematic research and in-depth study on climate change. Global warming not only cause a change in average temperature and precipitation but also increase the frequency of floods, droughts, heat waves, and intensity of Typhoons and hurricanes following the change in temperature and precipitation patterns. The impact of climate change is also shown in various other forms throughout the world, including the rise of sea level, decrease in glaciers, north world movement of plant habitats, changes in animal habitats, rise of ocean temperature, shortened winter and early arrival of spring. As the acceleration of global warming effects not only ecological systems but also human life, it has become an important issue both nationally and internationally (Kumar K. and Praikh J-1998).

Impact on Agricultural Production:-

Agricultural production is carried out through the selection of crops suitable for the climate of specific region and application of a proper farming methods. Therefore, agriculture is a climate dependents bio-industry with a notable regional characteristic refers to the ecosystem, characteristics determined by the climate of the region, climate change disturbs the agricultural ecosystem, resulting in the change in agricultural climate elements such as temperature precipitation and sunlight, while further influencing the arable, livestock, and hydrology sectors. Climate change brings about biological changes in areas such

as fertilization and breathing and also affects the growing pattern of pastures (IPCC-1996).

Food grain production in India has increased spectacularly due to the Green Revolution from 50 mt in 1951 to 2212 mt in 2002, and the mean cereal productivity has increased from 500 kg / ha to almost 1800 kg / ha (Government of India 2004). These increases were largely. The result of area expansion, large-scale cultivation of new high yielding semi-dwarf variance. Since the early 1960s, and the increased application of irrigation, fertilizers and biocides, supported by progressive government policies. The food security of India may be at risk once again in the future due to continued population growth. By 2050, India's population is projected to grow to 1.6 billion (IPCC-1998).

Food production in India is sensitive to climate change such as variability in monsoon rain falls and temperature changes within a season. Study by India Agricultural Research Institute (IARI) and others indicate greater expected loss in the Rabi crop. Every 2°C rise in temperature reduces wheat production by 4-5 million Tons. Small change in temperature and rainfall have a significant effect on the quality of fruits, Vegetables, Tea, Coffee, aromatic plants and basmati rice. Pathogens and insect populations are strongly dependent upon temperature and humidity and change in these parameters may change their population dynamics. Other impact on agricultural and related sectors includes lower yields from dairy cattle and decline in fish breeding, migration and harvests. Global reports indicate a loss of 10-40% in crop production by 2100 (Gautam H.R, Kumar.R-2007). Indian agriculture remains vulnerable to the vagaries of weather and the looming threat of climate change may expose this vulnerability further. It shows that climate change could reduce incomes by 50-80% and by 20-25% in unirrigated areas.

The Productivity Effect of Weather:-

We turn our attention to the effect of this change in temperature on agriculture output and yields. A simple correlation at the district level, say between average temperature and average agricultural productivity, will not yield the causal effect of interest. For example, if we find that in one district have the lower average productivity, it could be because of temperature, but it could also be because of several other factors correlated with temperature-soil quality, availability of water and so on. Production suggested that by the end of this century, significant change in climate may reduce productivity of Indian agriculture by 25%. Agriculture in very arid and semi-arid region is more sensitive to climate change and would be more impaired by climate change (Mall R.K, Singh, Gupta.R-2006). Kharif crop will be affected more rainfall variability, while rubber crops by minimum temperature which is likely to be negatively impacted in rubber season due to the terminal heat stress with 1°C rise in temperature result in loss of a metric tons of wheat. Similarly, legumes are going to be benefitted because of our evaluation of the level of atmospheric CO₂.

Climate change will have an economic impact on agriculture, including change in farm profitability, prices supply, demand and the magnitude and geographical distribution of such climate induced change may affect our ability to expand the food production as required to feed the populace. Climate change could thus have a far-reaching effect on the patterns of trade among nations, development, and food security. Agriculture production is directly dependent on climate change and weather possible change in temperature,

precipitation and CO₂ concentration are expected to significantly impact crop growth (Goyal R.K 2004).

CONCLUSION:-

Global climate change is not a new phenomenon the effect of climate change poses mini threats, one of the important consequences is bringing about change in the quality and quantity water resource and crop productivity. It can be concluded that the Indian region is highly sensitive to climate change. Climate change has a serious impact on the availability of various resource on the earth especially water, which sustains life on this planet. Changes the biosphere, biodiversity and natural resource are adversely affecting human health and quality of life.

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