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CLIMATE CHANGE AND ITS IMPACT ON EARTH AND SOCIETY

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Abstract:-
Climate change is defined as change in climate over time, whether due to natural variability or as a result of human activity. Adaptive capacity is the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, to cope with the consequences .

Key Words:- Climate change , Agriculture , Earth, Water, Society.

Introduction:-

Climate is the primary determinant of agricultural productivity.Climate change and agriculture are inextricably linked. Agriculture still depends fundamentally on the weather. Climate change has already caused a negative impact on agriculture in many parts of the world because of increasingly severe weather patterns. Climate change is expected to continue to cause floods, worsen desertification and disrupt growing seasons. The Food and Agriculture Organization (FAO) warns that an increase in average global temperatures of just two to four degrees Celsius above pre-industrial levels could reduce crop yields by 15-35 percent in Africa and western Asia, and by 25-35 percent in the Middle East. An increase of two degrees alone could potentially cause the extinction of millions of species. Agricultural practices also exacerbate climate change. The Intergovernmental Panel on Climate Change (IPCC) says that agriculture contributes 13.5 percent of global greenhouse gas emissions (2004). According to Greenpeace, if calculating both direct and indirect emissions from the food system, agriculture's contribution could be as high as 32 percent. (Greenpeace includes all related activities; in addition to agricultural production, they add land use, transportation, packaging and processing.) The future of agricultural production relies on both designing new ways to adapt to the likely consequences of climate change, as well as changing agricultural practices to mitigate the climate damage that current practices cause, all without undermining food security, rural development and livelihoods. The impacts of climate change are likely to be severe for the countries like India that have limited arable land but heavy dependence on agriculture (Mendelsohn et al., 2006; Stern, 2006; Nelson et al., 2009) and also have poor technological and financial capabilities for mitigation and adaptation to climate change. In India, the agricultural sector despite a significant decline in its share in national income (<15% in 2010-11 from 37% in 1970-71), remains an important segment of the economy because of its strategic importance to food security, employment generation and poverty alleviation. The sector still engages about 54 per cent of the country's workforce. In the past four decades India's surface temperature has increased by 0.3 °C or by 0.08 °C per decade. In recent years, the climate change has been accompanied by increased incidence of natural calamities such as droughts, floods, cyclones and heat waves (Goswamiet al., 2006). Such extreme events can cause a drastic decline in the agricultural output, exacerbating the problems of food insecurity and rural poverty. Bhandari et al. (2007) in their study in a few eastern states of India have estimated a 24-58 per cent decline in household income and 12-33 per cent rise in farm-household poverty in a drought year. Small farmers are likely to be more affected by the climate change because of their poor access to technologies, inputs, information and finances for mitigation and adaptation.

Objective of the study:-

1. To Study the Concept of Climate Change.
2. To examine the Impacts of Climate Change on Earth and Society.

Hypothesis:-

1. There are many reason behind Climate Change.
2. Climate change has a serious impact on the availability of various resources on the earth especially water & Agriculture.which sustains life on this planet.

Research Methodology:-

Present study will be based on secondary data. Secondary data will be collected through books, Reports, Magazines, Newspaper, Govt. Web-portals, etc.

Impacts of Climate Change on Agriculture:-

The nature of agriculture and farming practices in any particular location are strongly influenced by the long-term mean climate state—the experience and infrastructure of local farming communities are generally appropriate to particular types of farming and to a particular group of crops which are known to be productive under the current climate. Changes in the mean climate away from current states may require adjustments to current practices in order to maintain productivity, and in some cases the optimum type of farming may change. Higher growing season temperatures can significantly impact agricultural productivity, farm incomes and food security (Battisti& Naylor 2009). Crops prevalent in southern Europe such as maize, sunflower and soya beans could also become viable further north and at higher altitudes (Hilde´n et al. 2005; Audsley et al. 2006; Olesen et al. 2007). Here, yields could increase by as much as 30 per cent by the 2050s, dependent on crop (Alexandrov et al. 2002; Ewert et al. 2005; Richter & Semenov 2005; Audsley et al. 2006; Olesen et al. 2007). For the coming century, Fisher et al.(2005) simulated large gains in potential agricultural land for the regions such as the Russian Federation, owing to longer planting windows and generally more favorable growing conditions under warming, amountingto a 64 per cent increase over 245 million hectares by the 2080s. However, technological development could outweigh these effects, resulting in combined wheat yield increases of 37–101% by the 2050s (Ewert et al. 2005).

Effect of Climate Change on Earth and Society:-

The change in the level of light, temperature, wind, rainfall and humidity is called climate change. It may occur due to global warming. It affects the earth and lives on it very seriously. In Asia and Africa, frequent droughts have been recorded in the last decade. El Nino(It is a complex cycle of climate change affecting the Pacific region) has created great storms frequently since 1975.These have changed the climate of the earth to become worst for the survival of man. Meantime, the earth has lost its ability to balance the human activities. These are signs that our earth is sick. Many projection studies have been conducted the forecast the climate change on the earth based on population growth and energy demand. The climatologist have created global climate models. The Intergovernmental Panel on Climate Change(IPCC) has reviewed the climate change for this century. According to the IPCC,

- Theglobal surface temperature will rise by 1.4 to 5.8°C.
- Global warming will be high on land and at high altitude.
- The rate of warming will be higher than that in the previous 10,000 years.
- There will be frequent droughts and floods.
- There will be fewer cold spells but more heat waves.
- The frequent of El Nino will increase.
- The global sea level will increase by 9-88cm in 2100.
- Because of ingression of sea water, people who are living with in 60km from sea will lose their native areas. Nile delta(Egypt), Ganges delta(India) and many islands will g under sea water.
- Human societies will be seriously affected due to severe floods and droughts.
- There will be severe scarcity of water, food, shelter and social condition. So, public health will be affected.
- Freshwater supplies will be mostly polluted and the water table will go very deep.
- Food production will be reduced to disease, pests and loss of genetic diversity.
- Starvation and malnutrition will reduce the health status of people.
- Climate change associated diseases will appear in men and animal.
- Climate change will increase the distribution of vectors that spread pathogens to man. The seasonal spreading of the diseases will be more dangerous.
- Coral reefs will be destroyed by the year 2050.

Impacts of Climate Change in India:-

Agriculture is strongly influenced by weather and climate.While farmers are often flexible in dealing with weather and year-to-year variability, there is nevertheless a high degree of adaptation to the local climate in the form of established infrastructure, local farming practice

and individual experience. Climate change can therefore be expected to impact on agriculture, potentially threatening established aspects of farming systems but also providing opportunities for improvements. India is a large country with a diverse climate. Diverse seasons mean diverse crops and farming systems. There is a high dependency of agriculture on the monsoon rains and a close link exists between climate and water resources. Two thirds of the area is rain dependent. Add to this picture the small land holdings, poor coping mechanisms and low penetration of risk management products. With a 0.68 degrees Celsius increase in temperature so far in India, it is expected that there will be pronounced warming in future, particularly during the post monsoon period and winter. There will be increased frequency of floods during the monsoon and a decrease in winter precipitation with a lower number of rainy days.Amongst the key impacts will be the faster retreat of Himalayan glaciers, frequent floods and decrease in crop yields. Yield reductions are predicted in wheat and rice due to temperature rise in key growing regions.

In more detail, the potential impacts on Indian agriculture would look like this: the productivity of most cereals would decrease due to increase in temperature and CO2, and the decrease in water availability. There will be a projected loss of 10-40% in crop production by 2100 if no adaptation measures are taken. A one degree Celsius increase in temperature may reduce yields of major food crops by 3-7%. The length of the growing period in rain fed areas is likely to decrease, especially in peninsular regions. We are also going to see increased climatic extremes such as heat and cold waves, which are likely to increase production variability. In India, impact of climate change can be associated with the concepts of rising in the sea level, expansion of oceans, melting glaciers, small ice caps and ice sheets. In this way, the process can be explained as accelerated sea level rise by about 9-88 cm due to the thermal expansion of oceans and melting of glaciers, small ice caps, and ice sheets. And, this projected rise is 2-5 times faster than the rate observed over the last 100 years. Moreover, India is among the 27 countries identified as vulnerable to a rise in sea level. It leads to consequences in coastal infrastructure, tourism and other economic activities such as oil exploration are also at risk. It is estimated that a 1-metre rise in sea level will affect 5763 square kilometers. India being agro-based market economy, the intensity in the areas of agriculture and forestry and low technical and financial adaptive capacity, is vulnerable to climate change. Climate models indicate that India's climate could become warmer and heavy rainfall events are likely to be more. In the agriculture sector, it is estimated that a loss of 9% to 25% in farm revenue for a temperature rise of 2-3.5 degrees Celsius. Agriculture in the coastal regions of Gujarat, Maharashtra, and Karnataka is likely to be affected the most. Forests are the most important components for the equitable eco-system. This will be increased the rainfall and productivity of tropical forests in India. In teak plantations and in moist deciduous forest, higher temperatures will reduce soil moisture resulting in a decline in productivity of forests.

Conclusion:-

The climate change, as realized through trends of temperature rise and increasedCO2 concentration, is a major concern. In the recent past, the number of studies for assessing its impact on agriculture has increased. In the long run, the climatic change could affect agriculture in several ways such as quantity and quality of crops in terms of productivity, growth rates, photosynthesis and transpiration rates, moisture availability etc. Ciimate change is likely to directly impact food production across the globe. Increase in the mean seasonal temperature can reduce the duration of many crops and hence reduce the yield.The foodproduction systems are now under the confluence of a number of biotic and abiotic stresses including theclimate change.

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