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EFFECT OF CLIMATIC CHANGE ON AGRICULTURE

Prof. Dr. Siras Bhaiyalal Katmusre
Head Dept. Of Economics ,
Rani Indirabai Bhonsale College, Kuhi
Dist. – Nagpur. Maharashtra. India.

ABSTRACT

Agriculture productivity can be affected in two ways: one directly, due to change in temperature, precipitation or co2 level and two indirectly, through changes in soil, distribution and frequency of infestation by pests, insects, diseases or weeds. Sixty five per cent on India agriculture is heavily dependent on natural factors such as rainfall. It is also restricted by a lack of complementary inputs and institutional support system. In tropical Asia, although wheat crops are likely to be sensitive to an increase maximum temperature, rice crops would be vulnerable to an increase in minimum temperature. The adverse impacts of likely water shortage on wheat productivity in India could be minimized to a certain extent under elevated co2 levels; this impact, however, would be largely maintained for rice crops. Resulting in a net decline in rice yields. Acute water shortage conditions combined with thermal stress could adversity affects wheat and, more severely, rice productivity in Indian even under the positive effects of elevated co2 in the future.

KEYWORDS: *Agriculture productivity affected, co2level, impact on crop.*

INTRODUCTION

Many climatologists predict significant global warning in the coming decades due to increasing atmospheric carbon dioxide (CO2) and other green house gases including methane (CH4) nitrous oxide (N2O) etc. Changes in temperature, precipitation and solar radiation basically define crop production and will have an effect on the productivity of crop as well as live stock agriculture with economic effects on farm profitability, prices, supply, demand and trade. Sustainability of agriculture lies in the sustainability of the resources being used in the agriculture like soil, water, and atmosphere with weather and climate, plant etc. There exists a reciprocal relationship among these three, if one is changed. Remaining get automatically changed. This relationship decides the agriculture production. It was through necessary to study "Effect Of Climatic Change On Agriculture"

OBJECTIVE OF THE STUDY:

1) To study impact of global warming.
2) To study causes of climate change.
3) To study Effect of climatic Change on Agriculture.
4) Impact of climate change on soil.
5) Impact of climate change on productivity (Rice and wheat)

HYPOTHESIS OF STUDY:

1) Effect of climate change on crop productivity is negative.

2) Elevated co2 caused significant effects in the productivity of rice and wheat.
3) Global warming exhibits direct and indirect effect on agriculture.

METHODS AND MATERIALS:

Finding from the General circulation Modal based on the equivalent of doubling of carbon dioxide (co2) concentration have been used. In the present paper products of various group to study the effects of changing climatic scenario at IARI, IISC on crop through simulation models are utilized to study "Effect Of Climatic Change On Agriculture".

RESULT AND DISCUSSION:

Man made activities of pouring carbon dioxide. methane and nitrous oxide etc. increased warming due to green house in the atmosphere. Global mean air temperature is increased by 0-60C in the past 100 years due to increase in the green house gases.

BACKGROUND:

The prevailing international scientific opining on climate changes that human activities resulted in substantial global warming from the mid-20th century and that continued growth gas concentration caused by human-induced emission would generate high risks of dangerous climate change. The intergovernmental panel on climate change (IPCC) has predicted an average global rice in temperature of 1.40 c (2.50F) to 5.80C (10.40F) between 1990 and 2100. [4]

Climate change:

The average weather of an area is called the climate of that area. The climate change greatly affects the environmental features to the alarming situations. Man-made (Anthropogenic) activities are disturbing the delicate balance between various components of the environment. An increase of green house gases in the atmosphere has resulted in increase in the average globaltemperature. This rise in global temperature refereed as global warming may upset the hydrological cycle result flood and drought in different regions of the world cause sea level rise, changes in agricultural productivity deforestation, famines and finally death of human beings as well as livestock.

Causes of climate change:

The causes of climate change are natural and anthropogenic which are listed below:
Earth's tilt, Volcanoes, Temperature, Precipitation, Atmospheric Co2

Man & climate Change

Over population is another cause to exacerbate environmental problems, such as climate change, loss of wildlife habitat deforestation, and air and water pollution. The world population is getting doubled each 40 years. According to the united nations, for example, 95 percent of the world's cities still dump raw sewage into their water supplies. Over-population result in urbanization, pollution and deforestation.

Impact of Global warming on Agriculture Productivity:-

Global warming exhibits direct and indirect effect on Agriculture productivity. Frequency of heat waves alters the pattern of rainfall and also change in top soil management practices. Dry land yields of corn, wheat shorten a crop's life cycle. summer cooling electricity demands would increase, while winter heating demand would decrease. As a result of climate change, annual electricity demands are expected to increase by 4 to 6% by the year 2055, additional power plants will be required to meet peak demands.

Impact of climate changes in agriculture:-

The major impacts of climate change on agriculture are:-

1. Destabilization in production and productivity.
2. Less availability of irrigation.
3. Reduction in fertilizer use efficiency
4. Detrimental effect in fruits, vegetables, medicinal and aromatic plants.

Man made activities of pouring carbon dioxide, methane & nitrous oxide etc. increased warming due to green house in the atmosphere. Global mean air temperature is increased the by 0-6oC in the past 100 years due to increased in the green house gases. Assuming double increase of CO2 the global means temperature is likely to increase ranging from 1oC to 3.5oC. This rise will be unequally distributed over the globe. The temperature rise will be more in higher latitudes than in equilateral or low latitudes. Rise of at least 1 to 20oC by 2030 AD seem to result.

Impact of climate changes on soil :-

a) Decease in soil cabin.
b) Soil erosion due to denuding of forests and Vegetation
c) Shift in land suitability.
d) Increase in transient salinity.
e) Change soil biology and microbial population.

Impact of climate changes on wheat productions :-

Wheat production in Maharashtra is likely to e reduced by 50% due to less moisture in soil, inadequate rainfall attack and change in temperatures. Due to temperature rises of 2 to 50C during November 20C and 60C in January about 20% reduction in yields expected.

Consequences of Climate change and its impact:-

Despite increase in total yields on global basis, the growth yield rates of the various crops have been declined. Higher latitudes appear to benefit agriculture, more consistently.Lower latitudes either do not benefit significantly or Loose productivity. Straight Conclusion across the world is difficult to draw.

Rabi/Winter Crops to loose in Agriculture:-

Rise in temperature due to climate change can affect the rabi crops like wheat, gram, musters, linseed etc. giving tow yields due to fast maturity. Soyabean, pigeon-pea groundnut, semi-rabi sesamum originally "kharif sowri but domesticated in rabi can have better future and better yield which may find "new growing period" Higher temperature and higher CO2 values in rice. Plants resulted in 3-5 days early flowering in indica rice verities. In general it is necessary to modify the present cropping patterns to suit and to derive possible benefit of climate change.

Emission of carbon from fossil fuels:-

88th per cent of world energy needs are supplied by fissile fuels while the balance coming from hydro-electric generation and nuclear power plants. Nearly 75 percent carbon is released per unit of energy when coal is burnt instead of natural gas while the synthetic oil or gas made from coal or shale oil, produces about 80 percent carbon than coal.

Green House Gases : Past, Present and future Details.

Sr. No	Parameter Concentration	CO_2	CH_4	N_2O	CFC_s
1	1950	280 ppm	1150 ppb	285 ppb	0.0 ppb
2	1985	345 ppm	1790 ppb	305 ppb	0.4 ppb
3	Expected 2075	526 ppm	4402 ppb	478 ppb	3.8 ppb
4	Annual concentration increase	0.4	1	0.2	5
5	Relative green House efficiency $CO^{-1}{}_2$	51	25	230	1500
6	Current Green house contribution %	57	12	6	25
7	Anticipated rate between 1985 and 2075 %	0.57	10	0.5	25
8	Equilicipated temperature change 1850-2075 °C	3.12	0.62	0.28	0.93
				Total	4.95°C
9	% total temperature change	63	12	06	19=100%
10	Life time year	100	10	150	100

Table reveals that CO2 had generated significant amount of Green house gases and follows methane Nitrous Oxide and CFCs, respectively. Developed Countries are the main contribution for Green house gases by human activity.

CONCLUSION:-

The effects of climate changes on the agriculture are discussed and are alarming and to maintain its sustainability it is necessary to undertake suitable policy, research and planning to keep up the sustainability of the various resources like soil, water, atmosphere and plant on which agriculture depends. All economic equation of sustainability of agriculture are settled and climate and therefore may take new magnitude and dimension under the climate change to be faced in future.

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