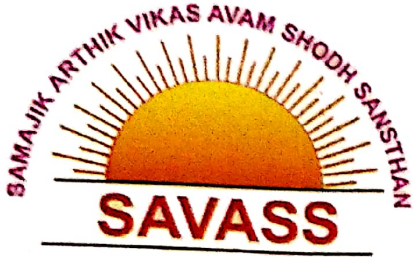


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Climate Change and Ecosystem in Context to Indian Economy



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# Climate Change and Indian Agriculture Sector: Effects and Remedies

Dr. Dilip Pandurang Mahajan\* & Dr. Rajendrakumar Ramrao Gawhale\*\*

## Abstract

India is an agriculture economy. The climate change brings about changes on Economy either in a good form or bad. The changes and ups and downs appear in economy have become the focus point in this present research paper. The researcher has gone through the various stages for finding out the variety of effects on Indian Economy. The researcher has tried his level best to find out the major instrumentals in deterioration of climate, for instance- global warming, draught, growing population etc. How do climatic changes affect not only the Indian Economy but also, it covers the whole world.

## Introduction

Agriculture is a backbone of Indian Economy and near-about 42% of total Indian population working in this primary sector. Indian agriculture is depended on the vagaries of nature and in this way it has become a business of gambling. Frequent changes in nature badly impress the livelihood and productivity of the people. Thus, the agriculture production is being decreased bit by bit. Agriculture sector covers 13.9% of the total GDP. Due to climate changes in the last 20 years, India had to suffer from the loss of rupees 79.5 billion Dollars is in Indian currency the worth is 30 lakh, crore rupees. In the financial year 2009-10 the total agriculture product occupied 14.6% of the Total Domestic Product which has come down to -8.3% in the year 2017-18. It is given below in the tabulation form,

Years	Agriculture and adjoining sectors' Development Rate (%)
2013-14	12.3
2014-15	-10.7
2015-16	-3.2
2016-17	22.5
2017-18	-8.3

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## Research Methodology

In this research paper entitled "Climate change and Indian Economy: Effects and Remedies" the researcher has gone through various means include-primary and secondary sources, Books, Newspapers, Magazines-weekly, monthly, quarterly, reports published in reputed journals, annuals and articles for substantiating the views given in this paper.

## Hypothesis

Some certain hypotheses are to be observed and used as a pedestal for this research:

1. Climate change and its Impact on the Agriculture Product.
2. The effect of population Growth.

## Objectives of Study

1. To study the reasons of climatic changes in India.
2. To study the effect and consequences of climatic changes in India.
3. To study to find out the remedies and solutions for the climatic changes.

## Fact of Today

The reports says that in the production of Rice and Maze, probably will go down by 10 to 30% and 25 to 70% respectively, as well as the temperature will increases by 3 to 4 Degree Celsius. The social and economic changes could bring about imbalance in demand to supply ratio, which affects the major needs of the people include- fresh water supply for the hygienic life. The reports warned that, the increase in temperature give birth to draught ridden situation and it can range from 5 to 20%.The increase in sea water level will affect 35 million people living near the sea areas and will have to face flood and other hazards, and if it is not controlled the number could reach to 150 million populous of India. This is not suffice to say that the people would be affected but the GDP will be decreased by 10 to 23% and not controlled yet it will be to 92%, in addition to this-Cancer, Dengue, Malaria like such pandemics can break about. This is all the report says.

The report published by the "Inter Governmental Panel on climate Change" brought to the notice that emission of green houses gases, if not decreases would affect the life of more than 3 billion people; they would suffer from its dire consequences.

According to the report of climate change-2022, if the emission of gases continue, the temperature and humidity will go beyond the human tolerance, which also affects the Indian subcontinent and its ecosystem include Agree and Food system; increase in global temperature affects more to Vidarbha region and Mumbai will be targeted and be a sufferer of both global warming and increase of sea water level. Till the 2050 the loss will be 4.9 to 5.0 billion in Indian currency and would reach to 2.9 times in 2070. Due to global warming, sudden changes appear in the atmosphere that resulted into various forms like-Hurricanes, increase in sea level which take the ports situated at the shore; as India has got 75000 km. of sea border; the metropolitan cities like Mumbai, Kolkata, Chennai in its gambits. Therefore these cities should accept nature friendly activities and must bring harmony between nature and fundamental amenities.

The modern life style relies on the various electrical and electronic gadgets that make an addition to the green house gases. Some part of India is drought prone. The increase in water management program is expected whereby the growing temperature could be resisted to some extent. India has got 650 billion rupees worth damages by the climatic changes-include: hurricanes, heavy rain. In the year 2020 the Asian regions have been vigorously affected and damaged, which left heavy loss in the form of property and lives. According to the report of 2020 India has lost 87 billion dollars property-in Indian currency-65352 crore rupees. The highest temperature is recorded in the year-2020.

### Reasons Behind Atmospheric Changes:

#### 1. Effect of Greenhouses:

In India some special plants are being raised in the special kind of shade i.e. called green houses which secure the plants from the outside atmosphere could affect the plants therefore it avoids plants' direct contact with the outside atmosphere. The result of this emission of carbon- dioxide makes an addition to the temperature.

#### 2. India's Temperature Rise:

The decrease in the area of forest land, pasture, and grass land add the dryness in the atmosphere which again brings down the scale of rainfall. 75% of the total heat is absorbed by the atmosphere that raises the atmospheric temperature.

#### 3. Methane:

Methane is used as a fuel. The biological activity of the virus is mixing methane from oil and natural gas refineries into the atmosphere, increasing the temperature.

#### 4. Hole in the Ozone:

Due to the hole in the ozone layer, the ultraviolet rays of the sun reach the earth directly and thereby increase the temperature of the atmosphere.

5. In the year 1986, **International Council of Scientific Union** set the objectives to study the atmospheric changes appeared and how this changes control the biosphere of the earth. More than 1,000 scientists conducted research on climate change between 1991 and 2000. According to them, human activity is causing the Earth's climate to change over millions of years. Deforestation has accelerated global warming and the increasing number of storms and storms, enlarging the number of species, worshipping, water use, etc. It has been shockingly observed that even if carbon emissions are reduced by 2017, it will be an order of magnitude warmer than it was in the last 125,000 years, so there is a threat of global climate change. The water limit has tripled as a result of the increasing amount of carbon dioxide in the atmosphere, so the situation is more alarming. After 1980, an increase in temperature will cause extreme events and heat waves. It will certainly affect the human very badly.

### Adverse effects of climate change in India:

#### 1. Worsening the seasonal cycle:

Due to climate change in India, the seasonal cycle is changing between monsoons, winters and summers. The situation varies due to the sudden changes in seasonal cycle-uncertain rainfall, ups and downs in temperature. The year 2018 has been recorded the hottest years on earth.

2. **Rise in sea level:**

Due to rise in sea level winds ocean currents increase in number of storms increase in the number of micro-organisms and have harmful effects on human health.

3. **Droughts are increasing:**

Due to monsoon rains the current situation in India is drought prone as a result of which people do not have access to drinking water hence the number of victims due to drought is getting increased.

4. **Less employment:**

Climate change in India influences many things and as the things depend on one another the concomitant goes on affecting e.g. less rain decreases employment, and increasing unemployment leading to starvation of people resulting in increase in number of famine victims. In 1966 drought; millions of people became victims of starvation in India.

5. Due to climate change, melting of glaciers, floods and natural storms such as snow storms and tsunamis, causing large-scale disruption of agriculture, crops are lost due to rains, and due to lack of rains, crop production and yields are reduced, drinking water shortages are felt.

6. Climate change is dangerous to human health. Skin diseases, Eye irritation, High blood pressure, breathing problems, Asthma, dieria, Coughs, Colds, Sore throats, heart diseases, and Sugar diseases are the result of atmospheric change. Climate changes are showing the effects on humans.

7. Climate change has resulted in rapid population growth in hot climate regions such as India, leading to early puberty in boys and girls.

Years	Population in Billion
1949-50	0.40
1970-71	0.70
1985-86	1.0
2010-11	1.21
2022	1.40 (Tentative)

8. The alarming information is that 2000 farmers are turning their backs on agriculture every day. If this migration continues, it will be a crisis for the food.

9. If it continues that one million and 60 thousand people will be lost in production, the big question about food security will take a serious shape.

10. The production capacity will be worsen day by day due to the change of global warming by 1.6%. This loss in money is 120 billion Dollar. If the output decreases day by day due to global temperature change, the GDP will decrease by 3.2 percent by 2030.

11. Climate change in India 2010 to 2013 were the years of highest cold and ice storms years Leh, Ladakh, Uttarakhand, Kedarnath, Badrinath and other places had many years of heavy rainfall is an indication of climate change.

12. Agricultural production in 2011 was 1.5 percent and population growth rate was 1.6 percent less than population growth rate in the country. This phenomenon is threatening the rate of food grains in India.
13. Climate change and land desertification are causing crop diseases are reducing yields. If the temperature increases by two degrees Celsius India's production is feared to drop by 12 percent. Why is it not at risk May this increase by 2100. It is feared that it will rise up to 2.5 to 5 degrees Celsius, so there is a fear that India's temperature will increase by 1 to 4 degrees
14. The sea level will increase due to the increase in salt water of the sea; as a result, the area under crop cultivation will decrease by 30% by 2020 and by 6% by 2050.
15. Between 1997 and 2012, 190,000 farmers would have committed suicide in India. Due to the changes in the climate the possibility cannot be denied that the desertification would be started.
16. The possibility cannot be ruled out that a 1 degree increase in temperature in India is causing less rainfall due to increasing temperature in the distance between Ghats, resulting in a decrease in crop germination and growth as well as production capacity and quality and a decrease in yield.
17. A faster release of water can threaten dams. Dam overflowing water can submerge land below the dam and lead to wet drought condition.
18. It can seriously affect the living arrangements of the coastal people. Situation in Lakshadweep appears to be critical. Oceanic cyclones have increased sea land subsidence. 19. India market imported 3.54 million food grains in 2009-10 resulting in decline in food production and threat of food shortages. Coming in 2001-02 food grain production was 212.9 million tons followed by 2006-07 it came down to 209.2 million tons.
20. In 1997-98 the share of India's total agriculture was 18.5% and then it came down to 9.9 by the end of 10th five year plan.
21. In the year 2000 the per day per capita production of food was 454.4 gram and then it decreased to 444.5 gram per day per capita in the year 2006.
22. After globalization the growth rate of Indian agriculture which was up to 3.2% seems to have come down to 1.3% .India is losing 100 of Millions of Dollars in exports every year.
23. The share of agriculture sector in gross domestic product is seen to have declined from 22% in 2004-5 to 17.2%
24. in 2008-09 Agriculture The production was 234.47 million tonnes which has decreased to 114.63 million tones.
25. In 2019, one out of every 4 deaths in India was due to Air Pollution. Due to Air Pollution 16 lakh 70 thousand people were died.
26. 2021 year was the hottest years, temperature growth started from the year 2009 (Growth-0.550), 2010 (Growth-0.539), 2016 (Growth-0.710), 2017 (Growth-0.541), Climate change killed 1750 people in India.
  1. In the last 30 years, production has declined by 4 to 10 percent.
  2. Natural disasters such as cyclones and floods have displaced 1.28 million people since 2008.

3. Marine fish stocks in tropical regions have been depleted by 40 to 70 percent.
4. Half of the people of the world will be affected by the communicable diseases.
5. 2.7 million people will be displaced by the flood Droughts.
6. People will be displaced by floods Droughts will affect 400 million people in urban areas.
7. Extreme temperature rise of 1.5 to 2 degrees Celsius will directly affect 1.7 Billion people around the world and 120 Million people will face heat waves.
8. Between 2020 and 2050 Migration is now predicted to increase six fold.
9. By 2050, 8 million to 80 million people will be at risk of starvation.
10. 2.25 billion People in Europe and Africa are likely to be at risk of dengue.
11. Till 2080, it is predicted that millions of people would be suffered from rising temperature at least for a month per year.
12. If the temperature rises by 2.7 Degrees-1.25 million people in the US would be affected, 280 million in Brazil and 3.1 million in South America.
13. As a result, 16.5 million people in Africa and the Americas will experience food shortages.
14. Climate change may put 1.4 million children in Africa at risk of malnutrition.

### Addressing Climate Change in India

Over the past year, Maharashtra has taken concrete steps towards climate resilience, with a focus on environmental action plans now focusing on adaptation and resilience, and how cities in Maharashtra will implement this, opined the research director of the Indian School of Business and IPCC. Dr. Anjal Prakash, author of the second working group in the current Sixth Assessment Report of the United Nations, expressed that the international agreement on climate change requires limiting the average temperature rise to 1.5 degrees Celsius by 2030. 45 percent reduction, complete shutdown of coal-based power plants by 2050, etc., otherwise there will be an increase in many natural disasters such as polar ice melting, increase in temperature, warming, extreme rainfall, various natural catastrophe would rise the report says.

1. The amount of Carbon-dioxide should be reduced first of all, for this; conservation should be undertaken by planting trees on a large scale.
2. The area of forest land should be increased. In India, only 32% (percent) of the land is covered by forests, but some parts are not forests but deserts. The trees themselves should be cool, which will help in reducing the temperature.
3. Reduce the amount of carbon dioxide on the earth. For example, petrol diesel cars contribute to the increase in temperature due to coal smoke. For this, it should be controlled. Environmental supplements and more use of solar energy will cause to decrease the temperature.
4. Control of epidemic diseases requires timely measures to prevent the spread of insects.
5. Remedial action is required-Raising the height of factory smokestacks and releasing pollution emissions higher into the atmosphere will help reduce ground level pollution.



To prevent climate change the world average temperature is expected to increase by 2 degrees Celsius by 2030, but in India by 2022 temperature will have increased by 2 Degree urgent measures are needed to prevent climate change.

Energy conservation, Alternative energy generation, Efficient use of water, Optimal use of land Environment Climate change management is necessary. It's and issue of Life and death. Environmental change is expected to have an adverse effect on agricultural planning Due to decline in production, the country needs. Increase in proper irrigation for agricultural development. Increase in use of technology, increase in use of generic seeds, change in research and management in response to climate change for green revolution.

### Conclusion

India needs to think about controlling climate change because 80% (percent) of people in India are dependent on agriculture, our agriculture is a precious gift from nature, and conservation of nature for human development is the key to our progress. The world is aware of the fact that the factor of temperature group rainfall has affected the Indian agriculture sector and its effect is on the crop formation area, and it is seen to be effective due to which human interference in nature has increased. The temperature has increased industrial revolution, science technology change. It is imperative that global measures be urgently implemented to prevent further devastation from the observation that climate change has not been brought under control by humans and will never forgive all humans.

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