

Impact of Climate Change on Indian Agriculture

Abhishek kumar ¹, Princi thakur ² and Priyanka kunjam ³

¹M.Sc. Scholar, College of Agriculture, RVSKVV, Gwalior, MP

²M.Sc. Scholar, School of Agriculture, ITM, Gwalior, MP

³ B.Sc (Ag). .BTCCARS,Bilaspur, IGKV, Raipur, CG

ARTICLE ID: 029

Introduction

Climate change is the historical change in the pattern of average seasonal conditions. These changes are generally studied by dividing the history of the Earth over long periods. This change in climate conditions can also be natural and also the result of human activities. Greenhouse effect and global warming are believed to be the result of human actions after the industrial revolution, the result of the increase in the amount of gases released by humans from the industries like carbon dioxide etc. in the atmosphere.

The potential impact of climate change is visible in the agricultural sector. Climate change will not only affect the production of crops but will also negatively impact their quality. Lack of nutrients and protein will be found in the grains, due to which the health of humans will be affected even after taking a balanced diet. Due to the increase in temperature in the maximum regions, production of most crops will decrease. Wheat and paddy are the main food crops of our country. Wheat production will suffer many losses due to climate change. If the temperature rises to about 2 ° C so in most places wheat production will be reduced. This will have less effect where the productivity of wheat is high. However, climate change will have a greater impact in areas where there is low production.

Global climate change

- Identifiable change in climate of Earth as a whole that lasts for an extend period of time (Decades or Longer).
- When due to natural process. It is usually referred to as Global climate variability.
- Usually refers to changes forced by human activities that change the atmosphere.

Climate is affected by many factors

- ✚ Abiotic factors

- Ocean currents
- Solar radiation
- Evaporation
- Volcanic activity

 **Biotic factors**

- Transportation
- Respiration
- Photosynthesis
- Decomposition

Some effects of climate change

- Melting of polar ice-polar bears and others animal and drowning.
- Migrating birds are forced to change their time and place of migration.
- Melting of glaciers will lead to higher sea low which will cause flood and put many low elevation regions at risk of disappearing under water.
- Longer summer can disrupt animal habitat.
- New and wild spread disease because of warm climate.
- Average precipitation increase around the world.
- Droughts heat waves, extreme winter and Storms hurricanes typhoons.
- More wildfires.

Agriculture and climate change 3 fair relationship

- Agriculture as a contributor of climate change.
- Impact of Climate Change on agriculture.
- Agriculture as a potential moderators of climate change.

Current issue of in agriculture

- Over production in short term, yet food security for a larger production.
- Decline in yields.
- Diversification
- Quality and quantity of water resources.

Impact of Climate Change on agriculture

- Greater Loss expected in Ravi every 1°C increase in temperature reduces wheat production by 4 to 5 million tones. Loss only 1 to 2 million tons if farmers could plant in time.
- Reduce frequency of frost damage less damage: Less damage to potato, Peas, mustard.
- Increase increased drought and floods are likely to increase production variability.
- Cereal productivity to decrease by 10 to 40% by 2100.

How hot is too hot?

✚ Rising CO₂ and Temp:

- CO₂ emitted by human is main cause (IPCC).
- Global surface temperature risen - in 0.8°C since 1880 (IPCC).
- Australian temperature risen 0.9°C since 1910 (CSIRO).

Heat stress in rice production system

All Rice production system will be exposed to heat stress but Rain fed uplands are particularly vulnerable.

- Heat stress leads to high sterility, Stunting and accelerate development.
- About 33°C sterility of rice drastically increase.
- Given yield reduction.
- Grain quality (chalkiness) increase with high temperature.

Climate variability and climate change and another driver in agriculture

- Increase in CO₂
- Increase in temperature
- Sea level rise
- Variability and extreme events such as flood and drought.

Agriculture as part of the solution?

- Increasing carbon sequestration through Land management.
- Rotation with cover crops, green manure Agro forestry.
- Conservation tillage.
- Could reduce global CO₂ emission by 5 to 15%.
- Organic farming (but limited benefits)
- Enhance carbon storage in soil.

Projected beneficial impact of Climate Change on Indian agriculture

- Reduce frequency of Frost damage: Less damage to Potato, Peas, Mustard.
- New “flooded” areas may become available for fisheries in coastal regions.
- Other potential benefits, If any need to be characterized.

Adaptation to climate change

- New varieties: Drought/heat resistant.
- New farm management practices.
- Change in land use
- Watershed management
- Agri-insurance.

What can be done

First we must admit that climate change is everyone's problems. No agency government or scientist can “Fix it” for us. we are all in this together. We get here because of our Lifestyle so our lifestyle has to be change.

Steps taken by the government so far.

- **National mission for sustainable agriculture (NMSA):-** To make agriculture productive, sustainable and climate resilient. It also developed capacity of farmers and stakeholders in the domain of Climate Change adoption and mitigation measures.
- **Soil health card:-** SHC scheme in 2015 carry crop wise Recommendations of nutrition and fertilizers required for the individual farms to help farmers to improve productivity through use of inputs.
- **Climate change knowledge network in Indian agriculture:** To established ICT enabled approaches for knowledge exchange on climate change adaptation in Indian agriculture. The eAric project was initiated in North east to disseminate climate smart agriculture practices.
- **Pradhanmantri fasal Bima Yojana:** In the direction of government saving farmers from the Worth of frequently changing climate pattern. A part from all this, Government of India started **National innovations in climate resilient agriculture (NICRA)**. To make the farmers but reliant by use of climate resilient agriculture Technologies.

Conclusion

Climate change is a reality. Indian agriculture is likely to suffer losses due to heat, erratic, weather and decreased irrigation availability. Adoption strategies can help minimize negative impacts. These need research funding and policy support. Costs of adoption and mitigation are unknown but likely to be high cost of in action could be even higher. Reduce emissions of greenhouse gases. Attempt to develop alternative energies. Allow emissions to continue but prepare for global climate change. Allow emissions to continue as Normal and leave preparations up to individual countries. Combine any of these ideas. Come up with your own unique plan.

