



Effect of Climate Change on Indian Farming and Economy

Hemant

Assistant Professor of Economics, Government College Kheri Chopta, Hisar, (India)

hemantahlawat007@gmail.com

DOI: 10.6084/m9.figshare.19898050

Abstract:

The paper indicates the economic aspect of climate change in several fields and particularly to the agriculture. India is an Agriculture dependent county more. More people are earning bread through agriculture. It is a county which depends upon weather for crop production as well as other business. Now a day global warming is a big issue and the main component of global warming is the climate change. Uncertainties in the weather affect the human life as well as agriculture and industries. By reviewing various literature meaning of climate and its different component is describe in the current paper. Mainly it is adversely affect the agriculture and it leads to the poverty in our country.

Keywords: Poverty, Climate, Global Warming, Agriculture

1. Introduction:

The world is warming, according to meteorological data accumulated over the last century. In line with this, the mean annual temperature in India as a whole indicates a strong heating trend of 0.51 grades Celsius apiece 100 years from 1901 to 2007. (Kothawale et al., 2010). Also, global fever and precipitation estimates, on average, point to a warmer and wetter world. Both yearly mean fevers and summer monsoon rainfall are anticipated to rise on average in India by 2030, according to simulations using regional climate models (GoI 2010). However, as one would expect in a country of sub mainland parts, there are considerable regional variances in historical and projected patterns. Both of these truths have major consequences for the Indian budget in terms of climate change's impact and regional influence.



This is especially true in agriculture, where climate is a direct factor on manufacture. While the importance of this industry has decreased in India over time, it leftovers vital to the country's socioeconomic fabric. Agriculture employs 55 percent of the workforce despite accounting for only around 15% of GDP (excluding forestry and fisheries). Furthermore, according to the 2011 census, 69 percent of the population is still rural and dependent on agriculture. Agriculture also has strong forward and retrograde links to the rest of the budget.

Generally people consider climate and weather as a same phenomenon but in reality there is difference between these two. Climate is an abstract notion that is defined by monitoring various atmospheric factors such as temperature, heaviness, humidity, wind intensity and direction, precipitation, snowfall, raincloud, and sunshine at a specific moment. It is the total of all atmospheric phenomena at a given location at a given time period in a year.

Our approach is to estimate a farming manufacture function using exogenous climate variables such as rain and temperature. As a result, we avoid crop imitation methods that rely on new data. We don't assess summary form correlations between financial variables like earnings or the financial worth of harvest and weather data.

Climate change and farming are interrelated procedures; together of them yield place on global measure. Farming is affected by climate change severally. Change in average temperature, rainfall, heat eaves affects agriculture. It is long duration change is predictable pattern of weather. It is abnormal variation to the climate that affects other part of the earth. Activities like industrialization, development, deforestation, farming, change in property, use shape leads to production of conservatory gas due to which the ratio of climate alteration is much faster. Greenhouse effect is important for agriculture in three different ways:

- For starters, higher CO₂ levels in the atmosphere can affect the rate at which crop plants and weeds develop.



- Second, CO₂-induced climate change may alter temperatures, rainfall, and sunshine, affecting plant and animal productivity.
- Finally, rising sea levels may result in the inundation of farms and an increase in the salinity of groundwater in coastal areas.

The complex process of climate change is frequently clarified with the assistance of a simple process titled the ‘greenhouse effect. Climate change indicated high temperature, decreasing rainfall. Six out of 10 nations greatest weal of climate alteration are in Asia-Pacific. Bangladesh max the list surveyed by Nepal, India, Philippines, Myanmar and Afghanistan. In Bangladesh, for instance, around one-fifth of the state's populace would be expatriate as a consequence of the farmland loss assessed for a 1.5 m sea-level rise. Maldives Landmasses in the Indian Sea would have one-half of their land part inundated with a 2 m increase in sea level.

2. Evidence of change in climate and environment

According to their assessment report of IPCC (2001) rise in the global superficial temperature decreases the snow shield and ice extent, due to that sea level increases and certain additional important features of global climate change. The most important global evidence of change in the atmosphere is the ozone hole. Some other examples of climate change are melting of snow, ice and glacier, excessively could winter in Europe, bleaching of great barrier reef, ozone hole, Asian Brown cloud.

3. Indian Situation of climate change

The most extensively used joined atmosphere-ocean-sea-ice-land-surface models by a resolve of 250-300 km grids have distinctive topographies that are frequently not effectively reflected by global climate replicas. The summer monsoon (and to a smaller extent the season monsoon) and the nation's physiological topographies, such as the western and eastern ghats, the central plateau, and Himalayas, shape India's climate. The straw-hat monsoon and the rains it transports are a prominent weather event on the Indian subcontinent that has a significant impact on the lives of the people who live there.



It is the Earth's most creative wet season, lasting four months (June-September) when enormous convective thunderstorms control India's weather (Collier and Webb 2002). Over 80% of India's rainfall falls during this season (Bagla 2006, 2012). Thus, the monsoon's precipitation (rainfall) quantity, timing, and spatial distribution is the most closely watched component, and it is especially significant for agriculture. The straw-hat rainy season is also the greatest economically crucial weather phenomenon, with Indian Finance Minister Pranab Mukherjee recently referring to it as "the actual finance minister." Despite this, it is "just partially understood" and "reputably difficult to forecast" (Wikipedia 2012).

The heating may be additional distinct in the Northam part of India. The excesses in maximum then minimum temperatures are probable to rise under changing climate, limited places are predictable to get volley while certain are dry. In India one should be more concerned about the negative effects of climate change, because most of the people depend on nature for their livelihood. The most significant climate event that mark India are heat surfs, cold surfs and fog, snowstorm, deluges and droughts, monsoon despairs and cyclones and increase in sea level.

3.1 Heat Wave

A heat wave happens when temperatures rise above the normal maximum temperature in the northwestern area of India during the summer season. Heat waves usually occur between March and June, but they can sometimes last into July. People who live in these areas are affected by these changes because they generate physiological stress, which can lead to mortality.

4. Indian Meteorological section has given the subsequent standards for heat surfs

- ❖ Heat surfs consider till supreme temperature of a position reaches at least 40°C aimed at grasslands and at lease 30°C for Hilly areas.
 - ❖ When standard supreme temperature of a position is less than or equivalent to 40°C Heat Wave Parting from standard is 5°C to 6°C Severe Heat Wave Departure after normal is 7°C or additional.
-



- ❖ When standard extreme temperature of a position is additional than 40°C Heat Wave Departure after normal is 4°C to 5°C Severe Heat Wave Parting from usual is 6°C or additional.
- ❖ Heat waves should be declared when the actual highest temperature is 45°C or higher, regardless of the normal maximum temperature. Due to climate change, higher daily peak temperatures and longer, more intense heat waves are becoming more common around the world.
- ❖ India, too, is facing the effects of climate change in the form of more frequent heat waves that are becoming more violent in nature with each passing year, wreaking havoc on human health and increasing the number of heat wave fatalities.

5. Cold waves and Fog

Cold waves and fog during winter, particularly in the north part of the country, not only create a lot of inconvenience to the public but also cause loss of lives and damage to agriculture products. India practiced severe cold movement from December 2002 toward January 2003. In certain part of Haryana, Jammu, Himachal Pradesh, Punjab, Uttar Pradesh, Bihar and the North Eastern State practiced high cold waves. During this time fruit size and superiority adversely affected. Temperature foods like apple, roost, desirable and cherry gave higher harvest due to great chilling.

5.1 Snow Ablation and Snow Fall:

Snow ablation is highly sensitive to climatic variations. Due to global warming atmospheric temperature increases as a result energy exchange between atmosphere and snowpack. Thus global warming is accompanied by an increase in melting of snow. Systematic measurement of snow ablation pattern can give an indication of global climate change. Climate change can alter how much snow falls and when the winter snow season begins. Between 1966 and 2010, the amount of snow-covered land and sea ice in several northern hemisphere regions declined each year, notably during the spring snowmelt season. Scientist predicts that over the next 100 years, snowflake will shelter the less of the earth, particularly ended Europe and Asia. Climate heating can decrease snowfall.



There is are also other effects of climate change, those are flood and draughts, rainfall, monsoon depressions and cyclones, sea level rise, water stress and deforestation and desertification etc.

6. Impact of climate change in farming:

Indian farming is depending additional on monsoon after ancient period. Some kind of change in monsoon affects the agriculture radically. Increasing the temperature also affect the indian agriculture. Pre-monsoon primarily affect the wheat crop. In the state like Jharkhand, Chhattisgarh unaccompanied, rice manufacture losses throughout severe draughts (around some year in five) average around 40% of total manufacture, with projected value of \$800 million (Pandey, 2007)

Agriculture and its related activities is the largest component of Indian economy. It contribute nearly 30% of the total gross domestic product. It also provide 68% of total workforce and constitute 21% of total exports.

Increasing temperatures, shifting rainfall patterns, and frequent extreme weather events will have an impact on agriculture production. These will have a direct impact on the crops planted and their water requirements, as well as soil fertility, irrigation water supply, and pest and disease prevalence.

Climate change will have an impact on farming in the following ways:

- Heat strain on plants
- Change in moisture of soil
- temperature
- Loss of soil fruitfulness finished erosion of top soil
- Less water obtainable for crop manufacture
- Loss of land as the sea equal rise.

Because agriculture is already stressed due to poor soil, limited accessible area, and water scarcity, the



implications of such impacts are anticipated to be more severe in the atoll island.

Climate change's negative impact on agriculture has a significant impact on poverty. According to recent estimates from developing nations, a 1% gain in agriculture GDP improves the consumption of the poorest three deciles by four to six percentage points. As a result, climate change could considerably delay India's poverty reduction efforts.

7. Conclusion

After analyzing the literature the clear meaning and of climate change is found. Importance of its negative impact on peoples life is also mentioned, India's more population is living on agriculture, uncertain climate will adversely affect human life. Different component leads affect the weather and it disturb overall climate. Very recently yesterday while speaking a gathering of the worldwide elite at the inaugural session of the biosphere economic forum's annual encounter, Hon. Prime Minister Shree Narendra Modi also talk about climate change. He said India is also giving equal weightage like US and China on the global tests of climate change, violence and protectionism. Thus climate change is that serious issue for which not only India but the county like US and China are also Working.

References

- ❖ Kumar, K.S. Kavi. 2009. "Climate sensitivity of Indian agriculture." Madras School of Economics Working Paper 43/2009 (April).
- ❖ Mahato, A. (2014). climate change and its impact on agriculture. *International Journal of Scientific and Research Publications*, 4(4), 1-6.
- ❖ Kumar, Krishna K., Rupa Kumar Kolli, R.G. Ashrit, N.R. Deshpande, and J.W. Hansen. 2004. "Climate impacts on Indian agriculture." *International Journal of Climatology*, 24:1375-1393.
- ❖ Mall, R. K., Singh, R., Gupta, A., Shrinivasan, G., & RAthore, L. S. (2006). Impact of climate change on Indian agriculture: a review. *Springer: Climate Change*, 445-478.
- ❖ Nelson, G. C. (2009). *Climate Change: Impact of Agriculture and cost of adaptation*. International Food Policy Research Institute.



-
- ❖ Mendelsohn, Robert, William Nordhaus and Daigee Shaw. 1994. “The Impact of Global Warming on Agriculture: A Ricardian Analysis.” *American Economic Review*, 84(4):753- 771.
 - ❖ Sen, P., & Gupta, S. (n.d.). Nation and regional impact of climate change on the Indian Economy. In *Stern Review: The Economics of Climate Change*. New Delhi: Center for science and environment. (2018, January 24). *Times of India* [Ahmedabad], p. 1.
 - ❖ User, S. (n.d.). Heat Wave - National Disaster Management Authority. Retrieved from <http://www.ndma.gov.in/en/media-public-awareness/disaster/natural-disaster/heat-wave.html>
 - ❖ Peng, Shaobing, Jianliang Huang, John E. Sheehy, Rebecca C. Laza, Romeo M. Visperas, Xuhua Zhong, Grace S. Centeno, Gurdev S. Khush, and Kenneth G. Cassman. 2004. “Rice yields decline with higher night temperature from global warming.” *Proceedings of the National Academy of Sciences (PNAS)*, 101(27): 9971-9975.
 - ❖ Poudel, Santosh and Koji Kotani. 2012. “Climatic impacts on crop yield and its variability in Nepal: do they vary across seasons and altitudes?” *Climatic Change*, published online May 23 (DOI 10.1007/s10584-012-0491-8).
 - ❖ Sen Roy, Shouraseni and Robert C. Balling Jr. 2004. “Trends in extreme daily precipitation indices in India.” *International Journal of Climatology*, 24(4):457–466, (March 30)
 - ❖ Singh, Madan Pal. 2009. “Rice productivity in India under variable climates.” Paper presented at MARCO (Monsoon Asia Agro-Environmental Research Consortium) Symposium, October 6-9, Tsukuba, Japan. Workshop 2 (October 6).
 - ❖ Schlenker, Wolfram and Michael J. Roberts. “Nonlinear temperature effects indicate severe damages to U.S. crop yields under climate change.” *Proceedings of the National Academy of Sciences (PNAS)*, 106(37): 15594-15598 (September 15).
 - ❖ World Bank. “Poverty & equity databank and PovcalNet.” <http://povertydata.worldbank.org/poverty/country/IND> (accessed September 30, 2012) and <http://povertydata.worldbank.org/poverty/country/IND> (accessed September 30, 2012).