



Trends of Climate Change and Their Impact on Indian Livelihood

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ABSTRACT

India is a vast country occupying 2.4% world geographical area sharing 16.2% of the global human population and 15% of the global livestock population. It is endowed with varied climate supporting rich biodiversity and high diverse ecology. More than 60% of its population living in rural areas, where agriculture is the major concerns of rural economy, that is the backbone of Indian economy. The Indian economy is mostly agrarian based and depends on onset of monsoon and its further behavior. The livelihood of the rural people are directly dependent on climate sensitive natural resources like land, water and forests. The impact of climate change on these natural resources affect the agriculture, forests, water resources and human health. The impact of global climate change on agriculture might end in issues with food security and should threaten the sustenance activities upon that abundant of the population depends. The global climate change and warming cause important threat to agriculture. Pests population are strongly dependent upon temperature and humidity. It has been predicted that 10-40% losses in crop production in India with increase in temperature 3 to 5°C by the end of 21 century (IPCC, 2007; Ninan and Bedamatta, 2012). Lower yields from dairy cow and decline in fish breeding, migration and harvests are impacts of temperature change. Changes in climate might alter the distribution of necessary vector species and should increase the unfold of vector borne diseases. The loss in net revenue at the farm level is calculable to vary between 9% to 25% for a temperature rise of 2°C to 3.5°C. This paper was attempted to review the extensive studies on current trends of climate change and their impact on Indian livelihood.

Key words: Climate change, Global warming, Livelihood, Agriculture, India.

INTRODUCTION

India is a vast country occupying 2.4% world geographical area sharing 16.2% of the global human population and 15% of the global livestock population. It is dowered with varied climate supporting made multifariousness and high numerous ecology. More than 60% of its population living in rural areas, where

agriculture is the major concerns of rural economy, that is the backbone of Indian economy. The Indian economy is mostly agrarian based and depends on onset of monsoon and its further behavior. The livelihood of the rural people are directly dependent on climate sensitive natural resources like land, water and forests.

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The impact of climate change on these natural resources affect the agriculture, forests, water resources and human health. The impact of global climate change on agriculture may end in issues with food security and should threaten the bread and butter activities upon that abundant of the population depends. The climate change and global warming pose significant threat to agriculture. The current trend of global warming is the heating of global surface temperature due to emission of green house gases, over a long period of time. The global average surface temperature has increased by approximately 0.6°C over the past century. Further, the global average surface temperature will increase by 1.4–5.8°C over the end of 21 century and atmospheric carbon dioxide concentrations by 540–970 ppm over the same period (IPCC, 2001). The Fourth Assessment report of the Intergovernmental Panel on Climate Change (IPCC,2007) concluded from direct observations of changes in temperature, sea level, and snow cover in the northern hemisphere during 1850 to the present, that the warming of the earth's climate system is unequivocal. The global region concentration of CO₂ has enhanced from a pre industrial price of concerning 280 ppm to 379 ppm in 2005. Multi Model averages show that the temperature increases during 2090 - 2099 relative to 1980 - 1999 may range from 1.1 to 6.4°C and sea level rise from 18 to 59 cm. These could lead on to impacts on water accessibility, oceanic activity, food production, flooding of coastal areas and accumulated burden of vector borne and water borne diseases related to extreme weather events.

The year 2002 was a classical example to indicate Indian food grain's production depends on precipitation deficiency was 19% against the long amount average on the country and 29% of the world was affected because of drought. The All Asian nation drought is asserted once the rainfall deficiency for the country as a full is over 10% of traditional, and once over 20% of the country's space is stricken by drought condition. The optimum temperature for fruit blossom and

fruit set is 24°C in the case of apple while it experienced above 26°C for 17 days. The entire region recorded between a pair of 1 and 7.9°C higher most temperature against the conventional across the State of Himachal Pradesh in March 2004. A decline of 39% in annual cocoa yield was noticed in 2004 compared thereto of 2003 thanks to rise in most temperature of the order of one to 3°C from 14th January to 16th March in Central a part of Kerala, India. Such trend was detected whenever summer temperature shot up by 2 to 3°C compared thereto of traditional most temperature of 33 to 36.5°C (Prasad and Rana, 2006). An increase of 1-4 °C, the grain yield reduced on average by 10% for each degree of temperature increased and annual wheat production could plunge by 4-5 million tonnes with every 1°C rise in the temperature have been predicted in India by the end of 21 century (NATCOM, 2004; NAPCC, 2008; Adhinarayanan, 2013). The loss in net revenue at the farm level is estimated to range between 9% to 25% for a temperature rise of 2°C to 3.5°C (Kavi Kumar and Parikh, 1998). It has been predicted that 10-40% losses in crop production in India with increase in temperature 3 to 5°C by the end of 21 century (IPCC, 2007; Ninan & Bedamatta, 2012).

A warming trend has been observed

MATERIALS AND METHODS

An extensive study was reviewed on current trends of climate change and their impact on Indian livelihood. The livelihood of the rural people are directly dependent on climate sensitive natural resources like land, water and forests. India lies to the north of the equator between 8° 4' and 35° 30' north latitude and 68° 7' and 97° 25' east meridian. It shares a value line of 7517 metric linear unit with ocean, the Arabian Sea and therefore the Bay of Bengal. India exhibits a large diversity of temperatures from the freeze cold winters within the chain to the hot heat of the Thar Desert. The climate of Asian country is dominated by the monsoon season, that is that the most vital season of Asian country. The average minimum temperature during winter

varies from 10°-15°C to average maximum temperature during summer varies from 41°-42°C and average relative humidity ranged between 44-81% across India. This investigation was undertaken on current trends of climate change and their impact on Indian livelihood by using reported studies and subject experts respectively.

RESULTS AND DISCUSSION

During extensive investigation, there were screened important factors of climate change which are currently impact and projected impact in India. Surface temperature and rainfall were highly correlated with impact of climate change regarding agriculture, that is the backbone of Indian economy.

Currently impact of climate change in India Rainfall

While the discovered monsoon precipitation at the All Asian country level doesn't show any vital trend, regional monsoon variations are recorded. A trend of skyrocketing monsoon seasonal rain has been found on the West Coast, northern Andhra Pradesh, and north-western Republic of India (+10% to +12% of the traditional over the last a hundred years) whereas a trend of decreasing monsoon seasonal rain has been discovered over eastern Madhya Pradesh, north-eastern Republic of India, and a few elements of Gujarat and Kerala (-6% to -8% of the traditional over the last a hundred years).

Rise in Sea Level

Using the records of coastal tide gauges in the north Indian Ocean for more than 40 years, Scientists have estimated that sea level rise was between 1.06-1.75 mm per year. These rates are consistent with 1-2 mm per year global sea level rise estimates of the IPCC.

Surface Temperature

At the national level, increase of 0.4° C has been observed in surface air temperatures over the past century. A warming trend has been ascertained on the geographical region, in central Asian country, the inside ground, and northeastern Asian country. However, cooling trends are ascertained in northwest India and components of south India.

Extreme Weather Events

Trends of maximum Weather Events discovered in multi-decadal periods of a lot of frequent droughts followed by less severe droughts. There has been associate degree overall increasing trend in severe storm incidence on the coast at the speed of 0.011 events p.a.. whereas the states of province and Gujarat have rumored increasing trends, a decline has been ascertained in Orissa.

Melting of Himalayan Glaciers

The mountain range possess one among the biggest resources of snow and ice and its glaciers type a supply of water for the perennial rivers like the Indus, the Ganga, and therefore the Brahmaputra. Glacial soften could impact their long-run lean-season ten flows, with adverse impacts on the economy in terms of water convenience and hydropower generation.

Projected impact of climate change in India Impacts on health

Changes in climate might alter the distribution of necessary vector species (for example, protozoal infection mosquitoes) and should increase the unfold of such diseases to new areas. If there's a rise of 3.8°C in temperature and a 7% increase in ratio, the transmission windows i.e., months throughout that mosquitoes square measure active, twelve are open for all twelve months in nine states in Asian nation. The transmission windows in Jammu and Kashmir and in Rajasthan may increase by 3-5 months. However, in Orissa and some southern states, a further increase in temperature is likely to shorten the transmission window by 2-3 months.

Impacts on Agriculture

Food production in Bharat is sensitive to climate changes like variability in monsoon precipitation and temperature changes among a season. each 1°C rise in temperature reduces wheat production by 4-5 million eleven tonnes. Different impacts on agricultural and connected sectors embrace lower yields from oxen and decline in fish breeding, migration, and harvests. It has been predicted that 10-40% losses in crop production in India with increase in temperature 3 to 5°C by the end of

21 century (IPCC, 2007; Ninan and Bedamatta, 2012).

Impacts on Biodiversity

The Intergovernmental Panel on Climate Change has projected that global average temperature increase during 21st century will range from 1.4 to 4°C. Research by the Consultative Group on International Agricultural Research based on distribution models of wild relatives of three staple crops of the poor i.e. Peanuts, thirteen cowpea and potato suggests that 16-22 per cent of untamed species are vulnerable by extinction by 2055. Loss of genetic diversity will have serious long-run consequences globally.

Impacts on Water Resources

Changes in key climate variables, particularly temperature, precipitation and humidness, might have vital long-run implications for the standard and amount of water. stream systems of the river, the Ganga, and also the Indus, that have the benefit of melting snow within the lean season, area unit probably to be significantly laid low with the decrease in snow cowl. Due to water level rise, the water sources close to the coastal regions can suffer salt intrusion.

Impacts on Surface Temperature

The simulation studies by Indian Institute of Tropical Meteorology (IITM), Pune, calculable that annual mean surface temperature is predicted to lift by the tip of century, ranges from 3 to 5° C with warming additional pronounced within the northern elements of Republic of India. By two070-2099 the typical temperatures across seasons ar doubtless to vary between 2.5 to 5° over completely different regions of Republic of India. Winter temperatures ar doubtless to be considerably higher go between 3.75 to 4.95° across the regions.

CONCLUSION

It has been ended that, the incidence of floods, droughts, heat and cold waves area unit common across the globe because of global climate change. Their adverse impact on resource of farmers is tremendous. it's additional therefore in Bharat as our economy

is additional addicted to agriculture. Food security and environmental property area unit the main focuses of world agriculture. The resource of the agricultural folks area unit directly addicted to climate sensitive natural resources like loud water and forests. The impact of global climate change on these nature resources have an effect on the agriculture, forests, water resources and human health mitigation and adaptation policy formulation, one in every of the crucial inputs required within the potential impact because of global climate change on numerous climate sensitive sectors. For mitigation, data would supply the specified justification for decarburizing the energy systems. on different hand, within the context of adaptation, information on global climate change included impacts are useful in prioritizing the variation in most required sectors and regions. there's got to guide formers on projected impact global climate change and sensitize then on propeople mitigation and adaptation choices to attenuate the danger in agricultural and allied sectors of rural livelihoods of Bharat.

REFERENCES

- Adhinarayanan, R. (2013). Climate change and food security. *Development Matters*, 2, 1-9.
- IPCC (2001). Climate change (2001). The scientific basis. <https://www.ipcc.ch/ipccreports/tar/wg1/index.htm>
- IPCC (2007). Climate change 2007 : The physical science basis. <https://www.ipcc.ch/ipccreports/tar/wg2/index.htm>.
- Kavi Kumar, K.S., & Parikh, J. (2001). Indian agriculture and climate sensitivity. *Global Environmental Change*, 11(2), 147-154.
- Morya, G.P., Kumar, R., Chand, S., & Gaur, S.C. (2017). Impact of climate change on rural life in India. In : Lead papers of *Proceedings of National Conference on Science for Rural India* 2, 27-28, Organised by Swadeshi Vigyan Sansthanam-U.P.

- Chapter III of Vijnana Bharti, Deoria, India, pp. 15-20.
- NAPCC (2008). National action plan on climate change. <http://envfor.nic.in/ccd-napcc>.
- NATCOM (2004). India's initial national communication to the United Nations framework convention on climate change. *Ministry of Environment and Forests, Government of India*, pp. 268.
- Ninan, K.N., & Bedamatta, S. (2012). Climate change, agriculture, poverty and livelihoods : A status report. *Working Paper 277, Institute of Social and Economic Change*, pp. 35.