Impact of climate change on various agricultural activities in India

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Abstract
Climate change is one of the biggest environmental challenges in all Countries in the world. Climate change refers to any change in climate over time, whether due to natural variability or/and as a result of human activity. It has become a major concern to society because of its potentially adverse impacts worldwide. There are already increasing concerns globally regarding changes in climate that are threatening to transform the livelihoods of the vulnerable population segments. Any adverse impacts on these natural resources will have repercussion on the nation’s livelihood security and economy and widen the gap between the rich and the poor. Scientists predicted that climate will have the main impact on agriculture, economy and livelihood of the populations of developing countries and India is one of them, where large parts of the population depends on climate sensitive sectors like agriculture and forestry for livelihood by adversely affecting freshwater availability and quality, biodiversity and desertification, climate change tends to disproportionately affect the poorest in the society, exacerbating inequities. Impact of climate change on agriculture could result in problems like food security and may threaten the livelihood activities upon which much of the population depend. Climate change can affect crop yield (both positively and negatively), as well as the types of crops that can be grown in certain areas, by impacting agricultural inputs such as water for irrigation, amount of solar radiation that affect plant growth as well as the prevalence of pests.

Keywords: Agriculture activity, climate change, impact, livelihoods

Introduction
Agriculture has an important role to play in the economic growth of an agrarian economy like that of India. Agriculture has been a way of life and continues to be the most important livelihood of the Indian masses. Agriculture productivity is sensitive to climate changes in the country and therefore its impacts need to be evaluated as climate affects many aspects of plant and animal biology, the effect of climatic elements and their extremes will significantly impact the productivity of agriculture sector and further generate negative impacts on socio-economic conditions of India where agriculture contributes little less than a quarter of the country's GDP. Climate change currently contributes to the global burden of many problems at very high confidence. Human being and earth system are exposed to climate change through changing weather patterns, temperature rise, precipitation imbalance, sea level rise and more frequent and extreme events and indirectly through change in water, air and food quality and changes in eco-systems agriculture, industry and economy. At this stage the effects may not appear big but, are projected to progressively increase in all regions of our country. Climate change is the change in the statistical distribution of weather over periods of time that range from decades to millions of years. It is one of the key components influencing agricultural production and has large scale inputs on food production and overall economy. Agriculture is an important driver of wheels of Indian economy and also treated as backbone of the country. Thus agriculture sector needs to be improved steadily on sustainable, viable and in ecofriendly way. The present study is an attempt to explore the co-relation of impact of climate change on Agricultural sector like (Animal husbandry, Fishery, Forestry and hydrological sector) and how the Greenhouse gases, Carbon dioxide, Temperature and all meteorological phenomena affect the agricultural production. It also highlights the relationship of climate change on agriculture by relating with the crop, soil, rainfall, greenhouse gases, and temperature and how the threatening of agriculture can mitigate in a sustainable and viable way by adopting suggested agricultural measures like crop varieties, drought and flood management, and restoration of waste and degraded lands.
Research Methodology
To complete the above objectives, by employing the appropriate research methodology, the study was conducted in
district Kanpur in the year 2017-2018 and 2018-2019. Two
blocks Kalyanpur and Chaubepur were selected randomly
in this study. From the selected blocks, twelve villages
Singhpur, Barahat, Haradaypur, Baikunthpur, Gambhirpur,
Mohamadpur, Abdulpur, Anilika, Ludhori, Tighra,
Bikhri pur, Bahlol pur. were selected. Twenty five
respondents were selected randomly from each village. Thus,
300 respondents were selected. Dependent and independent
variables, namely age, educational qualification, caste,
religion, type of family, size of family, type of house, annual
income, occupation, land holding, social participation,
awareness, constraints, suggestions etc. were used. For
analysis of collected information, suitable and appropriate
statistical techniques were such as percentage, arithmetic
mean, standard deviation, weighted mean, rank, correlation
coefficient; chi square test, z test etc were used.

Sampling procedure
Locale of the study
Uttar Pradesh was chosen as locale of the study This was
done with the intension that UP is a major state of the country
and farmers have an important role in agriculture.

Selection of district
Uttar Pradesh is comprised of 75 districts. Out of these one
district viz., Kanpur Nagar was purposively selected for the
study. This helped in collecting the necessary information
accurately and timely

Selection of Block
There are 10 blocks in district Kanpur Nagar. Out of these 2
blocks one is Kalyanpur and other is Chaubepur were
randomly selected for the study.

Selection of Villages
Twelve villages were randomly selected from the selected
blocks.

Selection of respondents
A list of farmers belonging to different villages was prepared
separately from each of the selected villages. From each list
25 respondents were selected randomly. Thus in all, 300
respondents were selected for the study purpose.

Analysis and Findings

| S. No. | Statement | Agree | Undecided | Disagree | Mean Score | Rank |
|-------|-----------|-------|-----------|----------|------------|------|
| 1.    | Production of various crops has decreased | 27.3 | 40.3 | 32.3 | 1.95 | III |
| 2.    | Use of traditional crop varieties has decreased | 28.7 | 32.3 | 39.0 | 1.90 | V |
| 3.    | Timing of flowering and fruiting has changed | 21.3 | 41.3 | 37.3 | 1.84 | VII |
| 4.    | Harvesting time of crops has changed | 19.3 | 41.0 | 39.7 | 1.80 | X |
| 5.    | Quality of food crops has declined | 27.7 | 31.3 | 41.0 | 1.87 | VI |
| 6.    | Cropping pattern has changed | 20.7 | 37.3 | 42.0 | 1.79 | XI |
| 7.    | Water availability has been decreased | 13.3 | 46.0 | 40.7 | 1.73 | XIII |
| 8.    | Ground water level is decreasing | 17.3 | 46.3 | 36.3 | 1.81 | IX |
| 9.    | Availability of fresh vegetables and fruits | 21.3 | 40.0 | 38.7 | 1.83 | VIII |
| 10.   | Pests and diseases have increased | 24.0 | 45.3 | 30.7 | 1.93 | IV |
| 11.   | Seasonal weeds have increased | 26.7 | 45.0 | 28.3 | 1.98 | I |
| 12.   | Area under forest cover has reduced | 25.7 | 43.3 | 31.0 | 1.95 | III |
| 13.   | Extinction of crop varieties and animals breeds | 20.7 | 36.7 | 42.7 | 1.78 | XII |
| 14.   | Increasing soil erosion | 18.3 | 32.0 | 49.7 | 1.69 | XIV |
| 15.   | Adverse effect on animal health | 25.7 | 45.0 | 29.3 | 1.96 | II |

The data pertaining in table1 indicates that Impact of Climate
change in various agriculture activities, 26.7 % farmers are
agreed and 45.0% farmers are undecided that seasonal weeds
have increased with mean score 1.98 and rank I. Followed by
25.7 % respondents agreed and 45.0 % respondents are
undecided about adverse effect on animal health due to
climate change with mean score 1.96 and rank II in the
research study area. While 27.3 % and 25.7 % farmers are
agreed that production of various crops has decreased and
area under forest cover has reduced with mean score 1.95 and
rank III, 24.0 % farmers are agreed and 45.3 % of farmers are
undecided pests and disease have increase due to climate
change with mean score1.93 and rank IV respectively
followed by 28.7 % farmers are agreed and 32.3 % are
undecided that use of traditional crop varieties has decreed the
climatic pattern with mean score 1.90 and stood rank V in the
area. 27.7 % farmers are agree and 31.3 % are undecided
about quality of food crops has declined with mean score 1.87
and rank VI, 21.3 % are agreed and 41.3 are undecided for
timing of flowering and fruiting has changed with mean score
1.84 and rank VII further 21.3 % respondents are agreed and
40.0 % are undecided that availability of fresh vegetables and
fruits have decreased with mean score 1.83 and rank VIII
respectively followed by 17.3 % farmers were agreed and
46.3 % farmers are undecided the ground water level is
decreasing with mean score 1.81 and rank IX., 19.3 % were
agreed and 41.0 % were undecided that the harvesting time of
crop has changed. Further 20.7 % were agreed and 37.3 %
were undecided about cropping pattern has changed due to
climate change with mean score 1.79 and rank XI. 20.7 %
farmers are agreed and 36.7 % were undecided that there is
extinction of crop varieties animal breeds. with mean score
1.78 and rank XII, 13.3 % were agreed and 46.0 %bare
undecided that water availability has been decreased with
mean score 1.73 and rank XIII respectively followed by 18.3
% farmers were agreed and 32.0 % were undecided that
increasing soil erosion with mean score 1.69 and rank XIV in
the research study area.

Conclusion
In the study, it was found that farmers in the study region
were able to recognize that temperatures have risen, winter
intensity has decreased and winter intensity has decreased.
There has been a fluctuation in the pattern of rainfall. The
The present analysis has therefore disproved the hypothesis that climate change, like most of the sample population, is merely a hoax. Some improvements have been made in relation to various climatic phenomena over the years. At the local level, there was minimal awareness, knowledge and ability Stage for understanding, discussing, and executing long-term climate change.

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