

## Impact of Climate Change on Ecology: Kerala Perspective

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### **Abstract**

Climate change is a problem with unique characteristics. It has become a reality and has its impact on ecology and agriculture. It is global, long-term and involves complex interactions between climatic, environmental, economic, political, institutional and social processes. In August 2018, the state of Kerala witnessed large-scale flooding, which affected millions of people and caused 400 or more deaths. This is the after effect of climate change. Climate change has its impact on all aspects of life including agriculture, fisheries, industries, health, transport, tourism and forests. In this article an attempt is made to explain the impact of climate change on ecology and agriculture in Kerala perspectives. Global warming also explained clearly in this study.

**Key Words:** Climate change, Ecology, Agriculture, Global warming, Flood, Drought, Temperature.

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## Introduction

Climate change is very important international challenge nowadays. Climate Change is the greatest ecological, economic and social problem of our time. Earth's Climate is undergoing changes for years. This will be one of the serious problems in the near future. Serious actions must be taken to mitigate this problem. Industries, governments, environmentalist, international organisations, citizens and communities will need to collaborate on an unprecedented scale in order to both mitigate and adapt its effects. The wide ranging potential impact of climate change on sustainable development shows that there is a linkage between these two concepts.

Climate change occurs over decades. Climate changes reflect variations within the earth's environment. Change in climate has different consequences on the physical environment. The intensity of extreme weather events in Kerala appears to be going up, as projected by various scientific assessments on climate change. But it can't be right to connect every such event with climate change, as pointed out by some scientists. In this article three aspects such as global warming, flood and impact of climate change on agriculture are explained in the Kerala context

### *Global Warming*

Global warming is defines as the long-term rise in the average temperature of the earth's climate system. It is a major aspect of climate change. Global warming and climate change are interchangeably used concepts. The effects of global warming include rising sea levels, regional changes in precipitation, more frequent extreme weather events such as heat waves, and expansion of deserts.(Wikipedia). Over the past 50 years, the average global temperature has increased at the very fastest rate. Greenhouse Effect is very much associated with global warming. The greenhouse effect is a natural phenomenon. However the increase in greenhouse gases is the result of human activities. Each year, scientists conducted research about the consequences of global warming on environment, economy, and health.

In fact, the average temperature of the planet has increased by 0.8° Celsius compared to the end of the 19th century. It is proved that the last three decades has been warmer than all previous decades. At the pace of current CO<sub>2</sub> emissions, scientists expects an increase of between 1.5° and 5.3°C (2.7° to 9.54°F) in average temperature by 2100. It would have harmful consequences to humanity and biosphere. Global warming causing a set of changes to the Earth's climate and long-term weather patterns on long term basis that varies from place to place. Observational and theoretical modelling studies shows increasing trends in temperature, precipitation and extreme events as realised by global warming.

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## Global Warming In Kerala

Kerala is blessed with scenic beauty and moderate climate. Global warming is having its worst impact on the state as it is tucked between the Western Ghats on the one side and the sea on the other. This is reflected in the extreme weather events in recent years, starting droughts followed by the Ockhi cyclonic storm and flood. Kerala witnessed significant decline in monsoon rainfall and increase in temperature during monsoon months in 2000 to 2015. There was also a decline in occurrence of rainfall over days. It denotes Kerala witnessed drying and warming during the monsoon season in these periods. From 2015 onwards, we can see the impact of global warming and climate change on Kerala's weather. So if we check last ten years data, we can see that extreme climate occurring in Kerala. Arabian Sea and the Bay of Bengal are warming at the rate of 1.1 degree Celsius in about 120 years compared to other oceans. In Kerala, Palaghat district is most badly affected by the global warming. Climate change indirectly affect on biodiversity in Kerala.

## Flood in Kerala

The state has the 13th largest population in India. Kerala is experiencing a type of humid tropical wet climate because it lies in the tropic region. Kerala is the land of monsoons. Rainfall pattern in recent years in Kerala exhibits uncertainties. The extreme rainfall and widespread flooding in Kerala in August 2018 has been internationally discussed problem. The persistent and extreme rainfall occurred in Kerala affected all aspects of human life including socio-economic conditions, transportation, infrastructure, agriculture and so on. Uninterrupted rains lashed most of the 38,852 sq km broad state, which was over 257 per cent of the normal rainfall this period in the past years. The carrying capacities of the water bodies to hold the water were also exhausted. The irrigation and hydel dams on the Western Ghats hill range were already getting to their peak storage capacity. Kerala had two notable extreme rain events in 1924 and 1961, which is prior to the global warming period. The role of climate change on 2018 flood in Kerala is remarkable.

In Kerala, climate-change-induced floods are becoming an annual affair. Following heavy rains over the year, the state witnessed heavy rain and flood in 2019 August also. The monsoon in Kerala has completely lost its traditional character. The enormous amount of damage occurred in 2019 flood also. Kerala got heavy rainfall, which is 116% more than the usual rain fall in Kerala. According to the India Meteorological Department (IMD), there was 2346.3 mm of rainfall, instead of the average 1649.55 mm. (Kerala Government Study report: Kerala floods of August 2018 )

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Kerala flood is directly co-related with climate change. After this incidence, scientists and meteorologists seriously researching about this issue. So Kerala also experiencing the negative impacts of climate change in the form of flood also

### **Impact of Climate Change on Agriculture**

Climate change and agriculture are very closely interrelated with each other. In the case of Kerala, last ten years accounts show this. Areas under agriculture are declining and crop productivity is stagnated since last one decade. ( G. S. L. H. V. Prasada Rao's study about Climate change adaptation initiatives in Kerala (India) under the humid tropics) The paddy productivity in Kerala is decreases due to long term climate change such as increase in temperature and unforeseen rain. Climate change heavily affected on food grains and plantation crops also. Temperature had a cumulative impact on crop productivity irrespective of the topography.

Other climate related issues in Kerala that have its impact on agriculture are decline in forest area, forest fires, declining in wetlands, indiscriminate sand mining and groundwater depletion. Development of climate based farming system is a solution to climate related agricultural problem. Soil degradation also affect on agricultural productivity. Soil fertility reduced due to bad weather.

### **Implications(Results of the Study)**

- Climate change has implications on extreme precipitation and flood events in Kerala. Therefore, we should take climate change seriously in terms of the rising frequency of extreme events.
  - Global warming will become a serious issue in near future in Kerala.
  - Kerala flood as a result of climate change have various dimensions like social, economic and ecological.
  - Droughts during summer and floods during rainy season are very common in Kerala. Weather related disasters are very much across Kerala.
  - The adverse impact of drought and flood is more significant on food grains in Kerala.
  - In Kerala, climate change and agricultural development are interrelated. The negative impacts of climate change affects on agricultural productivity.
  - Scientists and Administrators should take necessary actions to mitigate the negative impacts of climate change in Kerala.
  - It must protect biodiversity and ecology of Kerala from the negative impacts of climate change. Otherwise it will affect on tourism and sustainable development of Kerala.
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## Conclusion

In Kerala, impact of climate change will increase in the near future. More research is needed in climate change adaptation for the protection and development of agricultural production in the State of Kerala. There is a need of skilled personals in the field of climate change adaptation and mitigation. One of the eight missions of sustainable development is establishing a strategic knowledge platform for climate change. The climate change projections in terms of temperature indicate that the maximum temperature is likely to increase between 0.7°C and 1.03°C by 2050 at the current rate of increase. Climate change cannot be prevented. So we have to adapt it. For this climate mitigation options should implemented.

## References

1. Avinash Tyagi(2006).Climate change and global warming, Rajat publications, New Delhi,pp27-46
  2. Aggarwal, P.K. 2003 "Impact of climate change on Indian agriculture?, J. Plant Biology 30(2),189-198
  3. Campbell, A., Kapos, V., Scharlemann, J. P. W., Bubb, P., Chenery, A., Coad, L., Dickson, B. et al. (2009) Review of the Literature on the Links between Biodiversity and Climate Change: Impacts, Adaptation and Mitigation. Montreal: Secretariat of the Convention on Biological Diversity (Technical Series 42).
  4. Kerala Government Study report: Kerala floods of August 2018 (September, 2018)
  5. Study Report on Climate change adaptation initiatives in Kerala (India) under the humid tropics by G. S. L. H. V. Prasada Rao
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