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INITIATIVES FOR CLIMATE CHANGE ADAPTATION IN INDIA: A  
CRITICAL REVIEW

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**Abstract:**

*Climate change is referred as alternations in the statistical distribution of weather parameters for an extended period of time. Climate change is caused by factors such as biotic processes, variations in solar radiation received by Earth, plate tectonics, and volcanic eruptions. Certain human activities have also been identified as significant causes of recent climate change, often referred to as “Global warming. The ecosystems, agriculture, livelihoods and settlements of a region are very dependent on its climate. The fluctuations that occur from year to year, and the statistics of extreme conditions such as severe storms or unusually hot seasons are part of the climatic variability. In 21<sup>st</sup> century entire human society is experiencing the impact of climate change from local to global level. The phenomenon of climate change is a subsequent effect of alteration in weather conditions such as wind, rain, snow, sunshine, temperature, etc. at a particular time and place. With considering the wide range of impact of climate change on various sectors the government of India has taken several efforts for climate change adaptation. The present paper is an attempt to represent a critical review on Initiatives for Climate Change Adaptation in India.*

**Key words:** Climate, Global warming, Weather, Temperature, India,

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**Introduction:**

The phenomenon of climate change is an outcome of certain environmental changes due to human activities which may leads to alterations in weather conditions and further an emergence of global warming. The phenomenon of climate change is a subsequent result of global warming emerged due to increase in concentration of greenhouse gases from various sources. It may lead to melting of glaciers and ice gaps results in to increase in sea level. It also results into irregularity in rainfall, loss of biodiversity, impact on agriculture, impact on health, shifting seasons, threatens food security.

**Scenario of Climate Change:**

The current Global Scenario of Climate Change reveals that, CO<sub>2</sub> increased from a pre-industrial value of about 280 ppm to 379 ppm in 2005. Similarly, the global atmospheric concentration of methane and nitrous oxides, other important GHG's, has also increased considerably. The increase in

GHG's was 70% between 1970 and 2004. Eleven of the last twelve years rank among the 12 warmest years in the instrumental record of global surface temperature since 1850. The mean earth temperature has changed by 0.74°C during 1906 – 2005. The projected temperature increase by the end of this century is likely to be in the range 2 to 4.5°C with a best estimate of about 3°C, and is very unlikely to be less than 1.5°C. Values substantially higher than 4.5°C cannot be excluded. It is likely that future tropical cyclones will become more intense, with larger peak wind speeds and heavier precipitation. The projected sea level rise by the end of this century is likely to be 0.18 to 0.59 meters. The future projections show the end of the 21<sup>st</sup> century rainfall will increase by 15 – 31%, and the mean annual temperature will increase by 3°C to 6°C. The warming is more pronounced over land areas, with the maximum increase over northern India. The warming is also projected to be

relatively greater in winter and post-monsoon seasons.

#### **Initiatives for Climate Change Adaptation**

Govt. of India took several initiatives for formulating most efficient missions aiming to combat global warming and for climate change adaptation.

#### **National Mission on Sustainable Agriculture (NMSA):**

This Mission was structured under the National Action Plan on Climate Change (NAPCC) and made operational during 2014-15. It aimed to synergize resource conservation, enhancing or restoring the soil fertility, thereby, improving productivity with focus on soil health management, Integrated Farming System (IFS), integrated animal component and Water Use Efficiency (WUE) specifically in drylands or rainfed agriculture areas.

#### **National Adaptation Fund for Climate Change (NAFCC):**

This Scheme was implemented during 2015-16 mainly for supporting concrete adaptation activities dealing with mitigating the adverse effects of global climate change in sectors such as agriculture, water, forestry, animal husbandry, tourism, *etc.*

#### **Pradhan Mantri Krishi Sinchayee Yojna (PMSKY):**

This Scheme was planned and formulated to give more priority on water conservation and its management in agriculture with the vision to extend the area under irrigation from 1<sup>st</sup> July 2015. The main motto of this Scheme is 'Har Khet Ko Paani' to improve water use efficiency, 'More crop per drop' to provide end-to-end solutions in water source creation, distribution channels and its management.

#### **Pradhan Mantri Fasal Bima Yojna (PMFBY):**

This Scheme was introduced on 14<sup>th</sup> January, 2016 in order to reduce the agricultural distress and farmer's welfare without affecting substantial hikes in the Minimum Support Prices (MSP) on agricultural produces during monsoon fluctuations or any other natural calamity by providing full insured amount on crop

losses.

#### **Soil Health Card (SHC):**

This Scheme was launched in February, 2015 by Hon'ble Prime Minister Shri. Narendra Modi Govt. to issue soil health cards (SHC) to the farmers providing detailed information on test-based soil nutrient status of their own land along with recommended dose of fertilizers for improving productivity through judicious use of inputs. The Govt. of India targeted to issue 10.48 crores of SHCs since inception of the Scheme.

#### **Green India Mission (GIM):**

This Mission was started in February 2014 and outlined under NAPCC. The main objective of this Mission was to protect, restore and enhance the diminishing forest cover in India, and to fight climate change with adaptation and mitigation measures.

#### **National Water Mission (NWM):**

A Mission was mounted to ensure Integrated Water Resource Management (IWRM) for conserving the water sources and minimizing its wastage, and also to optimize Water Use Efficiency (WUE) by 20 per cent including agriculture sector.

#### **Paramparagat Krishi Vikas Yojna (PKVY):**

It is an extended component of Soil Health Management (SHM) launched in 2015 under NMSA with the objective of supporting and promoting organic farming through adoption of organic village by cluster approach, which in turn result in improvement of soil health.

#### **National Action Plan on Climate Change (NAPCC) and State Action Plan on Climate Change (SAPCC):**

The NAPCC was released on 30<sup>th</sup> June 2008 in order to create awareness among public, Govt. agencies, industries, scientists and the society on the risks posed by global climate changes, and steps to encounter the same. It pulls all the existing Government's national plans on energy efficiency agriculture, renewable energy, water, and others. The SAPCC have enlisted climate adaptation and mitigation strategies aligned with eight national missions under NAPCC.

### **Agricultural Contingency Plans and National Innovations on Climate Resilient Agriculture (NICRA):**

Agricultural Contingency Plans are technical documents comprising integrated information on field crops, livestock, horticulture, poultry and fishery and technological solutions for all weather-related problems for the respective farming activities. These are useful to plan earlier towards sustainable agriculture system during weather aberrations and extreme climatic conditions. NICRA is a Network Project of the Indian Council of Agricultural Research (ICAR) started in February 2011 with the objective of enhancing resilience of Indian agriculture to adverse climate changes by adopting innovative technologies. The Project consists of research, technology demonstration, capacity building and sponsored grants (Srinivasarao *et al.*, 2019).

### **National Livestock Mission:**

This Mission was initiated by the Ministry of Agriculture and Farmers' Welfare and got commenced from 2014-15 focusing mainly on livestock development through sustainable approach ultimately protecting the natural environment, ensuring bio-security, conserving animal bio-diversity and farmers' livelihood.

### **National Mission on Himalayan Studies:**

The Ministry of Environment, Forest & Climate Change (MoEFCC) launched this Mission to support innovative studies and related interventions on sustenance and development of the natural, ecological, cultural, and socio-economic capital values and assets of the Indian Himalayan Region.

### **Neem Coated Urea:**

It is a form of urea fertilizer coated with neem extracted material, which acts as a slow releaser of nitrogen reducing the pest and disease infestation ultimately minimizing the usage of chemicals in farming by achieving the overall increase in crop yield.

### **National Adaptation Fund:**

The National Adaptation Fund for Climate Change (NAFCC) is a Central Sector Scheme which was set up during

2015-16. The overall aim of NAFCC is to support concrete adaptation activities which mitigate the adverse effects of climate change. The activities under this Scheme are implemented in a project mode. The projects related to adaptation in sectors such as agriculture, animal husbandry, water, forestry, tourism, *etc.*, are eligible for funding under NAFCC. The National Bank for Agriculture and Rural Development (NABARD) is the National Implementing Entity (NIE).

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