GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

**LOK SABHA**
**UNSTARRED QUESTION NO. 150**
TO BE ANSWERED ON 04.12.2023

**Ill-effects of Climate Change**

150. SHRI DILESHWAR KAMAIT:
SHRI G.M. SIDDESHWAR:

Will the Minister of ENVIRONMENT, FOREST AND CLIMATE CHANGE be pleased to state:

(a) whether the Government has prepared any action plan in collaboration with global agencies to deal with the ill-effects of climate change and if so, the complete details of such action plan;
(b) whether the Government has conducted any study during the last three years to assess the impact of climate change on various sectors including agriculture in the country and if so, the details thereof;
(c) the steps taken by the Government towards environment and climate change which would help farmers in better planning and yield of crops; and
(d) the details of quantum of investment made in this regard during the last five years, State/UT-wise?

**ANSWER**

MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(SHRI ASHWINI KUMAR CHOUBEY)

(a) India has always emphasized that climate change is a global collective action problem and requires international cooperation for its solution. India is a Party to the United Nations Framework Convention on Climate Change (UNFCCC), and its Kyoto Protocol (KP), and the Paris Agreement (PA). India is also a party to the Convention on Biological Diversity (CBD) and United Nations Convention to Combat Desertification (UNCCD). Reports from various sources including Intergovernmental Panel on Climate Change (IPCC) highlight that the challenges faced due to global warming are mainly due to cumulative historical and current greenhouse gas emissions of the developed countries.

Even though, India is not part of the problem, it has done far more than its fair share in addressing the climate change. Government of India stands committed to combating climate change through its several programmes and schemes including the National Action Plan on Climate Change (NAPCC)/State Action Plan on Climate Change (SAPCC) which comprises missions in specific areas of solar energy, energy efficiency, water, sustainable agriculture, health, Himalayan ecosystem, sustainable habitat, Green India, and Strategic knowledge for climate change. The NAPCC provides an overarching framework for all climate actions. Thirty-four States /Union Territories (UTs) have prepared their State Action Plans on Climate Change (SAPCC) in line with NAPCC taking into account the State specific issues relating to climate change. India has also proactively taken a lead in promoting international

collaborations through International Solar Alliance and Coalition for Disaster Resilient Infrastructure and has undertaken various programmes and activities through these arrangements. Under the terms of the Paris Agreement, the Nationally Determined Contributions (NDCs) and Long-Term Low Emissions Development Strategy (LT-LEDS) are determined by countries themselves and communicated to the UNFCCC. In keeping with this, India has submitted its updated NDCs on 26thAugust 2022 and submitted its long-term low carbon development strategy on 14th November 2022.

(b) to (d) As part of its National Communication, the Ministry of Environment, Forest and Climate Change (MoEFCC) conducted studies on impact of climate change in India which are summarized in the 'Vulnerability Assessment and Adaptation' chapter. Climate change scenarios were analysed using high-resolution regional climate model. Simulations for 2020s, 2050s and 2080s indicate an all-round warming for Indian subcontinent. Impact of climate change and climate variability on the water resources are likely to affect irrigated agriculture, installed power capacity, environmental flows in the dry season and wet season. Under the NAPCC missions, a number of R&D projects have been supported in climate change studies across India to assess the impact of climate change on coastal vulnerability, health, agriculture and water. Studies on impact of climate change on agriculture conducted by Tamil Nadu Agricultural University (TNAU), Indian Agriculture Research Institute (IARI)-ICAR and Banaras Hindu University (BHU) indicate that the Rice yield is expected to decline by 6.5 % in the near century (2021 - 2035). In addition, rainfed maize is expected to decline in yield. Another study conducted by International Crop Research Institute for Semi-Arid Tropics (ICRISAT), Hyderabad on major pulse diseases (pigeon pea and chickpea) indicate variation in occurrence of blight diseases in different seasons in future climate scenario.

To meet the challenges of sustaining domestic food production in the face of changing climate, the Indian Council of Agricultural Research (ICAR), Ministry of Agriculture and Farmers Welfare, Government of India launched a flagship network project 'National Innovations in Climate Resilient Agriculture' (NICRA) in 2011. The project aims to develop and promote climate resilient technologies in agriculture which will address vulnerable areas of the country and the outputs of the project will help the districts and regions prone to extreme weather conditions like droughts, floods, frost, heat waves, etc. to cope with such extremes. The objectives of project are 1) To enhance the resilience of Indian agriculture to climatic variability and climate change through strategic research on adaptation and mitigation, 2) To validate and demonstrate climate resilient technologies on farmer's fields, 3) To strengthen the capacity of scientists and other stakeholders in climate resilient agriculture and 4) To draw policy guidelines for wider scale adoption of resilience-enhancing technologies and options. The project is implemented through components *viz.*, strategic research, technology demonstration & dissemination and capacity building in 151 clusters of villages in each one of the identified climatically vulnerable districts. The program is being implemented in 446 villages involving an area about 2,71,605 hectares with 2,31,421 households distributed in 28 States and one Union Territory. Demonstrations of proven technologies (location specific) were given to farmers to enhance adaptive capacity and to cope with current climatic variability. The interventions are divided into natural resource management, crop production, livestock and fisheries and creation of institutional structures.

Horticulture sector is likely to be severely affected due to unseasonal rains and temperature variations. The drought, flooding, hailstorm etc. associated with global warming can prove disastrous to farmers engaged in horticulture cropping. Increasing temperature due to climate change is likely to impact livestock production and health resulting into a decline in productivity in terms of milk, meat, wool and draught power.

As per the Ministry of Agriculture and Farmers Welfare, Climate change impacts several crops, natural resources, livestock and fisheries. In the absence of adoption of adaptation measures, climate change projections are likely to reduce rainfed rice yields by 20% in 2050 and 47% in 2080 scenarios while, irrigated rice yields by 3.5% in 2050 and 5% in 2080 scenarios, wheat yield by 19.3% in 2050 and 40% in 2080 scenarios, *kharif* maize yields by 18 to 23% in 2050 and 2080 scenarios and *kharif* groundnut yields are projected to be increased by 7% in 2050 scenario where as in 2080 scenario the yield is likely to decline by 5%. It is also found that future climate scenarios are likely to benefit chickpea with increase in productivity. Projected effects of climate change on rainfed sorghum is reduction of yield by 8% in 2050 scenario. Climate change is projected to impact mustard negatively with seed yields reduction up to 7.9% in 2050 and up to 15% in 2080 scenarios. Soybean yields are projected to increase by 8% in 2030 and 13% in 2080 scenarios.

The Department of Science & Technology (DST) is coordinating and implementing two national missions, National Mission for Sustaining the Himalayan Ecosystem and National Mission on Strategic Knowledge for Climate Change (NMSKCC), as part of the NAPCC. Under both the missions a large number of R&D projects have been supported in climate change studies to assess the impact of climate change on sectors like Health, agriculture and water and to come up with coping adaptation strategies.

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