GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION

RAJYA SABHA
UNSTARRED QUESTION NO-673
ANSWERED ON- 25/07/2025

IMPACT OF CLIMATE CHANGE ON AGRICULTURE

673. DR. DHARMASTHALA VEERENDRA HEGGADE:

Will the Minister of AGRICULTURE AND FARMERS WELFARE be pleased to state:

(a) whether Government is implementing any project, that studies the impact of climate change on agriculture including crops, livestock, horticulture and fisheries, if so, the details thereof;

(b) whether Government is aware that climate change can reduce agricultural income by 15-25 percent in the country and it is high time for Climate-Resilient Agriculture (CRA) to be valued and implemented, if so, the details thereof; and

(c) the steps taken for enhancing the resilience and adaptive capacity of farmers to climate variability, the details thereof?

ANSWER

THE MINISTER OF STATE FOR AGRICULTURE AND FARMERS WELFARE
(SHRI BHAGIRATH CHOUDHARY)

(a): Yes, the Government implements, ICAR flagship network project 'National Innovations in Climate Resilient Agriculture' (NICRA) to study the impact of climate change on agriculture including crops, livestock, horticulture and fisheries. Study revealed that in the absence of adaptation measures, climate change is likely to reduce rainfed rice yields by 20% during 2050's and 10-47% during 2080's. Irrigated rice yields projected to be reduced by 3.5% during 2050's and 5% during 2080's. Wheat yield is also likely to be reduced by 19.3% during 2050's and 40% during 2080's. Kharif maize yields projected to be reduced by 10-19% during 2050's and >20% during 2080's. Climate change especially irregular rainfall patterns and high temperatures is likely to affect the productivity of horticultural crops for example 36.6% yield loss in onion occurs by continuous six days water logging, high temperature stress of >40°C during flowering stage in tomato causes 65% yield loss, 1.5-2^{0}C rise in winter temperatures, leads to shifting of apple cultivation from low to high altitudes and results in 30% yield reduction. Similarly, increasing temperature due to climate change is likely to impact livestock production and animal health resulting into a decline in productivity in terms of milk, meat, wool and draught power. Further, a rise in temperature just by 1°C would cause a profound impact on survival and geographical distribution of different fresh water and marine fish species. Brackish water aquaculture is moderately vulnerable to seasonal variations (20-40% loss) and highly vulnerable to extreme weather events (EWEs) like a flood, heavy rains and cyclones (50 to 100% loss).

(b) & (c): Yes, the Government is aware of it.

The Government has undertaken steps to develop and out-scale climate-resilient agricultural technologies through Indian Council of Agricultural Research (ICAR) and Department of Agriculture & Farmers Welfare (DA&FW). The Government has developed various climate-resilient agricultural technologies viz. promotion of climate resilient varieties [2661 tolerant varieties (cereals 1258; oilseeds 368; pulses 410; fibre crops 358; forage crops 157, sugarcane 88 and other crops 22) developed, since 2014], resilient cropping systems, conservation agriculture, crop diversification, agroforestry systems, zero till drill sowing, alternate methods of rice cultivation, green manuring, integrated nutrient and pest management, organic farming, site specific nutrient management, in-situ moisture conservation, supplementary irrigation, micro-irrigation, sub-surface drainage and soil amendments. These technologies are demonstrated in 151 districts through KVKs. Further, these technologies have been documented and shared with 23 States and 3 Union Territories for upscaling and convergence with on-going schemes in the States. District Agricultural Contingency Plans (DACPs) also developed for 651 districts to tackle aberrant weather situation. Developed area specific mineral mixtures for withstanding heat stress in livestock. Also, anti-methanogenic formulations developed with a potential to reduce methane emissions by 17-20% in cattle. Integrated Multitrophic Aquaculture and Recirculatory Aquaculture System technologies developed for enhancing fish production in changing climate. Through Technology Demonstration component of NICRA, 775065 farmers were benefitted through technology demonstrations and 757447 farmers were benefitted through 25716 capacity building programs on climate resilient agriculture.

To help farmers in building resilience against extreme weather events and ensure long-term agricultural sustainability in the country, the Government of India implements National Mission for Sustainable Agriculture (NMSA) through DA&FW, which is one of the Missions within the National Action Plan on Climate Change (NAPCC). The Government of India provides financial assistance to the states through the NMSA to cope with the adverse impacts of climate change. Government has introduced flagship yield based Pradhan Mantri Fasal Bima Yojana (PMFBY) along with Restructured Weather Based Crop Insurance Scheme (RWBCIS) from Kharif 2016 to help farmers build resilience against extreme weather events. Further, Government issues agromet advisories for informed decision making on agriculture operation to cop-up with climate variability.

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