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Answer to the Rajya Sabha D No. U834, S2268

a) whether Government has made any qualitative and quantitative assessment of the nature of risks involved for major crops as a result of climate change/global warming;

- Yes. **b) If so, the details thereof, including major crops classified as risk prone crops, region-wise;**

To make qualitative and quantitative assessment of impact of climate change/global warming Government of India operated the ICAR-NPCC network project in X plan (from 2004-2010) and National Innovations on Climate Resilient Agriculture (NICRA) project in XI plan (started in 2011) and continuing the project in XII plan

The findings from the Climate Change impact assessment of the ICAR-NPCC network project, are as follows;

Rice

Irrigated rice yields are projected to reduce by -4% in 2020, 7% in 2050 and by -10% in 2080 scenarios. On the other hand, rainfed rice yields in India are projected reduce by -6%in 2020 scenario, but in 2050 and 2080 scenarios they are projected to decrease only marginally (<2.5%). Adopting improved varieties and input management can improve the yields by 6-17% in irrigated condition and by about 20-35% in rainfed condition.

Wheat

Climate change is projected to reduce the timely sown irrigated wheat production by about 6% in 2020 scenario from existing levels, however, late and very late sown wheat yields are projected to decrease by about 18% in 2020, 23% in 2050 and 25% in 2080 scenarios if no adaptation is followed. However, adaptation by sowing improved varieties coupled with improved agronomic management can improve the yields by about 10% in 2020 (2010-2040) scenario.

Maize

Climate change is projected to reduce the irrigated kharif maize yields by up to 18% in 2020 scenario, if no adaptation is followed. However, adapting to climate change by adoption of technologies such as improved varieties and agronomical management can improve the yields by about 21% in 2020 scenario. Climate change in 2050 and 2080 scenarios' is projected to reduce the irrigated kharif maize yields by 18 to 23% and the adaptation strategy is projected to improve the yields by about 10% in 2050 and by 4% in 2080 scenario.

Sorghum

Rainfed sorghum yields, on all India scale, are projected to marginally (2.5%) decline in 2020 scenario while it is projected to decline by about 8% in 2050 scenario.

Soybean

Likely increase in kharif soybean yield in the range of 8-13% under different future climate scenarios (2030 and 2080) is predicted.

Groundnut

Kharif groundnut yields are projected to increase by 4-7% in 2020 and 2050 scenarios where as in 2080 scenario the yield is likely to decline by 5%.

Chickpea

Future climates are likely to benefit Chickpea by an average increase in productivity ranging from 23 to 54%. However, a large spatial variability for magnitude of change in the productivity is projected.

Potato

Climate change may likely to benefit potato in Punjab, Haryana and western and central UP by causing 3.46 to 7.11% increase in production in A1b 2030 scenario, but in West Bengal and southern plateau region, potato production may likely to decline by 4 - 16% by 2030.

Apple

In Himachal Pradesh, consequent to warming and reduction in chilling temperatures, Apple cultivation has shifted to higher elevations.

From these results, it was observed that wheat is most sensitive crop to climate change followed by maize and rice.

Under the NICRA project, vulnerability of Indian agriculture to climate change was assessed and a vulnerability atlas was brought out. The states of Rajasthan, Gujarat, Uttar Pradesh, Madhya Pradesh, Karnataka and Maharashtra were found to be highly vulnerable to climate change and climate variability. Simulation modeling for vulnerability assessment in rice showed that states like Punjab, Haryana and Rajasthan are likely to lose 6-8% yield in 2020 scenario.

c) Whether crop insurance schemes would be reviewed and tuned in line with the nature of risks involved for the farmers due to natural calamities; and

Ans: Yes

d) if so, the details thereof ?

The details are available with Agriculture Insurance Company of India (AIC), premier implementing agency of different crop insurance schemes of the Government of India