

Answer to the Rajya Sabha Question Dy. No. 1871

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a) Whether the attention of government has been drawn to the latest study titled 'Climate change - A risk assessment' ?

- Yes.
- Sir David King, UK foreign secretary's special representative for climate change has published a project report entitled 'Climate change - a risk assessment', along with four other co-authors. They have done risk assessment in a global level for emissions, increase in global temperature, heat stress to people, effect of climate change in crop production, water stress, drought, floods, sea level rise and extreme weather events.

b) Whether government agree with the finding of the study that North India will be a high impact zone of climate change due to global warming;

Following points are given in the above mentioned study regarding North India or India in general.

- Heat stress: the probability of encountering intolerable conditions, even in the shade and rest, at +6 °C global warming is about 80% for North India
- Risk of crop failure: they have cited a study undertaken by Montesino and co-workers about how the likelihood of crossing the threshold temperature for flowering could increase over time. The study looked at the highest emissions scenario (RCP 8.5) to identify maximum probability boundaries for wheat in Punjab. here was a less significant risk of acute effects, since it remained possible for flowering to take place early enough in the year to avoid the hottest temperatures
- Southwest monsoon rainfall: Given the large perturbation of the climate system due to greenhouse gas emissions, we should be prepared that the future Indian Monsoon could have average rainfall outside the current normal range, and the variability between one year and another and in the active-break cycle could be very different

But, the following points are not clear about the project/study:

- In India so far the impact assessment studies under taken by the agencies are based on the SRES based A1B, A2, and B2 Climate Change projections down scaled to Indian Region using PRECIS model . The above mentioned study is based on the recent AR5, RCP scenarios of IPCC 2013. So any result may not be fully comparable.

- Every result in the text uniformly mentioned as North India ,but these results differ from global to regional and at local level studies
- The details of weather data used for North India are not clearly mentioned (station data or gridded weather data / resolution problem)

India's second national communication (published in 2008) to the UNFCCC by Ministry of Environment and Forest has highlighted that

- Simulations using dynamic crop models indicate a decrease in duration of cropping season and their yields, as temperatures increase in different parts of India between 2010 and the 2070s.
- Wheat yields in central India are likely to suffer by up to 2% under the pessimistic scenario but likely to improve by 6% in the optimistic scenario.

The following points have emerged from the ICAR-NPCC network project using SRES based future climate change scenarios

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 reduced 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 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. Adaptation strategies such as improved and tolerant variety managed under improved input efficiency with additional nitrogen fertilizer can enhance the irrigated maize net production by about 21% in 2020, 10% in 2050 and 4% in 2080 scenarios.

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 of 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.