

## CRIDA : HYDERABAD

### Answer to the provisionally admitted question for the Lok Sabha - D.No. S 18564

**(a) Whether the Intergovernmental Panel on Climate Change (IPCC) has express deep concern over spreading impact of climate change on agricultural sector;**

Yes

**(b) If So, the details thereof and the reaction of the Government thereof;**

Some impacts of climate change are occurring more rapidly than previously anticipated (IPCC, 2001c). The impacts will stem primarily from:

- regional temperature rises at high northern latitudes and in the centre of some continents;
- increased heat stress to crops and livestock, e.g. higher night-time temperatures, which could adversely affect grain formation and other aspects of crop development;
- possible decline in precipitation in some food-insecure areas, such as southern Africa and the northern region of Latin America, although the main impacts will occur after 2030;
- increased evapotranspiration rates caused by higher temperatures, with lowering of soil moisture levels;
- concentration of rainfall into a smaller number of rainy events with increases in the number of days with heavy rain, increasing erosion and flood risks – a trend that is already apparent (Easterling *et al.*, 2000);
- changes in seasonal distribution of rainfall, with less falling in the main crop growing season;
- sea level rise, aggravated by subsidence in parts of some densely populated flood-prone countries;
- food production and supply disruption through more frequent and severe extreme events.

**IPCC's Fourth Assessment Report**, With low to medium confidence, concluded that for about a 1 to 3 °C global mean temperature increase (by 2100, relative to the 1990–2000 average level) there would be productivity decreases for some cereals in low latitudes, and productivity increases in high latitudes. In the IPCC Fourth Assessment Report, "low confidence" means that a particular finding has about a 2 out of 10 chance of being correct, based on expert judgement. "Medium confidence" has about a 5 out of 10 chance of being correct.

- Under the aegis of Ministry of Agriculture, Government of India, the Indian Council of Agriculture Research (ICAR) has been analyzing the changes in rainfall pattern across the country from time to time. Recognizing the impact of climate variability on agriculture, a network project was initiated during X Plan which was continued during XI Plan. This project helped in understanding the impacts of global warming on productivity of rice, wheat and other crops, livestock and fisheries. Recognizing that the climate change is likely to have a major impact on agricultural and allied sector, the Council has initiated a mega network project, National Initiative on Climate Resilient Agriculture (NICRA) during 2010-11 with an outlay of Rs.350 crores. This scheme will continue during the XII plan with a multi-pronged strategy

encompassing strategic research on adaptation and mitigation, demonstration of technologies on farmers' fields and create awareness among farmers and other stakeholders. The strategic research aims mainly to evolve crop varieties tolerant to climatic stresses like floods, droughts, frost, inundation due to cyclones and heat waves. Standardization of management practices to reduce emission of greenhouse gases is also envisaged. Mitigation of heat stress on livestock through shelter management and feed supplements is also targeted.

**(c) Whether the Indian Council of Agriculture Research (ICAR) has conducted a survey in regard to impact of global warming on agricultural production and different agroclimatic zones including desert area of Rajasthan in the country;**

- Yes, Instead of surveys it conducted field experiments under controlled environment conditions and also used computer simulation models to assess the impact of Global warming / rise in temperatures on agricultural Production under different agroclimatic zones.

**(d) If so, the details and the outcome thereof; and**

- Irrigated rice production is projected to decrease by 4 per cent by 2020 and by 7 per cent by 2050 whilst rainfed rice yields may decrease by 6 per cent by 2020. Rainfed rice yields are projected to increase up to 15% in many districts on the east coast but reduced by up to 20% on the west coast. In Tamil Nadu kharif rice is projected to be more vulnerable compared to maize and sorghum to climatic change. The rice and sorghum crops are projected to be more climatically sensitive in southern agro climatic zone compared to western zone. Maize crop grown in southern climatic zone of Tamil Nadu is highly vulnerable to climatic change compared to the crop grown in northeastern zone.
- A simulation study projected a reduction of 3.9 million tons of wheat in the country as a whole by 2020 due to temperature rise. A 0.5°C increase in winter temperature would reduce wheat crop duration by seven days and reduce yield by 0.45 ton per hectare. An increase in winter temperature of 0.5°C would thereby translate in to a 10% reduction in wheat production in Indo-Gangetic plains.
- Controlled environmental studies under elevated CO<sub>2</sub> up to 550 ppm indicated a positive response in pulse crops like chickpea, soybean, green gram and vegetables like onion, tomato and non-edible oil seeds like castor.
- Consequent to warming and reduction in chilling temperatures, apple cultivation is getting shifted to higher elevations in Himachal Pradesh.
- In the north eastern region, climate change decrease rice yields up to 10%. However, in some states the yields are likely to increase by 5%. Maize and mustard are likely to experience fall in yields in the entire NE region.
- Climate change may increase production of potato in Punjab, Haryana and western and Central UP by 3-7%, but in rest of India particularly West Bengal and southern plateau region, potato production may decline by 4-16%.
- Yields of coconut are projected to increase in the west coast while in the east coast the effect will be negative.

**(e) the contingency plan of the government to deal with impact of climate change on agriculture sector and live stock in the country?**

- In general climate change includes the increase in frequency of occurrence of drought, floods, heat and cold waves besides the rise in long term temperatures and variability in rainfall and rainy days. So, to combat from these conditions broad Contingency plans have been developed by the government. These are static in nature and work like a compendium for the managers and line departments. where as a dynamic contingency plan will be issued in the crop season for the failure of rains for a week or two, suggestion will be made for alternate crops, various management practices for already sown crops, saving paddy from loss due to flood waters etc. for coping with week to week change in the weather during the cropping season.