GOVERNMENT OF INDIA
SCIENCE AND TECHNOLOGY
LOK SABHA

UNSTARRED QUESTION NO:6986
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ADOPTING TECHNOLOGY TO PREDICT MONSOON
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Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether there would be adequate rain in India in June 2005 and the fate of the monsoon in the remaining three months will depend upon the development of El Nino phenomenon;

(b) if so the details thereof;

(c) whether the country has acquired state-of-the-art technology to predict the monsoon ;

(d) if not, the reasons therefor; and

(e) the steps taken to adopt the technology so developed in the advanced countries in forecasting monsoon?

Answer

MINISTER OF STATE (INDEPENDENT CHARGE) OF THE MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTER OF STATE (INDEPENDENT CHARGE) OF THE DEPARTMENT OF OCEAN DEVELOPMENT (SHRI KAPIL SIBAL)

(a) Present indications suggest the country will receive near normal rainfall during June 2005. However, India Meteorological Department (IMD) will come out with a specific forecast for June rainfall by 20th May, 2005. Yes, it is true that rainfall during the four monsoon months (including June) is dependent on the evolution of El-Nino over the Pacific Ocean.

(b) Although a one to one relationship between El Nino and Monsoon rainfall has not been established, but adverse impact on the monsoon rainfall has been noticed during some El Nino years. The actual impact depends on the strength timing and spatial coverage of the El Nino warming in the Pacific.

(c) Monsoon prediction is one of the most challenging problems due to chaotic nature of weather systems in the tropics. This restricts the theoretical limit of prediction in tropics to about a week, whereas in the mid-latitude regions (like USA, UK and Australia) this limit is about two weeks. However, due to the role played by the Oceans and snow cover on tropical climate, prediction of monthly and rainfall pattern over a large area in the tropics is possible. Studies have also shown that in the Tropics, predictions over the Indian Monsoon Region is the most difficult, compared to the prediction of African monsoon and East Asian Monsoon. This is due to the fact that over the Indian Monsoon Region, contribution from chaotic intra-seasonal oscillations to the seasonal rainfall is more.

India Meteorological Department (IMD) has developed and is using the State of the art statistical model for the prediction of monthly and seasonal monsoon rainfall over the country making use of Oceanic and snow variables as predictors.

(d) Question Does not arise.

(e) IMD, at the National Climate Centre, Pune in collaboration with IISc Bangalore has also started a dynamical forecasting system based on the technology adopted from United State of America (USA). This model was used to prepare an experimental forecast for monsoon 2005. However, this system can be used for operational work only after some more validation. IMD proposes to use this system for operational work by 2007, in addition to operational statistical models.

For accurate prediction of monsoon, we should have coupled atmosphere-ocean model, which includes a detailed treatment of oceanic processes. Major climate prediction centres in USA and Europe are using the coupled dynamic models for prediction purposes. For this system to be implemented at the National Climate Centre, IMD, more investments are required. IMD has also to augment surface and upper-air observational network, to improve data assimilation techniques for ingesting this data into the numerical prediction model, to enhance the computing power and for the training of operational forecasters at reputed international climate centers.