



India releases major new study on climate change science

A “4X4” assessment of the impact of climate change on key sectors and regions of India in 2030s

New Delhi, November 16th 2010

A major new report released today provides an assessment of impact of climate change in 2030s on four key sectors of the Indian economy, namely Agriculture, Water, Natural Ecosystems & Biodiversity and Health in four climate sensitive regions of India, namely the Himalayan region, the Western Ghats, the Coastal Area and the North-East Region. The Report has been prepared by the Indian Network for Climate Change Assessment (INCCA), a network-based programme that brings together over 120 institutions and over 220 scientists from across the country to undertake scientific assessments of different aspects of climate change.

Releasing the report, the Minister for Environment & Forests, Mr Jairam Ramesh, noted: “There is no country in the world that is as vulnerable, on so many dimensions, to climate change as India is. This makes it imperative for us to have sound evidence-based assessments on the impact of climate change. I am glad that for the first time such a comprehensive, long term assessment has been undertaken. It is also for the first time that an assessment has been made for the 2030s (all previous assessments were for the 2070s and beyond). We must continue this focus on rigorous climate change science.”

This is the second major publication of INCCA. The first report, published in May 2010, was on India’s Greenhouse Gas Emissions 2007, making India the first developing country to publish such updated data. INCCA is preparing to publish its next report in May 2011 on India’s carbon aerosol (black carbon) programme.

Salient Findings of the 4X4 Assessment

The 4x4 Assessment examines the implications of climate change for India in 2030s deduced from a Regional Climate Model Had RM3 (Hadley Centre Regional Model Version 3) run for A1B scenario.

1. Climate change projections

- Climate change scenarios for 2030s indicate **an overall warming for all the regions** in focus. The net increase in annual temperatures in 2030s with respect to 1970s ranges between 1.7°C – 2.2°C, with extreme temperatures increasing by 1-4°C, with maximum increase in coastal regions. The extreme maximum and minimum temperatures are also projected to increase in 2030s with respect to 2070s.
- **All the regions are projected to experience an increase in precipitation in 2030s** with respect to 1970s and the increase is maximum in the Himalayan region and minimum increase in the North Eastern region. The extreme precipitation events are likely to increase by 5-10 days in all the regions



2. Sea Level Rise and extreme events

Sea level along the Indian coast has been rising at the rate of 1.3mm/year and **is likely to rise** in consonance with the global sea level rise in the future. Further projections indicate that the **frequency of cyclones is likely to decrease in 2030s, with increase in cyclonic intensity.**

3. Agriculture

- **Irrigated rice** in all the regions are likely **to gain in yields marginally** due to warming as compared to the rainfed crop as the irrigated rice tends to benefit from CO₂ fertilization effect. Maize and sorghum are projected to have reduced yields in all the regions. The Coconut productivity is projected to rise in the western coast and reduce in the eastern coastal region. Observations indicate a reduction in apple production in the Himalayan region, which is likely to continue in the future.
- **In case of marine fisheries some species will gain in yields**, as the warming favours their productivity such as Sardines. Some species like Indian mackerel are likely to move upwards to the northern latitudes thus maintaining their yields. Species like Threadfin breams, may shift their spawning seasons adjusting to the season which optimally favours spawning temperatures.
- **With overall warming**, the thermal humidity index is projected to increase in all the regions, especially in the months of May and June, leading to **stress to the livestock and hence reduction in its milk productivity.**

4. Water

- **Water yield** (which is a function of precipitation, total surface run off, evapo-transpiration and soil properties), is **projected to increase in the Himalayan region in 2030s by 5-20%**, however, **water yields are likely to be variable across the North Eastern region, Western Ghats, and Coastal region.** In some places in these regions, it is projected to increase and in some places it is projected to decrease.
- **Moderate to extreme drought severity is projected in 2030s for the Himalayan region**, as compared to the other regions. **All the regions are likely to experience flooding which are exceeding existing magnitudes by 10% to 30%.**

5. Forests

- **Change is projected for 8% 18%, 56%, and 30% of the vegetation grids and increase in Net Primary Productivity by 23%, 20%, 57%, and 31% is projected** in Western Ghats, North eastern region, Himalayan region, and the Coastal region.

6. Human Health – Malaria

- **Malaria is projected to spread in new areas in Jammu and Kashmir in the Himalayan region. In the North eastern region opportunities for transmission is likely to increase** for a longer period. **In the Western Ghats, no change** is observed between in 2030s and the trends observed in 1970s. However, **in the Coastal region, especially in the eastern coast a marked decrease** in number of months is projected in which that the malaria transmission window would be open.
