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# Jammu and Kashmir: Climate Change Issues, Implications & Activities

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***19<sup>th</sup> August, 2010  
New Delhi***

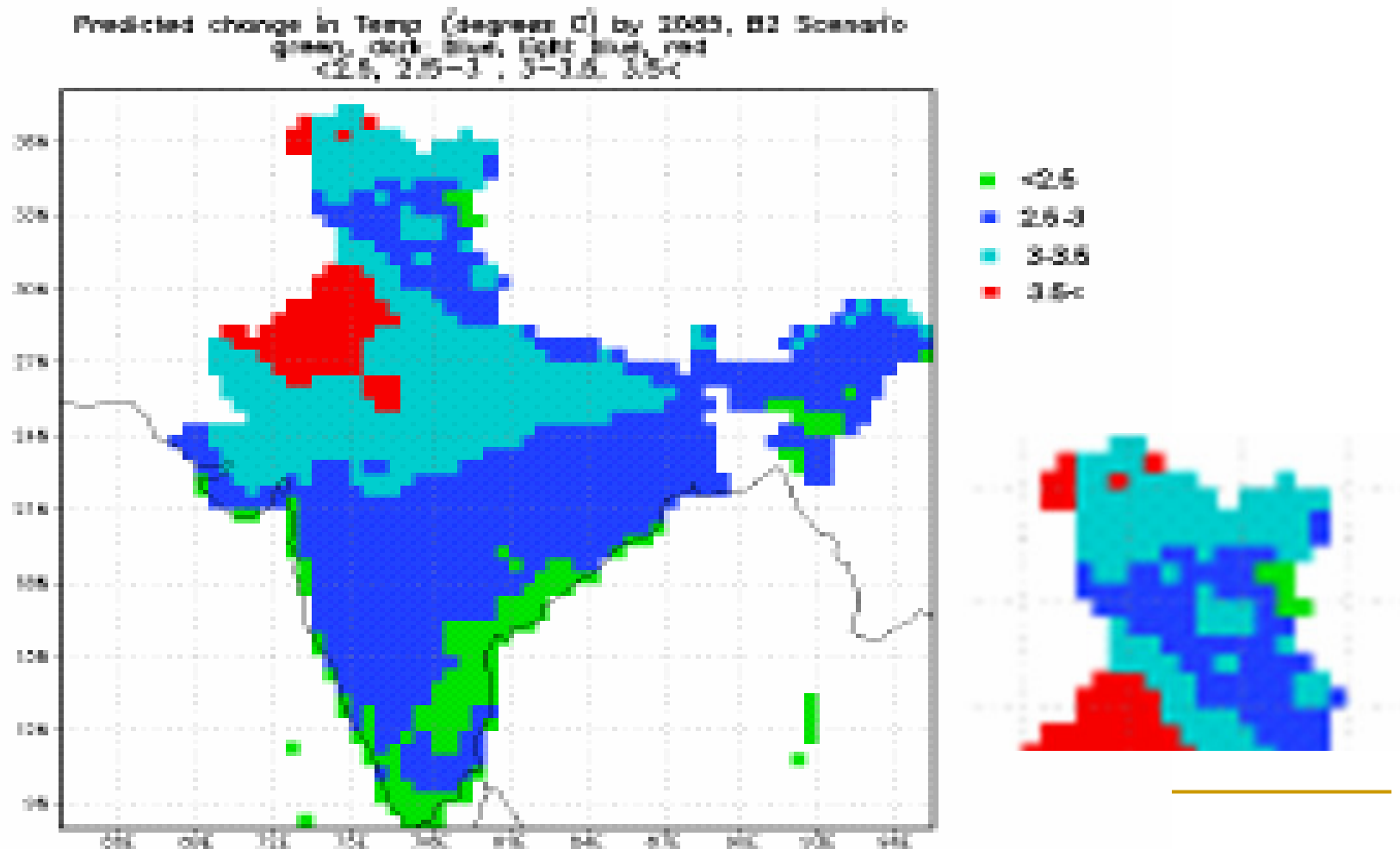
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# **Likely impacts of Climate Change in Jammu & Kashmir**

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# Predicted change in temperature in 2085 (B2 Scenario)

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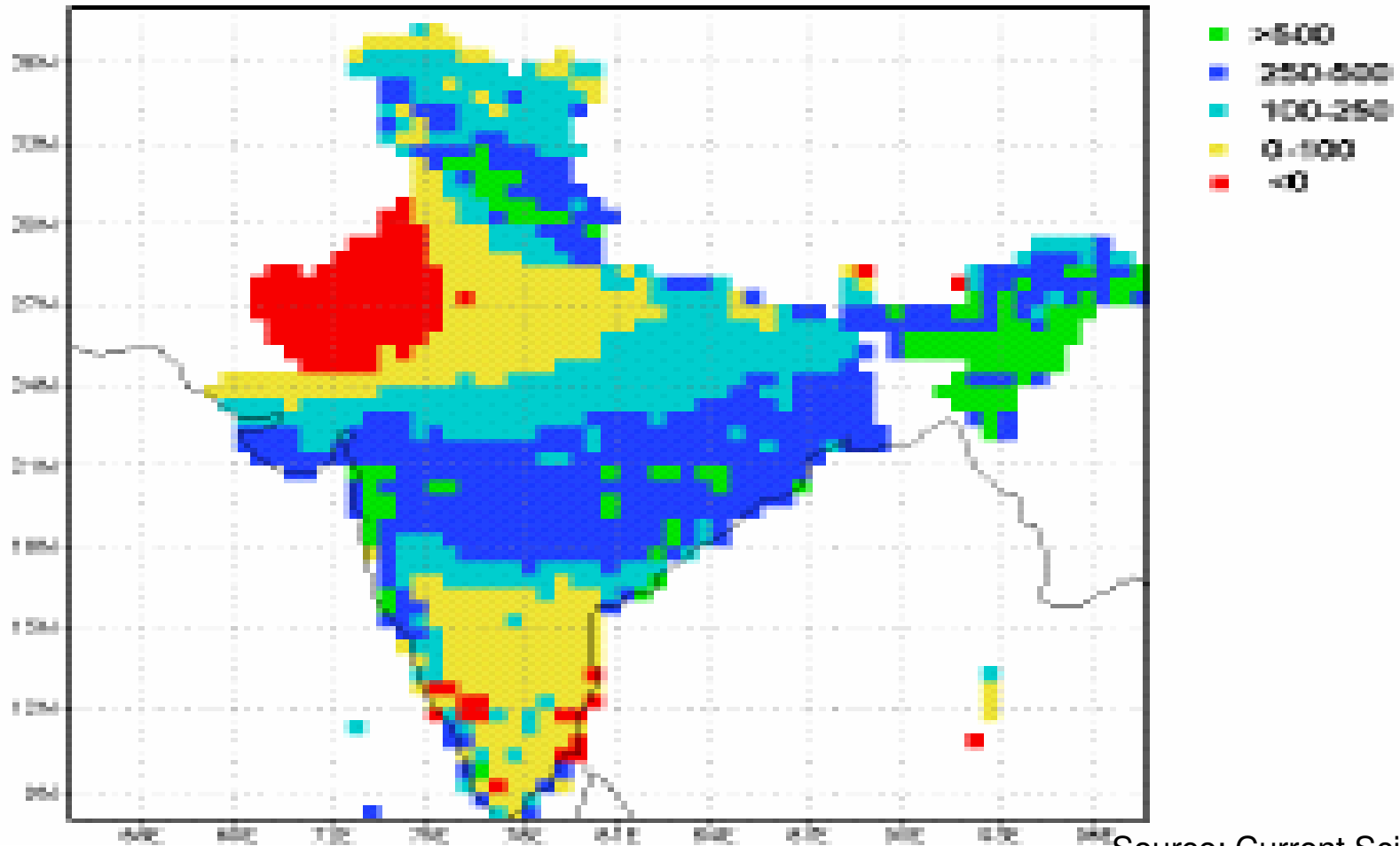


Source: Current Science

# Predicted change in precipitation (B2 Scenario)

b

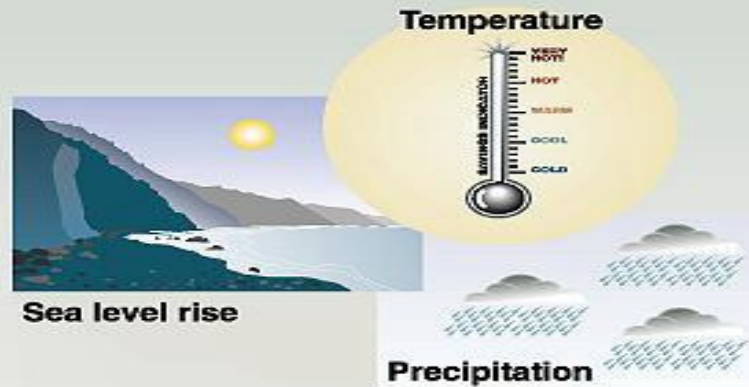
Predicted change in Pointed (mm) by 2050, B2 Scenario  
green, dark blue, light blue, yellow red  
>500, 250-500, 100-250, 0-100, <0



Source: Current Science

# Likely Impacts of Climate Change

## Potential climate changes impact



## Impacts on...

### Health



Weather-related mortality  
Infectious diseases  
Air-quality respiratory illnesses

### Agriculture



Crop yields  
Irrigation demands

### Forest



Forest composition  
Geographic range of forest  
Forest health and productivity

### Water resources



Water supply  
Water quality  
Competition for water

### coastal areas



Erosion of beaches  
Inundation of coastal lands  
additional costs to protect coastal communities

### Species and natural areas



Loss of habitat and species  
Cryosphere:  
diminishing glaciers

## Endemic regions of malaria during 1998-2000



## Regions likely to be affected by malaria by 2050s



Source: Current Science

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# Likely impacts on Forests of Jammu & Kashmir

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# Impacts of Climate Change on Forests of Himachal Pradesh

- **Marked expansion (11%) in Temperate deciduous, cool mixed and conifer forests at the cost of **alpine pastures** which are likely to shrink and move to re-establish towards northeast**
- **Temperate deciduous forests in lower limits are likely to be replaced by evergreen warm mixed forests**
- **Increased occurrence of**
  - Fire
  - Erratic rainfall &
  - Anthropogenic pressure
- **Decline in socio-economic important species like Deodar, Fir and Oak and increase in Blue and Chir Pine.**

*(Source. Deshingkar et. al., 1997)*



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## Some recent changes observed in Forests of Uttarakhand\* - *Uttarkashi Forest Division*

- Early flowering in Rhododendron species in Mukhem & Dharasu ranges
- Early sprouting of leaves & flowering in Oak
- Chir pine gradually replacing Oak forests in Jalkurgad & Bhukki blocks (*The reason assigned was pressure on Oak and increased incidence of forest fire*).
- Spread of invasive species like *Parthenium* and *Lantana*
- Decreasing tree density and forest fragmentation

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*Source: Varghese et al, 2004*

\*Based on people's perception

# Carbon Sequestration Potential of Long Rotation Tree Species on Forest Lands

Plantation Intervention	Annual incremental carbon (t/ha/yr)	Annual incremental carbon (tCO <sub>2</sub> /ha/yr)	Likely carbon benefits (Rs/ha/yr)
Pine	4.81	17.65	4060/-
Pine-Oak-Mixed	3.69	13.53	3112/-
Mixed species	3.99	14.65	3370/-



\* C-Price: \$5/t of CO<sub>2</sub>

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# Likely impacts on Agriculture & Horticulture

- More and more paddy land being converted to rain fed orchard or dry land
- Rise in deficit in food production over the years
- Increasing import of mutton, milk and poultry

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# Current knowledge about future impacts

- **Glacial melt** in the Himalayas is projected to increase flooding, rock avalanches from destabilized slopes, and affect water resources and decreased river flows as the glaciers recede.
- **Decreasing Freshwater availability.**
- Climate change is projected to impinge on **sustainable development** as it compounds the pressures on natural resources and the environment associated with rapid urbanization, industrialization, and economic development.

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# Responding to climate change

- While there has been significant improvement in scientific understanding of climate change in the past 20 years, *there remains considerable uncertainty about the nature, timing, spatial distribution, and severity of particular impacts. This calls for State/Regional level sector specific Climate Change impact studies.*
- Scientific studies and research are needed

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# Responding to climate change.....

- **Climate sensitive development strategies**
  - **Cleaner fuel**
  - **Clean energy**
    - *Solar energy*
    - *Wind energy*
  - **Sustainable forest management**
  - **Integrated watershed management approach**
  - **Promotion of dry land agriculture**
  - **Sustainable tourism**

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# Initiatives taken in J&K on Climate Change issues

- Awareness and Capacity building
    - Workshop on “**Setting up of priorities and piloting activities for carbon sequestration in J&K**” organised on 14<sup>th</sup> March, 2008 in coordination with the Institute of Global Warming and Ecological studies (IGWES).
    - Workshop on **Capacity Building** organised on 5-6 March, 2009 in collaboration with GTZ. Stakeholders from Forests, Social Forestry, SFC, SPCB, Wildlife, Environment and remote sensing, NGOs, Municipality, Industry, Agriculture, Energy, Universities etc. participated.
    - International workshop on “**Climate Change, Glacial Retreat and Livelihood, Assess Regionally, Act Locally**” organised in collaboration with TERI and Kashmir University during 12<sup>th</sup> -14<sup>th</sup> October, 2009.
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- A Carbon Cell for CDM has been created in SFRI.

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*Thanks for your  
Attention...*

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