

# Climate Change and Agriculture : Indicators and Impact studies

India needs *Climate-Smart Agriculture (CSA)* to increase productivity in an environmentally and socially sustainable way, strengthen farmer's resilience to climate change, and reduce agriculture's contribution to climate change by reducing GHG emissions

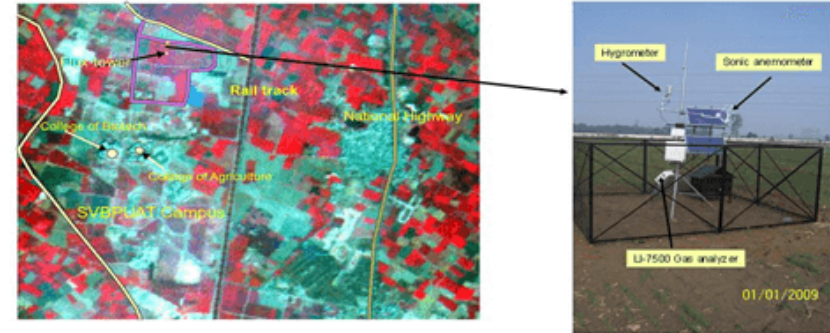
## Goals

1. Measurement of carbon and water vapor fluxes over major agro-ecosystems
2. Integrating CO<sub>2</sub> flux measurements, remote sensing and ecosystem models for estimating regional cropland carbon balance
3. Understanding the physiological behaviour of agro-ecosystems and predicting future climate change
4. Geospatial crop modeling for assessing climate change impact on productivity changes

## Geospatial crop modeling

- GIS-based EPIC model (GEPIC) to simulate rain-fed maize crop yields in Dehradun Valley at a grid resolution of 1km under current and future climate change scenarios.
- Maize productivity in Doon Valley will be decline slightly in 2050s and drastic reduction in 2080s under moderate CO<sub>2</sub> scenario. However, under extreme CO<sub>2</sub> scenario, maize yield will show decline only in 2080s

## CO<sub>2</sub> Flux-tower



## % CHANGE IN MAIZE PRODUCTIVITY

