



A modeling study of the impact of irrigation on India's climate

Roshni Mathur and Krishna AchutaRao

Indian Institute of Technology, IIT Delhi, Centre for Atmospheric Sciences, India (rosh.me91@gmail.com)

Humans have altered the earth's surface - primarily by urbanization and agricultural activities (IPCC, 2013). Use of land for agriculture, which is often accompanied by irrigation, modifies the land surface through changes in the water and energy balance between land surface and atmosphere. This further influences climatic parameters like temperature, precipitation and cloud formation. The effect is more pronounced on local as compared to global climate.

India is one of the regions of the world with a large irrigated area. The practice of irrigation has changed in recent years resulting in depletion of groundwater. In future, as the groundwater sources get depleted, the effect on agriculture and climate are bound to be locally significant. A systematic study on the effect of these changes is yet to be carried out.

In this study, we use the Community Land Model (CLM4.5) with an active crop model coupled to the Community Atmospheric Model (CAM5) to examine the impact of irrigation on the climate of India. We also carry out experiments to evaluate the affect on local climate when irrigation water availability is curtailed.