

# RES-NRSC-2022-015

## Name of ISRO Centre/Unit

National Remote Sensing Centre, Hyderabad

## Title of the research proposal

Predictive yield modeling under climate change scenarios.

## Name of Co PI from ISRO Centre/Unit

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## Area of Research

Agriculture/Spatial Crop Model/Climate Change Impact assessment on crop

## Summary of the proposed research and expected deliverables

Impact Assessment of climate change projections on cotton growth and yield under different emission scenarios will be carried out in the major cotton growing region of India. The climate projection and the baseline climate data for historical years will be generated by downscaling using ensemble products of global circulation models under different emission scenarios. The response of cotton crop to the climate change projections will be evaluated through crop growth simulation model after proper calibration and validation in the major cotton growing region of India followed by Risk zonation Crop growth simulation modelling will be again used to formulate region wise mitigation strategies by fixing alternate crop management practices.

## Scope of the Work:

- Impact assessment of climate change projections on Indian Agriculture is carried out by few researchers but all these studies are based on point based crop models where the spatial distribution of the crop and yield simulation is missing. The proposed study will address this issue using a spatialised crop growth model using finer resolution downscaled climate data. In addition, a hybrid approach is proposed where ML/DL techniques will be used to train a model using the ensembles of simulation results obtained for the baseline period.
- Risk zonation and mitigation strategies evolved through this study will be very useful and informative for policy makers and researchers working in different aspects of cotton crop including marketing and insurance sector.

## Deliverables:

- Quantification of Impact of climate change projections on cotton yield in major cotton

growing regions of India along with mitigation strategies in terms of alternate crop management strategies