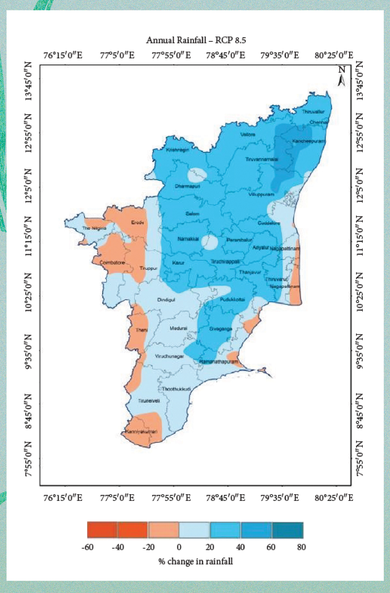
CLIMATE CHANGE IN INDIA: WHAT DO WE KNOW AND HOW?

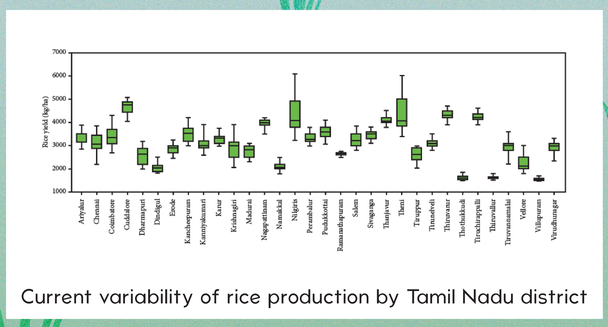
RAINFALL AND CROP MODELS FOR TAMIL NADU

With climate change, Tamil Nadu is projected to have higher temperatures and more variable rainfall. In addition, there will likely be more extreme weather events including cyclones, flooding and sea inundation. This can result in catastrophic flooding events leading to loss of crops, livestock and therefore livelihoods.

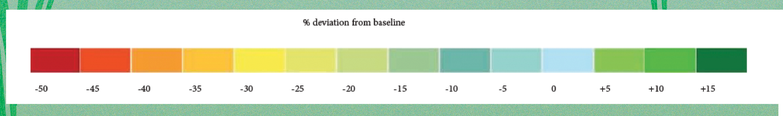
Crop models relate climate conditions including temperature and rainfall data to crop yield. Agricultural scientists at Tamil Nadu Agricultural University (TNAU) compiled long-term local data (1980–2020) on climate, soil profiles, crop varieties, and crop management. They used models to simulate yields under current and predicted climate conditions.

In Tamil Nadu, rice is grown in 18.5 lakh hectares (of 70 lakh hectares of farmland). Rainfall occurs in two periods: northeast monsoon (48%, October–December) and southwest monsoon (32%, June–September). In southern Tamil Nadu, annual rainfall is predicted to decrease by up to 20%. The crop model predicts that this could result in a decrease of rice yields by as much as 40% during the northeast monsoon by 2055.

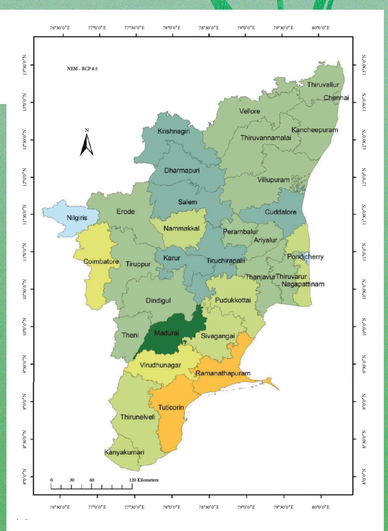




Current variability of rice production by Tamil Nadu district



General trends from these models indicate that there will be a decrease in crop yields with decreasing rainfall and increasing temperature. Such models are important to understand how climate change can affect agriculture to help administrators plan "adaptations", or measures to deal with these problems.



Predicted change in rice production

*based on projections for mid-century (2055) from Representative Concentration Pathway (RCP) 8.5 scenario. These could change based on our current and future emissions.

CONTRIBUTOR

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REFERENCES

Potential Impacts of Future Climate Changes on Crop Productivity of Cereals and Legumes in Tamil Nadu, India: A Mid-Century Time Slice Approach, 2023. Vellingiri Geethalakshmi and others. Advances in Meteorology.

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