

## RESEARCH BRIEF

# OBSERVED ARIDITY CHANGES OVER THE SEMIARID REGIONS OF INDIA IN A WARMING CLIMATE

Decreased rainfall and higher temperatures have caused an expansion of the semi-arid regions of India, with significant implications for the livelihoods and wellbeing of those living within and surrounding these areas.

## WHAT WAS DONE, AND WHAT WAS NOVEL?

Terrestrial aridity is a measure for a given area of the water available to plants, or the water content of soil. From an ecohydrological perspective, this is considered to be a good climate indicator, particularly in semi-arid regions, so we used it to investigate the changes in aridity and extent of India's semi-arid region.

Unlike previous studies, we offer a quantitative assessment of aridity changes over India's entire semi-arid region. We also examined how the sensitivity of different gridded precipitation datasets affected the identification of India's semi-arid regions, and made reliable assessments of the observed regional aridity changes. These changes are important for decision-makers to consider when thinking about India's regional adaptation plans.

## KEY FINDINGS

We used an index for aridity to quantify the observed changes in terrestrial aridity over the semi-arid regions of India in a warming climate.

We found a reduction in precipitation that, along with an increasing potential of evapotranspiration, has led to an increase in the aridity over most parts of the semi-arid region of India, with consensus among the data sets during 1951-2005.

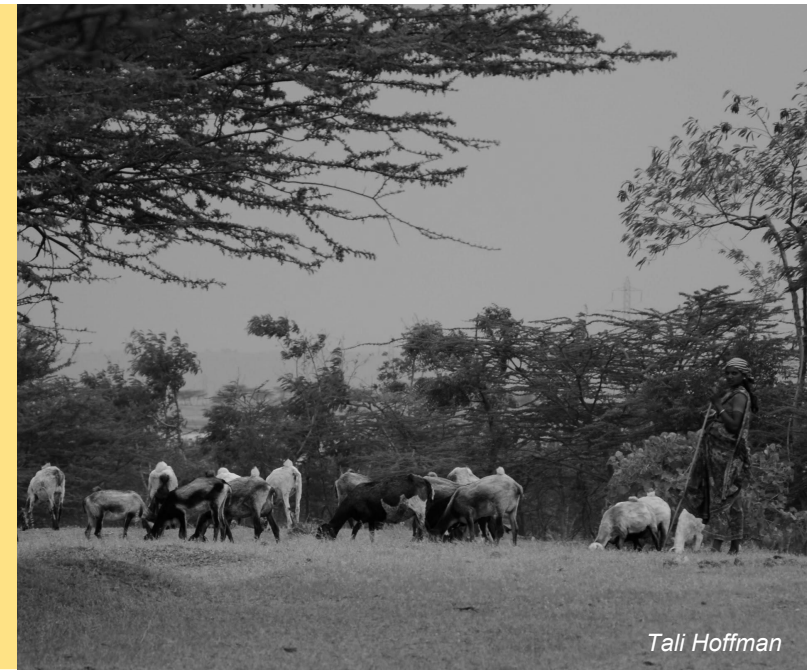
As a result, India's semi-arid regions have expanded by 10% in a decade, and now account for 4% of total Indian land area.

## KEY IMPLICATIONS FOR POLICY, PRACTICE AND RESEARCH

This work has led to a better assessment and understanding of the aridity changes, and their contributing factors, over semi-arid regions of India.

This understanding is important as it provides a scientific basis for regional and national governments to allocate scarce land-management resources.

Therefore, improving the certainty of aridity measures can provide critical input to the programmatic framework of the incumbent government.



Tali Hoffman

**Journal article:** Ramarao, M. V. S., Sanjay, J., Krishnan, R., Mujumdar, M., Bazaz, A. and Revi, A. 2018. On observed aridity changes over the semi-arid regions of India in a warming climate. *Theoretical and Applied Climatology*. [Link to paper.](#)



This work was carried out under the Collaborative Research Initiative in Africa and Asia (CARIAA), with financial support from the UK Government's Department for International Development (DfID) and the International Development Research Centre (IDRC), Canada. The views expressed in this work are those of the creators and do not necessarily represent those of DfID and IDRC or its Board of Governors.