



ICRISAT

# Water Management



## Background

- Less and erratic rainfall in the drylands is one of the major causes of water scarcity and poor agricultural productivity which leads to malnutrition and poverty.
- The absence of soil and water conservation measures and extreme rainfall events lead to severe soil erosion and land degradation.
- Over-grazing and rapid changes in land use, result in diminished organic carbon and moisture retention.
- Climate change further impacts these ecologies and increases the uncertainty of resources used in sustainable agricultural production.



## ICRISAT's Capability

- ICRISAT has undertaken research for development initiatives across different agroecologies of Asia and Africa and has found that nature-based solutions are the most promising to address water management challenges in drylands.
- ICRISAT has developed a need-based irrigation scheduling tool for enhancing land and water use efficiency in drylands.
- ICRISAT has trained relevant stakeholders from Africa and Asia on natural resource management for scaling best practices in water management.





## Technology Development

The following technologies were developed and validated in different research for development initiatives:

- *In-situ* measures with a combination of earthen and masonry structures for **controlling soil erosion and enhancing residue moisture availability**
- A range of **cost-effective water harvesting structures** for harvesting surface water runoff
- **Rainwater harvesting protocols** following the 'water budgeting approach' for balancing upstream and downstream ecosystem trade-offs
- **Cropping system design** including agroforestry by following the 'water budgeting approach' to optimize resource use efficiency
- State-of-the-art **hydrological monitoring** at micro and meso scale catchments.

ICRISAT has successfully applied these technologies in numerous sites ranging between **500 and 5000 ha** in India over the last three decades and 60 sites of learning created in India.

In Bundelkhand region of India water conservation measures increased groundwater availability, increased cropping intensity from 110% to 180%, increased productivity in the range of 20% to 60%, and overall farmers incomes increased by 40% to 140%. Opportunities exist to scale up water conservation measures to more than 10 million ha in the drylands.



## The Way Forward

Our approach has been deployed in Ethiopia and more recently in Mali and Tanzania, where it has influenced national approaches to natural resources management resulting in **100,000 hectares** of degraded lands transformed; **500,000 households** benefiting, and **60 sites** of learning created across South Asia and Eastern and Southern Africa.

Opportunities now exist to fund these initiatives that can be further scaled for the benefit of other dryland regions.

