ICRISAT

Landscape Management Capabilities Towards Land Degradation Neutrality and Ecosystem Services

Background

Since its establishment in 1972, ICRISAT has been working to reduce poverty, hunger, malnutrition, and environmental degradation in the drylands. The Institute represents the interests of many global stakeholders that share a common goal of improving the lives of dryland smallholder farming families and their communities across Asia and sub-Saharan Africa, through lasting impacts.

Landscape management and conservation, for achieving land degradation neutrality and strengthening ecosystem services, is a core research strength of the Institute.

ICRISAT's pioneering research on landscape management and conservation has led to the development of a number of innovative tools/approaches/technologies to control land degradation through a range of engineering (i.e., *in-situ* and *ex-situ* soil and water conservation approaches) and biological (appropriate crop rotation, agroforestry, farming system designs) measures.

These customized technologies and innovations in varying landscapes of Asia and Africa have led to impact at scale. They have led to improved water retention ability of landscapes by reducing the velocity of surface runoff, improving infiltration ability, increasing greenery and carbon sequestration and controlling soil erosion. In addition, groundwater recharge and improved baseflow generated by these interventions have helped ensure the perenniality of riverine ecosystems and in regulating ecosystem services.

Three decades of expertise

Over the past three decades, ICRISAT has successfully deployed and validated its landscape management approaches ranging between 500 and 5,000 ha in several Indian states (Maharashtra, Karnataka, Odisha, Uttar Pradesh, Madhya Pradesh, Rajasthan, Telangana, and Andhra Pradesh, etc.) and also in Africa (Ethiopia, Malawi, Mali and Tanzania). These approaches have been mainstreamed in national government plans for the sustainable management of natural resources.

Tangible Landscape Improvements

Some examples of this landscape approach that have led to vast improvements include improved groundwater availability and increased cropping intensity from 110% to 180%; a decline in well recovery period from 50 hours to 15 hours; and a 20% to 60% increase in productivity of different crops. As a result, overall farmers' income has increased by 40% to 140% above the baseline.

Skills Transfer and Benefits to Farmers

The integrated landscape management approach including designing sustainable farming systems based on Land Resource Inventory (LRI) and hydrology has also improved the knowledge and capacity of researchers, development practitioners, farmers, and other stakeholders through 60 well-established sites of learning. Significant impacts include the transformation of 15 million hectares of degraded lands benefiting around 10 million smallholder farmers, who have realized an additional income of US$ 1.5 billion apart from the indirect environmental benefits.

Promoting Sustainable and Climate Resilient Farming Systems

ICRISAT's approach to landscape resource conservation goes beyond just water and soil by bringing together both on-farm and off-farm actions using a science-based 'toolbox' for designing sustainable farming systems, whole farm bio-economic modelling and climate resilient systems for smallholder farmers by linking livelihoods to this transformational processes.

The potential for transformation is enabled through increased water availability and enriched soils coupled with the deployment of climate-resilient, disease-resistant, high-yielding food and fodder crops, diversification of farms, measures to boost livestock productivity, agro-processing, boosting market linkages and more.