

SIMFS Success Story

Before Intervention



After Intervention



Matephal Village - Aerial View Before and After Sustainable Farming Interventions.

From Struggle to Sustainability: How Latur Farmers Transformed Agriculture and Their Livelihoods in Maharashtra

Latur district in Maharashtra has long faced critical agricultural challenges, including erratic rainfall, groundwater depletion, acute water shortage and soil degradation. With fragmented landholdings averaging 1–2 hectares, smallholder farmers struggled to sustain agricultural productivity and profitability. Recognizing these challenges, the **Groundwater Survey and Development Agency (GSDA)**, in collaboration with **ICRISAT**, launched a transformative initiative under the **Atal Bhujal Yojana** (2023–2025) supported by **CGIAR Initiative on Sustainable Intensification of Mixed Farming Systems**.

About **440 farm households** were involved in this initiative. To design effective interventions, a **comprehensive multidimensional analysis** was conducted, evaluating the **economic, social, and environmental sustainability** of farming systems using ICRISAT's MSAT framework. Additionally, a **Land Resource Inventory (LRI) assessment** was undertaken to assess soil characteristics and land use potential, while a **hydrological assessment** helped identify water

availability, recharge potential, and vulnerabilities. These assessments provided a strong foundation for planning targeted resource conservation and use while designing holistic solutions from farm to landscape scale for sustainable agricultural improvements.

Based on these assessments and a **participatory community-led approach**, key entry points were identified at both the **landscape scale and farming systems scale**, along with **market linkages** to enhance sustainability.

The Journey: Implementation of Integrated Farming Practices

Matephal village was chosen as a benchmark site to test and implement solutions aimed at improving soil health, water management, agricultural productivity, farmers livelihoods and overall sustainability. A combination of Landscape management techniques and climate-smart farming practices was introduced across the identified intervention area.

Key Interventions

The multidisciplinary team, in collaboration with the community and government departments, designed and implemented the most prioritized interventions in the first year 2023-24, focusing on sustainable soil, water management, improved cropping strategies, diversification, and market integration:



Photo: Empowering Farmers through Science: Soil Testing and Advisory Support from ICRISAT.

Water Conservation and Management:

- Rainwater harvesting techniques were implemented to **recharge open wells and borewells** and **recycle water through farm ponds**.
- **Field bunding** with masonry surplus arrangements on **320 acres** of uplands reduced **soil erosion** and **improved moisture retention**.
- **Farm ponds** were constructed for water storage and supplemental irrigation.
- Installation of advanced monitoring tools, including **automatic weather stations and Time Domain Reflectometry (TDR) sensors**, enabled **real-time tracking** of rainfall, groundwater recharge, and soil moisture levels.

Enhancing Cultivable Land and Crop Diversification:

- Expansion of **cropped area into previously fallow lands**, enabling productive land use.
- **Crop diversification**, integrating multiple crops for better resilience, was introduced to address climate risks and increase income stability.
- Integration of **horticulture-linked markets**, including **fruits and flowers**, to **improve income security, reduce risk, and promote sustainability**.

Soil Health and Sustainable Farming:

- Farmers benefited directly from **high-quality seed availability**, improving **germination rates and productivity**.
- **Soil testing results provided through ICRISAT** guided farmers on **customized nutrient applications**, improving **soil health and optimizing fertilizer use**.
- **Organic farming** was introduced under the **direction of the ICRISAT team**, reducing dependency on **chemical inputs** and improving long-term **soil fertility**.
- Farmers adopted a **diversified cropping system**, integrating **legumes, cereals- millets, and vegetables** to optimize land use and enhance soil biodiversity.

Impact: Transforming Lives and Landscapes

The implementation of these integrated farming practices led to tangible benefits for the farmers and the ecosystem:

Water Security:

- Rainwater harvesting and improved water recycling significantly enhanced **groundwater recharge** across 500 hectares.
- Groundwater levels rose by **4 meters compared to control sites**, ensuring reliable irrigation and drinking water availability.

Agricultural Productivity:

- **Fallow lands were converted into productive farmlands**, expanding the total 30ha cultivated area
- Farmers **diversified their farming systems**, mitigating risks associated with climate variability- millets, legumes, inter-cropping, increased livestock integration.



From Barren Fields to Abundant Harvests: Farmers Reaping the Benefits of Transformation.



Reviving Agriculture: Before-and-After Transformation of Cultivated Land in Matephal.

- Increased adoption of horticulture-linked markets improved profitability and market resilience.
- **Crop yields increased by 30%** during the kharif season, translating to an additional income of US\$ 500,000 for the farming community.

Livelihood and Food Security:

- Farmers **earned additional income through diversified farming**, reducing dependence on a single crop.
- **Napier fodder cultivation improved livestock nutrition**, resulting in an additional **1 liter of milk yield per animal per day**.

Sustaining the Change: Lessons for the Future

This initiative underscores the power of integrated approaches from to landscape scale connected to

market in building climate resilience and improving rural livelihoods. The use of scientific data for water budgeting, strategic soil conservation practices, and diversified agricultural models ensured the sustainability of the interventions. The engagement of local communities in decision-making further reinforced ownership and long-term commitment to sustainable farming.

The success of Matephal village serves as a model for scaling similar interventions across rainfed and semi-arid regions in India and similar agro-ecologies in other countries of global south. By integrating systems analysis and combining traditional knowledge with scientific innovations, integrated farming systems considering landscape scale offers a viable pathway to secure food, water, and income security for millions of smallholder farmers facing climate uncertainties.



Building Knowledge for a Sustainable Future: Farmers Engaged in Community Training.

Contributors and Acknowledgments

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Conclusion

The GSDA-ICRISAT initiative, supported by CGIAR initiative-SIMF, has redefined the agricultural landscape of Matephal village. Through an ecosystem-based approach to farming, smallholder farmers have not only rejuvenated their lands but have also secured their livelihoods against climatic and economic shocks. This success story reaffirms that with the right interventions, collaboration, and farmer-centric solutions, rural communities can thrive, ensuring a sustainable and prosperous agricultural future for generations to come.



About

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a pioneering non-profit organization focused on scientific research for development, committed to transforming dryland farming and agri-food systems. Working with global partners, ICRISAT develops innovative solutions to address hunger, poverty, and environmental degradation, benefiting 2.1 billion people across the drylands of Asia, Africa, and beyond.

ICRISAT was established under a Memorandum of Agreement between the Government of India and CGIAR, dated 28 March 1972. In accordance with the Headquarters Agreement, the Government of India has extended the status of a specified "International Organization" to ICRISAT under section 3 of the United Nations (Privileges and Immunities) Act, 1947 of the Republic of India through Extraordinary Gazette Notification No. UI/222(66)/71, dated 28 October 1972, issued by the Ministry of External Affairs, Government of India.

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