

FROM SEED DEFICIT TO SELF-SUFFICIENCY:

How Odisha is Building a Resilient Groundnut Seed System

Limited access to quality seed remains a key barrier to agricultural productivity, food security and climate resilience across the Global South. Despite investments in crop improvement, weak seed delivery systems, low varietal replacement, fragmented markets and poor institutional coordination continue to prevent improved varieties from reaching farmers at scale. Evidence increasingly points to the need for an integrated approach linking research, seed production, quality assurance, market access and farmer adoption.

Odisha demonstrates how a systemic approach to seed sector development can transform agricultural productivity and self-reliance. Through partnerships among DA&FE, ICRISAT, OSSC, OSSOPCA, NMEO-OS, FPOs and farming communities, the state evolved from dependence on externally sourced groundnut seed to a decentralized, demand-driven and self-reliant system. Combining scientific innovation, institutional convergence, quality seed production and farmer-centered delivery, the initiative is laying a strong foundation towards self-sufficiency.

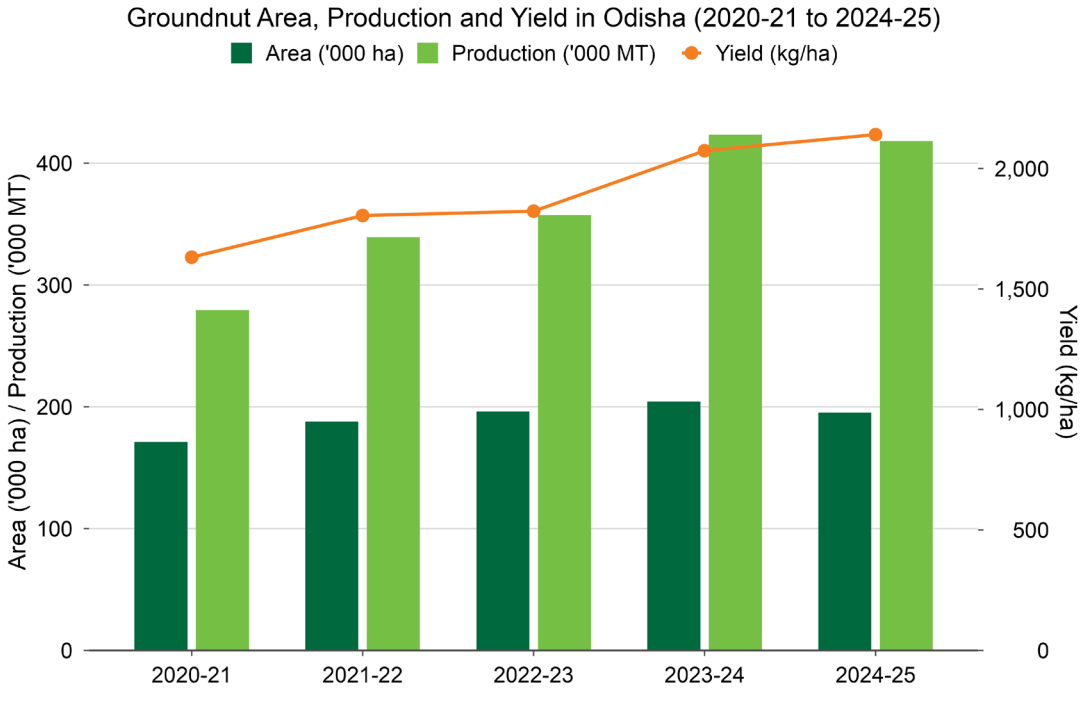
ICRISAT
INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS
CGIAR
Ministry of Agriculture & Farmers Welfare, Government of India
www.icrisat.org



Overview of Groundnut Cultivation in Odisha

Groundnut in Odisha has established a dominant presence in the oilseed sector, accounting for approximately 37.2% of the total area under oilseed cultivation and contributing more than 70.4% of the state's total oilseed production. Given Odisha's landholding dynamic comprising small-scale farmers, it is one of the preferred oilseeds due to its significant benefits for smallholding farmers and sharecroppers. The crop is grown across both Kharif and Rabi seasons, with Rabi being the primary growing season.

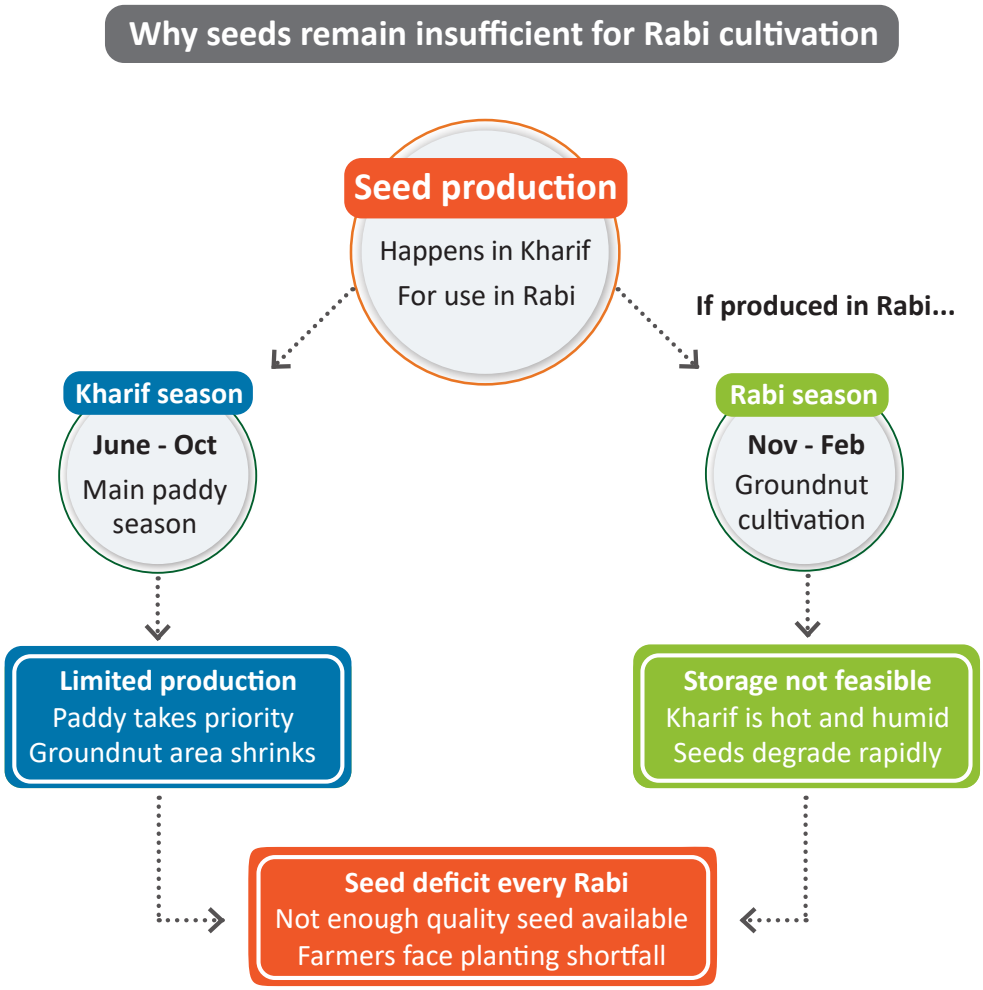
Major groundnut producing districts are Ganjam, Puri, Malkangiri, Dhenkanal, Angul, Deogarh, Balasore and Mayurbhanj.



(Source: Directorate of Agriculture & Food Production, Government of Odisha)

Challenges in Groundnut Cultivation

Timely access to quality seeds remains one of the most critical factors for successful and sustained crop production. With Rabi being the main season of cultivation, the availability of quality seeds before the season begins is crucial. However, rice being the major crop during the Kharif season limits the availability of suitable areas for groundnut seed production, resulting in a persistent gap between seed demand and supply.



Why Seed Systems Matter?

Without timely access to quality seeds, even the best farming conditions cannot deliver strong harvests. While cereals in India benefit from well-established seed systems, oilseeds and pulses have historically suffered from fragmented and underdeveloped seed networks.

In Odisha, the consequences have been reflected in the multiple challenges faced by farmers, including:

- Inconsistent seed quality
- Delayed seed supply
- Limited access to suitable varieties
- Weak market and institutional support.

Despite groundnut accounting for nearly one-third of Odisha's oilseed cultivation area and contributing more than two-thirds of total oilseed production, the state remained dependent on seed imports from other regions. The consequences were severe that declined farmer confidence in groundnut cultivation. The challenge, experts realized, is not the crop but the weak seed system.

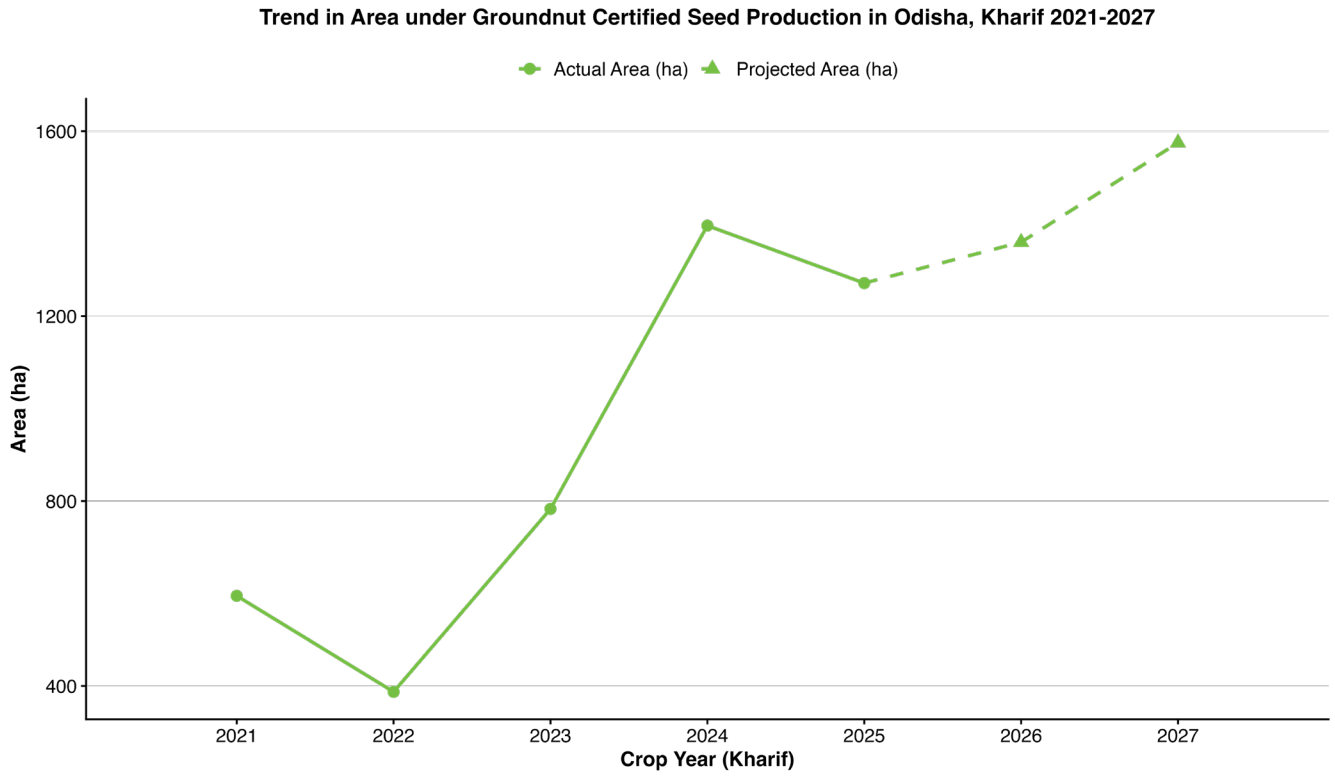
Inclusive Seed Systems Model for Sustainable Groundnut Seed Production

Over the past three years, ICRISAT and its partners designed a comprehensive seed systems approach tailored to Odisha's farming realities. The breakthrough came from aligning science, institutions and farmer participation into a single functional value chain.

The strategy focused on:

- Identifying high-yielding, climate-suitable groundnut varieties
- Producing seeds locally during the Kharif season for timely Rabi supply
- Engaging Farmer Producer Organizations (FPOs), Self-Help Groups (SHGs), and farmer groups in decentralize seed production
- Building capacity of seed growers for quality seed production, certification and market linkages
- Building awareness and confidence among farmers through field demonstrations
- Assured procurement and market support mechanisms.

*The result is a **demand-driven**, **decentralized** and **government-supported** seed ecosystem that now delivers quality seeds to the farmers on time while strengthening local livelihoods.*

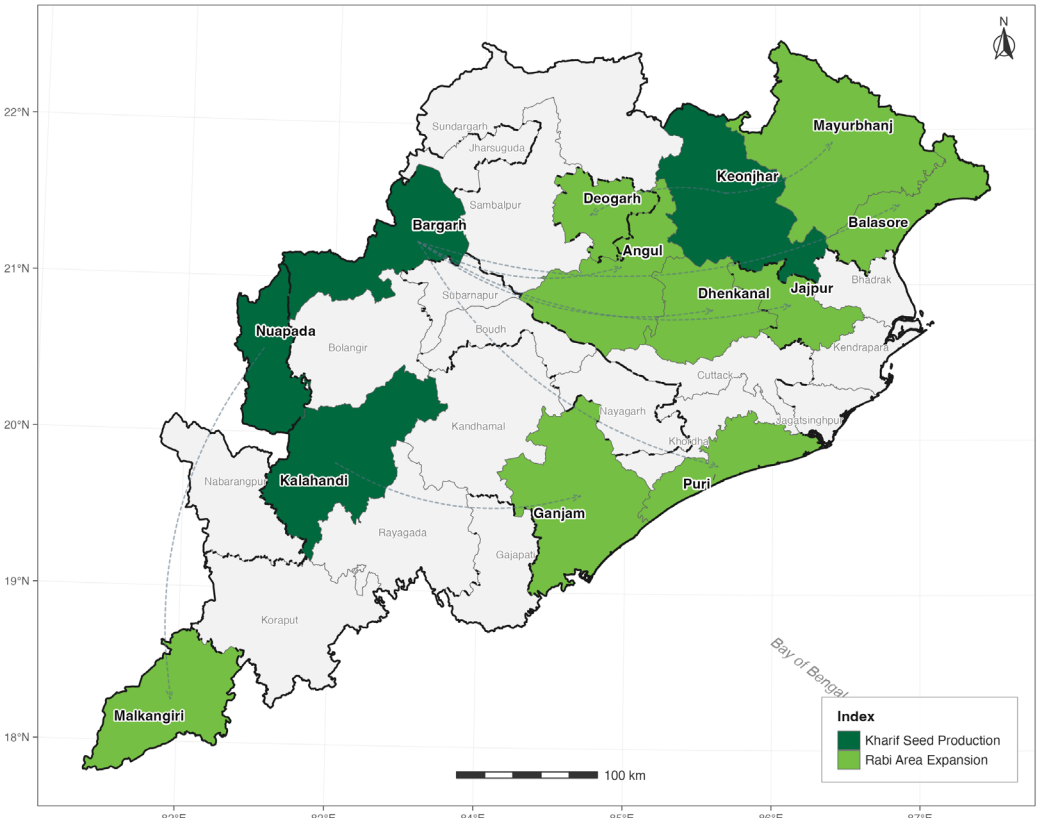


(Source: Odisha State Seed and Organic Products Certification Agency (OSSOPCA), 2026)

Decentralized Seed Production Creates Local Ownership

One of the most innovative elements of the initiative was the identification of niche areas for groundnut seed production during the Kharif season. ICRISAT and OSSC worked closely with local FPOs, SHGs and farmer groups to supply genetically pure, early-generation seeds of improved varieties. Farmers multiplied the certified seeds locally, after which OSSC procured and distributed them ahead of the crucial Rabi cultivation season.

This solved a long-standing challenge in Odisha, where high monsoon humidity made long-term seed storage difficult. By producing seeds locally and seasonally, the initiative reduced dependence on external states and created a reliable seed supply system rooted within farming communities themselves.



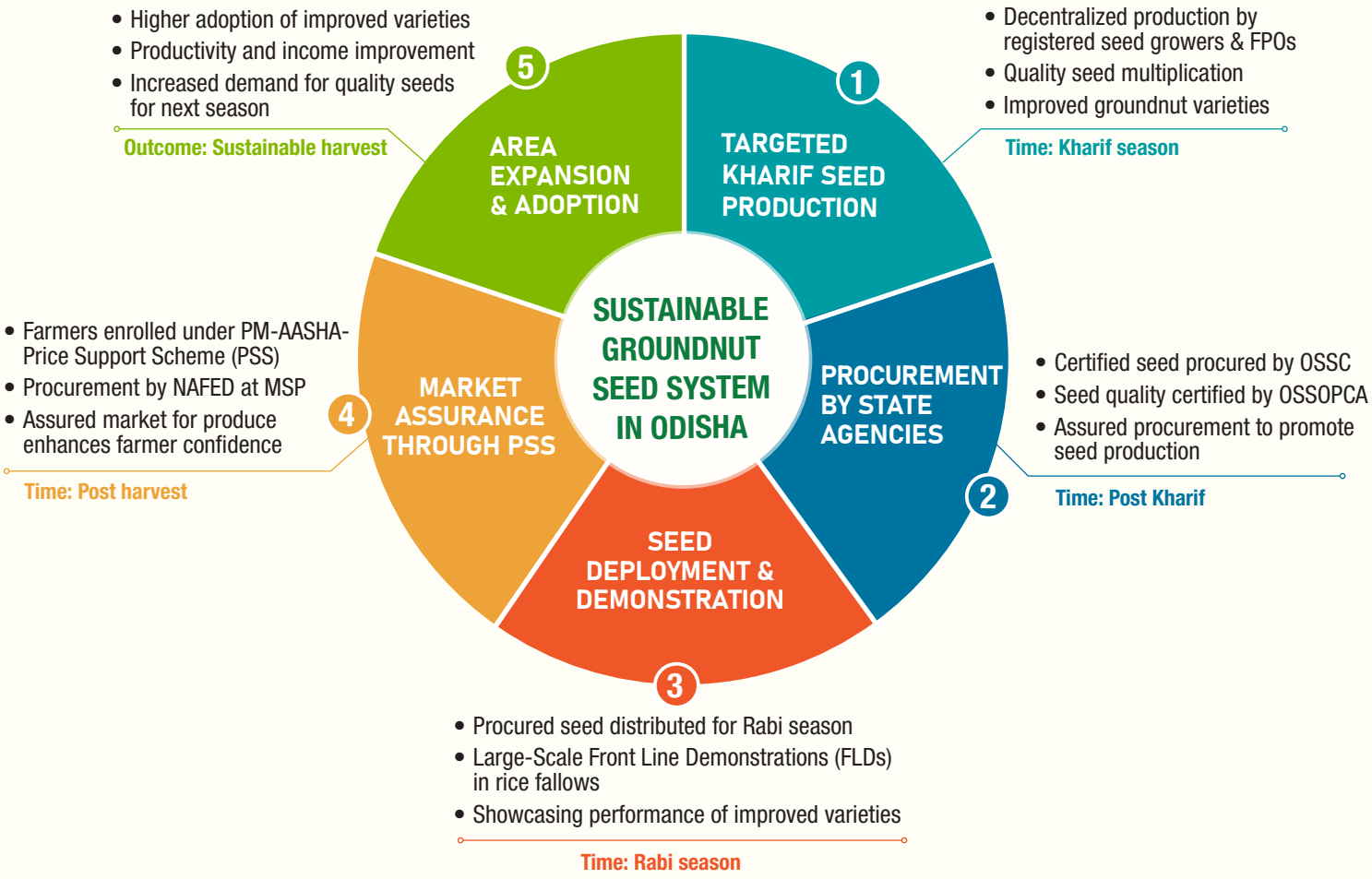
Source: ICRISAT, Enhancing Groundnut Productivity Through Increased Seed Quality Access in Odisha (2023-2027)

Area Expansion Through Strategic Convergence

By aligning state and national priorities, the convergence between the state plan on *Enhancing Groundnut Productivity through Increased Quality Seed Access* with the *Government of India's National Mission on Edible Oils–Oilseeds (NMEO-OS)* created an enabling framework linking seed system interventions with crop diversification and oilseed productivity goals. Through coordinated investments in quality seed production (DA&FE), field demonstrations (MoAFW) and procurement mechanisms (PM-AASHA), the initiative contributed to both the horizontal expansion of groundnut cultivation and vertical gains in productivity.

The approach advances the objectives of NMEO-OS while simultaneously supporting Odisha's Agriculture Policy (SAMRUDHI 2020) promoting diversified, climate-resilient and higher-income farming systems for smallholder farmers.





KEY PARTNERS IN CONVERGENCE

- ICRISAT - Technical leadership and capacity building
- OSSC - Seed procurement and distribution
- OSSOPCA - Seed certification and registration
- NMEO-OS (MoAFW) - Demonstration and convergence
- NAFED - Commodity procurement under PSS
- FPOs/Seed Growers - Production and aggregation
- Farmers - Adoption and scaling



Linking Farmers to Better Markets

The transformation extended beyond seed production. Once groundnut production scaled up, farmers were connected to the Government of India's Price Support Scheme (PSS), enabling procurement through NAFED at assured prices.

Under PSS, farmers received approximately ₹72.65 per kilogram for groundnut produce, compared to local market prices of nearly ₹45 per kilogram, significantly improving profitability and reducing market uncertainty.

Building Groundnut Seed Self-Sufficiency

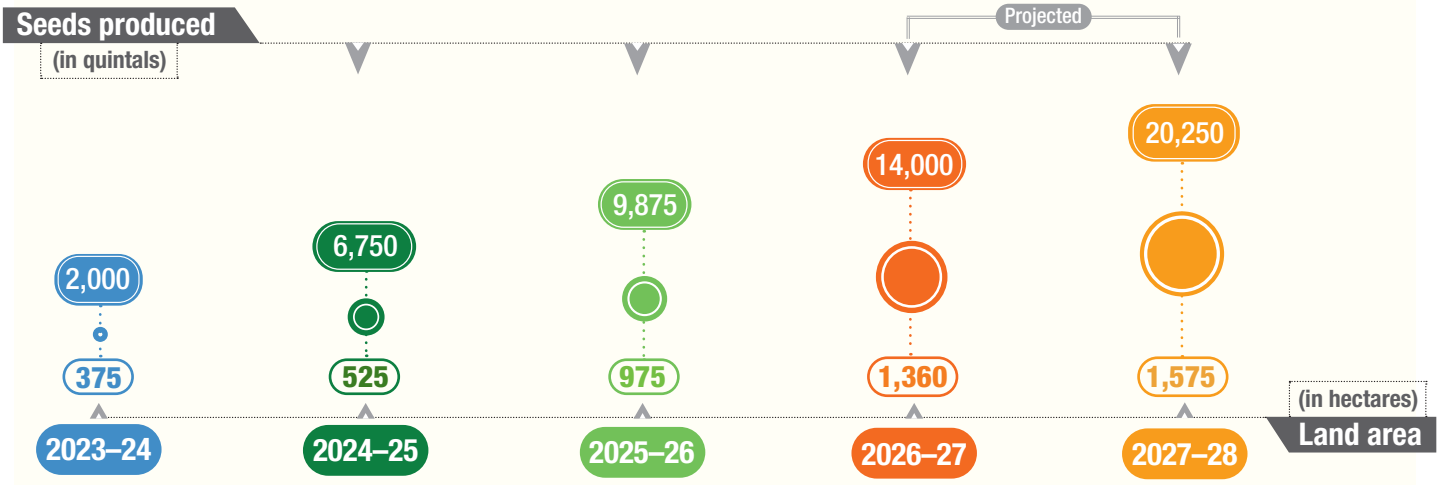
The initiative has delivered significant progress beyond increasing seed production by establishing:

- A fully functional seed value chain
- Adoption of improved varieties
- Stronger institutional coordination
- Increased farmer confidence
- Enhanced local seed entrepreneurship
- Improved income opportunities for smallholder farmers.

A Replicable Model for the Global South

Odisha's experience offers lessons far beyond India. The initiative demonstrates that agricultural transformation is not driven by improved varieties alone, but by the systems that ensure those technologies reach farmers effectively and sustainably. By synchronizing seed production, farmer engagement, institutional partnerships, market linkages and policy support, Odisha has built a resilient and scalable model for oilseed seed systems.

For countries across the Global South facing similar challenges in pulses and oilseeds, the message is clear: Strong seed systems are not merely a support mechanism for agriculture, they are the engine of agricultural transformation itself.





About the Authors

Manzoor Dar
Principal Scientist I - Global Head Seed Systems
International Crops Research Institute for the Semi-Arid Tropics
Hyderabad, India

Amrita Pal
Associate Manager - Seed Systems Development
International Crops Research Institute for the Semi-Arid Tropics
Hyderabad, India

Raman Babu
Global Research Program Director – Accelerated Crop Improvement
International Crops Research Institute for the Semi-Arid Tropics
Hyderabad, India

Communication Officer

Evanjelina Kullu
Consultant – Knowledge Management & Communications
International Crops Research Institute for the Semi-Arid Tropics
Hyderabad, India

For more information on the project

Research Theme: Seed Systems and Delivery

Research Program: Accelerated Crop Improvement

International Crop Research Institute for the Semi-Arid Tropics, Patancheru, Hyderabad - 502 324, Telangana, India

Email: icrisat.seedsystems@icrisat.org

Web: www.icrisat.org

ICRISAT
INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS

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.

Asia

ICRISAT - India (Headquarters)
Patancheru 502 324, Hyderabad
Telangana, India
Phone: +91 8455683071
Fax: +91 8455683074
Email: icrisat-ind@icrisat.org

ICRISAT - India (Liaison Office)
CG Centers Block
NASC ComplexDev Prakash Shastri Marg, New Delhi 110012, India
Phone: +91-11-25840294
Fax: +91 1125841294
Email: icrisat-ind@icrisat.org

West and Central Africa

ICRISAT - Mali
(Regional hub WCA)
BP 320 Bamako, Mali
Phone: +223 20 709200
Fax: 223 20 709201
Email: icrisat-mli@icrisat.org

ICRISAT - Niger
BP 12404
Niamey, Niger
Phone: +(227) 20722725, 20722626
Fax: +227 20734329
Email: icrisat-ner@icrisat.org

ICRISAT - Nigeria
PMB 3491
Sabo Bakin Zuwo Road
Tarauni, Kano, Nigeria
Phone: +234 7034889836
Email: icrisat-nga@icrisat.org

ICRISAT - Senegal
c/o Africa Rice
Mamelles Aviation, Villa 18
BP 24365 Dakar, Senegal
Phone: +221 338600706
Email: icrisat-sen@icrisat.org

Eastern and Southern Africa

ICRISAT - Kenya
(Regional hub ESA)
PO Box: 39063, Nairobi, Kenya
Phone: +254 20 7224550
Fax: +254 20 7224001
Email: icrisat-ken@icrisat.org

ICRISAT - Ethiopia
C/o ILRI Campus
PO Box 5689, Addis Ababa, Ethiopia
Phone: +251-11 617 2541
Fax: +251-11 646 1252, +251 11 646 4645
Email: icrisat-eth@icrisat.org

ICRISAT - Malawi
Chitedze Agricultural Research Station
PO Box 1096, Lilongwe, Malawi
Phone: +265 1 707 297/071/067/057
Fax: +265 1 707 298
Email: icrisat-mwi@icrisat.org

ICRISAT - Zimbabwe
Matopos Research Station
PO Box 776, Bulawayo, Zimbabwe
Phone: +263 292 809314/315
Fax: +263 383 307
Email: icrisat-zwe@icrisat.org

ICRISAT - Mozambique
(c/o IIAM) nr 2698 1st Floor, AV. FPLM
Maputo, Mozambique
Phone: +258 1 461657
Fax: +258 1 461581
Email: icrisat-moz@icrisat.org

ICRISAT - Tanzania
Plot 25, Mikocheni Light Industrial Area
Mwenge Coca-Cola Road, Mikocheni B,
PO Box 34441, Dar es Salaam, Tanzania
Email: icrisat-tza@icrisat.org