

# Transforming Agriculture and Livelihoods in Niger: ICRISAT's Impact and Strategic Partnerships



**Himanshu Pathak**  
Director General, ICRISAT



It is my great pleasure to introduce this country dossier, which highlights ICRISAT's long-standing partnership and shared progress in Niger. It is a collaboration grounded in science, shared purpose, and a common commitment to strengthening dryland agriculture and rural livelihoods.

ICRISAT's engagement in Niger spans more than four decades. Beginning with the establishment of the ICRISAT Sahelian Center at Sadoré in 1981 and our partnership with the Government of Niger, this collaboration has grown into one of the Institute's most important regional platforms for dryland research and innovation. Since its inauguration, the Center has served as a hub of scientific excellence, equipped with advanced laboratories and field infrastructure that support research in crop improvement, soil and plant science, biotechnology, entomology, aflatoxin management, and millet genetics, all tailored to the realities of Sahelian production systems.

This partnership has been consistently productive because it is built on strong national alignment and practical results. ICRISAT's work in Niger supports the country's vision for land restoration, food sovereignty, and climate resilience. In partnership with national institutions like the National Institute of Agronomic research (INRAN), the Direction Regionale de l'Agriculture (DGA) and partners, we have advanced integrated approaches that link improved varieties, resilient seed systems, soil fertility management, biological pest control, water harvesting, and agroecological restoration. These efforts are translating into measurable gains in productivity, resilience, and opportunity for farming communities.

A major pillar of this collaboration is the regional genebank at Sadoré, established in 1991, which conserves critical genetic resources of pearl millet, sorghum, groundnut, and pigeonpea from across West and Central Africa. For Niger, ICRISAT genebank in Sadoré is conserving 11,100 accessions of INRAN. Through conservation, seed sharing under international frameworks, and capacity strengthening of national research systems, this facility contributes not only to Niger's agricultural future but to regional and global food security.

Over the years, joint efforts have delivered improved and biofortified crop varieties (like Chakti, ICRI-TABI, MIL de Siaka), strengthened formal and informal seed systems, expanded climate-smart and regenerative practices, and supported inclusive market development through Smart Food innovations. The partnership has also placed strong emphasis on capacity development, equipping farmers, technicians, researchers, women's cooperatives, and youth entrepreneurs with the skills and tools needed to turn innovation into impact. The results include strengthened value chains, new nutrition-sensitive products, expanded local enterprises, and growing evidence-based contributions to national policy and resilience strategies.

What distinguishes the ICRISAT–Niger partnership is its integrated and forward-looking character, linking research, capacity, markets, and policy, and its openness to collaboration across government, research institutions, development partners, and the private sector. It is also a model of South–South cooperation, knowledge exchange, and co-development of solutions adapted to some of the world's most climate-vulnerable production environments.

As we look ahead, ICRISAT remains fully committed to deepening this productive partnership by advancing climate-resilient agropastoral systems, modernizing seed and advisory services, scaling biofortified and resilient crops, empowering women and youth in value chains, and strengthening national capacity for science-based agricultural transformation.

This dossier reflects a shared platform for future impact, powered by science, partnership, and a common purpose to improve the resilience, nutrition, and livelihoods of the people of Niger and the wider Sahel.



## 2

## Impact Highlights

ICRISAT has transformed Niger's dryland agriculture through decades of science-driven innovation and partnership, positioning the country as a regional model for climate-resilient seed systems, nutrition, and adaptation.

**Estimated cumulative economic impact (2010–2025): USD \$9 million – \$65 million (cumulative) through productivity gains, seed-system efficiency, and market expansion\***

*\* This figure is an indicative economic estimate based on AI-assisted analysis and should be interpreted as an order-of-magnitude assessment; supporting analysis can be provided upon request.*

### Farmers reached

**> 400,000** directly and  
**> 1.5 million** indirectly.

### Hectares under improved management

**> 250,000**

### Return on investment

**≈ 9–10:1** on donor-funded agricultural R&D.

## Seed and Innovation Systems

ICRISAT's collaboration with Niger's national institutions has strengthened the entire seed value chain.



Released and promoted **biofortified** pearl millet and sorghum varieties—GB 8735, ICRI-Tabi, and Chakti—addressing micronutrient malnutrition while increasing yield and resilience.



**Perennial sorghum varieties** now sustain livestock feed supplies year-round, linking crop and livestock systems.



Supported both formal and informal **seed systems** through capacity building, quality control, and breeder-foundation seed production.



Introduced a **seed pre-commanding system** that allows seed producers to anticipate demand and stock certified seed in advance of the season.



Enhanced the **technical and institutional capacity** of national seed authorities and cooperatives through training and digital traceability pilots.

## Nutrition and Food Security

Under its Smart Food initiative, ICRISAT has redefined the role of traditional cereals and legumes in household diets and rural entrepreneurship.



**Supported creation** of nutritious, market-ready products such as Crunch de Mil, Mougoudji, and Dégué Mokou.



Conducted **culinary events**, rural theatre, and training for women's cooperatives and youth entrepreneurs to raise awareness and spur value addition.



Linked **local nutrition with livelihoods** by building inclusive food markets that reward nutritional quality and local innovation.

## Climate and Resilience

---

ICRISAT champions climate-smart and nature-positive agriculture in one of the world's most climate-vulnerable countries.



Promotes integrated **soil fertility** analysis and precision fertilizer use to improve productivity.

---



Scales up **agroecological approaches** such as Farmer-Managed Natural Regeneration (FMNR), conservation agriculture, and fodder conservation.

---



Applies **remote-sensing tools** for land restoration and adaptation planning.

---



Adapts **Indian water-harvesting technologies** for Sahelian conditions to reduce runoff, recharge aquifers, and enable off-season irrigation.

## Capacity and Policy Influence

---

ICRISAT builds technical capacity and policy leadership across Niger's agricultural ecosystem.



Trains farmers, technicians, and students in **biopesticide formulation**, parasitoid production, and sustainable pest management.

---



Operates the **Sadoré Entomology Laboratory**, which rears *Trichogrammatoidea armigera* and *Habrobracon hebetor* parasitoids for national pest-control programs.

---



Provides **evidence and advisory inputs** that shape national biological control and climate-adaptation policies.

## Private Sector and Value Chain Development

---

Through the Smart Food program, ICRISAT integrates smallholders and entrepreneurs into profitable markets.



Empowers **women's cooperatives and youth groups** to lead food processing, packaging, and marketing enterprises.

---



Strengthens **local agro-processors** and small seed companies through training in quality assurance and business management.

---



Encourages **inclusive market growth** anchored in nutrition, sustainability, and resilience.



### 3

## Country Overview and Context



Niger



Niger, spanning **1.27 million** square kilometres and home to about **27 million** people, faces some of the harshest climatic conditions in the Sahel yet holds significant agricultural potential. **Agriculture** employs the majority of the population and contributes roughly one third of national GDP, although production remains largely dependent on rainfall.



**Key staples** include pearl millet, sorghum, groundnut, cowpea and rice, while crops such as onion, sesame and yellow nutsedge provide important sources of cash income. The livestock sector, which engages an estimated **87%** of rural households, contributes **12%** to national GDP and **24%** to agricultural GDP, underscoring its central role in livelihoods and food systems.



**National flagship programs** such as Resilience for Sovereignty, Food Sovereignty Support, Refoundation and Large Scale Irrigation reflect a strong commitment to food sovereignty and resilience. These priorities align closely with ICRISAT's mission to advance climate resilient agropastoral systems across the Sahel.





## Partnerships and Collaborative Ecosystem

ICRISAT's enduring success in Niger is built on strong, multi-sectoral partnerships.

<b>Government and Public Sector</b>	<ul style="list-style-type: none"> <li>Government of Niger; Ministry of Agriculture; National Crops Protection Department; National Adaptation Plan Coordination Units.</li> </ul>
<b>Development and Funding Partners</b>	<ul style="list-style-type: none"> <li>The Great Green Wall Initiative; Farmer-Managed Natural Regeneration (FMNR); national irrigation and resilience programs supported by AfDB, EU, GCF, and UNDP.</li> </ul>
<b>Research and Academic Institutions</b>	<ul style="list-style-type: none"> <li>ICRISAT Sadoré Research Station (100 ha of irrigated land for seed and fodder production); local universities; agricultural training centers.</li> </ul>
<b>Private Sector and Financial Institutions</b>	<ul style="list-style-type: none"> <li>Women's cooperatives, youth entrepreneurship networks, and local agro-processors advancing Smart Food-based value chains.</li> </ul>



## Key Achievements and Impact



Released **biofortified pearl millet and sorghum varieties** combating micronutrient deficiency.



Expanded **FMNR** and conservation agriculture, restoring degraded lands and improving soil fertility.



Established **Integrated Soil Analysis Systems** for targeted fertilization and erosion control.



Deployed **remote-sensing monitoring** for sustainable land and water management.



Strengthened **national capacity in pest management** through biological-control innovation and policy integration.





## Current and Past Research and Innovation Portfolio

### Ongoing Initiatives

- Soil-fertility mapping and decision-support for fertilizer optimization.
- Dissemination of biofortified pearl millet and perennial sorghum varieties.
- Smart Food value-addition pilots in rural communities.
- Adaptation of Indian water-harvesting technologies to Sahelian landscapes.

### Research Infrastructure

- **The Sadoré Research Station**—100 ha of irrigated plots with advanced entomology, biopesticide, and fodder facilities—serves as a regional hub for innovation and capacity building.





Niger holds one of the largest and most diverse germplasm collections in the Sahel, representing a strategically important resource for dryland agriculture. This collection is securely duplicated at the ICRISAT Regional Genebank in Niamey ([www.iscgbank.icrisatne.ne](http://www.iscgbank.icrisatne.ne)), which plays a central role in safeguarding the country's agrobiodiversity and strengthening national capacity for genetic resources management under some of the world's harshest climatic conditions.

Currently, the Niamey regional genebank conserves more than 11,100 accessions of priority dryland crops—primarily pearl millet and sorghum, alongside other traditional food and fodder species—on behalf of the Niger National Genebank, providing secure long-term conservation and safety duplication. These collections represent a critical reservoir of genetic diversity for traits such as drought tolerance, heat resilience, early maturity, and nutritional quality, which are essential for crop breeding, climate adaptation, and food security in Niger and the wider Sahel.

ICRISAT has led extensive germplasm collection missions across diverse agroecological zones of Niger, ensuring that farmer-developed landraces and wild relatives are systematically documented and conserved before they are lost to climate stress, land degradation, or socio-economic change. Beyond conservation, the genebank functions as a regional hub for capacity development, having trained thousands of National Agricultural Research System (NARS) scientists and technicians in genebank management, seed conservation, regeneration, characterisation, and international standards for genetic resources governance.

Through long-term conservation, strong national partnerships, and sustained human capacity strengthening, the Niger genebank stands as a cornerstone of the country's agricultural resilience and a vital asset for present and future crop improvement efforts in dryland Africa.







## Future Investment Opportunities

ICRISAT identifies ready-to-scale investment pathways that directly align with Niger's National Resilience and Food Sovereignty programs.



### Digital and Remote-Sensing Services

Expand real-time monitoring for land restoration and resource planning.

**USD 7 million;** cover > 2 million ha; enable data-driven decisions.



### Smart Food Processing Enterprises

Scale women- and youth-led agro-processing for domestic and export markets.

**USD 9 million;** reach 1 million consumers; create 30,000 jobs.



### Seed-System Modernization

Digital forecasting tools and demand-driven production through the pre-commanding model.

**USD 8 million;** increase certified-seed availability by 40%.



### Water-Harvesting and Irrigation Infrastructure

Deploy climate-adaptive technologies for smallholder irrigation.

**USD 12 million;** restore 150,000 ha; double off-season production.



### Biocontrol and Climate-Smart Training Centers

Regional capacity hubs for sustainable pest and resource management.

**USD 6 million;** train 20,000 farmers and technicians.

## Investor Rationale

With a fifty year history of scientific partnership in Niger, strong alignment with national food sovereignty priorities and the Great Green Wall, and proven co-financing with major development partners, ICRISAT offers investors a trusted and scalable platform for advancing resilience across the Sahel.

**50-year** track record of partnership and scientific leadership.

**Strategic alignment** with Niger's Food Sovereignty Program and the Great Green Wall.

Proven **co-financing** with AfDB, EU, USAID, and GCF.

ICRISAT-Niger will continue driving inclusive transformation through:



These priorities reinforce a joint vision of a climate-resilient, food-secure Sahel powered by science, partnership, and inclusion.

To support governments in building the skills needed to achieve their agricultural development goals, ICRISAT delivers high-quality international training programs through the Indian Technical and Economic Cooperation (ITEC) initiative of the Government of India. These programs are implemented by the ICRISAT Drylands Academy, the Institute's dedicated platform for knowledge exchange and capacity development.

ICRISAT-ITEC courses provide practical, systems-based training for government officials, researchers, and development practitioners from across the Global South. Participants are equipped with tools to scale climate-resilient agriculture, strengthen smallholder decision-making, and address real-world challenges in diverse agro-ecosystems.

Training blends classroom learning with hands-on field exposure, demonstrations of climate-smart technologies, and peer-to-peer exchange among countries with shared priorities.

Through these programmes, countries gain access to:

- Practical decision-support tools grounded in CGIAR science
- Climate-smart and sustainable farming solutions tested across the Global South
- Cross-learning opportunities with participants from ministries, research systems, and universities
- A strong professional network to support ongoing implementation at home

With multiple training cohorts held annually and participation already spanning more than a dozen countries, the ICRISAT-ITEC program offers partner governments a high-impact pathway to strengthen human capital, improve agricultural planning, and accelerate progress toward national development objectives.



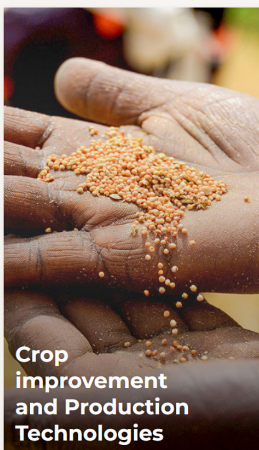


## ICRISAT Center of Excellence for South-South Cooperation in Agriculture (ISSCA)

### — Scalable Solutions —



Agribusiness & Market Systems



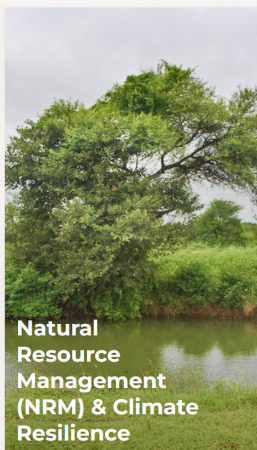
Crop improvement and Production Technologies



Digital Agriculture



Livestock improvement and Production Technologies



Natural Resource Management (NRM) & Climate Resilience

# 11

## ICRISAT's Centre of Excellence for South-South Cooperation in Agriculture (ISSCA)

To accelerate the Government of Niger's progress toward its national agricultural development goals, ICRISAT has established the Centre of Excellence for South-South Cooperation in Agriculture (ISSCA), a platform designed to translate shared experience across the Global South into practical, scalable solutions.

ISSCA strengthens collaboration among countries facing similar agroecological and socioeconomic challenges, enabling governments to access proven, climate-smart technologies, successful policy models, and innovations that have already delivered impact in comparable environments.

Through its digital knowledge hub, technical support, and partnership facilitation, ISSCA provides countries with the tools and evidence needed to fast-track food system transformation, enhance resilience, and drive inclusive agricultural growth.

Drawing on ICRISAT's five decades of scientific leadership and supported by leading Global South institutions, ISSCA offers a powerful mechanism to turn shared challenges into shared opportunities for sustainable development.

Learn more: <https://issca.icrisat.org/>

### Contact Information

#### ICRISAT Niger

Sadoré Research Station, Niamey, Niger

Phone: +(227) 20722529, 20722626, 20315625, 20315656, 20316074

Email: [info@icrisat.org](mailto:info@icrisat.org)

ICRISAT Niger Email: [icrisat-ner@icrisat.org](mailto:icrisat-ner@icrisat.org)

Website: [www.icrisat.org](http://www.icrisat.org)