Niger and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) have maintained a long-term relationship since 1981. Their collaboration has strengthened over the years based on similar and complementary interests, capacities and willingness to work together to improve the well-being of the poor of the semi-arid tropics (SAT). The mission and objective of both are similar and aligned with regard to improving food and nutritional security, reducing poverty, and protecting the environment in poor rural areas.

ICRISAT follows an inclusive market-oriented development (IMOD) approach to enable the poor to go beyond subsistence farming, paving the way to prosperity in the drylands. The Institute believes that a combination of agricultural research with effective support services and suitable market linkages and incentives can increase agricultural productivity. This, in turn, can increase income and the capacity to buy better or more nutritious food, which will lead to good health and a better grip on life for the poorest farmers in Africa and Asia.
ICRISAT Sahelian Center

In 1981, ICRISAT and the Government of Niger signed an Agreement to set up the ICRISAT Sahelian Center (ISC) on a 500-hectare site in Sadoré to serve as the base for millet breeding, crop diversification and socio-economic research. The Center was formally inaugurated in 1989. Research facilities include laboratories for soil and plant analysis, crop physiology/biotechnology, aflatoxin analysis, millet genetics, entomology, and genebank. The Center also has glasshouses, lysimeters, and plots for research under irrigated and rainfed environment. A seed unit for millet breeder seed production and supply of other horticulture seed was set up in 2012.

Interactions between Niger and ICRISAT

- His Excellency Brigi Rafini, Prime Minister and Head of Government of Niger, visited ICRISAT-Niamey on 31 January 2013. “This is the environment I will be willing to work in, and Niger authorities will make every effort to preserve and enhance this ICRISAT Sahelian Center here in Sadoré,” he said. The Prime Minister added that ICRISAT’s mission fits perfectly with the 3N (Nigeriens Nourish Nigeriens) Initiative launched by the President of the Republic, His Excellency Mahamadou Issoufou.

- With sustainable agricultural development on top of Niger’s agenda as key to national food security, His Excellency Mr Allahoury Amadou Diallo, Niger High Commissioner to the 3N Initiative, and His Excellency Mr Ali Illiassou, Niger’s Ambassador to India visited ICRISAT-Patancheru on 20-21 February 2013. According to Niger officials, the two-day productive and rewarding visit helped them better understand ICRISAT’s work and what ICRISAT can offer to Niger. “ICRISAT’s inclusive market-oriented development strategy and research agenda fit in well with our 3N Initiative,” the High Commissioner pointed out.

ICRISAT in Niger

The Institute’s work in Niger covers several fronts, such as the African Market Garden, the Sahelian Ecofarm, bio-reclamation of degraded land, conserving plant genetic resources, crop improvement and diversification, natural resource management, soil fertility improvement, and capacity building of stakeholders. In socio-economics, it targets women empowerment for income generation activities, nutrition, and market development around commodities.

- The African Market Garden (AMG)

This is a small-scale horticultural production package based on low-pressure drip irrigation, requiring just US$ 60 to outfit an 80 m² area. It pays for itself in the first year. Manifold boosts in income are possible from cultivating date palms, grapes, figs, citrus, pomegranates and vegetables. When date palms are included, the profit advantage is thirty times. Over 1800 pilot AMGs have been established so far in the Sahel and have spread in less drier countries of West Africa with benefits such as: reduced cost, water saving, high quality and yield, suitability for high value crops, etc.

The partners in this scheme include: Centre régional de formation et d’application en agrométéorologie et hydrologie opérationnelle (AGRHYMET) / Centre africain pour l’application de la météorologie au développement (ACMAD), Desert Margins Program (DMP), International Centre for Research in Agroforestry (ICRAF), Institut de l’environnement et de recherches agricoles (INERA), Institut national de recherches agronomiques du Niger (INRAN), International Program for Arid Land Crops (IPALAC), Institut sénégalais de recherches agricoles (ISRA), and NGOs along with support from International Development Research Centre (IDRC), United Nations Education, Scientific and Cultural Organization (UNESCO) and the World Bank.

- The Sahelian Ecofarm

The Sahelian Ecofarm is an integrated land use system that incorporates high value multi-purpose plants with soil and water conservation structures. It generates US$ 680 per hectare, thirteen times more revenue per ha than the $50 received from the traditional millet crop and is far more environmentally sustainable. It brings benefits in the form of fuel, forage, cash, plant nutrients, biomass for mulch, and protection from wind erosion. The Ecofarm features strategic choices in the placement of trees, hedges, grass and annual crops. The partners include AGRHYMET / ACMAD, ICRAF, International Livestock Research Institute (ILRI), INERA, INRAN, IPALAC, ISRA, and NGOs along with support from the World Bank.

His Excellency Mahamadou Issoufou, President of the Republic of Niger, being briefed by Dr M Gandah at the ICRISAT exhibit stall during the tripartite desertification conference in Niger held in October 2011.
ICRISAT works with National Agricultural Research System (NARS), and taps farmer’s traditional knowledge of biodiversity to preserve, document and utilize the rich genetic diversity. A total of 40,916 accessions are now preserved at ISC, with 6198 for Niger and 5920 for 6 other countries.

- **Biodiversity conservation and utilization**
  ICRISAT works with National Agricultural Research System (NARS), and taps farmer’s traditional knowledge of biodiversity to preserve, document and utilize the rich genetic diversity. A total of 40,916 accessions are now preserved at ISC, with 6198 for Niger and 5920 for 6 other countries.

- **Crop diversification**
  More than 151 fruit tree varieties have been tested in Niamey. The outstanding species are the grafted *Ziziphus mauritiana* (also called Pomme du Sahel), figs, grapes, pomegranates, pomelo, and various citrus species. A central Sahelian fruit tree supply nursery has been set up for outstanding varieties. Quality vegetable varieties adapted to the high temperatures in the Sahel have been selected, such as the icri-xina tomato that is well-suited for rainy season production. Successful crops to date are: Roselle, watermelons, forage millet and dual-purpose cowpea varieties. In *vitro* date palm has been a success in the oasis environment.

- **Natural resources and soil fertility management**
  Bio-reclamation of Degraded Land (BDL) and fertilizer microdosing technologies have been adopted in Niger and the region to provide food and income to farmers, especially women on highly degraded land.

- **Fertilizer microdosing**
  Soil and land degradation are occurring from under-use of inorganic fertilizer, not over-use. Farmers can profit with even tiny doses of fertilizer. Employing the innovation, more than 5,000 Nigerien farmers have raised millet yields by 50% and sell their crops for much higher prices. The partners include: Food and Agriculture Organization of the United Nations (FAO), Institut d’économie rurale (IER), INRAN, INERA, over 25 NGOs/CBOs, International Fertilizer Development Center (IFDC) and Tropical Soil Biology and Fertility (TSBF) / Centro Internacional de Agricultura Tropical (CIAT), with support from USAID.

**Integration of ICRISAT expertise in the national agenda on agriculture**
With 7 scientists at ISC, ICRISAT has signed an MOU with the 3N national program on agriculture to support its objectives in seed production, crop yield improvement, small-scale irrigation, etc. ICRISAT is a strong partner in various development projects funded by donors such as the United States Agency for International Development (USAID) and Agence Française de Développement (AFD).

### Collaborative Projects
ICRISAT works with several NARS in Niger on projects that are supported by a variety of donors. These projects are mentioned below.

**Harnessing Opportunities for Productivity Enhancement (HOPE) of sorghum and millets**
This project takes an integrated value-chain approach that harnesses market “pull” linked to increased production potential from technologies to stimulate the production of sorghum and millets in selected target areas representative of major sorghum and millet production zones.

The in-vitro date palm produces more fruits and is a big success in the dryland environment.
West Africa Seed Alliance (WASA)

The WASA project supports critical agricultural and trade measures aimed at increasing the production and marketing of food staples along key trade and transport corridors.

An integrated cereal-livestock-tree system for sustainable land use and improved livelihoods of smallholder farmers in the Sahel (CerLiveTreeS)

The aim here is to improve integrated cereal-livestock-tree systems and livelihoods of smallholder farmers through sustainable land use management in the Sahel in the context of agricultural land degradation and climate change. This project is implemented in Burkina Faso, Cameroon, Mali, Niger and Senegal.

Community management of crop diversity to enhance resilience, yield stability and income generation in changing West African climates

The goal of this research-action project is to enhance farm community resilience, production stability and income generation in West Africa under variable and changing climates by enriching agro-biodiversity management across a climatic gradient.

Enhancing grain legumes’ productivity and production, and the income of poor farmers in drought-prone areas of sub-Saharan Africa and South Asia (Tropical Legumes-II)

Tropical Legumes-II aims to increase productivity and production of legumes and the income of poor farmers in sub-Saharan Africa and South Asia by 15 percent, with improved varieties occupying 30 percent of the total area planted by several million poor farmers.

Improving tropical legume productivity for marginal environments in sub-Saharan Africa

This project focuses on improving the productivity of legume crops of high importance to food security and poverty reduction efforts in sub-Saharan Africa.

Mobilizing regional diversity for creating new potential for pearl millet and sorghum farmers in West and Central Africa

The purpose of this project was to enhance rural livelihoods and household food security in pearl millet and sorghum growing areas of West and Central Africa through cultivation of adapted, higher-yielding and stable cultivars of these staple cereals.

Conclusion

ICRISAT’s investments in Niger, its research activities and results, collaboration with national and international institutions, and outlook for the future will go a long way towards realizing the vision for a better Niger. The overall mission of both Niger and ICRISAT is to improve rural livelihoods, develop better natural resource management, and promote sustainable poverty reducing instruments. ICRISAT is committed to this mission and will continue to remain so.