

50 YEARS OF SCIENCE FOR THE WORLD'S DRYLANDS

ICARDA ANNUAL REPORT 2025

Conserving the foundations of dryland agriculture while advancing more resilient food systems under climate, water, and geopolitical pressures.



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BY THE NUMBERS

2025 Indicator Values

517

PEOPLE

improved their income through ICARDA-supported interventions.

37,445

PEOPLE

benefited from ICARDA-hosted or co-hosted capacity development activities.

200,888

PEOPLE

adopted and used ICARDA innovations.

139,950

HECTARES OF LAND

were brought under improved management practices.

128,000

HECTARES

were newly planted with improved crop varieties.

15–80%

INCREASE

in water productivity was achieved across select project interventions.

120,437

PLANT ACCESSIONS

were made available for distribution by ICARDA genebanks.

16,052

TONS

of certified and quality-declared seed produced from ICARDA-developed varieties.

15,446

GERMPLASM LINES

were developed and transferred to National Agricultural Research Systems.

103

PARTNERSHIP AGREEMENTS

were signed or renewed.

143

INNOVATIONS

were developed to address agricultural and environmental challenges.

114

POLICY AND INSTITUTIONAL RECOMMENDATIONS

were developed to support evidence-based decision-making.

684

KNOWLEDGE PRODUCTS

were published.

Where impact **takes root.**

In 2025, across the world's drylands, ICARDA delivered science-driven solutions that helped farmers adapt to climate change, strengthen food systems, and build more resilient livelihoods. Working with national and international partners, governments, and communities, our research translated into measurable impact across:

- Agricultural productivity under increasingly challenging climate conditions
- Water-use efficiency and reduced pressure on natural resources
- Restoration of degraded landscapes and strengthened ecosystem resilience
- Stronger seed systems and accelerated adoption of climate-resilient crops
- Increased livestock productivity and more resilient value chains
- Scaling climate-smart innovations through research, partnerships, and capacity development



Global

10M

Hectares estimated to be under crop varieties with ICARDA parentage to date

4M+

Farming households estimated to be reached through ICARDA-derived crop varieties to date

45

Countries received ICARDA's improved germplasm

13

Countries committed to regional genebank network

Regional



USD 582–5,000/ha increase in profitability through smart relay intercropping trials across multiple CWANA countries



1,012 tons of early-generation wheat seed produced across six African countries

National



ICARDA-led Consortium for Red Palm Weevil Control launched in the UAE



African Breeding Accelerator launched in Morocco, cutting crop breeding cycles from up to 12 years to as little as six.



0.4M ha of rice fallows converted to pulse production in India.

The year behind us, the road ahead



DIRECTOR GENERAL

Reimagining Dryland Agriculture in Uncertain Times

Fifty years ago, ICARDA was founded on the premise that science and innovation could unlock the productive potential of dryland agriculture and transform the lives and livelihoods of the people who depend on it. Today, that premise is supported by decades of evidence and impact across some of the world's most vulnerable regions, while the urgency of its mission has only intensified.

Drawing on five decades of scientific leadership in dryland agriculture and the trust of our partners and the communities we serve, ICARDA has developed integrated, systems-based solutions that strengthen agricultural production, sustainably manage natural and genetic resources, support evidence-based policy, and improve livelihoods. These efforts are underpinned by capacity building, digital innovation, and inclusive development.

The 2025 Annual Report captures the collective achievements of the past year while showcasing the impact of ICARDA's science across the drylands. The report also reflects the dedication of ICARDA's staff, scientists, and partners across the region, who continue to operate in highly diverse and often disrupted operating environments. Through flexibility, collaboration, and innovation, they have sustained the delivery of the research that generates tangible benefits for farming communities and national systems alike.

In 2025, ICARDA-developed crop varieties continued to reach millions of farmers, with further expansion of new improved varieties through our ongoing programs. Genebank systems became better connected across the regions where we work, strengthening the long-term conservation and accessibility of the crop diversity that underpins dryland food systems. Advances in genomics, phenotyping, pre-breeding, and accelerated breeding are enabling valuable diversity conserved in ICARDA's genebanks to be incorporated into improved varieties more rapidly and efficiently.

ICARDA has also helped establish major regional initiatives to address shared agricultural threats and leverage opportunities. The Consortium for Red Palm Weevil Control program, developed with partners including the International Affairs Office of the United Arab Emirates (UAE) Presidential Court and the Gates Foundation, is advancing integrated detection and control systems across multiple countries to reduce damage to date palm plantations. Integrated Desert Farming Systems are demonstrating how regenerative practices, precision water management, and renewable energy can transform deserts into productive, resilient farming systems. Multi-partner efforts have also begun rebuilding research and seed systems following conflict in Sudan and Syria, helping to restore critical capacities for food production and recovery.

Leading ICARDA over the last decade has been both a privilege and a responsibility. As I prepare to step down as Director General, I remain confident that ICARDA is entering its next chapter with robust scientific foundations, strong partnerships, and a clear strategic direction. During my tenure as Director General, ICARDA has navigated a period of unprecedented

global uncertainty, where conflict, climate shocks, and economic instability have evolved from isolated disruptions into interconnected and compounding challenges. These converging pressures have exposed serious vulnerabilities across global food systems and reaffirmed the critical importance of agricultural science as a global public good. Nowhere is this more evident than in the Arab region, where more than 66 million people faced hunger in 2023, with conflict and geopolitical tensions remaining among the primary drivers of food insecurity.

Yet these challenges have also reinforced ICARDA's purpose. Working alongside our national and international partners, we continued to deliver science-based solutions that strengthened food security, improved livelihoods, conserved vital genetic resources, and helped farming communities build resilience to climate change. Even as the global funding landscape shifted, we adapted our approach, strengthened strategic partnerships, and remained focused on delivering measurable impact where it matters most.

As I conclude my tenure, I do so with the recognition that ICARDA's achievements are the result of decades of leadership, scientific excellence, and the dedication of countless colleagues and partners. This milestone also provides an opportunity to acknowledge my predecessor, Director General Dr. Mahmoud El Solh, whose vision and leadership transformed ICARDA into a globally respected research institution and advanced the science of dryland agriculture. His passing in 2025 was a profound loss to ICARDA and to the many communities, partners, and colleagues whose lives he touched.

ICARDA's strong governance and management structures will ensure continuity through the upcoming leadership transition, keeping ICARDA well-positioned to respond to the growing scale and complexity of challenges facing dryland agriculture and to leverage expanding opportunities for innovation and collaboration. However, ICARDA's long-term impact will depend on sustained investment in science, strategic partnerships, and locally grounded innovation. By building on its scientific strengths, focusing on areas where it has a clear comparative advantage, and working across disciplines to scale proven solutions, ICARDA can continue to strengthen food systems,

safeguard natural resources, and improve livelihoods across the drylands.

The organization's future relevance will depend not only on generating excellent science, but on demonstrating how that science strengthens national systems, reduces risks for dryland farmers, safeguards natural resources, and supports recovery and resilience in some of the world's most vulnerable regions. I remain confident that ICARDA can continue to rise to the challenge of serving dryland communities, remaining at the forefront of agricultural innovation and excellence for dryland communities by demonstrating the myriad ways in which science, when coupled with strong partnerships and a clear sense of purpose, can transform lives, strengthen resilience, and help shape a more food-secure and sustainable future.

Aly Abousabaa

Director General, ICARDA



BOARD CHAIR

Stewarding ICARDA Through Complexity and Change

As ICARDA marks its fiftieth anniversary, the Board of Trustees reflects with pride on its five decades of scientific excellence, innovation, and partnerships that have advanced resilient agricultural systems across the global drylands. Since its establishment, ICARDA has helped countries and communities address some of the world's most pressing agricultural and environmental challenges, generating solutions that have strengthened food security, improved livelihoods, and enhanced the sustainable management of natural resources. These achievements are a testament to the dedication of ICARDA's staff, the commitment of its partners, and the enduring support of its donors and stakeholders.

Over the past decade, ICARDA has continued to evolve in response to a rapidly changing global landscape. While climate change, water scarcity, conflict, and evolving global funding

priorities have created new challenges for international agricultural research and development, they have also reinforced the importance of ICARDA's mission and the value of science-led solutions. Throughout this period of transition, the Board has remained committed to ensuring strong governance, strategic oversight, and institutional resilience, enabling ICARDA to continue delivering impact where it is needed most.

On behalf of ICARDA's Board of Trustees, I would like to recognize Aly Abousabaa's leadership and significant contributions over the last 10 years. Aly has successfully improved ICARDA's scientific standing, expanded strategic partnerships, and positioned ICARDA for long-term success. During his tenure as Director General, ICARDA navigated a period of unprecedented change, including decentralization, the COVID-19 pandemic, regional conflicts, and more, all while continuing to deliver impactful science and innovations that save lives and feed some of the world's most vulnerable communities.

As ICARDA enters a new chapter, the Board will continue to work closely with the Senior Management Team to support the implementation of its critical strategy and mandate, ensuring ICARDA remains well positioned to deliver scientific excellence and lasting impact for the dryland communities it serves.

With a clear strategic direction, strong governance, exceptional scientists, and an expanding network of partners, ICARDA is well positioned to seize emerging opportunities, respond to evolving global priorities, and to continue delivering innovative, science-based solutions that improve the resilience, productivity, and sustainability of dryland food systems.

The Board remains steadfast in its commitment to supporting ICARDA's mission to generate meaningful research that actively contributes to reducing poverty while strengthening food, water, and nutritional security and promoting environmental health in the face of global challenges for decades to come.

Dr. Tareq Alzabet

Board Chair, ICARDA

Crops & Genebanks.

Transforming Genetic Diversity into Climate Resilience

Dryland farmers have long been stewards of extraordinary crop genetic diversity, shaped over generations by environmental and farmer-led selection. This has produced a rich array of varieties adapted to heat, drought, salinity, and other challenging local conditions.

However, the pace of climate change is now outstripping what traditional knowledge and existing varieties can sustain. Using science and innovation to safeguard, understand, and unlock this diversity to create practical solutions for dryland farmers is central to ICARDA's crop improvement work for climate resilience.

ICARDA operates across the full spectrum of genetic diversity to turn potential into impact. This means conserving crop diversity in its genebank, identifying and characterizing valuable traits, developing improved varieties with resistance to drought and emerging diseases, and strengthening seed and plant health systems to ensure these varieties reach farmers' hands and thrive in their fields.

Conserving and Deploying Genetic Resources for Dryland Impact



BOLD's drought tolerant durum wheat in Morocco. Photo: Ahmed Ismaili, Crop Trust.

ICARDA's global genebank holds the world's largest collections of crop genetic resources adapted to dry areas, including legumes, forage species, and cereals. These materials are conserved, analyzed, and made available to researchers and crop breeders worldwide.

By the end of 2025, **90% of ICARDA's priority crop collections** – including wheat, barley, lentil, and chickpea – had been documented and placed in the public domain, with essential support from the Crop Trust. **More than 80% of ICARDA's original Syrian genebank collection** has now been safely duplicated, following years of painstaking recovery efforts in the aftermath of conflict. To further

safeguard critical traits in crops such as faba bean, wild chickpea, and wild lentil, in 2025, ICARDA deposited 2,707 samples into the Svalbard Global Seed Vault.

In 2025, ICARDA also shared germplasm with **partners in 45 countries**. This included the rapid delivery of **1,200 promising barley varieties to Tunisia**, which enabled the National Institute for Agricultural Research of Tunisia (INRAT) to rebuild its drought-tolerance breeding program after a hailstorm destroyed field trials just days before harvest. The response demonstrated the value of maintaining internationally connected breeding and genebank systems. When a national program suffered an unexpected loss, ICARDA's conserved materials and nursery networks provided an immediate route to recovery, protecting years of scientific investment.

Breeding for Resilience



A field day event of TAAT II Wheat Compact at El Mangael Innovation Platform site in Gezira Scheme, Sudan.

The true impact of ICARDA's work is ultimately realized in farmers' fields. ICARDA's improved crop varieties continued to deliver impact at scale in 2025. Based on national and partner estimates, varieties developed with ICARDA parentage or direct breeding contributions were cultivated on approximately 10 million hectares, benefiting more than four million farming households. Separately, ICARDA's 2025 project-level monitoring system recorded 128,000 hectares newly planted with improved varieties through active implementation activities during the reporting year. This scale was made possible through sustained collaboration between ICARDA's scientists, national agricultural research systems, and farming

communities, whose local knowledge shapes every stage of ICARDA's breeding program.

Through its global breeding network, ICARDA distributed **239 international cereal and legume nurseries to 74 collaborators across 37 countries**. This collaborative effort resulted in **the release of 10 climate-resilient varieties** of bread wheat, durum wheat, barley, chickpea, and lentil during the 2025 cropping season, strengthening food security across seven countries in Africa and Asia.

In Morocco, a drought-tolerant wheat variety developed using wild wheat genes from ICARDA's genebank is **delivering yields 50% higher than older varieties under drought conditions**, prompting a rapid national rollout.

In Zimbabwe, the heat-adapted SAVE wheat variety is contributing to national efforts to expand domestic wheat production. With **reported yield potential of up to 7 tons per hectare under suitable management**,

this breakthrough variety can be cultivated in both summer and winter, making it ideal for Zimbabwe's diverse agricultural landscapes.

The [African Breeding Accelerator](#), formally inaugurated in 2025, provides controlled-environment facilities that deploy high-tech innovations such as LED lighting systems and greenhouses, and **can simultaneously handle up to 150,000 cereals and legumes**.

ICARDA's pulse improvement work – including lentil, chickpea, and faba bean – is advancing rapidly through genomic tools. Genotyping-by-Sequencing has enabled significant progress in mapping the complex faba bean genome, opening new pathways for climate-resilient varieties of a crop central to nutrition and soil fertility in dryland food systems.

Building Resilient Seed Systems and Safeguarding Plant Health



Inside the African Breeding Accelerator in Morocco. Photo: Ismail Belkhadir, ICARDA

Climate-resilient varieties can only deliver impact when supported by strong seed systems that ensure seed quality, varietal identity, traceability, and farmer confidence. In 2025, ICARDA strengthened national seed systems by improving quality assurance and certification processes. New digital seed request systems and AI-enabled tools are improving access to ICARDA's global collections, while support to countries such as Cameroon, Kenya, Mali, Tanzania, and Zimbabwe is helping develop national seed roadmaps that better connect improved varieties with farmers.

Through AfDB's Technologies for African Agricultural Transformation Initiative, nearly 1,012 tons of early-generation seed and 13,052 tons of certified wheat seed were produced by national partners and through partnership with the public and private sector across six African countries. Despite ongoing conflict in Sudan, ICARDA's AfDB-funded Technologies for African Agricultural Transformation (TAAT-II) wheat project is [rebuilding seed production systems](#). In the 2024-2025 season, it yielded over 122 tons of early-generation seed and 1,770 tons of certified wheat seed.

ICARDA is also addressing escalating plant health threats, including the [Red Palm Weevil](#), which has caused an estimated USD 2 billion in annual losses globally and threatens the livelihoods of 50 million farmers dependent on date palm systems. In 2025, ICARDA – together with the International Affairs Office of the UAE Presidential Court, the Gates Foundation, and partners – [launched the Consortium for Red Palm Weevil Control](#) to advance a [coordinated, science-based response](#). By integrating early detection, surveillance, targeted control measures and cross-border collaboration, the consortium is strengthening countries' capacity to manage infestations, reduce crop losses, and protect the long-term productivity of date palm systems.

“In the UAE, date palm is part of our identity, our hospitality, and our cultural heritage. Protecting it is both a national responsibility and a shared commitment to our food security and legacy. The Red Palm Weevil has challenged the scientific community for decades, which is why the UAE and the Gates Foundation came together to bring CGIAR science, under ICARDA's leadership, into practical action and build a coordinated global response.

— **Ms. Fatema AlMulla**, Senior Specialist, International Affairs Office, Presidential Court, UAE

FEATURE STORY

From 0 to 50,000 Hectares: Transforming Wheat Production in the Senegal Basin



A member of the women's cereal processing and production group in Sanar Walof village near Saint-Louis, Senegal.

In 2016, an ambitious effort began to test five heat-tolerant durum wheat varieties in parts of Senegal and Mauritania that had long been considered unsuitable for cultivation. This effort has since [transformed agricultural production in the region](#).

A group of pioneering women farmers was the first to successfully grow these adapted varieties, demonstrating that durum wheat could thrive under extreme heat. Their success sparked a transformation.

Today, the crop is cultivated by **more than 30,000 farmers over 50,000 hectares**, resulting in national wheat expansion plans in Mauritania and Senegal, where **agricultural GDPs have increased by 0.5%**. It has also led to the release of a heat-tolerant durum variety in Nigeria. The achievement was not the result of a variety alone. It combined heat-tolerant germplasm, multi-location testing, farmer participation, national policy engagement, seed multiplication, market development, and long-term scientific collaboration.

This initiative is supported by the Swedish International Development Cooperation Agency (SIDA) and the Swedish Research Council and carried out in partnership with the Swedish University of Agricultural Sciences (SLU), the Senegalese Institute for Agricultural Research (ISRA), and Mauritania's National Center for Agricultural Research and Rural Development (CNRADA).

Soil, Water & Agronomy

Achieving More with Less Through Smarter Farming

Across some of the world's most water-scarce landscapes, generations of farmers have developed locally adapted ways of managing soil, water, crops, and livestock. That knowledge remains essential, but it is under growing strain. Water is becoming scarcer, soils are more degraded, and the climate is more unpredictable at a moment when increasing populations and geopolitical pressures are placing greater demands on already stretched food systems.

ICARDA's approach is built on the understanding that soil, water, and crops must be managed together. Healthier soils retain moisture longer, diverse cropping systems rebuild soil fertility, and smarter water management gets more from every water drop.



A field of freshly harvested potatoes in Tajikistan.

Deploying Water Strategically

Water scarcity is the defining constraint of dryland agriculture. In 2025, ICARDA worked with partners across the region to improve water management at multiple levels, from farm practices and landscape restoration to the policies and institutions that shape who gets water, how much, and when.

In Tajikistan, in collaboration with the Swiss Government and CARITAS, weather-based irrigation advisory services are helping farmers shift from intuition to data in decision-making. In two-year potato field trials, optimized irrigation based on real-time weather and soil information reduced water use by up to 51%, while the best-performing treatment achieved up to a 580% increase in water productivity compared with conventional irrigation under the trial conditions.

In Morocco, ultra-low-energy drip irrigation systems showcased during a series of sustainability days with international partners use pressure-compensating emitters to **reduce hydraulic energy by 43% in the first year and 69% within three years**, making sustainable irrigation accessible to smallholders who previously could not afford it.

Trials in agrivoltaics – integrating solar panels into farming systems – and solar-powered desalination systems are opening further possibilities, including new water resources in areas where conventional sources are unreliable. These innovations were showcased to global policymakers at Cairo Water Week 2025 in Egypt as part of efforts to move them beyond pilot initiatives and into mainstream climate and water policy.

“In the MENA region, where water scarcity is a defining challenge, our goal is to make renewable-powered irrigation and desalination truly practical and accessible. By partnering with ICARDA and the private sector, we're turning research into real solutions, from low-pressure drip systems that cut energy use to AI tools that ensure water is used efficiently and solar desalination that makes farming in new areas possible.

— Dr. Amos Winter, Director, K. Lisa Yang Global Engineering and Research (GEAR) Center, Massachusetts Institute of Technology (MIT)

Restoring Soil Health

Healthy soils do far more than support crop cultivation. They hold water, host the microorganisms that cycle nutrients, and store carbon that would otherwise escape into the atmosphere.

Conservation agriculture – combining practices such as reducing soil disturbance, maintaining ground cover, and using crop rotations – is rebuilding organic matter and improving water retention in Algeria, Egypt, Iraq, Jordan, Lebanon, Morocco, Syria, Tunisia, and Uzbekistan. In Morocco, these practices have **doubled – or even tripled – yields** compared with conventional systems under drought conditions, prompting the Ministry of Agriculture, Fisheries, Rural Development, Water, and Forests to target **one million hectares of cereal production under conservation agriculture by 2030. The target is part of Morocco's Generation Green strategy and reflects the country's broader push to scale conservation agriculture nationwide.**

Through the Fertilize Right Pakistan Initiative, ICARDA and 14 national and provincial partners are demonstrating how precision nutrient management, including the use of biofertilizers, can **reduce nitrogen use by up to 20% and chemical fertilizer use by up to 25%**, improving yields in rice, wheat, and cotton, and reducing greenhouse gas emissions. In 2025, workshops and field days engaged **more than 1,230 scientists, policymakers, fertilizer companies, NGOs, agricultural professionals, and farmers**, helping to translate these findings into practice.



Relay cropping of an irrigated summer crop into a rainfed winter lentil.

Diversifying Cropping Systems to Reduce Risk

Narrow cropping systems are high-risk systems. When one crop fails, as it does with increasing frequency under climate stress, farmers have nothing to fall back on. ICARDA is helping farmers diversify what they grow by reintroducing underutilized crops such as cowpea, quinoa, millet, and sorghum, which are adapted to heat, drought, and poor soils, and are up to **30% more productive than major cereals such as maize and wheat**. Many are also high in micronutrients such as iron and zinc, which are essential for healthy development.

Smart relay cropping systems maximize land, water, and growing seasons by planting a first crop, such as lentil, chickpea, or quinoa, before planting wheat. Trial results show gains of up to **USD 5,000 per hectare in profitability, 25% higher water productivity, 50% more protein yield, and 30% improved soil while increasing the following wheat crop by up to 15% compared to wheat-wheat systems**. This innovation was recognized as one of the top five solutions in the Middle East, North Africa, and Turkey (MENAT) by Goumbook's 2024-2025 MENAT Regenerative Agriculture Programme Venture in 2025.

FEATURE STORY

Mixing Things Up to Turn Deserts into Farmland



ICARDA's Integrated Desert Farming Systems (IDFS) – Inside a solar-powered greenhouse.
Photo: Ahmed El Sheemy, ICARDA

To most eyes, dry, hot deserts filled with degraded soils are the last place to invest in agriculture. ICARDA's Integrated Desert Farming Systems (IDFS) proves otherwise. Rather than a single technology or crop variety, this whole-systems approach integrates date palms, legumes, and fruit trees into agroforestry systems, alongside climate-smart livestock and resilient crops. Regenerative soil management is paired with precision water use, greenhouses, and agrivoltaics that generate renewable energy while shading crops. Nothing goes to waste as water, nutrients, and organic matter are captured and reused throughout.

Water productivity gains of up to 78% were recorded for cucumber production in the UAE and Oman, **cutting energy use and reducing greenhouse emissions by nearly 5 metric tons per season** compared to conventional greenhouses. Hydroponics trials across the Arabian Peninsula have produced **tomato yields nearly seven times higher** per cubic meter of water than soil-based systems. Farming communities – with women's participation a central priority – are gaining skills, building enterprises, and redefining their futures as desert farmers.

An event in 2025 in Egypt showcased the striking results of the Integrated Desert Farming for Resilient Livelihoods initiative. Project economic analyses found that the fully integrated technology package, including improved barley, panicum, azolla and silage production, generated the highest return on investment, with returns of up to 87% for participating farmers under the project's evaluation.

The Integrated Desert Farming for Resilient Livelihoods (IDFRL) project was supported by the Spanish Agency for International Development Cooperation, and implemented in partnership with Egypt's Agricultural Research Center, Desert Research Center, and National Water Research Center.

Livestock & Rangelands.

Securing a Climate-Smart Livestock Future for Dryland Pastoralists

For 265 million dryland pastoralists, livestock is vital for income, nutrition, and financial security. Their herds depend on rangelands and silvopastoral systems rich in native grasses, shrubs, and trees. These ecosystems are now under pressure from land degradation, biodiversity loss, and competing land uses.

Building on traditional knowledge, ICARDA works with dryland communities to strengthen livestock systems. Through climate-smart breeding, sustainable grazing management, and low-emission production, ICARDA helps improve productivity while restoring and protecting the rangelands on which these communities depend. These landscapes are far more than grazing areas. They sustain biodiversity, regulate soil health, increase climate resilience, and store carbon. Restoring them is a core priority of ICARDA's work with regional partners.



Restoring Silvopastoral Systems to Rebuild Livelihoods

ICARDA's restoration work goes beyond diagnosing the problem. Working with partners, it tests and scales approaches that restore degraded landscapes while delivering tangible livelihood benefits, demonstrating that large-scale recovery is possible when science is translated into practical solutions and backed by strong institutional and community engagement.

In Tunisia, the carob tree has long been difficult to scale despite its many valuable uses. It stabilizes soils, provides shade for livestock, and produces pods used in traditional foods, remedies, and high-energy animal feed. However, expanding carob cultivation has been constrained by propagation challenges, such as seed-grown trees being slow to establish and produce variable-quality plants, while grafting—the standard alternative—is labor-intensive and often achieves success rates below 20%. ICARDA has responded by developing advanced vegetative propagation techniques that enable the cloning of high-quality trees. In 2025, **32 participants from Tunisia's forestry services** received hands-on training that has helped build the capacity needed to scale out this practice, supporting biodiversity, rural livelihoods, and food and fodder security across rangeland and silvopastoral systems.

Over 15,000 multipurpose aromatic and medicinal plants were distributed across 16 Groupements de Développement Agricole (GDAs) in Kef and Zaghouan in Tunisia, benefiting more than 350 households and supporting the adoption of silvopastoral practices to enhance livelihoods.

Putting Communities in the Driving Seat to Improve Livestock Breeding

Goats and sheep account for more than half of all livestock populations across the drylands and are central to food security and income. Yet conventional approaches to improving their productivity by crossbreeding with exotic breeds have not always been well-suited to local realities.

ICARDA's community-based breeding programs take the opposite approach. Farmers lead decision-making, local breeds are the starting point, and the priorities of both men and women livestock keepers are considered and

incorporated into science-based innovation. This approach was first developed in Ethiopia, where it has now reached more than 19,140 households, supported the establishment of over 120 breeder cooperatives, and contributed to average income increases of around 20%. In 2025, a [national workshop](#) with Ethiopia's Ministry of Agriculture, Ministry of Labor and Skills, and the Livestock Development Institute brought together policymakers, researchers, and private-sector stakeholders to agree on priorities for scaling community-based breeding programs, strengthening market linkages, and accelerating the transformation of Ethiopia's small ruminant sector encompassing more than 70 million sheep and goats.

Community-based breeding has since expanded to [India](#), [Tunisia](#), [Mongolia](#), and [Mali](#). The Global Methane Hub is supporting the integration of methane emission recording into CBBPs in Ethiopia, India, Tunisia, and Mongolia to develop climate-smart, environmentally friendly breeding objectives and practices, while the CGIAR Initiative on Sustainable Animal Productivity for Livelihoods, Nutrition and Gender Inclusion (SAPLING) and the Sustainable Animal and Aquatic Food (SAAF) Science Program support the expansion in Mali. In 2025, ICARDA also launched [Pakistan's first community-based breeding program \(CBBP\)](#) in collaboration with national research organizations with the support of the Australian Centre for International Agricultural Research (ACIAR).

“Small ruminants already account for most of Ethiopia's livestock export earnings. If we are to increase that contribution tenfold over the next five years, we must invest in productivity, quality, genetic improvement, and community-based breeding.

— H.E. Dr. Fikru Regassa, State Minister of Livestock and Fisheries Resource Development, Ethiopia



ICARDA's community-based breeding program for sheep and goats in Ethiopia.

Understanding What Makes Goats Resilient

ICARDA scientists joined an [international initiative to develop, for the first time, a resource reference that reveals the full spectrum of the genome profile of goats arising from the species' evolutionary history](#). Unlike previous resources based on the genomes of single highly inbred individuals, this new resource, built from the genomes of multiple individuals, provides researchers with foundational information that makes goats versatile, opening new avenues for research and sustainable breeding of goats.

FEATURE STORY

Restoring Tunisia's Degraded Rangelands with a Native Legume



Sulla (*Hedysarum coronarium* L.), a native forage legume. Photo: ICARDA

Native forage legumes such as *Sulla* provide a low-cost, scalable solution to restore degraded rangelands while boosting livestock productivity, farm income, and ecosystem resilience.

Sulla, a native legume long overlooked by modern agriculture, is proving that even the most unassuming plants can pack the biggest punch in reviving Tunisia's degraded rangelands. It thrives in poor soils, requires little water, and produces high-protein biomass that farmers can use as animal feed.

In restoration trials that reintroduced *Sulla* to rangelands, plant species diversity doubled, and ground cover increased by up to 330%. For farmers, savings of around 900 TND (~305 USD) per cow annually are achieved by reducing reliance on costly supplementary feed, while better-nourished livestock produce 5% heavier lambs and kids and up to 25% more milk.

To boost *Sulla*'s performance, ICARDA and national partners have developed a tailored biofertilizer containing beneficial bacteria. Field trials show that treated *Sulla* produced around 60% more biomass, with 80% higher nitrogen content and 21% greater phosphorus uptake, eliminating the need for synthetic fertilizers. *Sulla* also actively restores soil health through nitrogen-fixing.

This work is supported by the CGIAR Research Initiative on Agroecology, the CGIAR Science Program on Multifunctional Landscapes, Chahda Local Community, Commissariat Régional de Développement Agricole, PRIMA TRansforMed Project, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Direction Générale des Forêts (DGF), Tunisia's Institut National de la Recherche Agronomique (INRAT), Office de l'Élevage et du Pâturage, and SWC@Scale-Prosol Project.

People & Capacity.

Creating Resilient Dryland Systems Through Inclusion

When women, young people, and marginalized groups have equal access to land, finance, training, and technology, dryland food systems become more productive, more resilient, and more equitable. Their inclusion is fundamental to delivering food security, sustainable livelihoods, and meaningful employment.

ICARDA's 2030 Research and Innovation Strategy responds to this directly, embedding gender equality, youth and social inclusion, capacity development, and socio-economic analysis in every aspect of how it designs and delivers its work. This means ensuring that improved varieties, water technologies, and farming innovations reach the people who need them most, while creating jobs, strengthening local economies, and investing in the next generation of community leaders who will carry this work forward.

Empowering Communities Through Seed Networks

Community seed networks are proving to be one of the most effective routes to getting improved varieties into farmers' hands while creating job and income opportunities at the same time.

In South Asia, ICARDA is working with the World Bank and government partners to build community networks that support pulse production. Training community members to become quality seed producers is generating local employment and expanding access to improved, climate-smart varieties. A field day organized with the Centre for Child and Women Development in Odisha, attended by more than 250 farmers, deepened knowledge of pulse varieties and opened new value chain opportunities.

“ I've been growing lentils for over ten years, but using traditional methods, my yields were always low. With ICARDA's support, I started using quality seeds, proper seed treatment, fertilizers, and pest management. From just one hectare, I harvested 6.8 quintals of lentils and sold them at ₹85 (US\$0.94) per kilogram, earning ₹55,250 (US\$613). That income helped me invest in my children's education, cover household needs, and repair my farm assets.

— **Mr. Kanturu Majhi**, Farmer participating in ICARDA's Comprehensive Rice Fallow Management (CRFM) program, Odisha, India



Indian farmers in Odisha holding lentil harvest. Photo: ICARDA

Creating Equitable Market Opportunities

Simple tools and targeted training are opening new economic opportunities in agri-food for women and young people across dryland communities.

In Egypt, introducing simple food-processing equipment – vegetable slicers, dryers, grinders, sesame oil extractors, and packaging machines – is enabling women to process and sell products locally, diversifying their incomes. Beyond immediate economic gains, these tools are reshaping how women participate in local food systems, building practical skills, increasing their visibility as economic actors, and creating new enterprise opportunities.

In Pakistan, women farmers are converting agricultural waste into compost following training delivered in 2025. This activity is cutting dependence on expensive chemical fertilizers and improving soil health, while strengthening participants' confidence, deepening their involvement in farm management decisions, and expanding their role in household decision-making.

In Tunisia, ICARDA, the Olive Tree Institute (IO), the National Agronomic Research Institute (INRAT), and the General Directorate of Agricultural Production (DGPA) co-developed a novel inclusive business model to support the transition to agroecological, labeled olive oil production. The initiative is advancing a new olive oil Geographical Indication for the Elles community to strengthen product identity, market access, and sustainable production. Building on this progress, a Business Incubator has been established in Elles to support local agroecological enterprises and develop a scalable model for strengthening olive oil value chains across Tunisia.

Shifting Norms to Build Lasting Legacies



In Tunisia, Haitham Ben Ali built a livestock enterprise from scratch after witnessing the impact of sulla-driven rangeland restoration.

Measuring impact goes beyond improved yields. Lasting change happens when people gain the confidence, opportunity and support to reshape the social norms that influence who participates, who leads and who benefits.

Across Morocco, Tunisia and Lebanon, women in food-processing cooperatives are transforming not only their businesses but also perceptions of who can lead. Through leadership training, governance support and community dialogue, women are taking on decision-making roles, strengthening their economic independence and building greater recognition within their households and communities. As families witness the benefits, support for women's participation is growing, creating more inclusive and resilient rural communities.

These shifts are reflected in individual lives.

In Ethiopia, Ayelech, a farmer from near Bonga, joined ICARDA's Community-Based Breeding Program in 2009 with a small initial investment. Through access to improved sheep breeds, technical knowledge and community support, she increased her income, built her own home and helped establish a community veterinary clinic.

In Tunisia, Haitham Ben Ali transformed a small livestock operation into a thriving enterprise after adopting sulla-based rangeland restoration, reducing feed costs by around USD 300 per cow while improving productivity and reinvesting in his business.

ICARDA is also helping communities address the social norms that shape agricultural decision-making. In Ethiopia, more than 8,500 people participated in initiatives that encouraged dialogue on gender equality. Participants were more than twice as likely as non-participants to reject the belief that men alone should control livestock sales, while community groups, local radio, women's associations, police and microfinance institutions reinforced these conversations. In Morocco, participatory theater and public dialogue created safe spaces for communities to discuss women's land inheritance, entrepreneurship and mobility. Across nine performances in villages in the Fès-Meknès and Souss-Massa regions, around 450 participants engaged in conversations that contributed to measurable improvements in attitudes towards women's inheritance rights and economic participation.

FEATURE STORY

Cashing In on Wheat Snacks in Zimbabwe



Students at the TAAT Workshop SOS Hermann Gmeiner High School in Bindura Zimbabwe.
Photo: Jacqueline Tanhara MLAFWRD.

Zimbabwean Wheat is becoming a story of innovation, entrepreneurship, and local resilience after students, teachers, farmers, and researchers gathered at a high school in Bindura to explore how locally produced varieties could create new business opportunities.

The enterprising group worked on making snacks, including moringa buns, baobab-flavored cakes, and rosella muffins, combining modern food innovation with indigenous ingredients. The budding entrepreneurs also learned about branding, packaging, and marketing.

The impact was immediate. The school tuck shop now sells a range of wheat-based snacks, generating income while giving students hands-on experience in agribusiness beyond the school gates. Farmers and parents have begun experimenting with new wheat varieties and products, while innovation platforms are connecting breeders, millers, processors, and private-sector actors to strengthen collaboration across the value chain.

This training was organized by the Directorate of Research, Education and Specialist Services (DRESS) under the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development (MLAFWRD). It took place as part of the African Development Bank's Technologies for African Agricultural Transformation (TAAT) Wheat Compact, led by ICARDA under the Feed Africa Strategy which links research, capacity development, entrepreneurship, and local food production across several countries. In 2024, this initiative trained 7,500 people.

Partnerships & Collaborations.

Advancing Partnerships and Global Influence

ICARDA's impact is inseparable from its partnerships. As a trusted scientific partner, policy influencer, and convenor across dryland regions, ICARDA has built long-term relationships – many spanning nearly five decades – with governments, national agricultural research systems, development institutions, and farming communities.

ICARDA recognizes that these partnerships are essential to scaling innovation. They help move solutions beyond pilots, ensure evidence informs investment and policy, and position ICARDA as a bridge between research, implementation, financing, and policy.

Deepening Long-Term National Partnerships



ICARDA's long-standing collaborations continue to advance climate mitigation and adaptation, water security, and sustainable agriculture, while integrating new technologies.

In Jordan, ICARDA signed a new Memorandum of Understanding with the Ministry of Water and Irrigation, the organization's partner since its founding. The MoU builds on nearly 50 years of work on water-use efficiency, conservation agriculture, drought management, digital water technologies, rainwater harvesting, and gender and youth inclusion.

In Morocco, ICARDA has deepened its collaboration with the National Agency for the Development of Oasis Zones and the Argan Tree and the National Institute for Agricultural Research, establishing new research and development platforms for desert agriculture. The 2025 visit of the Minister of Agriculture to the Merchouch Research Station also highlighted strong political support for four decades of joint work on climate-resilient cereals.

In Egypt, an ICARDA-led initiative supported by the Governments of Egypt and Japan and implemented with the Food and Agriculture Organization of the United Nations (FAO) has restored production on degraded, saline soils. Through the Enhancing Agriculture Productivity project, completed in 2025, smallholder farmers gained access to solar-powered irrigation, improved seeds, soil restoration approaches, digital advisory tools, and improved water management practices, while local extension agents were trained to sustain impact beyond the project period. The initiative **reduced soil salinity by up to 94% within four months, cut water use and pumping costs by 25%, halved seed requirements, and improved fertilizer efficiency and yields by 30%**, while creating new income opportunities such as fish farming. A new ICARDA-led project, launched in 2025 and also funded by Japan, will build on this progress.

ICARDA's long-standing partnership with Japan is also advancing climate-resilient agriculture, innovation, and knowledge exchange through the student exchange program with Japan's Tottori University, which continues to build the next generation of scientists ready to tackle climate challenges.

A new Memorandum of Understanding with the Global Green Growth Institute – an international NGO in South Korea – expands ICARDA's engagement in climate-smart agriculture, regenerative farming, and green growth pathways for sustainable livelihoods beyond its traditional geographic focus.

“By pairing ICARDA's science with the Global Green Growth Institute (GGGI)'s expertise on policy and finance, we can turn climate-smart agriculture into investable, job-creating projects that boost rural incomes and resilience across the world's drylands.

— Mr. Sang-Hyup Kim, Director General, Global Green Growth Institute (GGGI)

Shaping Global Research and Dialogue



In 2025, ICARDA expanded its engagement in global research and policy, contributing expertise to international efforts on climate vulnerability, food insecurity, and sustainable agriculture.

In India, ICARDA inaugurated expanded facilities under its Food Legume Research Platform in Madhya Pradesh in February 2026, a cornerstone of ICARDA's South Asia work since 2014, with the Government of India and the Indian Council of Agricultural Research. The updated facilities include genomics, breeding, and plant pathology laboratories, as well as training facilities for farmers and partners.

ICARDA received major recognition in 2025, including the Almarai Prize for Creative Scientific Work, which honored a 12-year project across ten Arab countries, and the Date Palm Innovation Technology Prize for its Solar Mobile Dryer, which improves dried date quality while reducing energy use, labor costs, and post-harvest losses.

Supporting Post-Conflict Rehabilitation and Disaster Recovery Through Partnerships



In fragile and crisis-affected contexts, recovery depends on trusted partnerships. ICARDA's experience in the drylands and its reputation as a neutral scientific actor able to navigate complex geopolitical and environmental challenges enable it to help restore agricultural systems, rehabilitate degraded lands, and rebuild farmer livelihoods.

In 2025, ICARDA has been part of multi-partner efforts supporting the recovery of wheat research and seed systems in Sudan and Syria following conflict, helping to restore critical capacities for food production and recovery.

In Central Asia, ICARDA's collaboration with the United States Forest Service increased national capacity in Uzbekistan and Tajikistan to assess and respond to flash floods, erosion, and land degradation using geospatial tools and climate vulnerability analysis.

FEATURE STORY

Accelerating Syria's Post-Conflict Agricultural Recovery



Syria holds a special place in ICARDA's history as the organization's original host country. Years of conflict took a heavy toll on its agricultural sector, including the destruction of ICARDA's genebank in Aleppo, home to uniquely adapted legume, forage, cereal, and rangeland species. By 2025, **more than 80% of this collection had been safely duplicated**.

Attention is now shifting toward restoring Syria's domestic agricultural systems. In October 2025, under the patronage of the Syrian Ministry of Agriculture, ICARDA convened a High-Level Consultation Workshop to present its Program for the Rehabilitation of Syria's Agriculture Sector, to encourage discussion, and to agree on next steps. Syria's Minister of Agriculture, ICARDA's Director General, 85 senior representatives of Syrian national institutions, and international partners, including humanitarian agencies and international NGOs, gathered to establish a coordination platform, identify investment priorities, align technical and humanitarian support, and chart a course toward the rehabilitation of Syria's agriculture sector.

Next steps will focus on training agricultural specialists to strengthen national systems through more stringent seed inspection and certification procedures, improved border quarantine controls, and expanded institutional coordination among Syria's seed and plant health agencies to support a more resilient recovery.

Financial statements

An overview of how ICARDA's resources were invested in research and development across our regions in 2025.

~\$42m

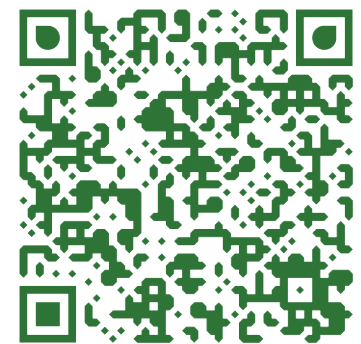
Total expenditure

~\$32m

Research expenditure

~\$32m

Directed to Programs



Download the audited
financial report

Expenditure by classification

Personnel cost 44%



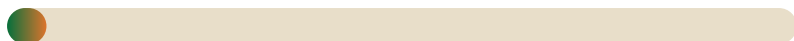
Supplies & services 39%



Collaborators partners 8%



Depreciation 2%



Travel 3%



Collaborators – CGIAR Centers 1%



Expenditure by activity

Research programs 75%



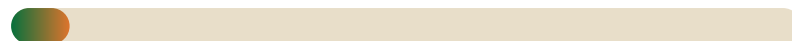
Corporate services 12%



Resource mobilization & project office 6%



Management 5%



Research support 2%



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