

An actor performs in the forum theatre play “She Inherits, She Sells,” which uses the “Theatre of the Oppressed” format to help communities address challenges faced by rural women’s cooperatives in Morocco due to societal gender norms. During the performances, audience members are encouraged to participate as “spect-actors” to collectively analyze and explore solutions to issues such as harmful marital relations, women’s economic independence, gender-based violence, and inequitable inheritance.

Credit: Dina Najjar, ICARDA

CGIAR Research Initiative on **Fragility to Resilience in Central and West Asia and North Africa**

Author: CGIAR Research Initiative on Fragility to Resilience in Central and West Asia and North Africa

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The Artificial Intelligence (AI) software ChatGPT was used to support the editing of parts of this report, specifically to improve clarity, grammar, and style. ChatGPT was not used to generate the content of the report. All edits made with AI assistance were reviewed and validated by the authors to ensure accuracy, coherence, and alignment with the original intent.

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CGIAR Technical Reporting 2024

CGIAR Technical Reporting has been developed in alignment with [CGIAR's Technical Reporting Arrangement](#). This annual report ("Type 1" Report) constitutes part of the broader CGIAR Technical Report. Each CGIAR Research Initiative/Impact Platform/Science Group Project (SGP) submits an annual "Type 1" Report, which provides assurance on progress towards end of Initiative/Impact Platform/SGP outcomes.

As 2024 marks the final year of this CGIAR Portfolio and the 2022-24 business cycle, this Type 1 Report takes a dual approach to its analysis and reporting. Alongside highlighting key achievements for 2024, the report also provides a cumulative overview of the 2022-24 business cycle, where relevant. This perspective captures the evolution of efforts over the three-year period. By presenting both annual and multi-year insights, the report underscores the cumulative impact of CGIAR's work and sets the stage for the transition to the 2025-30 Portfolio.

The 2024 CGIAR Technical Report comprises:

- **Type 1 Initiative, Impact Platform, and SGP Reports:** These annual reports present progress towards end of Initiative/Impact Platform/SGP outcomes and provide quality-assured results accessible via the [CGIAR Results Dashboard](#).
- **Type 3 CGIAR Portfolio Practice Change Report:** This report provides insights into CGIAR's progress in Performance Management and Project Coordination.
- **Portfolio Narrative:** Drawing on the Type 1 and Type 3 reports, as well as data from the CGIAR Results Dashboard, the Portfolio Narrative synthesizes insights to provide an overall view of Portfolio coherence. It highlights synergies, partnerships, country and regional engagement, and collective progress.
- **Type 2 CGIAR Contributions to Impact in Agrifood Systems: evidence and learnings from 2022 to 2024:** This report offers a high-level summary of CGIAR's contributions to its impact targets and Science Group outcomes, aligned with the Sustainable Development Goals (SDGs), for the three-year business cycle.

The Portfolio Narrative informs the 2024 CGIAR Annual Report – a comprehensive summary of the organization's collective achievements, impacts, and strategic outlook.

Elements of the Type 2 report are integrated into the [CGIAR Flagship Report](#), released in April 2025 at [CGIAR Science Week](#). The Flagship Report synthesizes CGIAR research in an accessible format designed specifically to provide policy- and decision-makers at national, regional, and global levels with the evidence they require to formulate, develop, and negotiate evidence-based policies and investments.

The diagram below illustrates these relationships.

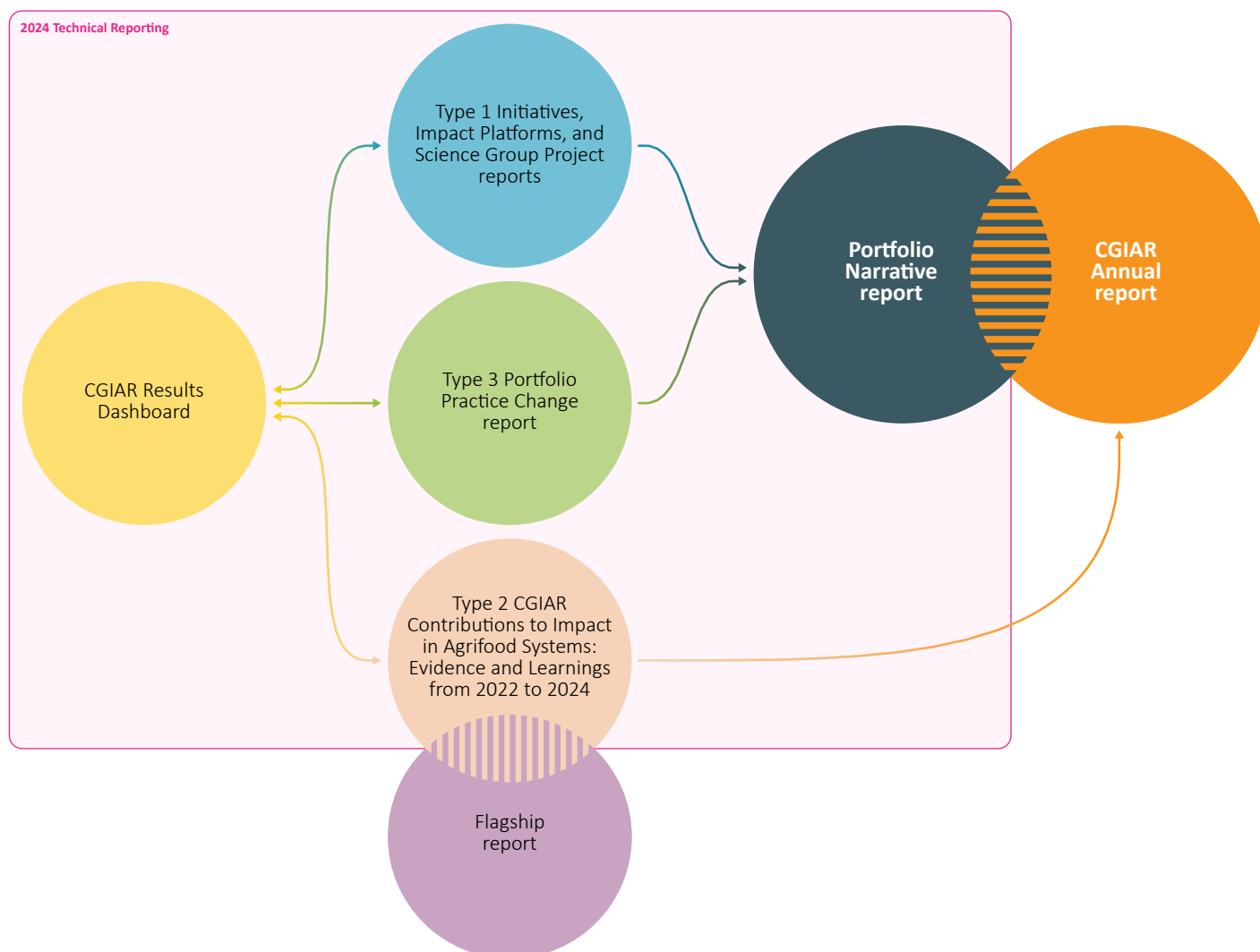


Figure 1. CGIAR's 2024 Technical Reporting components and their integration with other CGIAR reporting products.

Section 1: Fact sheet, executive summary and budget

Initiative name	Fragility to Resilience in Central and West Asia and North Africa
Initiative short name	Fragility to Resilience in Central and West Asia and North Africa
Initiative Lead	Michael Baum (m.baum@cgiar.org)
Initiative Co-lead	Maha Al-Zubi (m.al-zubi@cgiar.org)
Science Group	Science group
Start – end date	01 April 2022 – 31 December 2024
Geographic scope	<p>Regions</p> <p>Central and West Asia · North Africa</p> <p>Countries</p> <p>Egypt · Lebanon · Morocco · The Republic of the Sudan · Uzbekistan</p>
OECD DAC Climate marker adaptation score¹	<p>Score 2: Principal</p> <p>The activity is principally about meeting any of the three CGIAR climate-related strategy objectives—namely, climate mitigation, climate adaptation, and climate policy—and would not have been undertaken without this objective.</p>
OECD DAC Climate marker mitigation score¹	<p>Score 1: Significant</p> <p>The activity contributes in a significant way to any of the three CGIAR climate-related strategy objectives—namely, climate mitigation, climate adaptation and climate policy—even though it is not the principal focus of the activity.</p>
OECD DAC Gender equity marker score²	<p>Score 0: Not targeted</p> <p>The Initiative/project has not been found to target gender equality. However, as a minimum requirement for all Initiatives/projects, (1) a gender analysis was conducted, (2) its findings should be used to ensure at minimum that the Initiative activities/interventions do no harm and do not reinforce gender inequalities, and (3) data that are collected are gender disaggregated.</p>
Website link	https://www.cgiar.org/initiative/fragility-to-resilience-in-cwana/

¹ The Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) markers refer to the OECD DAC [Rio Markers for Climate](#) and the [gender equality policy marker](#). For climate adaptation and mitigation, scores are: 0 = Not targeted; 1 = Significant; and 2 = Principal.

² The CGIAR Gender Impact Platform has adapted the OECD gender marker, splitting the 1 score into 1A and 1B. For gender equality, scores are: 0 = Not targeted; 1A = Gender accommodative/aware; 1B = Gender responsive; and 2 = Principal.

These scores are derived from [Initiative proposals](#), and refer to the score given to the Initiative overall based on their proposal.

EXECUTIVE SUMMARY

The CGIAR Research Initiative on Fragility to Resilience in Central and West Asia and North Africa (F2R-CWANA) operated from 2022 to 2024 as a microcosm of the broader CGIAR system in the Central and West Asia and North Africa (CWANA) region. Led by ICARDA and IWMI and implemented in collaboration with the Alliance of Bioversity and CIAT, CIMMYT, CIP, IFPRI, and WorldFish, the Initiative strengthened integration across food, land, and water systems in the seven formally prioritized countries of Egypt, Jordan, Lebanon, Morocco, Sudan, Tunisia, and Uzbekistan.

There were five thematic Work Packages (WPs), each addressing key regional priorities: WP1 on enabling partnerships, platforms, and policies; WP2 on genetic innovations, seed systems, and the community management of indigenous agrobiodiversity; WP3 on developing bundles of agronomic innovations for farm-level solutions to sustainably bridge yield gaps; WP4 on landscape-level nexus governance of resources, especially water, and considerations of conditions of fragility and conflict; and WP5 on enabling innovation development and the scaling of digital innovations.

Between 2022 and 2024, F2R-CWANA reported a total of 478 results, including at the output level: 72 capacity development, 50 innovation development, 236 knowledge products, and 88 stakeholder engagement-related and “other” results. At the outcome level, the Initiative report 9 innovation use, 12 policy change, and 11 “other” results.

F2R-CWANA collaborated internally with Initiatives in each of the three Science Groups and externally with 533 partners, primarily from the National Agricultural Research and Innovation Systems, and other government ministries and agencies, universities, international nongovernmental organizations (NGOs), national and local NGOs, and private companies

Notable results included the gender-accommodative and-transformative approaches implemented with 25 women’s cooperatives in Morocco and Tunisia. The on-station and on-farm gender-sensitive participatory evaluations of more than 355 elite lines of eight regionally important crops—bread wheat, durum wheat, barley, chickpea, lentil, faba bean, potato, and sweet potato—resulted in 24 elite lines being selected for official registration and release across Egypt, Lebanon, and Morocco, with decisions from Sudan and Uzbekistan expected in 2025. Potato and sweetpotato

work in Uzbekistan was restarted after a more than 20-year-long hiatus. The Sustainable Rangeland Management Toolkit to support the large-scale restoration of agro-silvopastoral systems was integrated into the rangeland management policies of Tunisia and positively impacted more than 6,000 people across 180,000 hectares. The scaling of mechanized conservation agriculture by smallholder farmers and development of water-efficient management practices, crop diversification options, and bundled solutions supported the Moroccan government's ambition to have 1 million hectares of farmland under conservation agriculture by 2030, with 200,000 hectares already achieved, involving 17,000 farmers and 500 other actors. The Online Water Accounting Dashboard for the Souss Massa basin in Morocco, which visualizes past, current, and predicted future water availability, water balance, and long-term hydrological changes, was put into use and is being replicated in other water basins. The Lebanon Water Reuse standards to ensure the safe and sustainable use of wastewater for irrigation, protecting both human and environmental health, were in the process of being given legal obligation status by the Lebanese government. The process for developing wastewater treatment and reuse for agriculture in Morocco was also underway. Integrated Agriculture-Aquaculture (IAA) systems were adopted by 200 farmers in the Menia governorate and other regions of Egypt. In Egypt's Minya and Benisuef governorates, 2,400 smallholder farmers took part in digital literacy training on agricultural marketing and advisory services apps. The AgriFoodTech and ClimateTech innovation challenges held in Morocco, Uzbekistan, and Egypt accelerated early-stage, accessible, science-based technologies for sustainable agriculture, climate action, and job creation. Thirty-four teams participated in the full 12-week program, with several achieving notable successes.

Operating in the region during the 2022–2024 period presented several significant challenges, such as the soaring prices for essential agricultural products and commodities due to the escalation of the Russia-Ukraine war; the crisis in Sudan that erupted in April 2023, leaving 24.6 million people facing acute food insecurity and displacing 3.8 million people, including national agricultural research system (NARS) partners and CGIAR staff; and the sustained attacks on Palestine, Lebanon, and Syria that have had devastating humanitarian consequences and disrupted work in Lebanon. As the global average temperature reached 1.55 °C above the 1850–1900 preindustrial average, CWANA also experienced extreme, prolonged heat waves.

	2022 ▼	2023 ▼	2024 ▼
PROPOSAL BUDGET ▶	\$9.08M	\$10.04M	\$10.88M
APPROVED BUDGET ¹ ▶	\$4.06M	\$4.00M ²	\$4.11M ²

¹ The approved budget amounts correspond to the figures available for public access through the [Financing Plan dashboard](#).

² These amounts include carry-over and commitments.



A family in Giza, Greater Cairo, returning from work in their fields, irrigated by the Nile River, Egypt.

Credit: Senderistas/Shutterstock

Section 2: Progress towards End of Initiative outcomes

Initiative-level theory of change diagram

This is a simple, linear, and static representation of a complex, non-linear, and dynamic reality. Feedback loops and connections between this Initiative and other Initiatives' theories of change are excluded for clarity.

CHALLENGE STATEMENT

- The Central and West Asia and North Africa (CWANA) region covers a vast swath of land containing a great diversity of human cultures and agroecological systems. This area is unified by its relatively semi-arid and arid climate, which will only become more extreme with ongoing climate change. CWANA is expected to experience an increase in the severity and frequency of hot temperatures, ecological droughts, flash floods, and climate variability, with significant consequences for society and the environment.
- CWANA's agrifood systems provide one of the region's largest sources of employment, especially for women, despite the inherent lack of productive agricultural land and water resources. These predominantly rainfed systems also significantly contribute to national GDP and local food security in a region heavily dependent upon food imports. CWANA's regional agrifood systems are incredibly vulnerable to overuse of limited natural resources and interplay with societal pressures, such as gender inequalities; youth unemployment; demographic shifts; the predominance of small, non-specialized smallholdings; and institutional and economic pressures. The consequences of experiencing multiple compounding events in places that lack resilient coping systems can be devastating.
- Many of the countries in CWANA are considered fragile and conflict-affected, with Fragile States Index scores that fall into the "warning" and "alert" categories. There is a causal pathway from climate change impacts, environmental degradation, and water scarcity to fragility and conflict. Poor governance and an ineffective institutional environment create a situation whereby the root causes of fragility are not adequately addressed, leaving communities continually vulnerable to worsening threats and exacerbating social tensions.

RESEARCH QUESTIONS

- What are the main challenges to and opportunities for improving the effectiveness, inclusiveness, and resilience of national agrifood systems, including where they are fragile and/or conflict-affected?
- What gender-transformative and accommodative approaches can empower women and men in CWANA to address gender-specific bottlenecks, including limited access to technologies, information, and land rights?
- How can global genetic innovations most suitable for CWANA be developed and brought to demand partners?
- How can seed systems be made more efficient, inclusive, and resilient?
- How can the unique agrobiodiversity of the CWANA region be better sustained and conserved?
- What is the current state of the natural resource base that acts as a determinant of yield gaps?
- Which evidence-based agronomic management practices can be bundled into solutions to bridge yield gaps in diverse farming systems?
- What management-targeted varieties or genotypes are needed to support resilient and sustainable farming systems?
- What is the current and long-term potential of sustainable livelihoods at the landscape scale (basin and country) within the context of climate change?
- How can water-energy-food-ecosystem nexus governance be improved to strengthen resilience and productivity?
- How can water productivity be improved through water recycling and reuse?
- How can the productivity of marginal and saline landscapes be maintained and improved at watershed and country levels?
- What climate information data and services do food value chain actors need to manage climate risks in the CWANA region?
- How can agri- and market-advisory scaling-up strategies for climate-resilient food value chains be made socially inclusive, effective, and sustainable?
- How can the enabling environment be improved to accelerate efficient and inclusive adoption scaling of the best digital agri-climatic bundled services and solutions?

SPHERE OF CONTROL

WORK PACKAGES

WORK PACKAGE 1

Innovations in partnerships, policies and platforms for the efficient, inclusive and climate resilient transformation of agrifood systems.

WORK PACKAGE 2

Genetic innovations, seed systems, and agrobiodiversity conservation for climate resilient food and nutrition security.

WORK PACKAGE 3

Sustainable intensification of farming systems for climate resilient reduction of yield gaps.

WORK PACKAGE 4

Integrated food, land, water and energy systems for climate resilient landscapes.

WORK PACKAGE 5

Scaling innovation and digital tools for climate resilient food value chains.

SPHERE OF INFLUENCE

END-OF-INITIATIVE OUTCOMES

END-OF-INITIATIVE OUTCOME 1

- 1 ▶ Government, civil society organisations, private sector and INGOs jointly develop strategies and policies to create more effective, socially-inclusive and resilient national agrifood systems.

END-OF-INITIATIVE OUTCOME 2

- 2 ▶ Government, private sector, and civil society organisations support and facilitate the use of Best Bet Genetic Innovations developed for CWANA.

END-OF-INITIATIVE OUTCOME 3

- 2 ▶ Government, civil society organisations, and farmers support and facilitate the on-farm and ex-situ conservation of agrobiodiversity in CWANA.

END-OF-INITIATIVE OUTCOME 4

- 3 ▶ Government, private sector, civil society organisations and farmers scale up bundled solutions to decompose yield gaps.

END-OF-INITIATIVE OUTCOME 5

- 4 ▶ Government, civil society organisations, and private sector put into practice the integrated management of food, land, water and energy systems.

END-OF-INITIATIVE OUTCOME 6

- 5 ▶ Government, private sector, civil society organisations, and other food value chain (FVC) actors scale up innovations for FVC climate risk management.

ACTION AREA OUTCOMES

GENETIC INNOVATION

- 2 ▶ 1 • Seed system actors promote the adoption of quality seed of improved varieties by women and men farmers in selected countries, geographies, and market segments.
- 2 ▶ 2 • CGIAR-NARS-SME networks use market segments, target product profiles to orient variety development and deployment towards those that provide larger scale benefits across the 5 Impact Areas.

SYSTEMS TRANSFORMATION

- 1 ▶ 3 • National and local multi-stakeholder platforms are strengthened to become more effective and sustainable, addressing development trade-offs and generating strategies for effective food, land, and water systems transformation.
- 4 ▶ 4 • Implementation partners (e.g. NARES, NGOs, private companies) actively support dissemination, uptake, and implementation of CGIAR innovations.
- 6 ▶ 5 • CGIAR partners develop and scale innovations that contribute to the empowerment of women and other social groups in food, land, and water systems.

RESILIENT AGRIFOOD SYSTEMS

- 1 ▶ 6 • National and sub-national government agencies use CGIAR research results to design or implement strategies, policies and programs which have the potential to transform food, land and water systems contributing to livelihood, inclusion, nutrition, environmental and climate resilience objectives

SPHERE OF INTEREST

IMPACT AREAS

CLIMATE ADAPTATION & MITIGATION

- 1 ▶ • Turn agriculture and forest systems into a net sink for carbon by 2050, with emissions from agriculture decreasing by 1 Gt per year by 2030 and reaching a floor of 5 Gt per year by 2050.
- 2 ▶ • Implement all National adaptation Plans (NAP) and Nationally Determined Contributions (NDC) to the Paris Agreement.
- 3 ▶ • Equip 500 million small-scale producers to be more resilient to climate shocks, with climate adaptation solutions available through national innovation systems.

ENVIRONMENTAL HEALTH & BIODIVERSITY

- 1 ▶ • Stay within planetary and regional environmental boundaries: consumptive water use in food production of less than 2500 km³ per year (with a focus on the most stressed basins), zero net deforestation, nitrogen application of 90 Tg per year (with redistribution towards low-input farming systems) and increased use efficiency, and phosphorus application of 10 Tg per year.
- 2 ▶ • Maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed genebanks at the national, regional, and international levels.



Farmers in the highland region of Tashkent, Uzbekistan, transplant adapted in vitro potato plants of new varieties recently introduced by CIP directly into their field.
Credit: CIP

Summary of progress against the theory of change

F2R-CWANA operated from 2022 to 2024 as a microcosm of the broader CGIAR system in the CWANA region. Led by ICARDA and IWMI and implemented in collaboration with the Alliance of Bioversity and CIAT, CIMMYT, CIP, IFPRI, and WorldFish, the Initiative strengthened integration across food, land, and water systems and enabled flexible, priority-driven programming that responded to evolving national needs, either by complementing global CGIAR Initiatives or by addressing critical gaps not covered by the wider CGIAR portfolio.

The CWANA region encompasses a vast and diverse landscape of cultures and agroecological systems unified by dryland environments where the rate of evaporation far exceeds the amount of precipitation received. With climate change disproportionately affecting drylands, CWANA is projected to experience excessive warming that exposes communities and ecosystems to prolonged and extreme heatwaves, chronic and severe water shortages, reduced agricultural yields, and the loss of biodiversity and ecosystem services.

Land degradation in the form of soil erosion, salinization, and loss of organic carbon is a major concern in the drylands because the rate of soil formation is so slow, and it is largely driven by the conversion of woodlands and rangelands/grasslands into agricultural land, inappropriate irrigation, and overgrazing. The CWANA region is the center of origin and diversity for important crops such as wheat, barley, lentil, and chickpea, but biodiversity—including this agrobiodiversity—is under significant threat. Rural communities in the drylands, whose livelihoods depend primarily on agriculture, are heavily reliant on the existence of functional ecosystems and ecosystem services.

Many of the countries in CWANA are classified as fragile and/or conflict-affected, with Fragile States Index scores greater than 60, placing them in the “warning” or “alert” categories. The combined effects of climate change, environmental degradation, and water scarcity act as a multiplier, exacerbating risks and threats and limiting the ability of dryland communities to adapt, thus contributing to hunger, fragility, conflict, and forced migration. Poor governance and a weak institutional environment prevent the root causes of fragility

and conflict from being adequately addressed, leaving communities continually exposed and vulnerable to worsening threats.

Countries in the CWANA region are diverse, with public policy processes that are generally complex and not always responsive to emerging development challenges. In fragile contexts, public institutions frequently lack the capacity to meet needs on the ground, while even in more stable contexts, there is often a limited tradition of accountability for policy outcomes, though there is a growing interest in adopting evidence-based approaches to policymaking.

The West Asia and North Africa subregions of CWANA are the most gender-unequal in the world. In agriculture, women make up nearly half the workforce in some countries, yet they remain largely invisible in official labor statistics and policymaking. Severely restricted land ownership significantly undermines women’s access to credit, capital, training, and other agricultural inputs. In addition, women face greater barriers to organizing, mobilizing, and forming agricultural cooperatives.

Despite the inherent constraints to agriculture in the CWANA region, the predominantly rainfed agrifood systems are often the largest source of employment, especially for women, and make significant contributions to national GDP and local food security in a region that is heavily dependent on food imports. Within this regional context, F2R-CWANA formally prioritized working in seven countries, starting in 2022 with Egypt, Lebanon, Morocco, Sudan, and Uzbekistan, and expanding in 2024 to include Tunisia and Jordan. The Initiative was structured around five thematic WPs, each addressing key regional priorities.

WP1 focused on enabling partnerships, platforms, and policies to support the cocreation of research, innovation, capacity building, and policy developments—with the aim of contributing to the effective, socially inclusive, and climate-resilient transformation of national and regional agrifood systems (EOIO 1). Challenges related to a fragmented policy environment, barriers to adoption, and gender were addressed here. WP2 focused on genetic innovations, seed systems, and the community management of indigenous

agrobiodiversity—with the aim of governments and partners supporting and facilitating the use of “best-bet” genetic innovations developed for CWANA (EOIO 2) and the on-farm management and ex-situ conservation of agrobiodiversity (EOIO 3). Challenges related to adapting crop varieties in farmers’ fields to climate change and the loss of agrobiodiversity were addressed here. WP3 focused on developing bundles of agronomic innovations for farm-level solutions to sustainably bridge yield gaps—with the aim of government and partners scaling up the bundled solutions (EOIO 4). Challenges related to land degradation and food- and nutrition-security through better yields were addressed here. WP4 focused on landscape-level nexus governance of resources, especially water, and considerations of conditions of fragility and conflict—with the aim of government and partners putting into practice the integrated management of food, land, water, and energy systems (EOIO 5). Challenges related to water scarcity, climate change, and integrated governance were addressed here. WP5 focused on enabling innovation development and the scaling of digital innovations—with the aim of government and partners scaling up innovations that provide solutions to food, land, and water challenges (EOIO 6). The key achievements of the WPs are discussed in Section 3.

Operating in the region presented significant challenges to F2R-CWANA during the three-year period. North African countries, in particular, grappled with surges in wheat, fertilizer, and fuel prices caused by the escalation of the Russia-Ukraine war in February 2022, which disrupted the production and international trade of

these essential commodities. The crisis that erupted in Sudan in April 2023 has been described as the “largest and most devastating displacement, humanitarian and protection crisis in the world today,” leaving 24.6 million people facing acute food insecurity and displacing 3.8 million people, including NARS partners and CGIAR staff. On 7 October, 2023, the attack by Hamas on Israel, and Israel’s sustained response—including strikes on Lebanon and Syria—caused devastating humanitarian consequence in the region and disrupted work in Lebanon, where travel was suspended, and national agricultural research and extension system (NARES) staff were internally displaced. The International Court of Justice issued provisional measures to prevent acts of genocide in Palestine including ensuring access to adequate food and water - highlighting the urgency and complexity of supporting the region’s people and their food, land, and water systems.

Meanwhile, the World Meteorological Organization confirmed that 2024—and all previous 10 years—was the hottest on record, with global average temperature 1.55 °C above the 1850–1900 preindustrial average. The CWANA region experienced extreme and prolonged heat waves, especially in North Africa, where the temperature reached a record-breaking 50.4 °C in Agadir, part of the Souss-Massa basin in Morocco, where we worked to provide decision support tools for water governance.

Compounding challenges across the five Impact Areas are keenly felt in CWANA, making our efforts there more essential than ever.



*Irrigation of an alfalfa crop using fishpond water in Minya Governorate, Egypt.
Credit: Nada Habashi/WorldFish*

Progress against End of Initiative Outcomes

This infographic provides a concise summary of the Initiative's progress toward achieving its Theory of Change End-of-Initiative outcomes for the 2022-2024 period. By drawing on reported results, it offers a comprehensive synthesis of progress made against the established outcome targets, highlighting the Initiative's overall impact and key achievements at the conclusion of this three-year cycle.



EOIO 1

Government, civil society organizations, private sector, and international NGOs jointly develop strategies and policies to create more effective, socially inclusive, and resilient national agrifood systems.



EOIO 2

Government, private sector, and civil society organizations support and facilitate the use of best-bet genetic innovations developed for CWANA



EOIO 3

Government, civil society organizations, and farmers support and facilitate the on-farm and ex-situ conservation of agrobiodiversity in CWANA.



EOIO 4

Government, private sector, civil society organizations, and farmers scale up bundled solutions to decompose yield gaps



EOIO 5

Government, civil society organizations, and private sector put into practice the integrated management of food, land, water, and energy systems.



EOIO 6

Government, private sector, civil society organizations, and other food value chain actors scale up innovations for climate risk management across food value chains.

This EOIO was the goal for WP1, as well as the whole Initiative. F2R-CWANA contributed to the development of strategies and policies with many partners throughout the three-year period. Formal agreements of cooperation were made with ministries in Egypt, Lebanon, Kyrgyz Republic, Morocco, Sudan, Tajikistan, Uzbekistan, and League of Arab States, demonstrating the crucial role CGIAR plays as a trusted provider of research, technological innovation, capacity development, and policy development in food, land, and water systems. National Alliances of Stakeholders were formed around the cereal seed sector and for water reuse in Morocco to work together to overcome system bottlenecks. Gender-accommodative and-transformative approaches were implemented in Morocco with Oxfam and 25 women's cooperatives and in Tunisia. Policies and strategies were developed on the global drylands, and water reuse, gender, agriculture, and climate change.

F2R-CWANA worked closely with NARES in Egypt, Lebanon, Morocco, Sudan, and Uzbekistan to select target product profiles and conduct gender-sensitive on-station and on-farm evaluations of more than 355 elite lines of eight regionally important crops: bread wheat, durum wheat, barley, chickpea, lentil, faba bean, potato, and sweet potato. As a result, 24 elite lines were selected for official registration and release across Egypt, Lebanon, and Morocco, with decisions from Sudan and Uzbekistan expected in 2025. The work on genetic innovations in Lebanon will scale into Syria, where ICARDA was asked to advise on the reconstruction of the agricultural sector, including plant breeding and improved seeds. Ongoing demonstration of newly released varieties aims to inform farmers and generate demand for them. Importantly, potato and sweet potato research was reestablished in Uzbekistan after more than 20 years, with the importation of new CGIAR varieties and activities to build the capacity of NARES partners and farmers to handle the tuber crop from in vitro to field production. Analyses of local seed systems and regional seed trade under COMESA will help to inform seed scaling strategies.

Surveys of traditional farming systems and engagement with community members in Morocco and Uzbekistan will result in community management plans for indigenous agrobiodiversity in 2025. In 2024, F2R-CWANA expanded its work to include local communities in Tunisia dependent on agro-silvopastoral systems in collaboration with the CGIAR Research Initiative on Livestock and Climate, including innovations such as flexible livestock grazing, the use of indigenous plant species for restoration, and the Sustainable Rangeland Management toolkit. The toolkit was adopted by the Tunisian government, impacting 180,000 hectares and directly benefiting 6,212 individuals. Additionally, in 2024, the Initiative introduced the Farming with Alternative Pollinators innovation, which boosts insect biodiversity and led to higher fruit and seed yields, improved quality, and increased income for participating farmers, as compared to those using monocultural crop growing and field management practices.

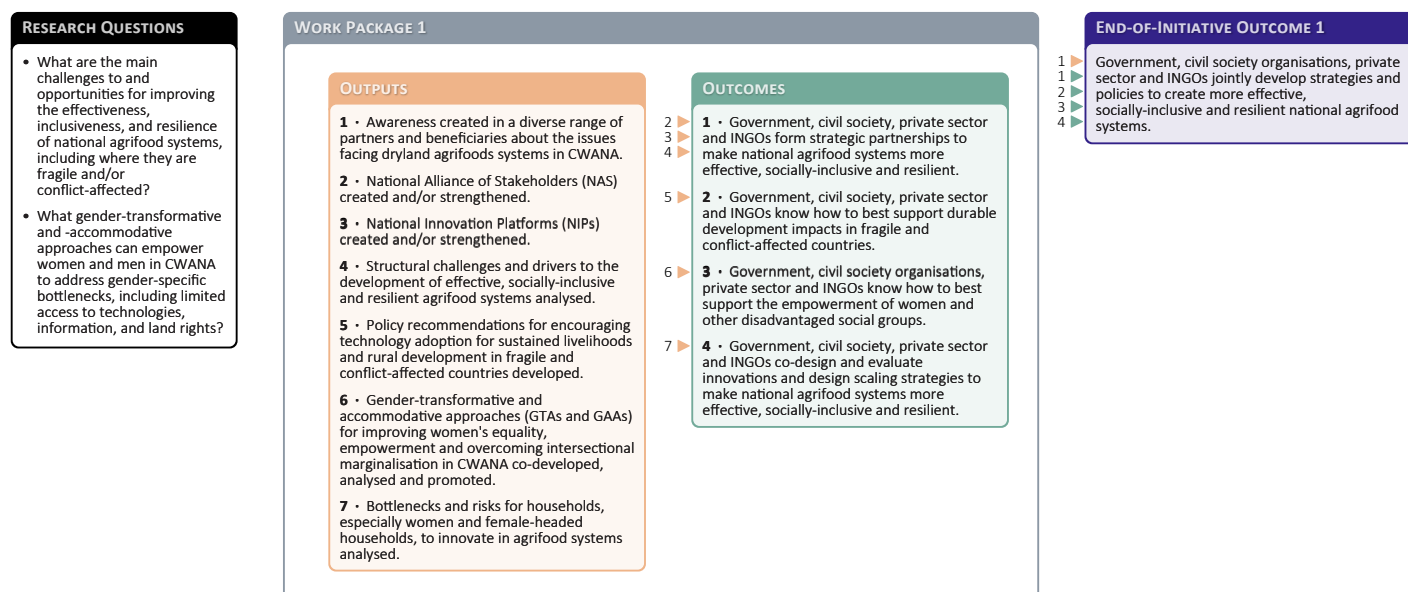
F2R-CWANA, in collaboration with the CGIAR Research Initiatives on Excellence in Agronomy and Climate Resilience, worked on bundled solutions to promote the scaling of mechanized conservation agriculture by smallholder farmers in Morocco, in support of the government's ambition to have 1 million hectares of farmland under conservation agriculture by 2030. By the end of 2024, this plan had already achieved coverage of 200,000 hectares involving 17,000 farmers and 500 other actors. The digital platform Zar3Direct was being developed to track the adoption of conservation agriculture practices by smallholder farmers and provide a comprehensive dashboard. Solutions for wheat-based cropping systems across the CWANA region remain the central focus, including soybean production in Egypt in support of the government's desire to increase its production, and potato in Uzbekistan, also in support of the government's stated desire to increase production.

The Online Water Accounting Dashboard for the Souss Massa basin in Morocco was made available for public use and will allow relevant agencies to make evidence-based decisions on multisectoral water use. The dashboard will be replicated in other basins across Africa. Numerous ministers and key organizations across CWANA were sensitized to the importance of the water-energy-food-environment (WEFE) nexus and its relationship to fragility and conflict. The Lebanese Council of Ministers approved a mandatory decree to legally adopt the Lebanon Water Reuse Standards. Work will begin with partners to develop Water Reuse Standards for Morocco. IWMI signed agreements to formally cooperate with the League of Arab States to improve regional water security and ICARDA signed with Egypt's Ministry of Water Resources and Irrigation to mitigate water scarcity. Numerous stakeholders were gathered to develop a soil and water salinity roadmap for Egypt. IAA systems were scaled in partnership with the Lake and Fish Resources Protection and Development Agency to reach 200 farmers to date.

F2R-CWANA worked with a wide range of partners across society to support innovators in bringing their agritech solutions to fruition by connecting them with key players in the innovation ecosystem. At the same time, it worked to understand and create solutions to remove barriers that prevent people—particularly women, youth, and underrepresented groups—from accessing and implementing these innovations. The Agritech Innovation Challenges in Morocco, Uzbekistan, and Egypt brought together a large and diverse network of traditional and nontraditional partners to accelerate early-stage, accessible, science-based technologies for sustainable agriculture, climate action, and job creation. A total of 67 teams participated in the bootcamp stage, with 35 progressing to the full acceleration program. Several teams went on to achieve significant success. In parallel with the challenges, comprehensive analyses of the innovation ecosystem, including the digital innovation ecosystem, were conducted and digital literacy training was provided to 2,400 smallholder farmers in Egypt. The IWMI-developed climate data extractor, developed to provide accessible climate information, was used with NARES and other partners.

Section 3: Work Package progress

WP1: Innovations in partnerships, policies, and platforms for the efficient, inclusive, and climate-resilient transformation of agrifood systems



Work Package 1 progress against the theory of change

Over the past three years, F2R-CWANA WP1 focused on addressing two key research questions: (1) What are the main challenges and opportunities to make national agrifood systems—including those in fragile and conflict-affected areas—more effective, inclusive, and resilient? (2) How can gender-transformative and -accommodative approaches empower women and men in CWANA to overcome gender-specific bottlenecks such as limited access to technologies, information, and land rights? The goal was to codevelop strategies and policies with governments, NGOs, civil societies, and the private sector to create more effective, socially inclusive, and resilient national agrifood systems (EOIO 1).

Significant progress was made, particularly in Central Asia, where IFPRI established formal agreements in [Uzbekistan](#) and [Tajikistan](#) to support agrifood development, and food and nutrition security issues, and in the [Kyrgyz Republic](#) to implement policies and programs to meet the Nationally Determined Commitments. In 2024, the President of Uzbekistan issued a [Presidential Decree](#) to strengthen climate-resilient agriculture with support from CIMMYT, CIP, ICARDA, and IRRI. Similar outcomes were reported in other countries under other WPs.

F2R-CWANA actively participated in high-profile national, regional, and international forums to raise awareness of dryland agrifood system challenges, including SIAM [2023](#) and [2024](#), Cairo Water Week [2023](#) and [2024](#), [UNFCCC COP28](#), and [UNCCD COP16](#), among others. F2R-CWANA scientists contributed significantly to the [CGIAR 2030 Global Strategy for Resilient Drylands](#), a whole of CGIAR Initiative with great relevance to the CWANA region.

National Alliances of Stakeholders were established for cereal seed sector actors in [Morocco](#), [Lebanon](#), and [Egypt](#), and for water reuse

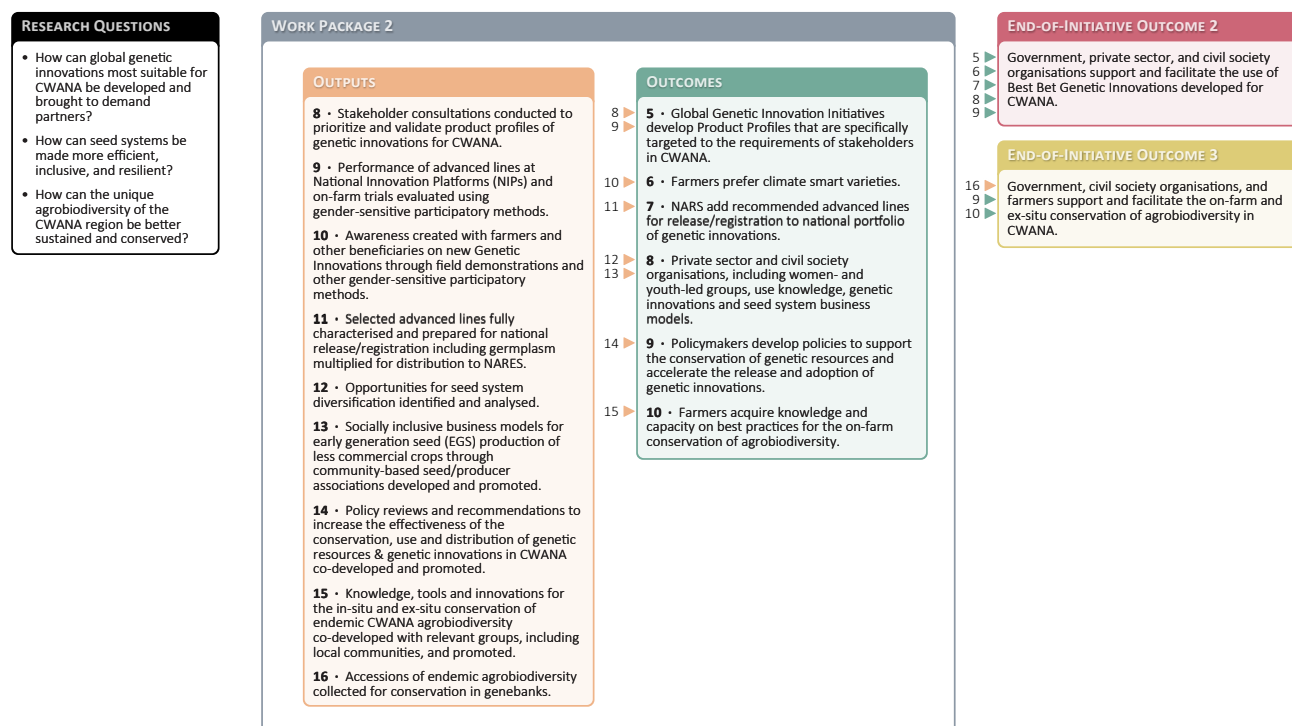
actors in [Morocco](#). National Research Stations in four countries were evaluated for their potential as Innovation Platforms to support agricultural innovation development and scaling.

Women's empowerment was a central focus. F2R-CWANA partnered with [Oxfam Intermon](#) (Spain) to implement gender-transformative and -accommodative approaches with 25 rural women's cooperatives. A notable innovation was the forum theatre play "[She inherits, She Sells](#)," using the Theatre of the Oppressed format, alongside leadership training. Further capacity-building support was provided to [women's cooperatives in Tunisia](#) through collaboration with the Livestock and Climate Initiative. Policy research outputs included a [strategic review](#) on women's resilience and participation in climate governance and a [policy brief](#) and associated [stakeholder engagements](#) on gender equality, climate change, and agriculture in the Middle East and North Africa region.

F2R-CWANA also addressed fragility and conflict, collaborating with the CGIAR Research Initiative on Fragility, Conflict, and Migration on the [Stability-and-Peace Accelerator](#) in Jordan and publishing research on the [adoption of climate-smart technologies and practices in fragile and conflict-affected settings](#).

The F2R-CWANA WP1 theory of change assumptions largely held true, demonstrating the importance of partnerships and multistakeholder collaboration for agrifood system resilience, gender equality, and social inclusiveness. F2R-CWANA made significant progress in addressing its research questions and engaging key stakeholders to advance toward the intended outcomes and impacts.

WP2: Genetic innovations, seed systems, and agrobiodiversity conservation for climate-resilient food and nutrition security



Work Package 2 progress against the theory of change

Over the past three years, F2R-CWANA WP2 focused on addressing three key research questions: (1) How can global genetic innovations most suitable for CWANA be developed and delivered to demand partners? (2) How can seed systems be made more efficient, inclusive, and resilient? (3) How can the region's unique agrobiodiversity be better sustained and conserved? The goal was to partner with governments, the private sector, civil society organizations, and farmers in CWANA to support and facilitate the use of best-bet genetic innovations (EOIO 2) and the on-farm and ex-situ conservation of agrobiodiversity (EOIO 3).

F2R-CWANA, in collaboration with the Genetic Innovation Initiatives, conducted a large program of multi-country, gender-sensitive, on-station, and on-farm participatory evaluations of 355 elite lines of six regionally important crop, and two regionally novel crops (potato and sweet potato) in the following countries: Egypt (barley, [bread wheat](#), [chickpea](#), and [faba bean](#)); Lebanon ([barley](#), [bread wheat](#), [durum wheat](#), [chickpea](#), [faba bean](#), and [lentil](#)); Morocco ([barley](#), [bread wheat](#), [durum wheat](#), [chickpea](#), [faba bean](#), and [lentil](#)); Sudan ([barley](#), [bread wheat](#), [chickpea](#), [faba bean](#), and [lentil](#)); and Uzbekistan ([barley](#), [bread winter wheat](#), [chickpea](#), [lentil](#), [potato](#), and [sweet potato](#)). As a result, NARES in [Egypt](#), [Lebanon](#), and [Morocco](#) will submit 24 elite lines for official variety registration and release, with Sudan and Uzbekistan following later in 2025.

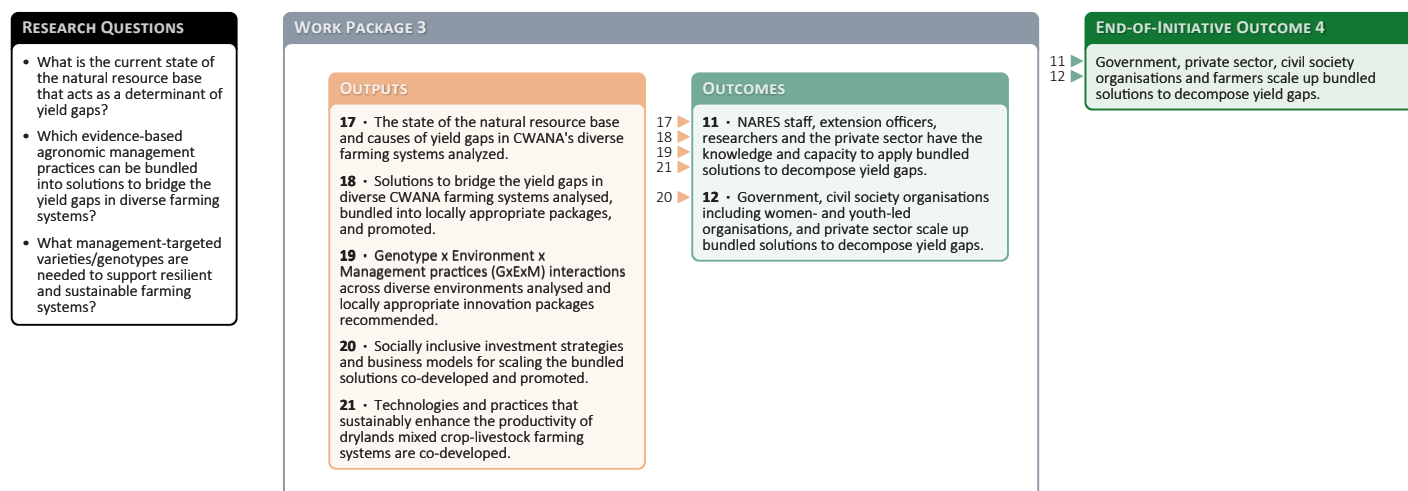
In 2022, a [Presidential Decree](#) from Uzbekistan reinitiated collaboration with CIP to improve potato production in the country, after a more than 20-year-long hiatus. The introduction of new materials and training for NARES and farmers on in vitro and field production was conducted alongside a [rapid seed system](#)

[assessment](#). To address the policy aspect of adopting new genetic innovations, case studies from Egypt and Sudan on the [harmonized seed trade regulations in COMESA](#) were published with the aim of improving regional seed systems.

Surveys conducted in Lebanon, [Morocco](#), and [Uzbekistan](#) identified areas for community-based management and conservation of locally significant agrobiodiversity, including cereal and legume landraces and crop wild relatives; fruit and nut trees such as almonds, apples, cherries, pears, pistachios, and walnuts; rangeland forages; and medicinal plants. [Workshops](#) and [trainings](#) (and [here](#)) facilitated the development of conservation management plans and community capacity to implement. In collaboration with the Livestock and Climate Initiative, innovations such as [flexible livestock grazing](#), using [indigenous species](#) and [organic growth additives](#), and the [Sustainable Rangeland Management Toolkit](#) supported the large-scale restoration of agro-silvopastoral systems in Tunisia, with the [support of the government](#), positively impacting 180,000 hectares and more than 6,000 people. The [Farming with Alternative Pollinators](#) approach, which is a proven ecological intensification approach that uses marketable habitat enhancement plants, was used by the Initiative for its ability to increase pollinators, crop yield, and quality in low- and middle-income countries.

WP2's focus on facilitating the use of genetic innovations for the CWANA region—ranging from crop varieties bred by CGIAR and national programs to indigenous agrobiodiversity in traditional farming systems—was actively supported by our partners, and the WP made significant progress toward achieving its goals.

WP3: Sustainable Intensification of farming systems for climate-resilient reduction of yield gaps



Work Package 3 progress against the theory of change

Over the past three years, WP3 focused on addressing three key research questions: (1) What is the current state of the natural resource base that determines yield gaps? (2) What evidence-based agronomic practices, inclusively adapted to diverse user groups, are needed? (3) How can management-targeted varieties/genotypes help bridge these gaps and support resilient, sustainable farming systems? The goal was to partner with governments, private sector, civil society organizations, and farmers to scale bundled solutions that can bridge yield gaps (EOIO 4).

Natural resources in [Egypt](#), [Morocco](#), and [Uzbekistan](#) were mapped to identify hotspots, and this information was used in all subsequent localized management advice. F2R-CWANA, in collaboration with the Excellence in Agronomy and Climate Resilience Initiatives, worked on various “bundled solutions” to promote the [scaling of mechanized conservation agriculture](#) by smallholder farmers, efficient water management practices, and crop diversification options. This work in Morocco supported the government’s ambition to have 1 million hectares of farmland under conservation agriculture by 2030, with [200,000 hectares already achieved by the end of 2024](#), involving 17,000 farmers and 500 other actors. The digital platform [Zar3Direct](#) was being developed to track the adoption of conservation agriculture practices by smallholder farmers and provide a comprehensive dashboard.

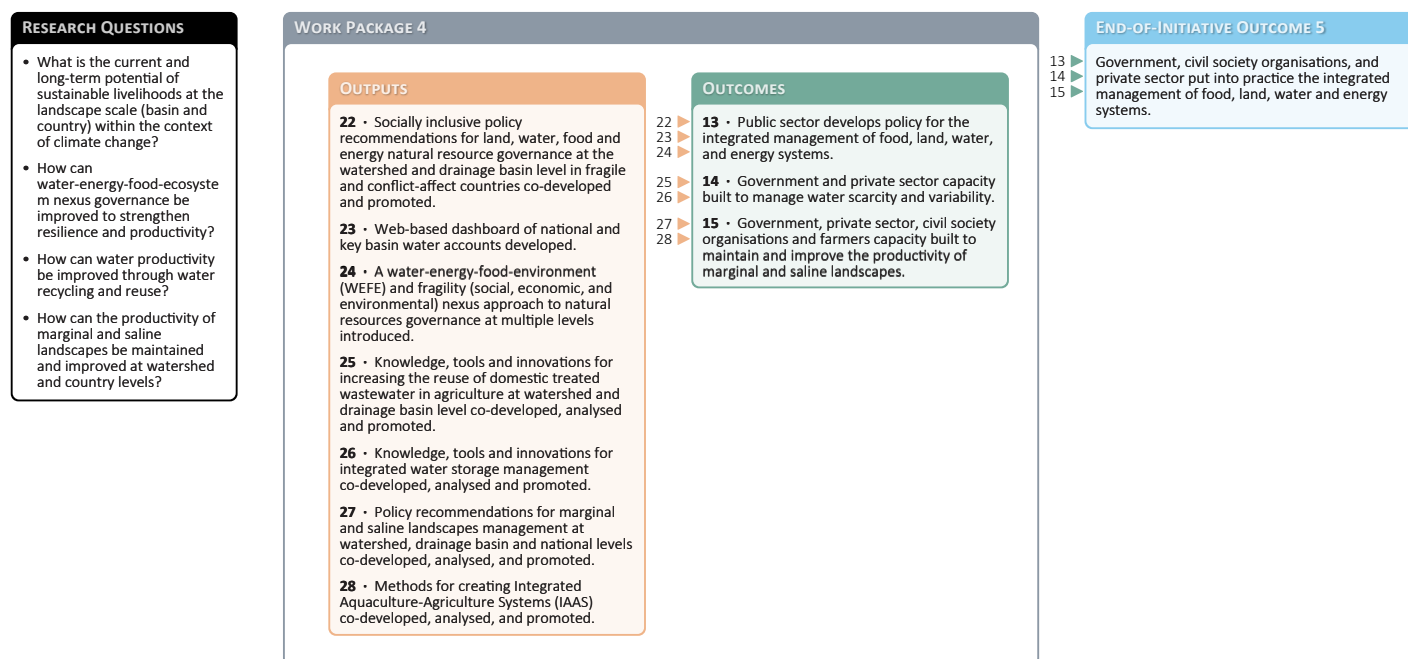
F2R-CWANA worked on the development of [Genotype x Environment x Management Innovation Packages](#) to sustainably bridge wheat-based yield gaps at research stations of Egypt, Lebanon, Morocco, Sudan, and Uzbekistan. One of the developed innovations was the

[supplemental irrigation of wheat](#) to mitigate productivity loss by 2 to 3 tonnes per hectare during periods of drought in rainfed cropping systems. Experimental field trials in Morocco and Egypt explored optimizing nitrogen fertilization, diversifying wheat-based systems through crop rotations (sorghum, soyabean), and intercropping (citrus, maize, soyabean), estimating irrigation requirements and employing minimum tillage and raised-bed planting techniques. Guidelines for the sustainable intensification of wheat in [Egypt](#), [Sudan](#), and [Uzbekistan](#) and on [soybean production](#) in Egypt were published, along with many related analyses. These guidelines and bundles of solutions to bridge yield gaps were used as discussion and training materials with members of the [Agronomy Community of Practices](#).

Numerous capacity development events were conducted with NARES and research partners, including [online geoinformatics training](#) and workshops on [conservation agriculture](#). Service providers received [advanced training on conservation agriculture](#), and farmers were sensitized to the national [no-till program](#) and educated on [responsible pesticide use](#).

The WP theory of change assumptions largely held true, emphasizing the importance of multistakeholder collaboration and evidence-based innovation for resilient, sustainable farming systems. By actively engaging governments, research institutions, the private sector, and farmers, F2R-CWANA, alongside other entities in the CGIAR portfolio, made significant progress toward its outcomes, particularly in improving productivity and fostering sustainable agricultural practices in support of government ambitions.

WP4: Integrated food, land, water, and energy systems for climate-resilient landscapes



Work Package 4 progress against the theory of change

Over the past three years, WP4 addressed four key research questions: (1) What is the potential for sustainable livelihoods in a climate change context? (2) How can WEF(E)-nexus governance be improved to strengthen resilience and productivity in food, land, and water systems? (3) How can water productivity be improved through water recycling and reuse? (4) How can productivity in marginal and saline landscapes be maintained or improved? The goal was to partner with governments, civil society organizations, and the private sector to implement integrated management of food, land, water, and energy systems (EOIO 5).

A key achievement was the development of the [Online Water Accounting Dashboard for the Souss Massa basin](#) in Morocco, which visualizes past, current, and predicted future water availability, water balance, and long-term hydrological changes. After several training courses, the dashboard was made publicly available, [receiving 3,000+ views](#), and was being [replicated in other water basins](#). IWMI also developed a [Fragility Analysis Framework](#) to assess drought, erosion, and flood risks in Morocco's Bouregreg region.

IWMI held WEF/WEFE nexus events at [Arab Water Week](#), [World Water Week](#), and a [regional dialogue](#). These discussions produced a roadmap for [building resilience in fragile and conflict affected agrifood systems through a WEF-Nexus approach](#), as well as a brief on [conceptualizing the intersection of the WEFE nexus, human security, and inclusive society](#). In collaboration with the CGIAR Research Initiative on NEXUS Gains, the [second international summer school](#) was held in Uzbekistan in 2024 to build professional capacity to adopt a WEFE-nexus approach.

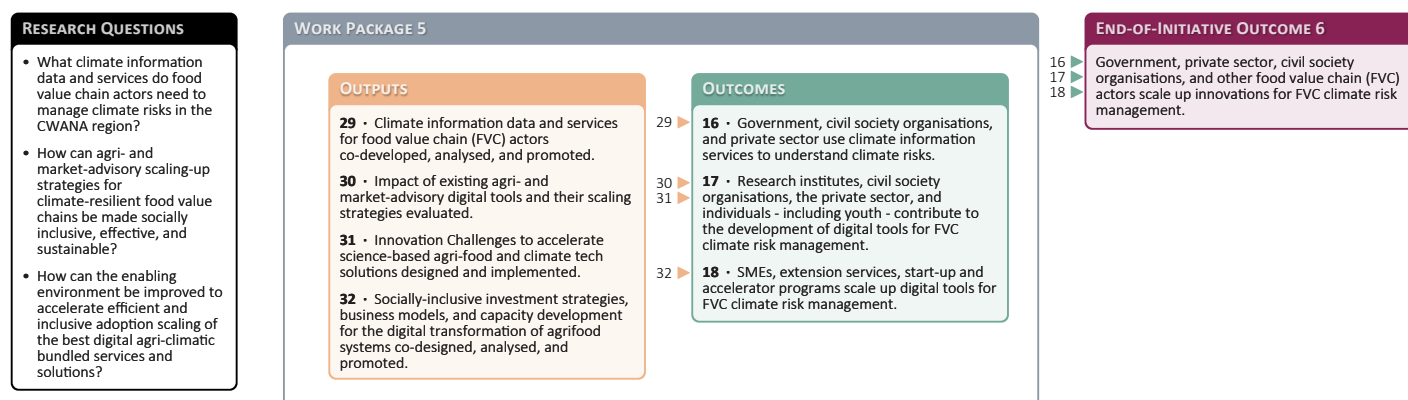
In Lebanon, the Council of Ministers approved a [Mandatory Decree to give legal obligation status to the Lebanon Water Reuse Standards](#), codveloped by IWMI, which ensure the safe and sustainable use of wastewater for irrigation, protecting both human and environmental health. IWMI established agreements with the Moroccan Ministry of Agriculture [to boost wastewater reuse in agriculture](#) and with Morocco's National Association of Land Improvements, Irrigation, Drainage, and Environment to [promote science-policy dialogue and capacity building](#) for wastewater treatment and reuse.

In Egypt, a [new soil leaching technique](#) reduced soil salinity by 84 percent and internal drain water salinity by 96 percent. Stakeholder engagement events, including a [science-policy dialogue](#), a soil salinity [monitoring and mapping workshop](#), a [policy roundtable](#) on the gender-WEFE nexus, and a [consultation workshop](#), will culminate in a soil and water salinity roadmap and policy brief to be published in 2025.

[IAA systems](#) were [scaled in partnership with the Lake and Fish Resources Protection and Development Agency](#) for economic development. To date, [200 farmers](#) in the Menia governorate of Egypt and other regions have adopted IAA systems.

These achievements demonstrate that addressing complex challenges in fragile and conflict-affected dryland agrifood systems requires multipartner, cross-sector approaches that enable an objective analysis of trade-offs and impacts, leading to the integrated management of food, land, and water resources.

WP5: Scaling innovation and digital tools for climate-resilient food value chains



Work Package 5 progress against the theory of change

Over the past three years, WP5 focused on addressing three key research questions: (1) How can climate information data and services be tailored to support agricultural food value chain actors in managing climate risks in the CWANA region? (2) How can scaling strategies for agri- and market-advisories for climate-resilient food value chains be socially inclusive, effective, and sustainable? (3) How can the enabling environment for the adoption of the best digital agroclimatic services be improved to accelerate scaling? The goal was to partner with government, private sector, civil society organizations, and other food value chain actors to scale up innovations for climate risk management (EOIO 6).

To support better access to climate information data, IWMI developed the [satellite-based regional-scale climate data extractor](#) for CWANA. The web-based tool simplifies the process of accessing weather data for NARES, scientists, and policymakers and was [being used by](#) Uzbekistan’s Ministry of Agriculture, the Ecological Movement of Uzbekistan, National Academy of Sciences of the Republic of Tajikistan, and other stakeholders.

In Egypt, in-depth analyses explored the [current state of digital agriculture](#), [e-extension and digital augmentation](#) of the agricultural sector, [social equity](#) considerations, [institutional and policy constraints](#), and the [investment and policy frameworks](#) needed to scale digital transformation. Key stakeholders needed for this transformation process were brought together in a [national workshop](#) and later in a [deep-dive into the innovation ecosystem](#). In Uzbekistan, analyses focused on the [business models of agritechs in Uzbekistan](#) and the impact of [farmers’ participation in messenger-based social groups on performance](#) in irrigated areas of

Kazakhstan and Uzbekistan. A comprehensive review examined the transformative potential of [digital innovations for African agricultural markets](#), identifying barriers and solutions to scaling, while a related paper explored the [opportunities and constraints of digital innovations in the CWANA region](#). In Egypt’s Minya and Benisuef governorates, 2,400 smallholder farmers took part in [digital literacy training](#) on agricultural marketing and advisory services apps.

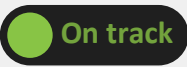
The [AgriFoodTech and ClimateTech innovation challenges](#)—held in Morocco (2022), Uzbekistan (2023), and Egypt (2024)—were a cornerstone of WP5. These challenges accelerated early-stage, accessible, science-based technologies for sustainable agriculture, climate action, and job creation. Over the three years in three countries, [34 innovation teams participated in the full 12-week program](#), refining their products, business plans, and messaging to drive their network development, growth, and impact. Several teams achieved notable successes after participating in a challenge, including Sand to Green, which [raised \\$US1 million](#), [planted 292 trees and 7,000 intercropping plants](#) in Morocco, and [signed an agreement with UNCCD COP15 President](#). Manhat was [selected to participate in other incubator and accelerator programs](#) and was recognized on the [UAE’s “Future 100” list](#) for 2023.

The achievements of WP5 demonstrate that addressing food, land, and water challenges through innovative solutions requires a whole-of-society approach that enables innovators with brilliant ideas to bring these to fruition through connecting with key players in the innovation ecosystem, and enables members across society—especially women, youth, and underrepresented groups—to access and implement them.

Work Package progress rating summary

WORK PACKAGE	PROGRESS RATING & RATIONALE
1	<div><div>On track</div><p>The progress of WP1 throughout 2022–2024 was largely in line with the Plan of Results and Budgets (PORB) and TOC, except for outputs planned in Sudan that were delayed or cancelled because of the war. In Sudan, the affected areas of work were the characterizations of the National Innovation Platform and work involving National Alliances of Stakeholders. Resources were allocated elsewhere to account for this and progress continued.</p></div>
2	<div><div>Delayed</div><p>The progress of WP2 throughout 2022–2024 was largely in line with the PORB and TOC, except for outputs planned in Sudan and Lebanon that were delayed or cancelled because of the war. In Sudan, the affected areas of work were the on-station field trials of elite lines and newly released varieties of barley, bread wheat, faba bean, chickpea, and lentil, and the stakeholder consultations related to the regional seed trade policy. In Lebanon, the final stakeholder consultation was affected.</p></div>
3	<div><div>Delayed</div><p>The progress of WP3 throughout 2022–2024 was largely in line with the PORB and TOC, except for outputs planned in Sudan that were delayed or cancelled because of the war. In Sudan, the affected areas of work were the genotype by environment by management trials and the Sudanese Agronomy Community of Practice. Many of the planned contributions from one of the Centers did not materialize due to administrative issues related to staff hiring and hosting agreements.</p></div>
4	<div><div>On track</div><p>The progress of WP4 in 2024 was in line with the PORB and TOC</p></div>
5	<div><div>On track</div><p>The progress of WP5 in 2024 was in line with the PORB and TOC</p></div>

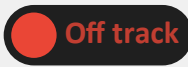
Definitions



On track



Delayed



Off track

- Progress largely aligns with Plan of Results and Budget and Work Package theory of change.
- Can include small deviations/issues/delays/risks that do not jeopardize success of Work Package.

- Progress slightly falls behind Plan of Results and Budget and Work Package theory of change in key areas.
- Deviations/issues/delays/risks could jeopardize success of Work Package if not managed appropriately.

- Progress clearly falls behind Plan of Results and Budget and Work Package theory of change in most/all areas.
- Deviations/issues/delays/risks do jeopardize success of Work Package.

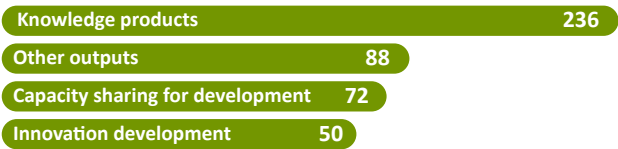
Section 4: Quantitative overview of key results

This section provides an overview of results reported and contributed to, by the CGIAR Initiative on Fragility to Resilience in Central and West Asia and North Africa from 2022 to 2024. These results align with the [CGIAR Results Framework](#) and Fragility to Resilience in Central and West Asia and North Africa’s theory of change. Further information on these results is available through the [CGIAR Results Dashboard](#).

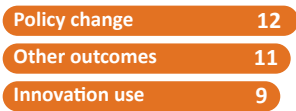
The data used to create the graphics in this section were sourced from the CGIAR Results Dashboard on 04 April 2025. These results are accurate as of this date and may differ from information in previous Technical Reports. Such differences may be due to data updates throughout the reporting year, revisions to previously reported results, or updates to the theory of change.

CUMULATIVE OVERVIEW OF RESULTS BY CATEGORY

Outputs

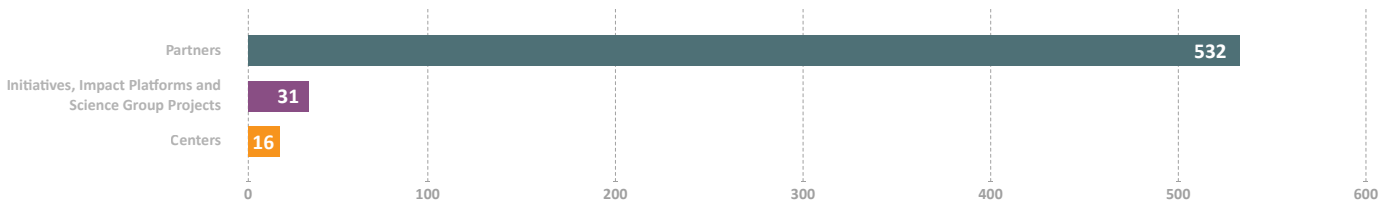


Outcomes



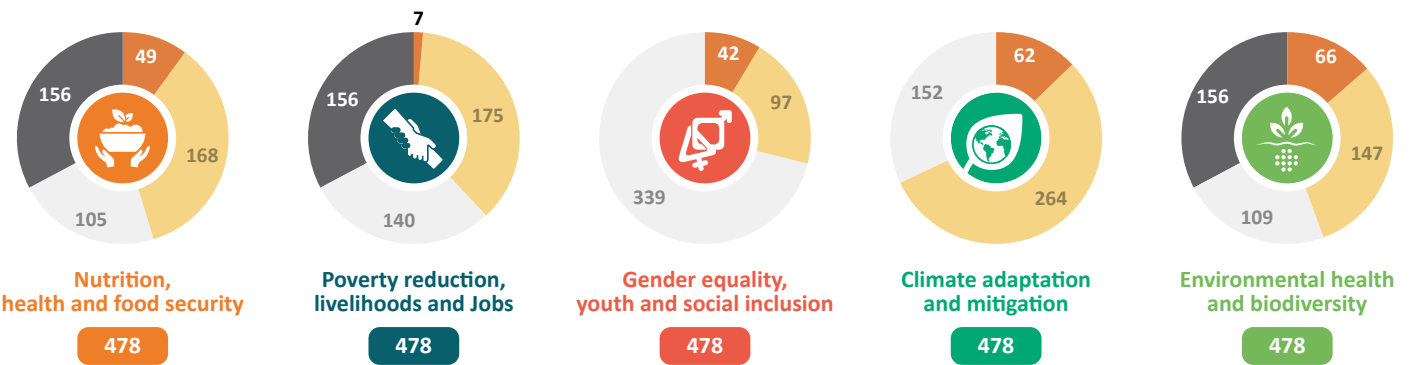
Between 2022 and 2024, F2R-CWANA reported a total of 478 results. This includes 72 capacity development outputs, 50 innovation development outputs, 236 knowledge products, and 88 stakeholder engagement related and “other” outputs. At the outcome level, F2R- CWANA reported 9 innovation use outcomes, 12 policy change outcomes, and 11 “other” outcomes.

MAIN CONTRIBUTORS TO ACHIEVEMENTS



The 478 results reported by F2R-CWANA between 2022 and 2024 were achieved in collaboration with 532 partners, 31 CGIAR Initiatives, Platforms, and Science Group Projects, and 16 Centers.

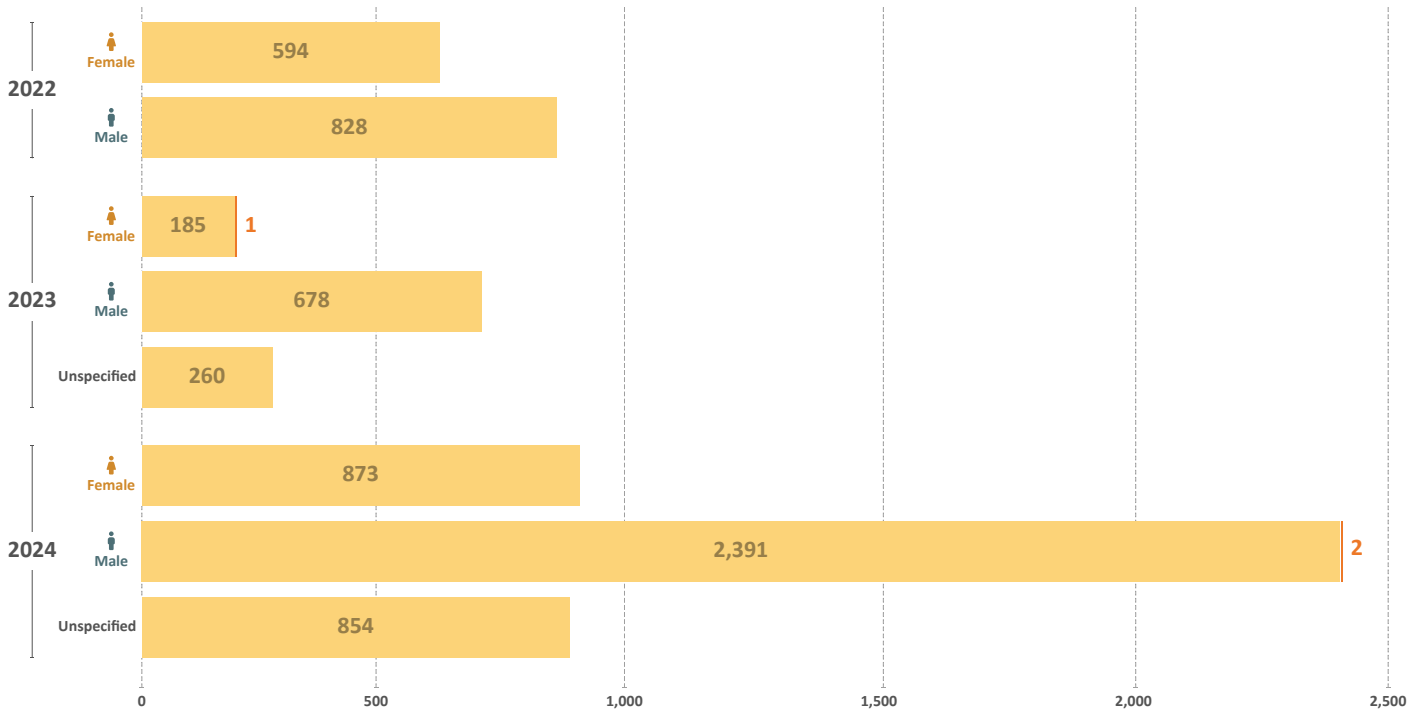
CONTRIBUTIONS TO THE CGIAR IMPACT AREAS



- **2 = Principal:** Contributing to one or more aspects of the Impact Area is the principal objective of the result. The Impact Area is fundamental to the design of the activity leading to the result; the activity would not have been undertaken without this objective.
- **1 = Significant:** The result directly contributes to one or more aspects of the Impact Area. However, contributing to the Impact Area is not the principal objective of the result.
- **0 = Not targeted:** The result has been screened against the Impact Area, but it has not been found to directly contribute to any aspect of the Impact Area as it is outlined in the [CGIAR 2030 Research and Innovation](#) strategy.
- **Not applicable:** Pertains to 2022 reported results when only information on Gender and Climate impact area tagging was available.

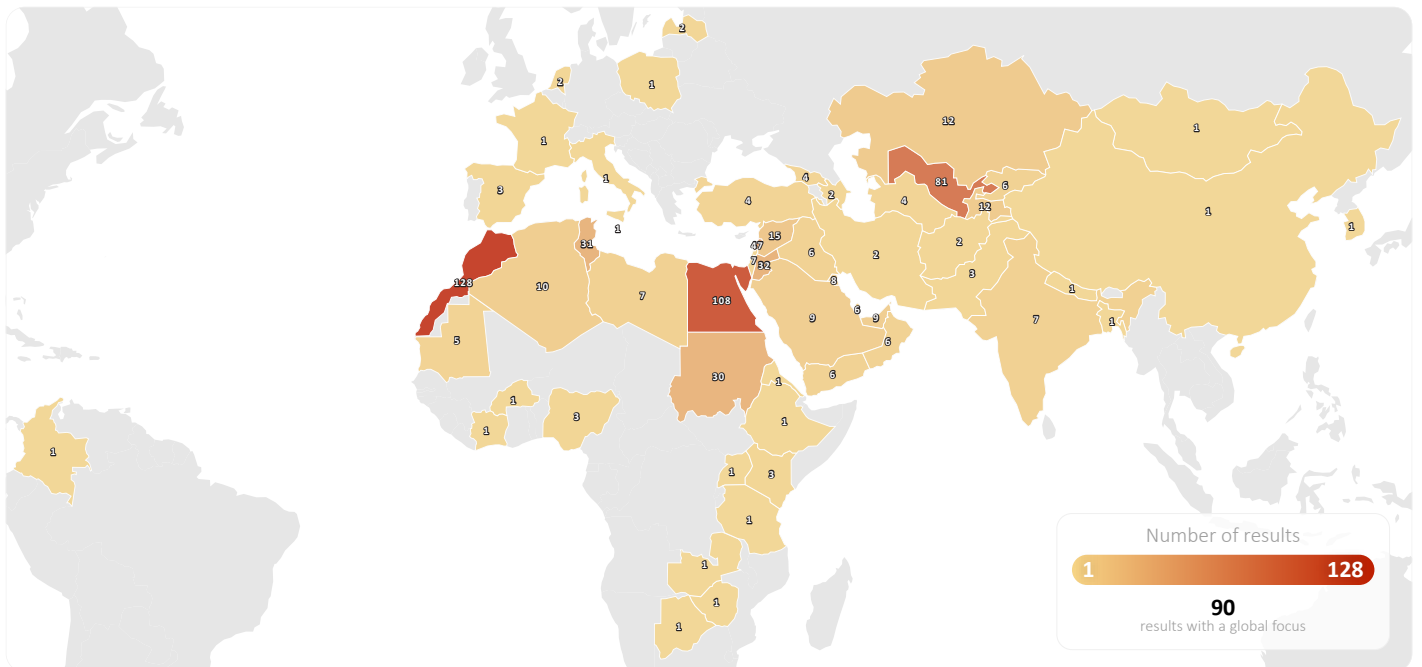
As a CGIAR Regional Integrated Initiative, F2R-CWANA aimed to achieve impact across all five CGIAR Impact Areas. Results were most often “Principally (2)” tagged to the Environmental Health and Biodiversity Impact Area (14 percent) and the Climate Adaptation and Mitigation Impact Area (13 percent). Considering “Principally (2)” and “Significantly (1)” tagged results together, the Impact Areas with the most results mapped to them were Climate Adaptation and Mitigation (68 percent), Environmental Health and Biodiversity and Nutrition, Health, and Food Security (45 percent), Poverty Reduction, Livelihoods, and Jobs (38 percent), and Gender, Equality, Youth, and Social Inclusion (29 percent).

NUMBER OF INDIVIDUALS TRAINED BY THE INITIATIVE



Between 2022 and 2024, F2R-CWANA provided short-term training to 6,663 people (1,652 women, 3,897 men, and 1,114 unspecified), and long-term training to three MSc and PhD students (one woman, two men).

GEOGRAPHIC FOCUS OF RESULTS (2022-2024)



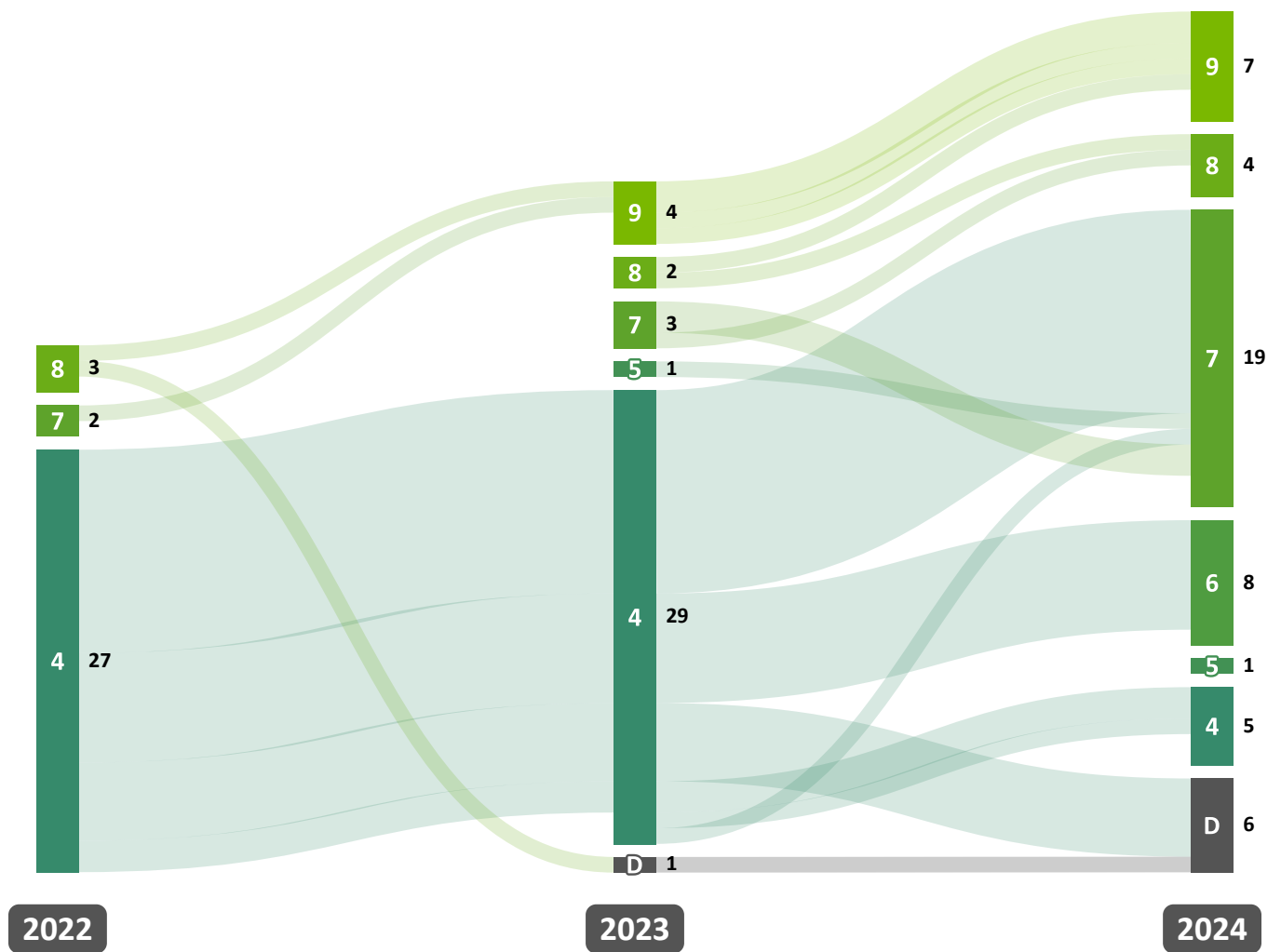
The map illustrates the number of results reported by F2R-CWANA, by geographic location, between 2022 and 2024. The seven prioritized countries reported the following number of results: Morocco (128), Egypt (108), Uzbekistan (81), Lebanon (47), Jordan (32), Tunisia (31), and Sudan (30).

NUMBER OF INNOVATIONS AND THEIR READINESS LEVELS



The Bouregreg watershed in Morocco, where IWMI and the Watershed Agency of Bouregreg and Chaouia co-developed the multi-dimensional Fragility Analysis Framework to assess the severity of droughts, erosion and floods under current and projected climate change scenarios.
Credit: Louise Sarant, IWMI

INNOVATIONS READINESS LEVEL PROGRESS OVER THREE YEARS (2022-2024)

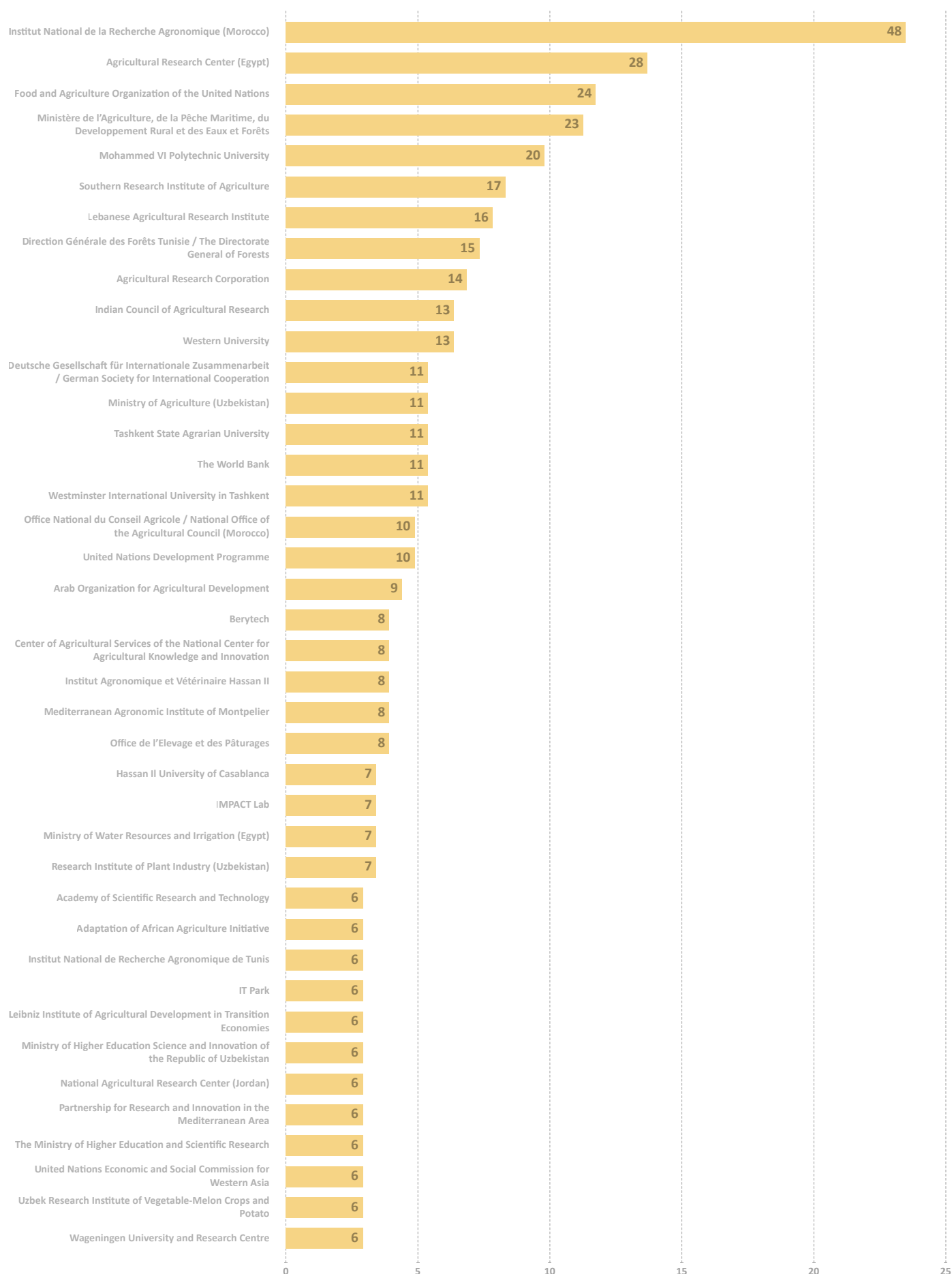


9 Proven Innovation • 8 Uncontrolled Testing • 7 Prototype • 6 Semi-Controlled Testing • 5 Model/Early Prototype • 4 Controlled Testing • 3 Proof of Concept • 2 Formulation • 1 Basic Research • 0 Idea • D Discontinued

Between 2022 and 2024, F2R-CWANA profiled a diverse set of 50 innovations across a range of Innovation Readiness Levels (IRL), from IRL 9 Proven Innovation to IRL 4 Controlled Testing. Illustrative examples of this diversity include Integrated Agriculture-Aquaculture systems (IRL 9); an Online Water Accounting Dashboard to capture water-status parameters over time (IRL 9); AgriFoodTech and ClimateTech Innovation Challenges (IRL 9); Farming with Alternative Pollinators: Boosting Yields, Biodiversity, and Farmer Income (IRL 9); Theatre of the Oppressed to transform harmful gender norms (IRL 9); scaling conservation agriculture through mechanization in Morocco (IRL 8); supplemental irrigation of wheat to mitigate productivity loss during drought (IRL 7); the majority of the elite lines and new varieties of cereals and pulses (IRL 7); and Unlocking Indigenous Plants for Restoring Degraded Silvopastoral Systems (IRL 4).



TOP 30 PARTNERS COLLABORATING TO RESULTS OVER THE THREE YEARS



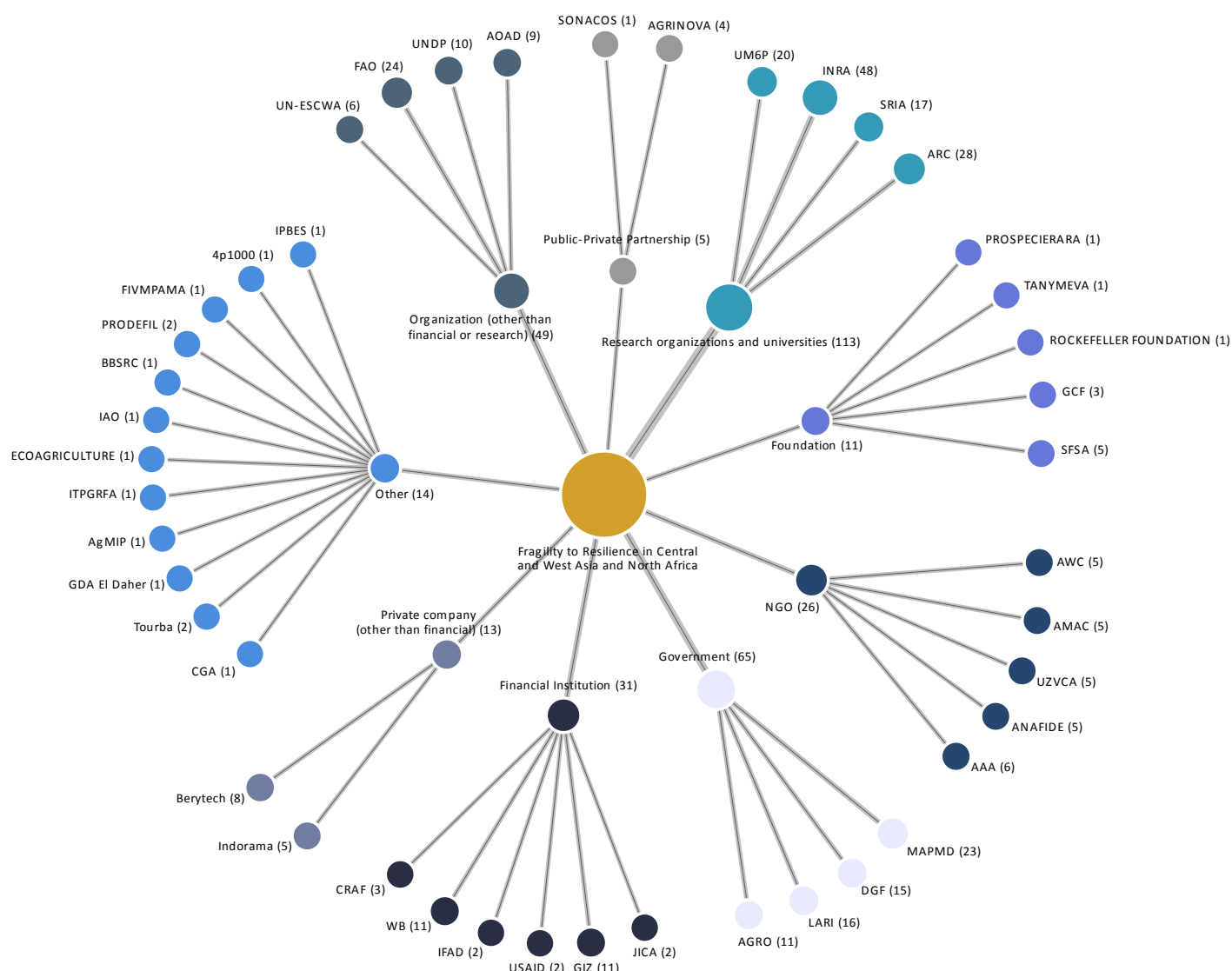
Between 2022 and 2024, F2R-CWANA collaborated with 532 partners, primarily from national agricultural research and innovation systems, and other government ministries and agencies, universities, international NGOs, national and local NGOs, and private companies. This chart displays collaborations with partners on six or more results.



A shepherd herding a flock of small ruminants that are grazing on an improved silvopastoral site in semiarid Tunisia.
Credit: Mounir Louhaichi/ICARDA

Section 5: Partnerships

FRAGILITY TO RESILIENCE IN CENTRAL AND WEST ASIA AND NORTH AFRICA'S EXTERNAL PARTNERS



Network of partners by partner type involved in F2R-CWANA results between 2022 and 2024. The numbers in brackets represent the number of results each partner has contributed to, reflecting the scale and diversity of collaborations. To allow for a clearer view, a maximum threshold of four partners was applied for each typology. The list of partner acronyms is [available here](#).

Partnerships and Fragility to Resilience in Central and West Asia and North Africa's impact pathways

F2R-CWANA collaborated with 533 partners to deliver its outputs and drive progress toward the EOIOs. Our core partnership model was built around in-country networks of NARES and national agricultural research and innovation systems (NARIS), government ministries and agencies, national universities, and research organizations. These partners were selected based on their ability to find solutions to the challenges faced by the countries in their food, land, and water systems, and their ability to create long-term sustainable systemic change, whether through their research expertise, policy influence, or mandate and capacity to scale innovations within national systems.

Partnerships with **NARES/NARIS and government partners** were essential since they are frequently CGIAR's primary next users with the responsibility and mandate to embed the research outputs and innovations into national systems and scaling pathways to reach

the ultimate beneficiaries. These partners typically play all three of the defined partnership roles: (1) demand—identifying national agrifood system priorities and signaling interest in working with CGIAR to address these; (2) innovation—coinvesting, codesigning, and codeveloping with CGIAR research and innovations to provide solutions for national agrifood system challenges; and (3) scaling—using their mandates to create or adapt strategies, policies, budgets, and programs and their access to national systems to advance the uptake and use of innovations at scale to achieve impact.

National universities and research organizations primarily contributed as innovation partners, bringing in highly skilled researchers with technical expertise, contextual knowledge, and research capacity to help codevelop solutions that can work in the local environment.

This partnership approach was foundational to all F2R-CWANA's Work Packages and EOIOs, organized around the thematic areas of national networks of stakeholders and innovation platforms (WP1, EOIO 1), genetic innovations (WP2, EOIO 2 and EOIO 3), agronomy (WP3, EOIO 4), water and WEFE-nexus issues (WP4, EOIO 5), and innovation development and scaling (WP5, EOIO 6). A selection of core NARES, government, university, and research organization partners in the countries included:

- **Egypt:** Agricultural Research Center; Ministry of Water Resources and Irrigation; Academy of Scientific Research and Technology; Agricultural Economics Research Institute; Soil, Water, and Environment Research Institute, and Ministry of Higher Education and Scientific Research.
- **Jordan:** Ministry of Agriculture, Ministry of Water and Irrigation, National Agricultural Research Center, and Royal Scientific Society.
- **Lebanon:** Lebanese Agricultural Research Institute, Lebanese University, American University of Beirut, and Lebanese Standards Institution.
- **Morocco:** Institut National de la Recherche Agronomique; the Ministry of Agriculture, Fisheries, Rural Development, Water and Forests; Mohammed VI Polytechnic University; Office National du Conseil Agricole; Hassan II Institute of Agronomy and Veterinary.
- **Sudan:** Agricultural Research Corporation; Ministry of Irrigation and Water Resources.
- **Tunisia:** Institut National de la Recherche Agronomique de Tunis; and Directorate General of Forests, Office de l'Elevage et des Pâturages.
- **Uzbekistan:** Southern Research Institute of Agriculture; Ministry of Agriculture, Tashkent State Agrarian University; Westminster International University in Tashkent; and Research Institute of Plant Industry, Ministry of Higher Education, Science and Innovation.

Beyond this core partnership approach, F2R-CWANA further engaged with a diverse range of partners to achieve key strategic objectives where needed. **Intergovernmental organizations, international organizations, and donors** with a shared interest in achieving shared national and regional objectives, including FAO, GIZ, the World Bank, United Nations Development Program, Arab Organization for Agricultural Development, United Nations Economic and Social Commission for West Asia, Arab Water Council, and World Food Programme, among others, were involved across the entire program.

Nontraditional partnerships with **start-ups, private companies, agribusinesses, and financial institutions** were brought into CGIAR networks through the AgriTech Innovation Challenges (WP5, EOIO 6) conducted in Morocco (2022), Uzbekistan (2023), and Egypt (2024). These include Manhat, Sand to Green, Agrinova, IMPACT Lab, Hackconnect, FE Indorama Agro LLC, Uzbekistan Venture Capital Association, Chemonics Consultants, Berytech, Climate Resilient Africa Fund, ALEXBANK, and SEKEM, among many others, as the partners responsible for the creation and scaling of agritech and climate-tech innovations.

Civil society organizations such as farmers' groups, women's cooperatives, and cereal processor groups, among others, were engaged in gender-transformative actions such as Forum Theatre, governance and leadership training, and cereal seed sector stakeholder workshops (WP1, EOIO 1); gender-sensitive participatory evaluations of genetic innovations and the development of conservation management plans for indigenous agrobiodiversity (WP2, EOIO 2 and EOIO 3) and farmers' field days for agronomy innovations (WP3, EOIO 4); IAA workshops, WEFE and fragility nexus workshops; and the testing of new innovations (WP5, EOIO 6).

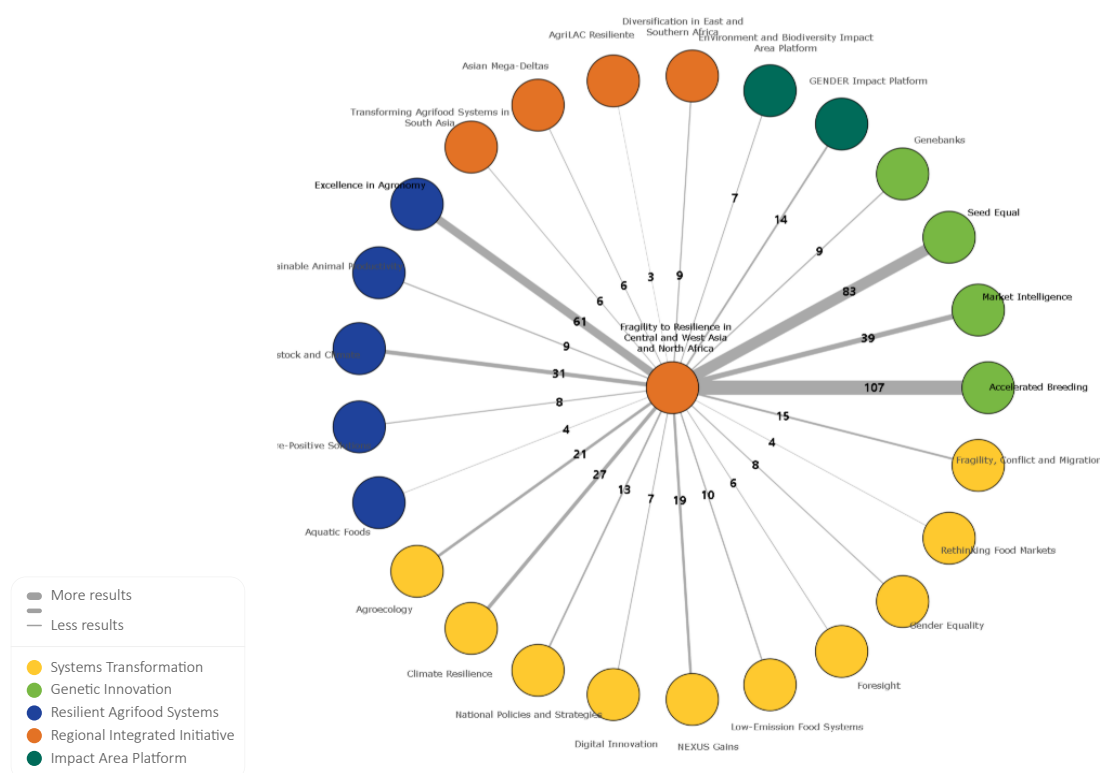
As one of the CGIAR Regional Integrated Initiatives, F2R-CWANA's approach to partnership was to work with necessary partners to ultimately create more effective, socially inclusive, and resilient agrifood systems in countries across the CWANA region.



Participants of the AgriTech4Egypt Innovation Challenge Bootcamp, a four-day training event held from 10–13 June 2024, at SEKEM in Belbeis, Egypt.
Credit: Odelly

Section 6: CGIAR Portfolio linkages

FRAGILITY TO RESILIENCE IN CENTRAL AND WEST ASIA AND NORTH AFRICA'S INTERNAL NETWORK OF COLLABORATIONS



Connections are sized according to the number of shared reported results, highlighting the depth of collaboration across the CGIAR Portfolio. A results threshold filter is applied (set to a minimum of five results) to focus the view on the most significant collaborations. Thicker lines represent stronger collaborative links based on a higher number of shared results.

Portfolio linkages and Fragility to Resilience in Central and West Asia and North Africa's impact pathways

F2R-CWANA actively collaborated with many CGIAR Initiatives and some Platforms to deliver a comprehensive offering of CGIAR research and innovations to CWANA countries by integrating genebanks and crop breeding (Genetic Innovation), farming and food supply (Resilient Agrifood Systems), and food systems research and innovations (Systems Transformation). Our approach to collaboration within the CGIAR portfolio followed two key strategies: (1) **coinvesting with other Initiatives** to strategically allocate resources around shared challenges, and (2) **filling critical gaps** in programming where essential research and innovations were not being implemented in CWANA countries by other Initiatives.

Our strongest linkages were with **the Genetic Innovation Initiatives** – the CGIAR Research Initiatives on Accelerated Breeding (113 shared results), Seed Equal (88), Market Intelligence (39), and Genebanks (9). Through these collaborations we made progress toward supporting and facilitating (1) the use of best-bet genetic innovations developed specifically for CWANA countries (EOIO 2), and (2) the on-farm and ex-situ conservation of agrobiodiversity (EOIO 3). With the target product profiles, elite lines, and newly released varieties developed by CGIAR and NARES partners under Market Intelligence and Accelerated Breeding, F2R-CWANA focused on later-stage activities in the breeding-to-release pipeline. This included stakeholder consultations with NARES, farmers, and value chain actors. Work to strengthen national and regional systems was included in our workplan from the beginning and was done in collaboration with Seed Equal from 2023 onwards, in recognition of

its value. Although in-situ and on-farm conservation of indigenous agrobiodiversity was not a major focus of the 2022 – 2024 CGIAR portfolio, F2R-CWANA filled this gap through our own outputs and in collaboration with Genebanks and Livestock and Climate.

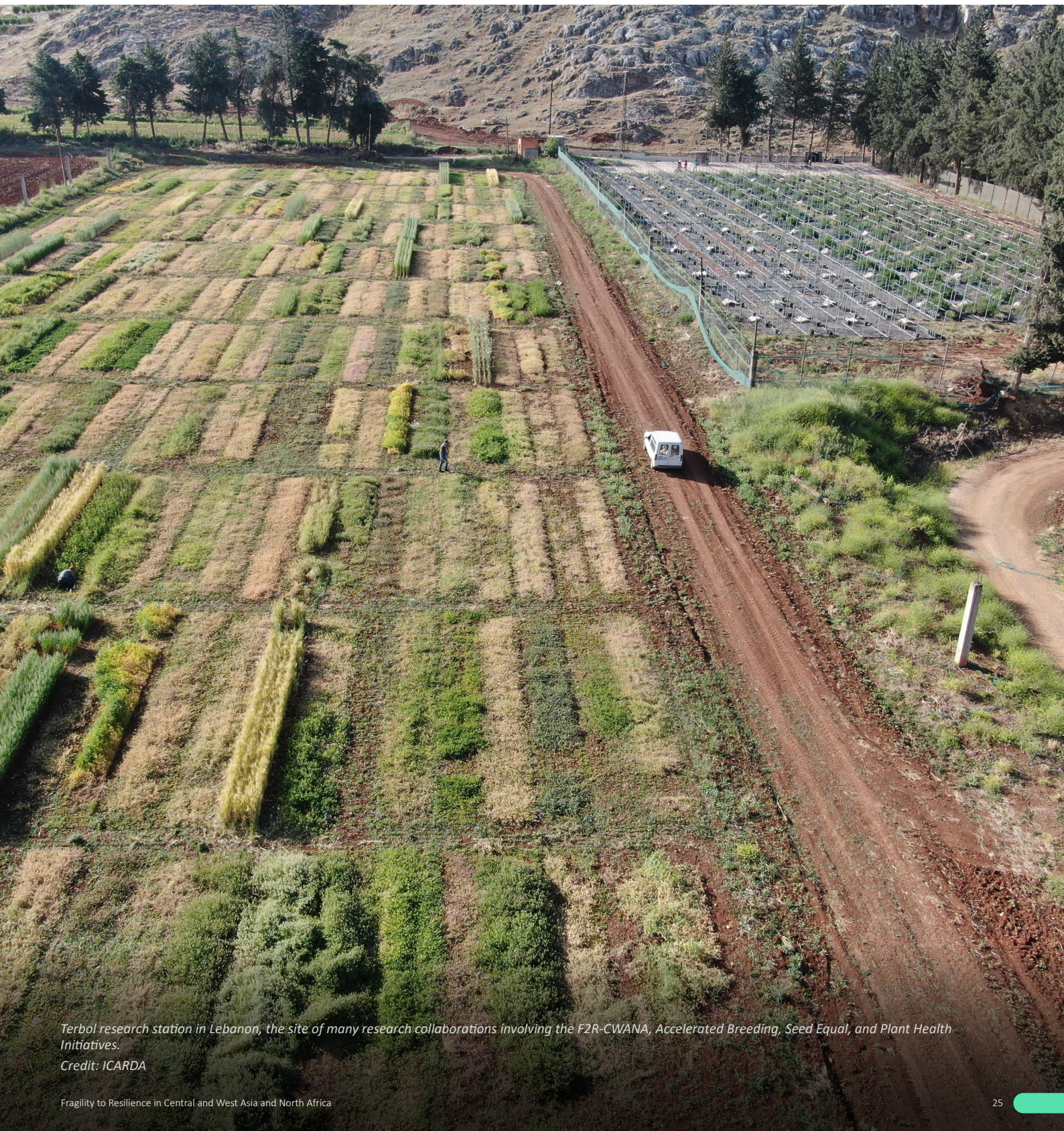
We worked closely with the **Resilient Agrifood System Initiatives** – the CGIAR Research Initiatives on Excellence in Agronomy (61), Livestock and Climate (31), Sustainable Animal Productivity (9), and Nature-Positive Solutions (8) – to progress toward supporting and facilitating the on-farm and ex-situ conservation of agrobiodiversity (EOIO 3) and scaling-up of bundled solutions to decompose yield gaps (EOIO 4). In 2024, we added Tunisia as a priority country for F2R-CWANA and partnered with Livestock and Climate to boost investment in the sustainable management and governance of rangeland systems and the conservation and restoration of indigenous silvopastoral species. In Morocco and Egypt, designated as use cases by Excellence in Agronomy, we worked together to bridge yield gaps, with F2R-CWANA focused on developing genotype by environment by management options and bundled solutions through field trials and farmer demonstrations at the ICARDA and NARES research stations. A key accomplishment in Morocco was our collaboration with the Excellence in Agronomy and Climate Resilience Initiatives to support the government's Generation Green 2030 strategy, which aims to bring 1 million hectares of land under conservation agriculture by 2030.

We also worked closely with the **Systems Transformation Initiatives** of Climate Resilience (27), Agroecology (21), NEXUS Gains (19),

Fragility, Conflict, and Migration (15), and others to progress toward putting into practice the integrated management of food, land, water, and energy systems (EOIO 5), scaling up innovations for (EOIO 6), and developing strategies and policies to create more effective, socially-inclusive and resilient national agrifood systems (EOIO 1). A particularly notable collaboration was with NEXUS Gains in Uzbekistan, where the two Initiatives worked in complementary yet distinct areas. F2R-CWANA focused on (1) water management in the Amu Darya basin, a lift-irrigated system where the genetic innovation and agronomy field trials were conducted at the Qarshi research station, and on (2) innovation development, capacity building, policy, and scaling for the whole agrifood system. NEXUS Gains, meanwhile,

focused on the Aral Sea and Syr Darya basins, characterized by natural water flow, where their work addressed more targeted WEFE-nexus challenges. We collaborated with Fragility, Conflict, and Migration to address fragility and its intersection with WEFE management, which was added as priority country for F2R-CWANA in 2024.

Through strategic and well-coordinated programming of the F2R-CWANA Initiative, and in close collaboration with several Initiatives across the CGIAR portfolio, we strived to ensure that CGIAR's research and innovations were integrated, complementary, and responsive to the unique challenges of agrifood systems in CWANA.



Terbol research station in Lebanon, the site of many research collaborations involving the F2R-CWANA, Accelerated Breeding, Seed Equal, and Plant Health Initiatives.

Credit: ICARDA

Section 7: Key result story

Market-selected crop varieties for dryland countries

An inclusive market-driven approach led to the selection of 24 new high-yielding and climate-resilient varieties of key crops for official release.



A farmer participates in the evaluation of elite wheat lines in Egypt.
Credit: Ahmed El Sheemy, ICARDA

Primary Impact Area



Other relevant Impact Areas targeted



Contributing Initiative

Accelerated Breeding; Seed Equal

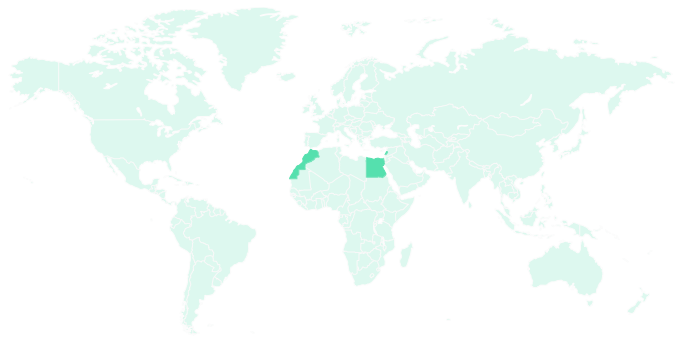
Contributing Centers

ICARDA · CIP

Contributing external partners

Lebanese Agricultural Research Institute (LARI, Lebanon) ·
Agricultural Research Center (ARC, Egypt) · Institut National de la
Recherche Agronomique (INRA, Morocco)

Geographic scope



Regions: West Asia · North Africa

Countries: Lebanon · Egypt · Morocco

New climate-resilient crop varieties are essential for adapting agrifood systems to climate change. However, adoption—and ultimately climate resilience—will remain low if these varieties are not preferred by stakeholders across the entire value chain. The CGIAR Research Initiative on Fragility to Resilience in Central and West Asia and North Africa, in collaboration with the CGIAR Genetic Innovation Initiatives, implemented an inclusive, multistakeholder approach to integrate user-preferred traits into the breeding pipeline. As a result, 24 new productive and climate-resilient crop varieties, which are expected to be popular with value-chain actors, were designated for release across countries in Central and West Asia and North Africa.

New crop varieties are the most impactful technology developed by CGIAR and national breeding programs over the past 50-plus years, delivering a remarkable return on investment estimated to be at least tenfold. The release of thousands of new varieties has revolutionized agriculture in the Global South by boosting agricultural productivity and resilience, reducing hunger and malnutrition, and enhancing environmental sustainability. However, breeding new varieties that are not only more productive, pest- and disease-resistant, and climate-resilient but also meet the needs of men and women farmers, processors, industry, and consumers continues to be a significant challenge. When the needs of key customers are not met, adoption rates of new varieties remain low—as reflected in low varietal turnover in farmers' fields—ultimately limiting the contribution of breeding programs to maintaining climate-resilient food and nutrition security for people in the Global South.

To bridge this gap and accelerate adoption, the CGIAR Research Initiative on Fragility to Resilience in Central and West Asia and North Africa (F2R-CWANA), in collaboration with the CGIAR Genetic Innovation Initiatives, developed and implemented a multistakeholder, preference-based approach to variety development, evaluation, selection, and delivery. This market-driven

approach aimed to integrate stakeholder trait preferences into the decision-making process at every stage of the breeding-to-release pipeline to ensure the development of new varieties that are popular and will be widely adopted.

This multistakeholder approach was put into practice in Egypt, Lebanon, Morocco, Sudan, and Uzbekistan through a series of structured engagements. Starting with prioritization meetings, CGIAR and the national programs engaged with diverse stakeholders to identify the target product profiles that would meet the needs of their countries.

Based on the selected target product profiles, “best-bet” elite genotypes with matching traits were identified and rigorously tested through on-station and on-farm trials. Approximately 330 elite lines of eight crops—barley, bread wheat, durum wheat, chickpea, lentil, faba bean, potato, and sweet potato—were tested in the five countries.

To ensure gender-specific preferences were captured, field days were organized with more than 350 participants, including women and men farmers, researchers, extension agents, and industry stakeholders. Gender specialists helped design evaluation tools to ensure nuanced insights were gathered, reflecting the distinct roles men and women play within the value chain.

After three years of rigorous testing and stakeholder engagement, 24 elite lines of wheat, durum wheat, barley, chickpea, faba bean, and lentil were selected by national agricultural research and extension systems for registration and release through national seed systems in Egypt, Lebanon, and Morocco. The evaluation and selection process in Sudan and Uzbekistan is expected to be completed in 2025. This multistakeholder consultation approach will ensure that new, climate-resilient, high-performing varieties with user-demanded traits reach farmers and other key actors in these countries.

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The progress we're making with drought-tolerant varieties is crucial, especially with the ongoing drought in Morocco. What stands out today is not just the focus on climate resilience, but the way so many people across the value chain—from farmers to processors to the consumers—are involved in evaluating the varieties. If we can meet the needs of all these different people, we'll have a better chance of achieving widespread adoption across Morocco, which is essential for our national food security.

H.E. Mohamed Sadiki, former Minister of Agriculture, Morocco, during a field visit to Merchouch research station, 17 April, 2024



2022 key result story

The AgriTech4Morocco Innovation Challenge trained 32 teams from around the world to accelerate their solutions for creating climate-resilient agrifood systems - CGIAR



2023 key result story

Resilience through informed water management in the Souss-Massa basin - CGIAR



INITIATIVE ON
Fragility to Resilience in Central
and West Asia and North Africa



*The role of appropriate mechanization to meet the needs
of small-scale farmers toward sustainable and resilient
agricultural systems... our activities in Sids Research
station in Bani Sweif Gov.*

Credit: Ahmed El Sheemy, ICARDA