CGIAR

INITIATIVE ON

Fragility to Resilience in Central and West Asia and North Africa

CGIAR Initiative on Fragility to Resilience in CWANA

ANNUAL TECHNICAL REPORT 2022

CGIAR Technical Reporting 2022

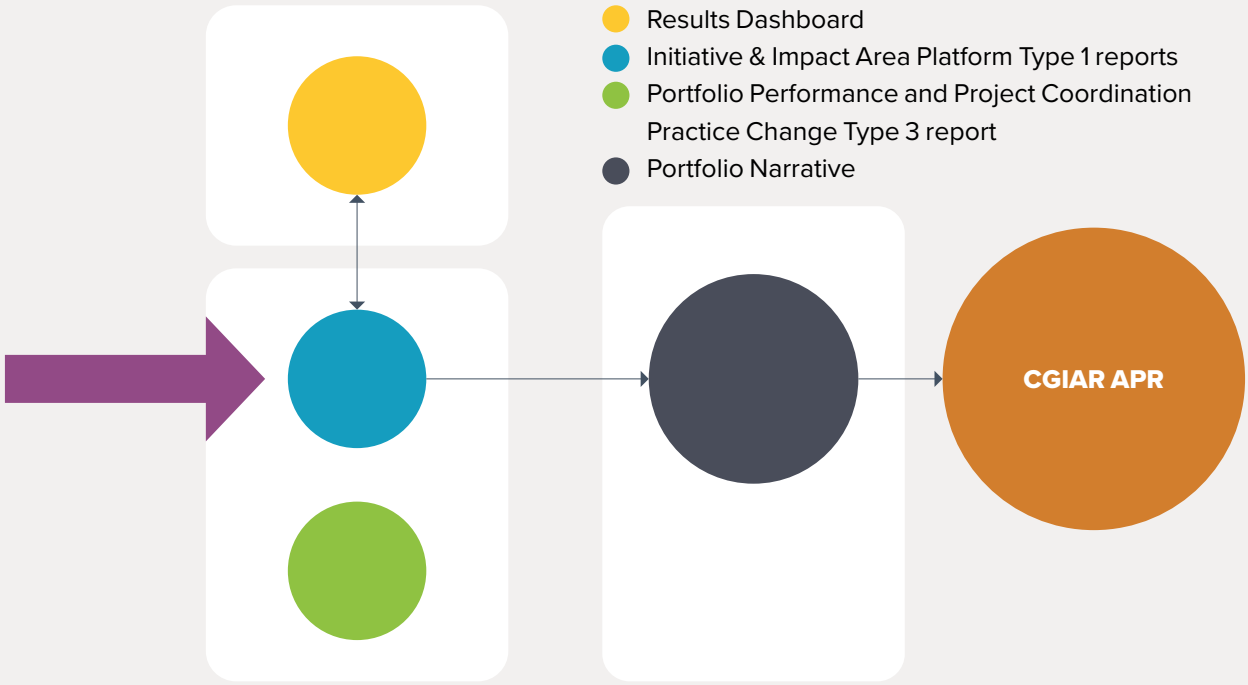
CGIAR Technical Reporting has been developed in alignment with the CGIAR Technical Reporting Arrangement.

This Initiative report is a Type 1 report and constitutes part of the broader CGIAR Technical Report. Each CGIAR Initiative submits an annual Type 1 report, which provides assurance on Initiative-level progress towards end-of-Initiative outcomes.

The CGIAR Technical Report comprises:

- Type 1 Initiative and Impact Area Platform reports, with quality assured results reported by Initiatives and Platforms available on the CGIAR Results Dashboard.
- The Type 3 Portfolio Performance and Project Coordination Practice Change report, which focuses on internal practice change.
- The Portfolio Narrative, which draws on the Type 1 and Type 3 reports, and the CGIAR Results Dashboard, to provide a broader view on portfolio coherence, including results, partnerships, country and regional engagement, and synergies among the portfolio's constituent parts.

The CGIAR Technical Report constitutes a key component of the CGIAR Annual Performance Report (APR).



US$	2022	2023	2024
Proposal Budget from initial submission	$9,084,848	$10,036,660	$10,878,492
Approved 2022 Budget	$4,058,895		

2022 Disbursement Target based on Approved FinPlan

Section 1 Fact sheet

Initiative name	From 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
Action Area	Resilient Agrifood Systems
Geographic scope	**Regions targeted in the proposal:** Central and West Asia and North Africa (CWANA) **Countries targeted in the proposal:** Egypt; Lebanon; Morocco; The Republic of the Sudan; Uzbekistan
Start date	April 1, 2022
End date	March 31, 2025
Initiative Lead	Michael Baum – m.baum@cgiar.org
Initiative Deputy	Maha Al-Zu'bi – m.al-zubi@cgiar.org
Measurable three-year End of Initiative outcomes (EOI-Os)	**EOI-O 1:** Government, civil society, private sector, and INGOs jointly develop strategies and policies to create more efficient, inclusive, and resilient national agrifood systems.
	EOI-O 2: Government supports and facilitates the use of best bet genetic innovations developed for CWANA.
	EOI-O 3: Government supports and facilitates the on-farm and ex-situ conservation of agrobiodiversity in CWANA.
	EOI-O 4: Government, civil society, and private sector scale up bundled solutions to decompose yield gaps.
	EOI-O 5: Government, civil society, and private sector put into practice the integrated management of food, land, water, and energy systems.
	EOI-O 6: Government, civil society, and private sector scale up innovations and digital tools for food value chain (FVC) climate risk management.

OECD DAC Climate marker adaptation score*	**Score 2:** Principal: 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.
OECD DAC Climate marker mitigation score*	**Score 1:** Significant: 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.
OECD DAC Gender equity marker score*	**Score 0:** Not targeted: The Initiative/project has not been found to target gender equality. However, as a minimum requirement for all Initiatives/projects: (i) a gender analysis was conducted; (ii) its findings should be used to ensure that, at a minimum, the Initiative activities/interventions do no harm and do not reinforce gender inequalities; and (iii) data that is collected is gender disaggregated.
Website link	https://www.cgiar.org/initiative/fragility-to-resilience-in-cwana/

*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.
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.

Leafy vegetable farm in the city, Lebanon.
Photo credit: Jano Hatem/IWMI

Section 2 Initiative progress on science and towards End of Initiative outcomes

A woman washing wheat in the Nile River, Egypt.
Photo credit: Hamish John Appleby/IWMI

Overall summary of progress against the theory of change

The CGIAR Research Initiative on Fragility to Resilience in Central and West Asia and North Africa (CWANA) officially started on April 1, 2022 with the involvement of CGIAR Centers the Alliance of Bioversity International and CIAT, CIMMYT, CIP, ICARDA, IFPRI, IWMI, and WorldFish, and a focus on the five countries of Egypt, Lebanon, Morocco, Sudan, and Uzbekistan. The overarching aim of Fragility to Resilience in CWANA is for its co-created research and innovation development to contribute to the effective, socially inclusive, and climate-resilient transformation of national and regional agrifood systems. The Initiative has thematically grouped Work Packages of Work Package 1: partnerships, platforms, and policies; Work Package 2: genetic innovation, seed systems, and resources; Work Package 3: farm-level agronomic innovations; Work Package 4: landscape-level Nexus governance of resources, especially water; and Work Package 5: digital innovations and scaling and operates through capacity development, innovation, and policy impact pathways. In 2022, Fragility to Resilience in CWANA made progress against each of these impact pathways in all Work Packages and countries. For the nine months of operation in 2022, we reported 173 results (ranked 8th out of all Initiatives) under capacity sharing for development (26), innovation development (32), knowledge products (91), other outputs (23), and innovation use (1). These results were achieved through the collaboration of 19 Initiatives and the Gender Platform, 14 Centers, 213 partners, and linked to 36 countries (with partners coming from even more countries beyond where the results were delivered) — showing the breadth and depth of our research networks and potential for delivering our research and innovations to achieve beneficial outcomes and impacts across the incredibly large and diverse CWANA region where

A farmer in front of a man-made lake.
Photo credit: Lien Arits/IWMI

climate change, food insecurity, water scarcity, loss of biodiversity, gender inequality, youth dissatisfaction, economic instability, and poverty present enormous challenges.

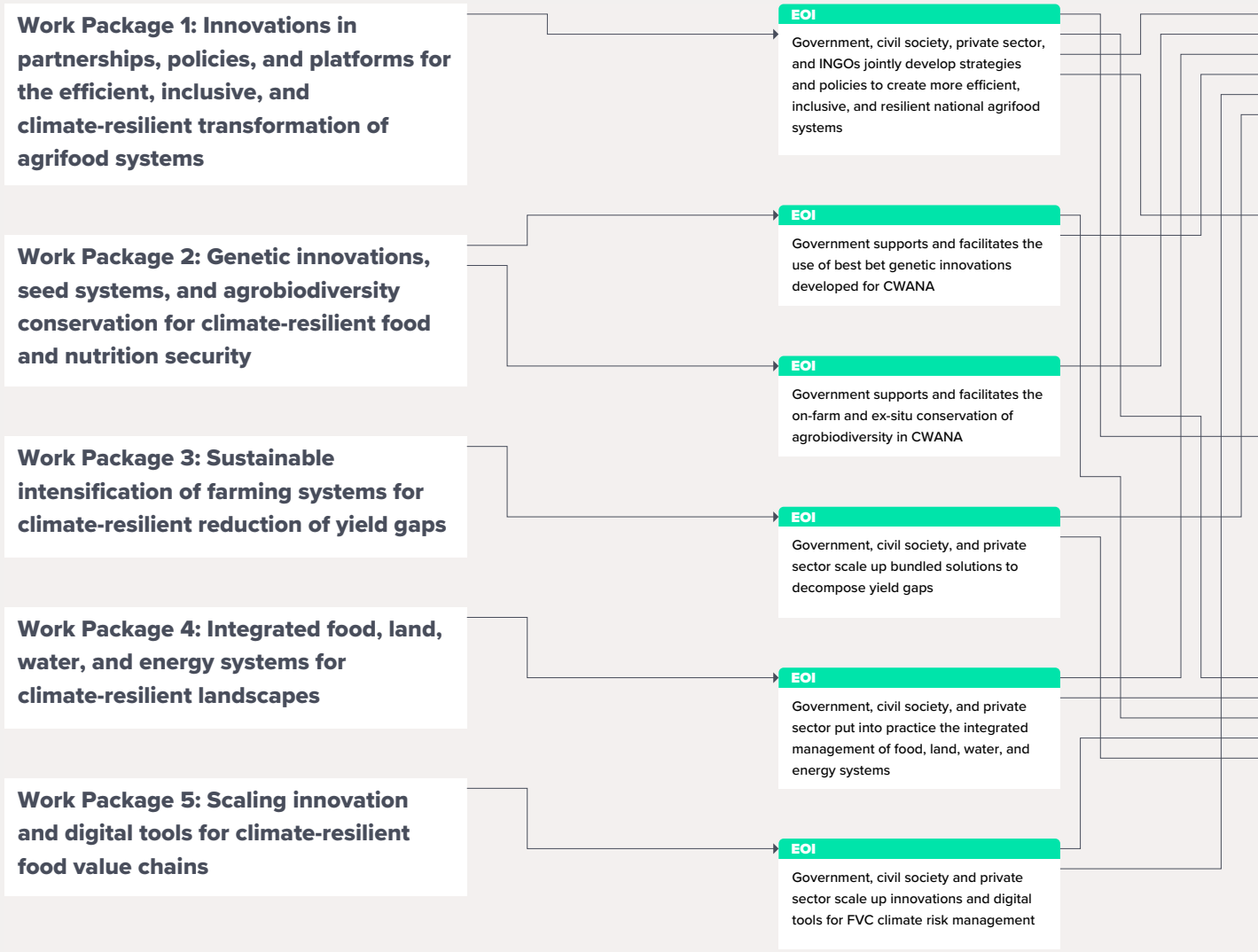
The creation or strengthening of National Innovation Platforms (NIPs) and National Alliances of Stakeholders (NASs) is a core cross-cutting component of how we intend to facilitate the development and scaling of CGIAR co-developed innovations through well-communicated, evidence-based, socially inclusive decision-making by partners across all sectors of society. The NIPs have been selected at Sids in Egypt, Terbol in Lebanon, Merchouch in Morocco, Wad Medani and Hudeiba in Sudan, and Karshi in Uzbekistan. Two research field trials are under way at the NIPs: (i) the evaluation and demand creation for 430 prioritized lines of genetic innovations of the regionally important crops barley, faba bean, lentil, potato, sweet potato, bread wheat, and durum wheat, planted in 26 Crop x Country combinations to achieve climate-resilient and trait quality genetic gains in farmers' fields; and (ii) Genotype x Environment x Management experiments in wheat-based systems to develop bundled solutions to bridge yield gaps. In 2023, we expect to include the summer crops of millet and sorghum in Sudan, and to integrate circular aquaculture systems. Where possible, water-based innovations such as web-based dashboards of water basins, the Water Accounting Plus (WA+) decision-support tool to enhance water resources management, water productivity and reduce trade-offs, wastewater reuse, soil salinity management, and Nexus governance are being trialled close to the field station NIPs, such as the Karshi watershed (Uzbekistan) or nearby such as the Souss Massa watershed in Morocco. Stakeholder consultation to develop the scope of the sector-specific (e.g., seed, water, agronomy) and Nexus-level NASs began in Uzbekistan and will continue in Egypt and Morocco in 2023. A seed-sector NAS is operational in Morocco and will meet in 2023. National policies are also influenced by ongoing stakeholder engagement with ministers and their policymakers and National Agricultural Research and Extension Systems (NARES) director generals by the Initiative Delivery Team, the CGIAR Regional Director CWANA and other Systems Office and Center-level Directors. Work on policy analysis and recommendations for the harmonization of seed system regulations is under way.

The bundled solutions and work on mechanization being developed in Work Package 3 feed into the Conservation Agriculture approach spearheaded in Morocco by partners INRA under the provision of the Generation Green Strategy 2020–2030 and in collaboration with Excellence in Agronomy. The direct seeding program reached an additional area of 100,000 ha, on its way to reaching 1 million ha by 2030. The testing and scaling of the Conservation Agriculture approach is planned for Egypt and Uzbekistan.

Work to promote the in-situ/on-farm management and ex-situ conservation of the Indigenous agrobiodiversity found in the region is ongoing in Lebanon, Morocco, and Uzbekistan and is considered critical to safeguarding biodiversity and cultural heritage, breeding climate-resilient crops, and protecting the food and nutrition security of people across the region.

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



EOI — End of Initiative outcome

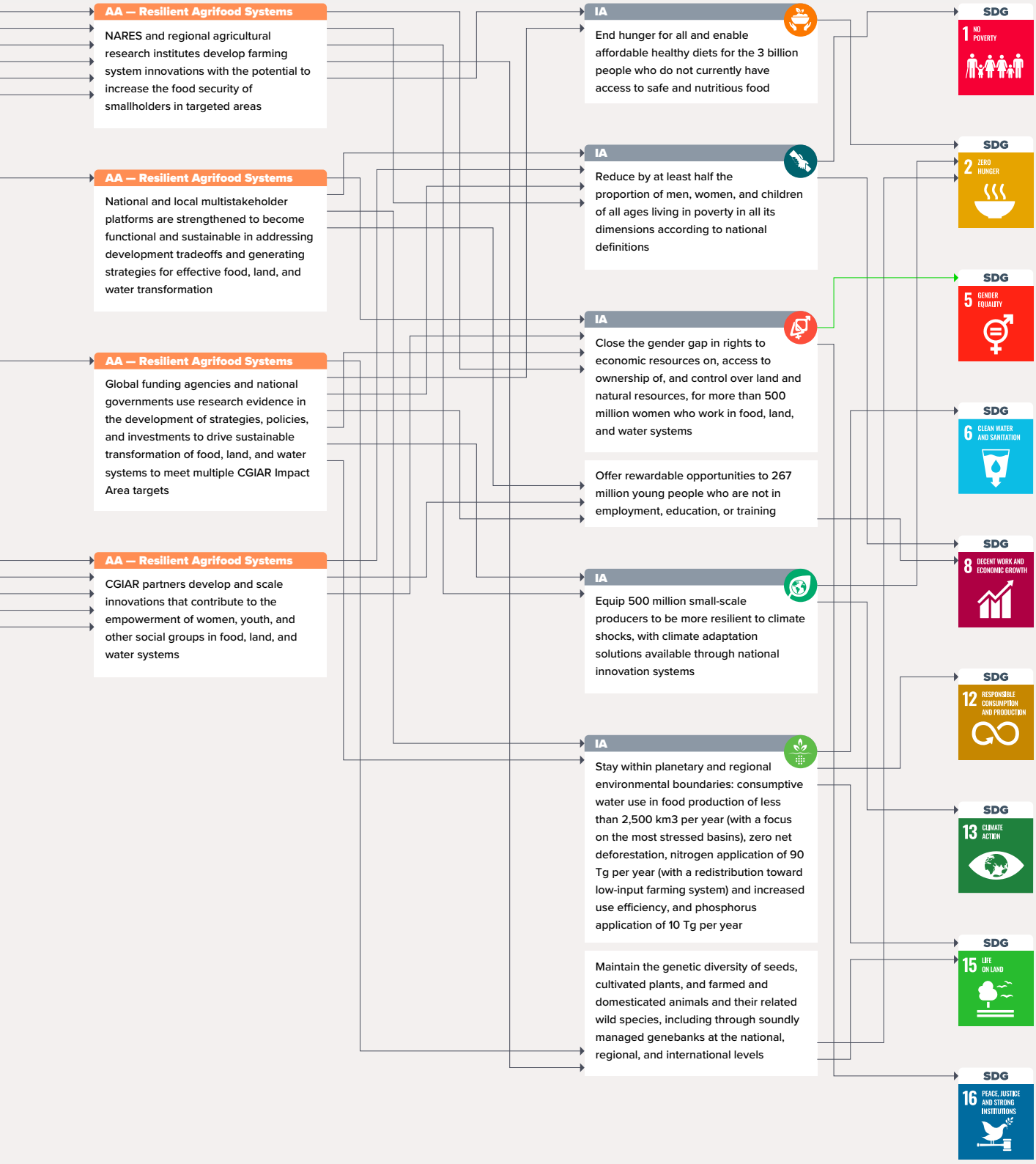
AA — Action Area

IA — Impact Area

SDG — Sustainable Development Goal

- Nutrition, Health, and Food Security
- Poverty Reduction, Livelihoods, and Jobs
- Gender Equality, Youth, and Social Inclusion
- Climate Adaptation and Mitigation
- Environmental Health and Biodiversity

Teams from CGIAR's three Action Areas — System Transformation, Resilient Agrifood Systems and Genetic Innovation — worked to develop an improved set of Action Area outcomes in October 2022. Since this was near the end of the reporting cycle for 2022, it was decided not to update the theories of change based on these new Action Area outcomes.
The exception to this is Genetic Innovation — for this Action Area, as the new outcomes had already been widely discussed among the relevant Initiatives, and with its advisory group of funders and other stakeholders, the decision was made to update their outcomes in time for the 2022 reporting cycle.



The AgriTech4Morocco Innovation Challenge delivered in Morocco in 2022 is a hugely successful innovation in capacity development that resulted in the training of 32, 20, and finally, 10 innovation teams to bring to scaling readiness their agri- and climate-tech innovations for the transformation of the Moroccan agrifood system. The three winning innovation teams — YieldsApp, Green Growth, and Sand to Green — benefited from further post-program support to connect to investors and beneficiaries.

A Gender research strategy for the Middle East and North Africa (MENA) region was published in 2022 and its recommendations will be implemented into the operation of Fragility for Resilience in CWANA in 2023. Other Initiatives working in the region will be invited to adopt these. Work on innovation adoption, achieving durable development impacts, sustainable resource use, and overcoming intersectional marginalization in fragile and conflict-affected countries started in 2022 and is ongoing.

A capacity-building programme, with the aims of placing university students with CGIAR staff and projects to conduct research for their degrees and delivering advanced-level training courses, began to be integrated into the Initiative in 2022. The Initiative is working on building the capacity of NARES staff, starting in Sudan, through the creation of National Agronomy Taskforces in CWANA countries with the objective of sharing innovations and research findings, emerging problems, local and expert knowledge, and context-specific solutions for improving the resilience and productivity of major crops.

Profiling of the innovations across Fragility to Resilience in CWANA started — especially of the technological ones linked to the NIPs — and will continue in 2023, alongside the more in-depth innovation profiling and packaging work on a smaller number of key innovations. Innovation packaging work has already started in Uzbekistan for water-related innovations of Basin Smart Tools for Water Efficiency and Management, Toolbox of Nature-based Solutions for People and Planet, and Weather Station-based Irrigation and Advisory System.

Progress by End of Initiative outcome

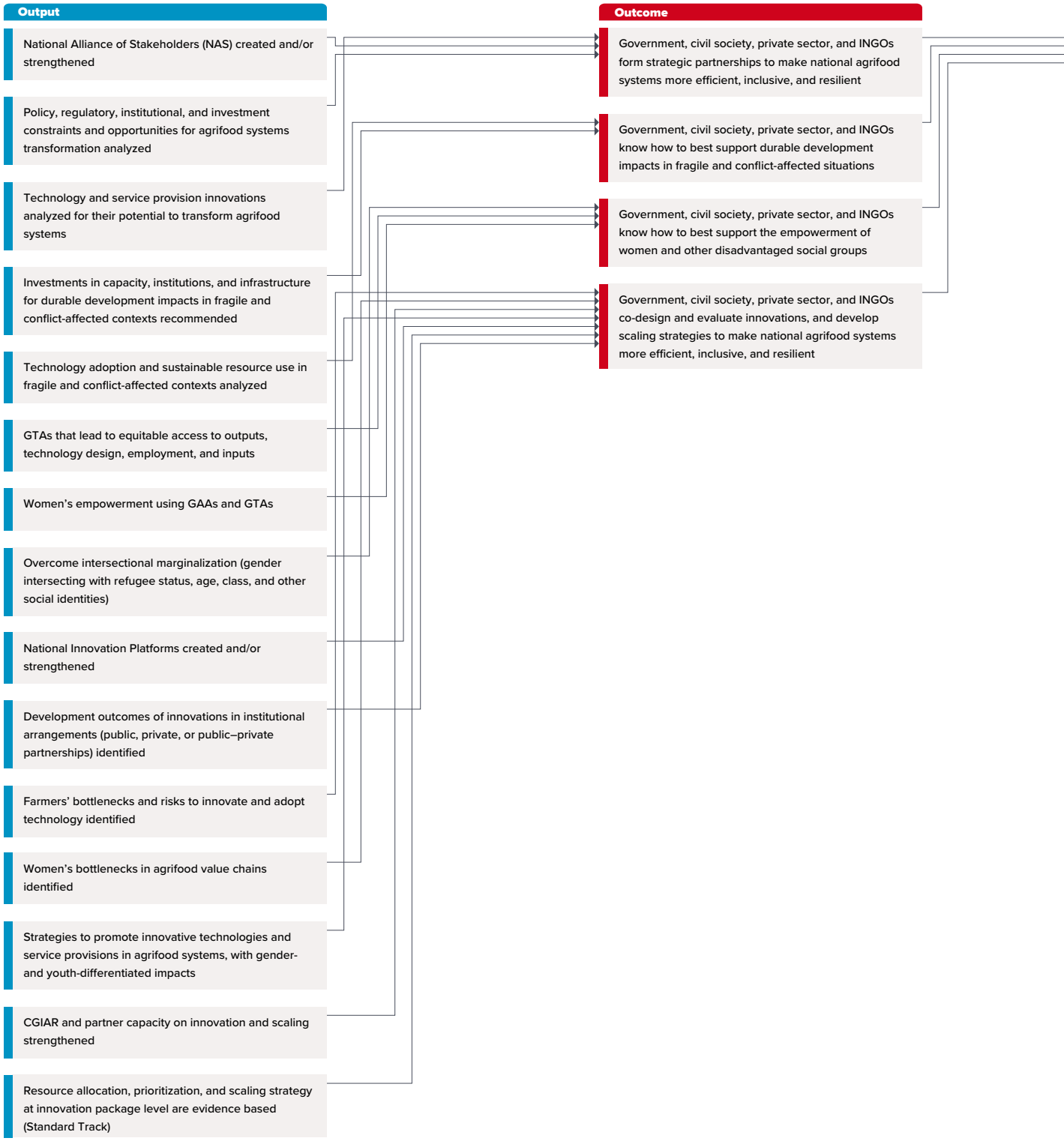
EOI-O 1: Government, civil society, private sector, and INGOs jointly develop strategies and policies to create more efficient, inclusive, and resilient national agrifood systems.	Initiative inception events were attended by Ministers, NARES, donors, and key partners and marked the beginning of our collaboration as One CGIAR and reaffirmed our commitment to co-creating efficient, inclusive, and climate-resilient agrifood systems. High-level support for the Initiative was received from ministers in Egypt, Jordan, Morocco, Sudan, Syria, United Arab Emirates (UAE), Uzbekistan, and key regional donors during engagement events. We anticipate that creating and strengthening National Alliances of Stakeholders (NASs) and National Innovation Platforms (NIPs) will result in increased engagement and coordination at local, regional, national and international levels.
EOI-O 2: Government supports and facilitates the use of best bet genetic innovations developed for CWANA.	NARES representatives from 14 countries met with CGIAR to define their CWANA region crop breeding priorities until 2030. The resulting co-signed Aide-Memoire will steer the breeding portfolio and variety release, promotion, and dissemination strategies implemented by Fragility to Resilience in CWANA, **Accelerated Breeding**, and **Seed Equal** Initiatives until 2030. Twenty-six crop-by-country genetic innovations of product profile, elite lines, and new varieties were prioritized through NARES consultations in Egypt, Lebanon, Morocco, Sudan, and Uzbekistan. Policy analysis to facilitate the uptake of genetic innovations is under way.
EOI-O 3: Government supports and facilitates the on-farm and ex-situ conservation of agrobiodiversity in CWANA.	NARES and CGIAR co-selected the species, sites, and communities where the agrobiodiversity conservation management work will be done — cereals and food legume landraces in Morocco, food legume crop wild relatives and forages in Lebanon, and crop wild relative populations of apples and walnuts in Uzbekistan. National partners conducted community meetings to prepare for this work and performed eco-geographic surveys with further research and community consultations taking place in 2023. NARES scientists from 10 countries attended a 10-day training on the on-farm and ex-situ conservation of plant genetic resources, delivered in collaboration with the Genebanks Initiative and donors.
EOI-O 4: Government, civil society, and private sector scale up bundled solutions to decompose yield gaps.	Collaborative research on genotype x environment x management to develop Innovation Packages of bundled solutions to sustainably bridge wheat-based yield gaps and inform breeding strategies were set up with NARES at the NIPs in five key countries. NARES scientists from eight countries took part in a consultation, then in a capacity-building event, to develop roadmaps on the sustainable intensification of farming systems and scaling innovations. Fragility to Resilience in CWANA and **Excellence in Agronomy** continue to support the Government of Morocco to reach 1 million ha under Conservation Agriculture by 2030 through research and innovation.

EOI-O 5: Government, civil society, and private sector put into practice the integrated management of food, land, water, and energy systems.	NARES and partners in Egypt, Lebanon, Morocco, Sudan, and Uzbekistan were involved in expert consultations, working group meetings, policy meetings, and trainings on water accounting, water reuse cost benefits analysis, soil salinity, and integrated agriculture-aquaculture systems in an effort to produce scientific methodologies and tools, roadmaps, and guidelines for these water-related issues in the world's most water-stressed region. In addition to stakeholder engagement through research and innovation development, Fragility to Resilience in CWANA scientists made a concerted effort to communicate about the integration of food, land, water, and energy systems in CWANA through events such as 2022 UN Climate Change Conference (COP27), and podcasts, television interviews, and other media outlets.
EOI-O 6: Government, civil society, and private sector scale up innovations and digital tools for food value chain (FVC) climate risk management.	Stakeholder consultations in Uzbekistan and Egypt brought together a diverse mix of NARES, NGO, public, private, and financial sector partners to discuss climate information data services, national innovation ecosystems, and the digital transformation of the agricultural sector in order to better understand the innovation environment around the FVC and climate risk management. The Agritech4Morocco Challenge Call also brought together a unique set of stakeholders to provide training to innovation teams on how to bring to market concrete solutions to address the interwoven challenges of cutting emissions, increasing yields and quality, and protecting business viability.

Spring bread wheat breeder holding up new varieties bred by CGIAR. Photo credit: ICARDA

Section 3 Work Package-specific progress

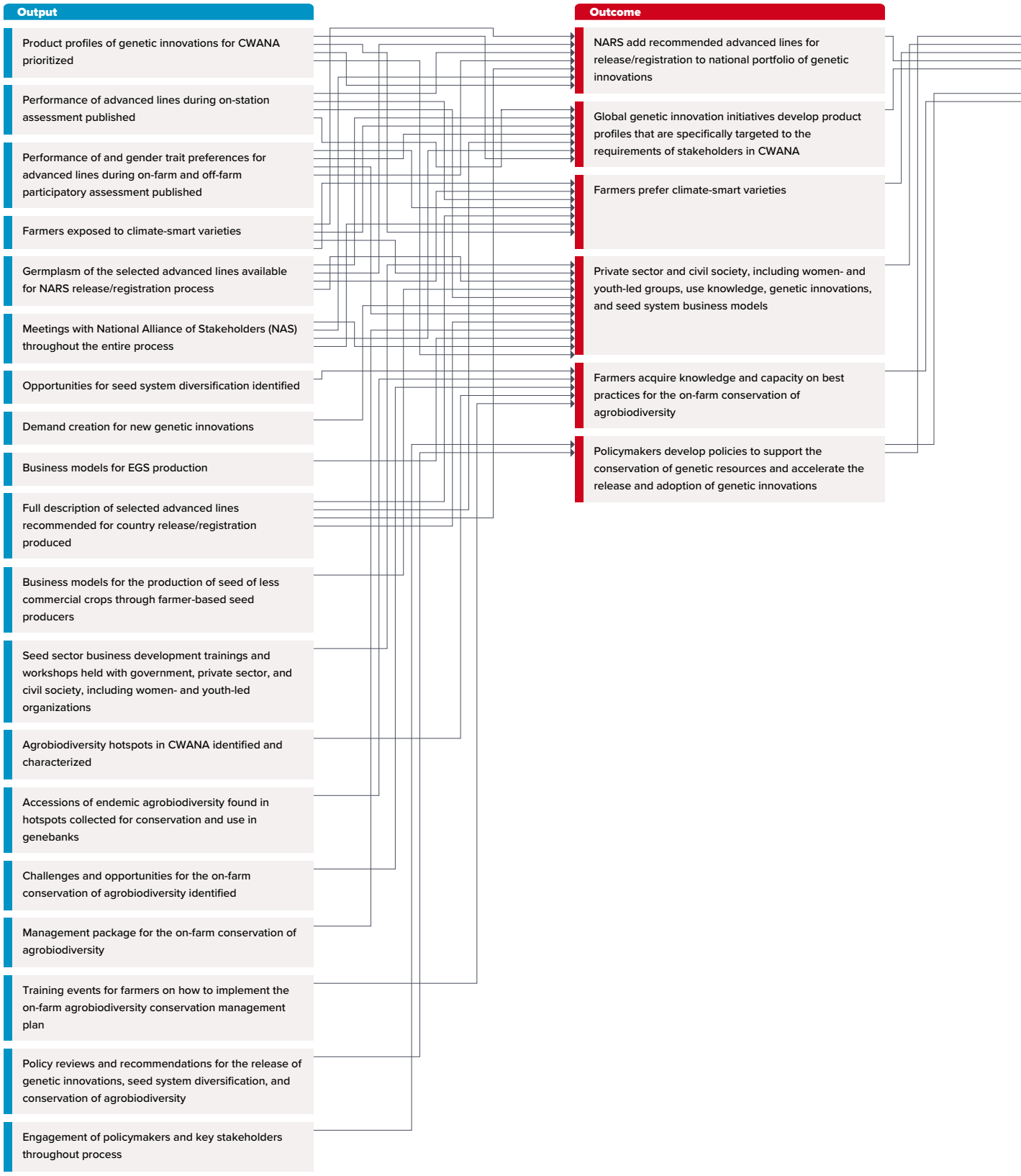
Work Package 1:
Innovations in partnerships, policies, and platforms for the efficient, inclusive, and climate-resilient transformation of agrifood systems

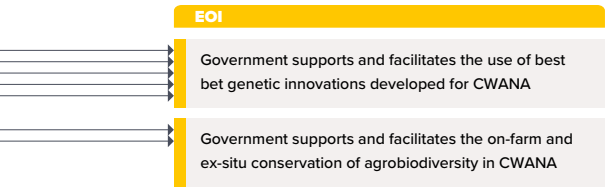


Work Package 1 progress against the theory of change

Launch events for Fragility to Resilience in CWANA were held in Egypt including Sudan, Lebanon including Syria, Morocco, and Uzbekistan with attendance from key partners and stakeholders and reaffirmed our collective commitment to work together. The process of forming National Alliance of Stakeholders (NASs) as a new model for evidence-based policymaking was addressed in a workshop in Uzbekistan and will continue in other countries in 2023. NIPs were selected at established research stations in Morocco, Egypt, Sudan, Lebanon, and Uzbekistan and genetic innovation and agronomic field trials and demonstrations were established. The work to create an inventory of innovation development outputs in Fragility to Resilience in CWANA started and will continue in 2023 alongside the Innovation Package and Scaling Readiness work. Fragility to Resilience in CWANA participated alongside national policies and strategies in a series of knowledge products and events linked to the Global Food Crises and One CGIAR's response and COP27 held in Egypt. The key papers "Climate Security in the MENA Region" and "Gender Equality, Climate Change and Agriculture in the MENA Region: Priorities and Possibilities" were published in collaboration with **Climate Resilience** and **the Gender Platform**, respectively, and outline what we know, what we do not know, and our learning agenda for the next decade. A systematic literature review to assess the determinants of adoption and or dis-adoption of a range of agricultural technologies and sustainable natural resource management practices in fragile and conflict-affected countries is under way. Research on gender transformative and accommodative approaches in Morocco and Lebanon is ongoing. Journal articles analyzing the factors behind the adoption of new technologies, how gender roles and norms affect women's involvement in FVCs, and an econometric assessment of the spatial market integration of cereal markets in Sudan were published. The NARES of Jordan, Syria, and Turkey expressed their willingness to participate in Fragility to Resilience in CWANA.

Work Package 2:
Genetic innovations, seed systems, and agrobiodiversity conservation for climate-resilient food and nutrition security

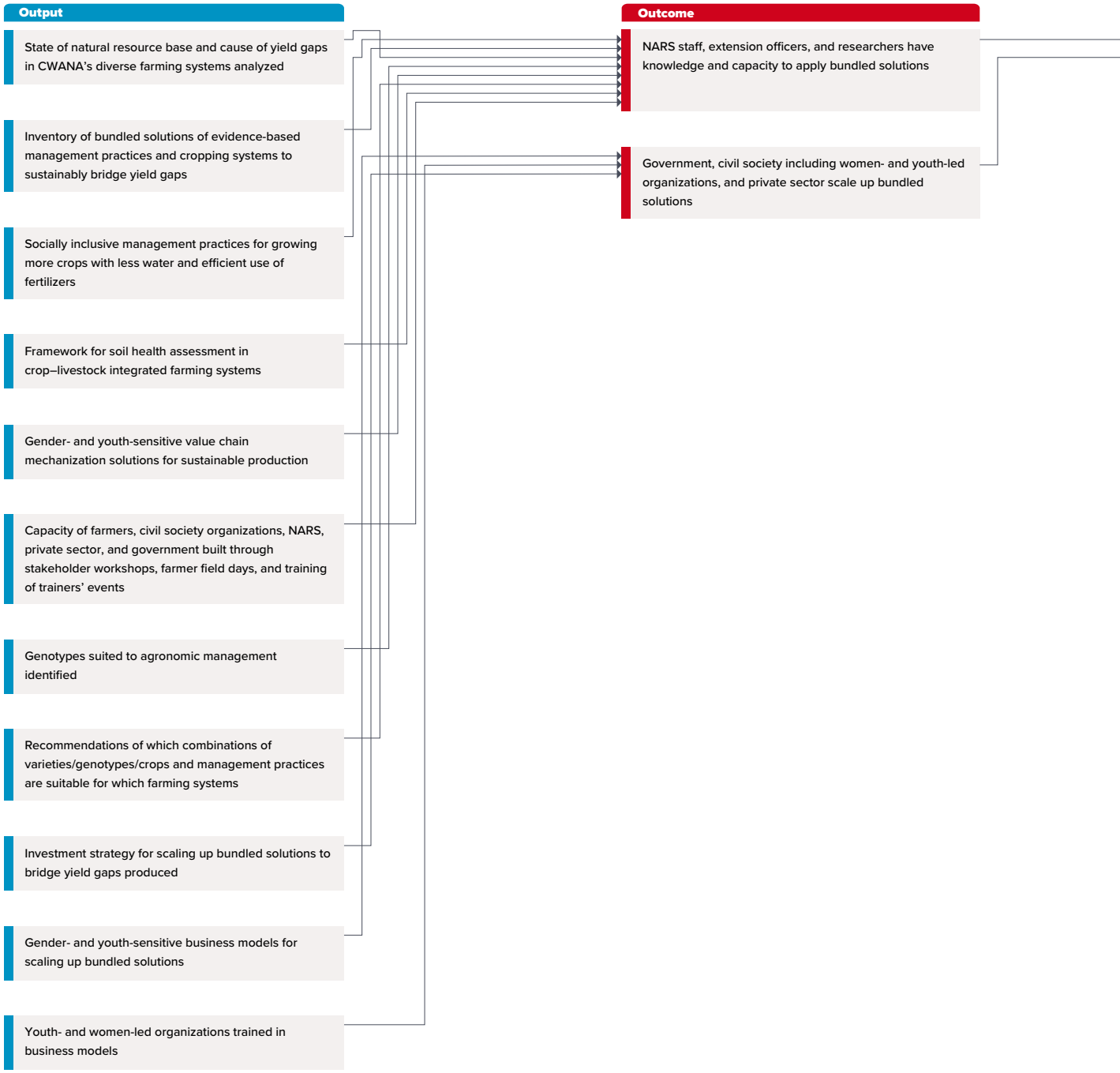


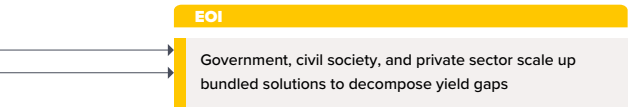


Work Package 2 progress against the theory of change

Fragility to Resilience in CWANA and regional partners in Egypt, Lebanon, Morocco, Sudan, and Uzbekistan validated and prioritized target product profiles, elite lines, and recently released new varieties of important crops to meet the needs of farmers and consumers in their countries through fast-track validation for release, demonstration, and demand-creation. Twenty-six crop-by-country combinations of prioritized genetic innovations were planted in field trials and demonstration plots at the NIPs in the five countries. Guiding principles and priorities for crop breeding for CWANA were established by 15 regional NARES director generals and CGIAR, with the potential of becoming a tool for facilitating decision-making in the region. Many journal articles on crop breeding were published. This work on genetic innovations is in collaboration with **Accelerated Breeding**, **Market Intelligence**, and **Seed Equal** based on coordination meetings with the leadership of each Initiative. Cactus pear continued to be promoted and scaled across the CWANA region as a multi-functional climate-resilient crop, in collaboration with **Livestock and Climate** and **Sustainable Animal Productivity**. A book on the wheat seed systems, varietal adoption, and impacts in Uzbekistan was published and similar work in Egypt is under way, including a survey of 1,300 households. In Georgia, an online potato production training course strengthened the capacity of local technicians to produce healthy potato seed. The Potato Tracker web-app was released and is connecting potato seed producers, traders, and a certification agency to ensure an efficient seed system. Sites and communities with regionally unique crops, landraces, and wild relatives of cereals, legumes, forages, and fruit trees in Lebanon, Morocco, and Uzbekistan were selected and workshops were held to discuss the challenges and opportunities for in-situ and ex-situ conservation management. Eco-geographic surveys, farming system surveys, and gap analysis are under way. A 10-day workshop for regional NARES staff about the conservation and use of plant genetic resources was held in Lebanon, in collaboration with the **Genebanks** Initiative, Food and Agriculture Organization of the United Nations (FAO) Benefit Sharing Fund and Crop Trust. Work on harmonizing seed system regulations in the Common Market for Eastern and Southern Africa (COMESA) to enhance regional seed trade has begun with case studies in Egypt and Sudan.

Work Package 3:
Sustainable intensification of farming systems for climate-resilient reduction of yield gaps



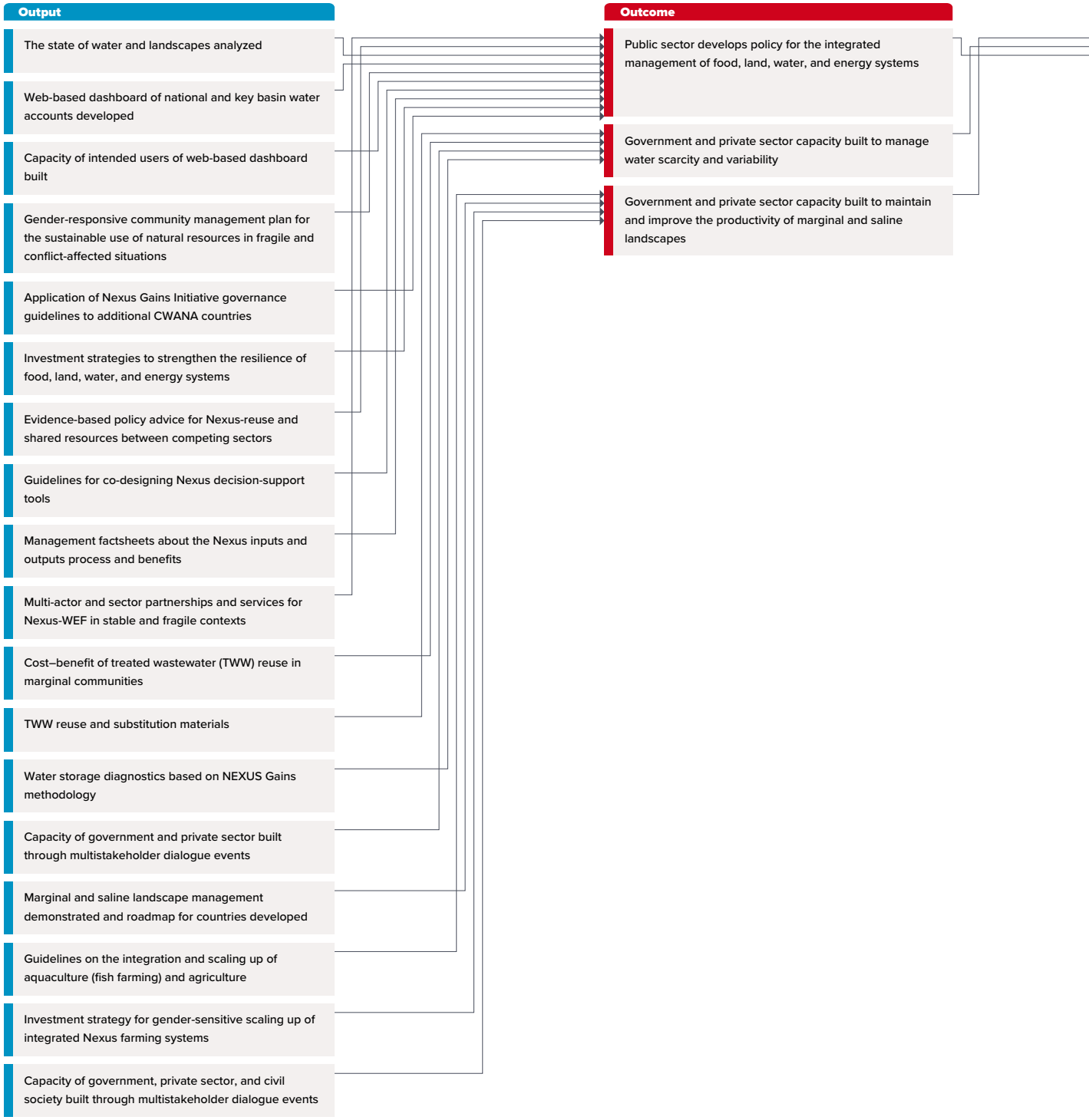


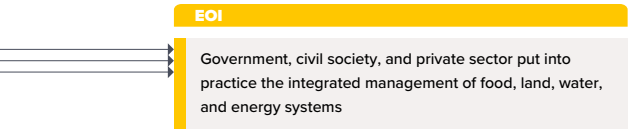
Work Package 3 progress against the theory of change

Collaborative research trials on Genotype x Environment x Management were set up at the NIPs in Egypt, Lebanon Morocco, Sudan, and Uzbekistan to help develop bundled agronomic solutions and inform crop breeding strategies to sustainably bridge wheat-based yield gaps. The mapping of climate, soil, water, and vegetation using real-time geospatial information to help develop location-specific guidelines for agricultural practices, policies, and strategies was completed for Morocco, Egypt, and Uzbekistan and is under way for Sudan and Lebanon. The 7th International Workshop for Farming Systems Design was held in Morocco with support from Fragility to Resilience in CWANA. Online advanced training courses in conservation agriculture in Mediterranean environments and weed management were held.

Journal articles, reports, and posters were published on conservation agriculture and practices of no-tillage and nitrogen fertilization, relay intercropping, crop diversification and increased farm resilience, managing salinity, mechanization, and flexible grazing strategies, in collaboration with **Excellence in Agronomy** and **Livestock and Climate**. Initiative scientists were invited to events to speak on dryland farming, soil health, and sustainable intensification at external events in Turkey and Saudi Arabia. Decision Support System for Agrotechnology Transfer (DSSAT) and Agricultural Production Systems Simulator (APSIM) models for crop growth, development, and yield formation as a function of biophysical factors were calibrated and validated for major crops and cropping systems of wheat, barley, chickpea, and lentil in Morocco, and rice, wheat, and cotton in Uzbekistan. An overview of the current status of farm mechanization and government policy around this in Uzbekistan was produced. Guidelines on the minimum dataset required from agronomic field trials were produced. A combined stakeholder consultation and training event was held in Egypt with regional NARES staff to identify research gaps and build their capacity to conduct agronomic research, including how to use scientific equipment and manage data, and how to apply single and bundled solutions to sustainably bridge yield gaps.

Work Package 4:
Integrated food, land, water, and energy systems for climate-resilient landscapes

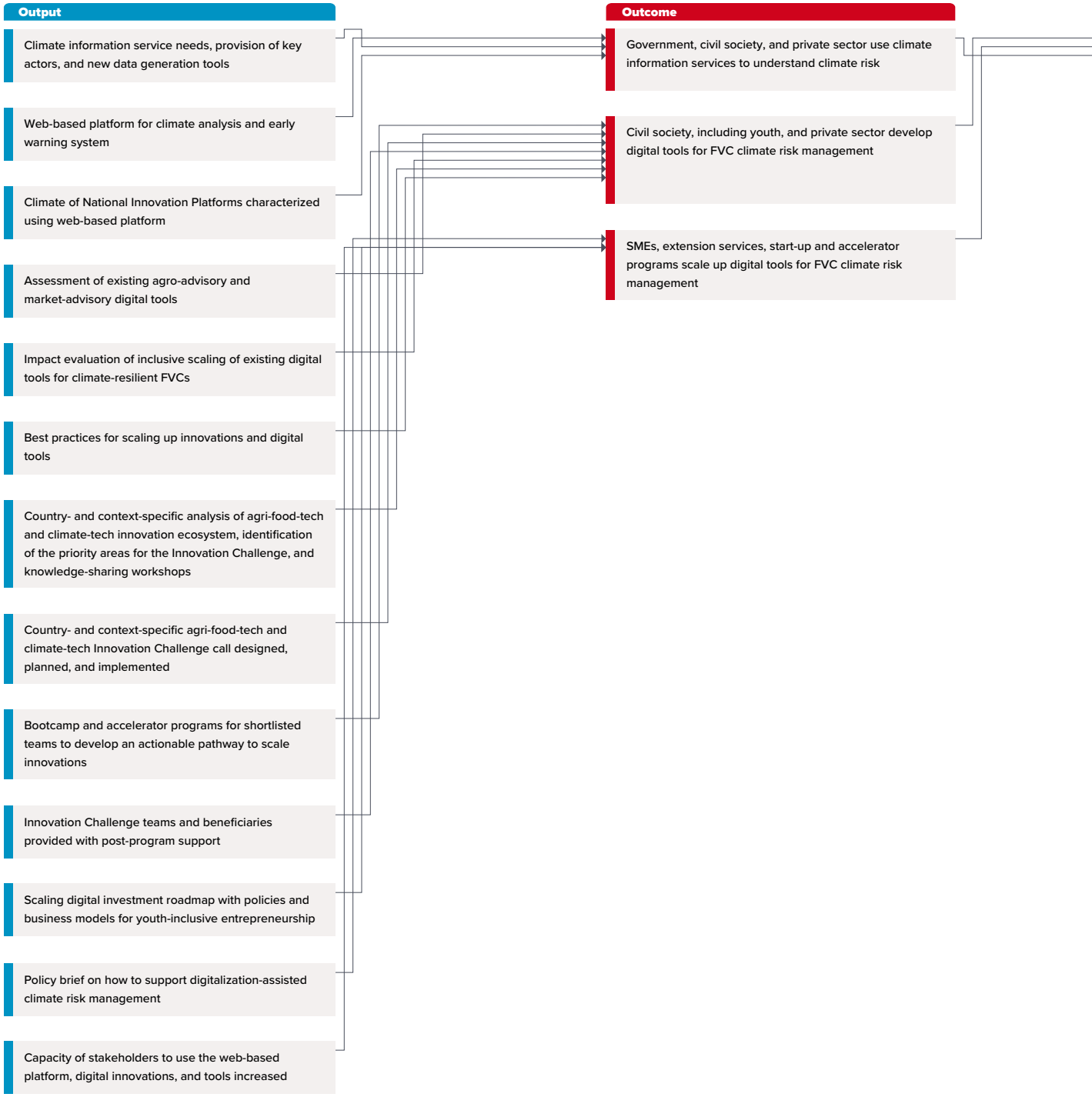


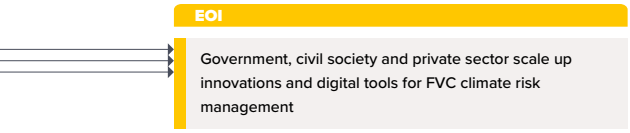


Work Package 4 progress against the theory of change

Initiative scientists engaged with the topics of food security in the MENA region, climate security, and COP27 in Egypt, through participation in opinion pieces, blogs, podcasts, LinkedIn, and TV interviews. Journal articles and reports were published on African perspectives on climate change research, a new index on agricultural land greenhouse gas emissions in Africa, assessment of crop evapotranspiration and deep percolation in irrigated citrus orchards, better preparedness of Mediterranean rainfed agricultural systems to climate-change-induced water stress, and the water–agriculture–energy nexus in Central Asia through the lens of climate change. Water sector partners linked to the Souss Massa basin in Morocco, the Karshi basin in Uzbekistan, Egypt, Lebanon, Sudan, and Jordan were engaged in a three-day regional Water Accounting Plus training. The Moroccan partners were engaged in the co-design and development of the Souss Massa Basin Water Accounting Dashboard, as well as in a national dialogue to investigate the cost-benefit analysis, investment options, and the different funding possibilities of wastewater treatment and reuse for various consumptive and non-consumptive purposes in marginal communities in Morocco. A working group meeting and a subsequent science-policy dialogue in Egypt brought key partners and stakeholders together to identify practices and technologies to maintain or improve the productivity of crops grown in saline landscapes across Egypt, and to ultimately develop a new and innovative strategy to reduce the cascading negative impacts of crop irrigation on land and water quality. Two expert consultation workshops on Integrated Agriculture-Aquaculture Systems in Egypt, and the prospects for their scaling to new sites, were held. An inventory of sustainable land management practices for marginal landscapes in Uzbekistan, with a focus on water harvesting and storage, was compiled and the practices were mapped to the areas where they are most suitable. Partners linked to the Bouregreg watershed in Morocco and the Karshi watershed in Uzbekistan, were engaged in analyzing the fragility of the natural resources by applying the water–energy–land–food–fragility nexus approach.

Work Package 5:
Scaling innovation and digital tools for climate-resilient food value chains





Work Package 5 progress against the theory of change

A consultative workshop on the role of climate information data for climate risk management was held in Uzbekistan to better understand the needs of stakeholders and to demonstrate the beta version of the climate risk assessment tool. The web-based innovation "satellite-based regional scale climate data extractor for CWANA" was developed to provide easy access to climate data in the countries of Morocco, Egypt, Sudan, Lebanon, and Uzbekistan and was released as a demo version for further testing and feedback during country consultation meetings. A survey of farms in Kazakhstan and Uzbekistan to elaborate on the determinants and impact of farmers' participation in social media groups took place and a discussion paper and policy brief is being prepared. A review of digital apps to support smallholder farmers in Egypt, Morocco, and Uzbekistan is currently being undertaken to assess and describe the landscape of digital tools in the three countries. The repository of the digital applications are currently hosted and publicly available through the International Food Policy Research Institute (IFPRI) website. The AgriTech4Morocco Innovation Challenge Call was designed based on a needs assessment of the agriculture and food sector, an innovation ecosystem assessment, and in alignment with the national Generation Green 2020–2030 strategy. The call was launched with a website, a blog, an online kick-off event, and a Q&A. A bootcamp and pitch day was held over three days in Morocco with 20 teams and numerous mentors. A nine-week-long online Acceleration Program was attended by 10 teams and numerous mentors. A demo day marked the end of the program along with the selection of three winning innovations, with ongoing support provided to the winning teams. The concept of the AgriFoodTech and ClimateTech innovation challenges to build the capacity of the innovators — often youth, often women — to accelerate the development and scaling of their science-based innovations is itself an innovation in capacity building and the model will be applied to Uzbekistan in 2023. Work began on this in 2022 with a consultation workshop with key stakeholders to deep-dive into the innovation ecosystem of Uzbekistan. In Egypt, a national workshop and stakeholder consultation brought together a diverse set of stakeholders to discuss the potential for the digital transformation of the Egyptian agricultural sector.

Work Package progress rating

WORK PACKAGE	TRAFFIC LIGHT / RATIONALE	
1		Work Package 1 annual progress largely aligns with the Plan of Results and Budget and the Work Package theory of change. Some stakeholder workshops around the formation of the NAS were delayed until 2023 due to the difficulties of finding a suitable time for all the identified stakeholders.
2		Work Package 2 annual progress largely aligns with the Plan of Results and Budget and the Work Package theory of change. The potato seed system work in Uzbekistan was delayed but will be implemented in 2023 once the hosting agreement between CIP and ICARDA is finalized and staff are hired to do this work.
3		Work Package 3 annual progress largely aligns with the Plan of Results and Budget and the Work Package theory of change in all areas. In all five countries, ICARDA has country offices and has good networking with national partners and scientists. Tireless efforts by the scientists, good collaboration with key stakeholders, and timely hiring of consultants made it possible. Of the two Centers working in Work Package 3, CIMMYT was unable to hire the necessary staff during 2022 and therefore did not contribute to the submitted results.
4		Work Package 4 annual progress largely aligns with the Plan of Results and Budget and the Work Package theory of change. All activities were well co-designed, coordinated, and co-implemented with the national partners and stakeholders from all countries. Minor delays in implementation were experienced in Lebanon and Sudan related to internal partner capacity and capability to operate within the currently fragile and constantly changing political and economic situation of those countries.
5		Work Package 5 annual progress largely aligns with the Plan of Results and Budget and the Work Package theory of change. All activities were well co-designed, coordinated, and co-implemented with the national partners and stakeholders from all countries. The presence of the Centers in the different CWANA countries provides strengths to reach the final user of the product, tools, approaches, and technologies.

KEY		
On track		• Annual 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 jeopardise success of Work Package
Delayed		• Annual progress slightly falls behind Plan of Results and Budget and Work Package theory of change in key areas • Deviations/issues/delays/risks could jeopardise success of Work Package if not managed appropriately
Off track		• Annual progress clearly falls behind Plan of Results and Budget and Work Package theory of change in most/all areas • Deviations/issues/delays/risks do jeopardise success of Work Package

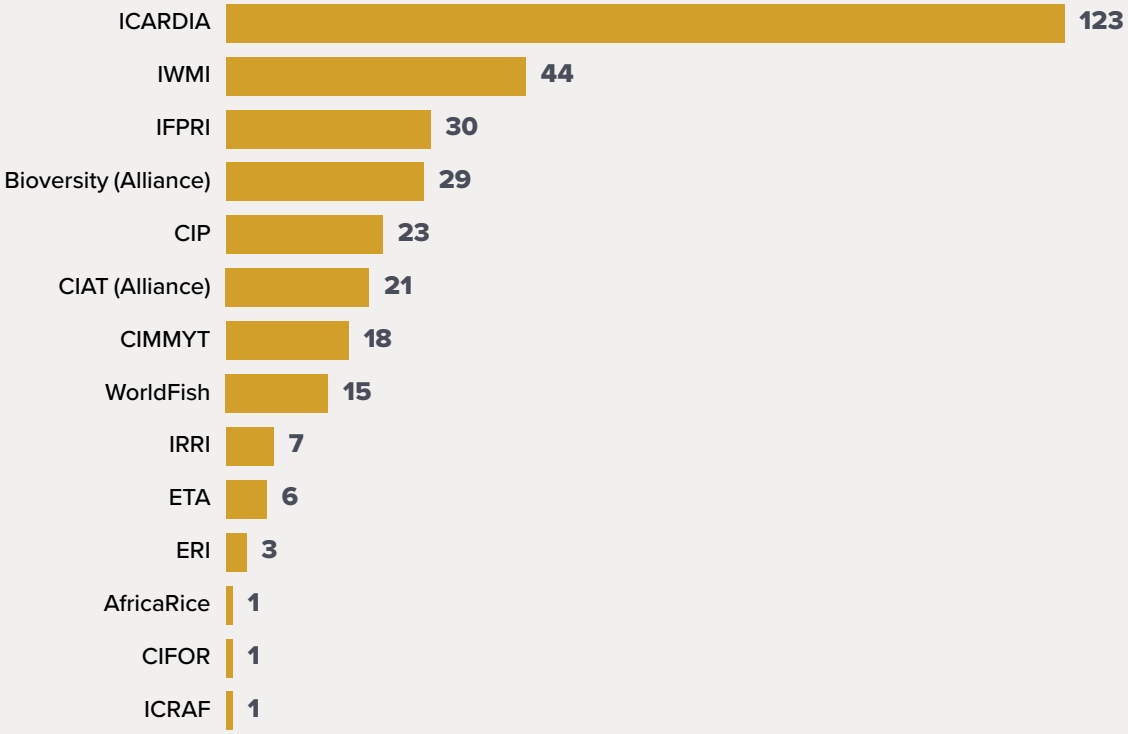
Section 4 Initiative key results

This section provides an overview of 2022 results reported by Fragility to Resilience in Central and West Asia and North Africa Initiative. These results align with the CGIAR Results Framework and Fragility to Resilience in Central and West Asia and North Africa Initiative's theory of change. Further information on these results is available through the CGIAR Results Dashboard.

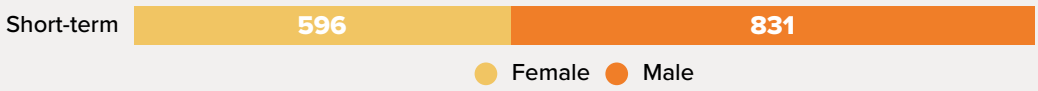
Overview

Results	Outputs				
173	9 SDGs	26 Capacity sharing for development	32 Innovation development	91 Knowledge products	23 Other outputs

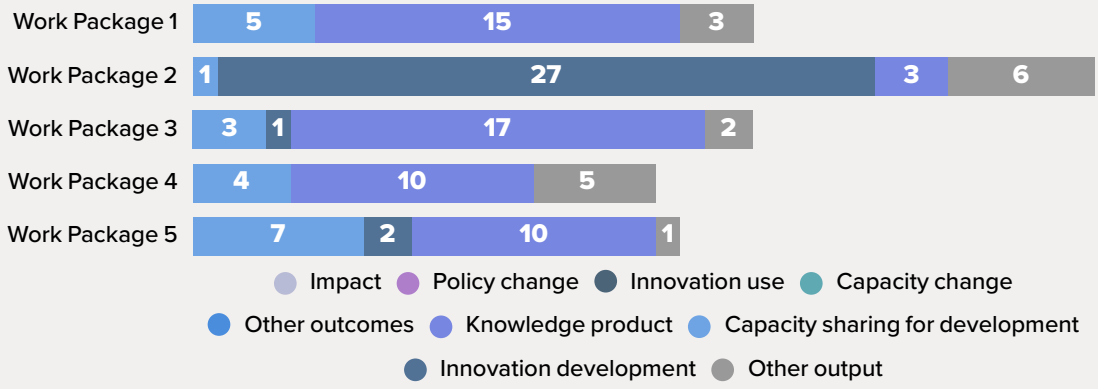
Contributing CGIAR Centers



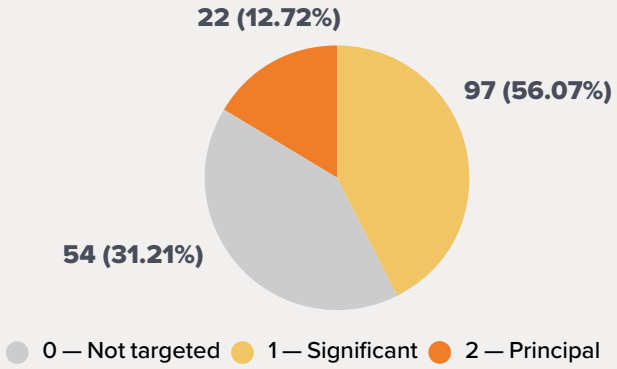
Capacity development trainees by term



Results by Work Package



Results by climate change tag

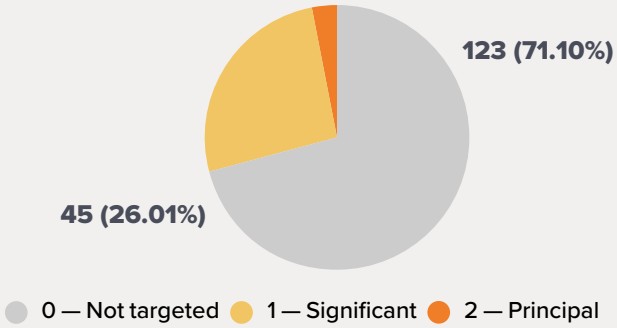


0 = Not targeted: The activity does not target climate mitigation, adaptation, and climate policy goals of the CGIAR as put forward in its strategy.

1 = Significant: The activity contributes in significant ways to either one 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.

2 = Principal: The activity is principally about meeting either one of the three CGIAR climate-related strategy objectives — namely, climate mitigation, climate adaptation, and climate policy, and would not have been undertaken without these objectives.

Results by gender tag

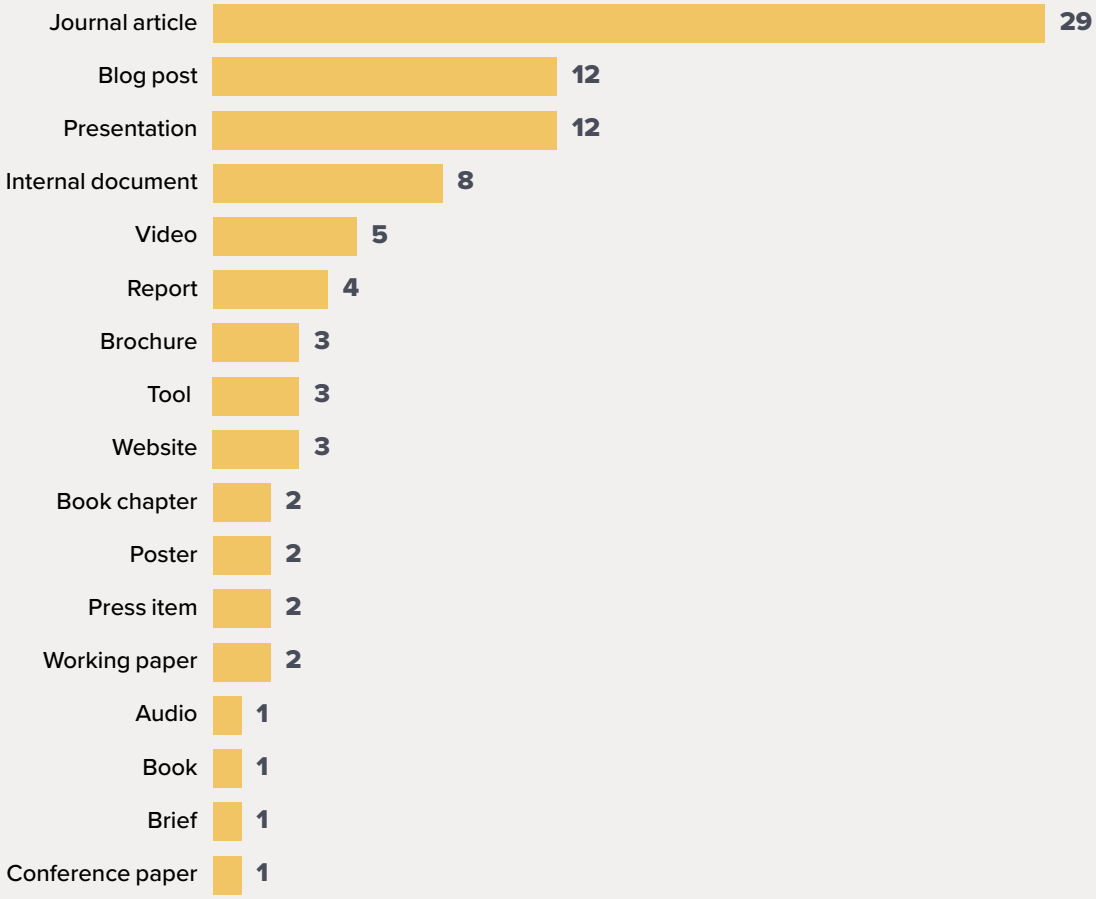


0 = Not targeted: The activity/result does not target gender equality.

1 = Significant: The activity/result contributes in significant ways to gender equality, even though it is not the principal focus of the activity.

2 = Principal: Gender equality is the main objective of the activity/result and is fundamental in its design and expected results.

Knowledge products by category



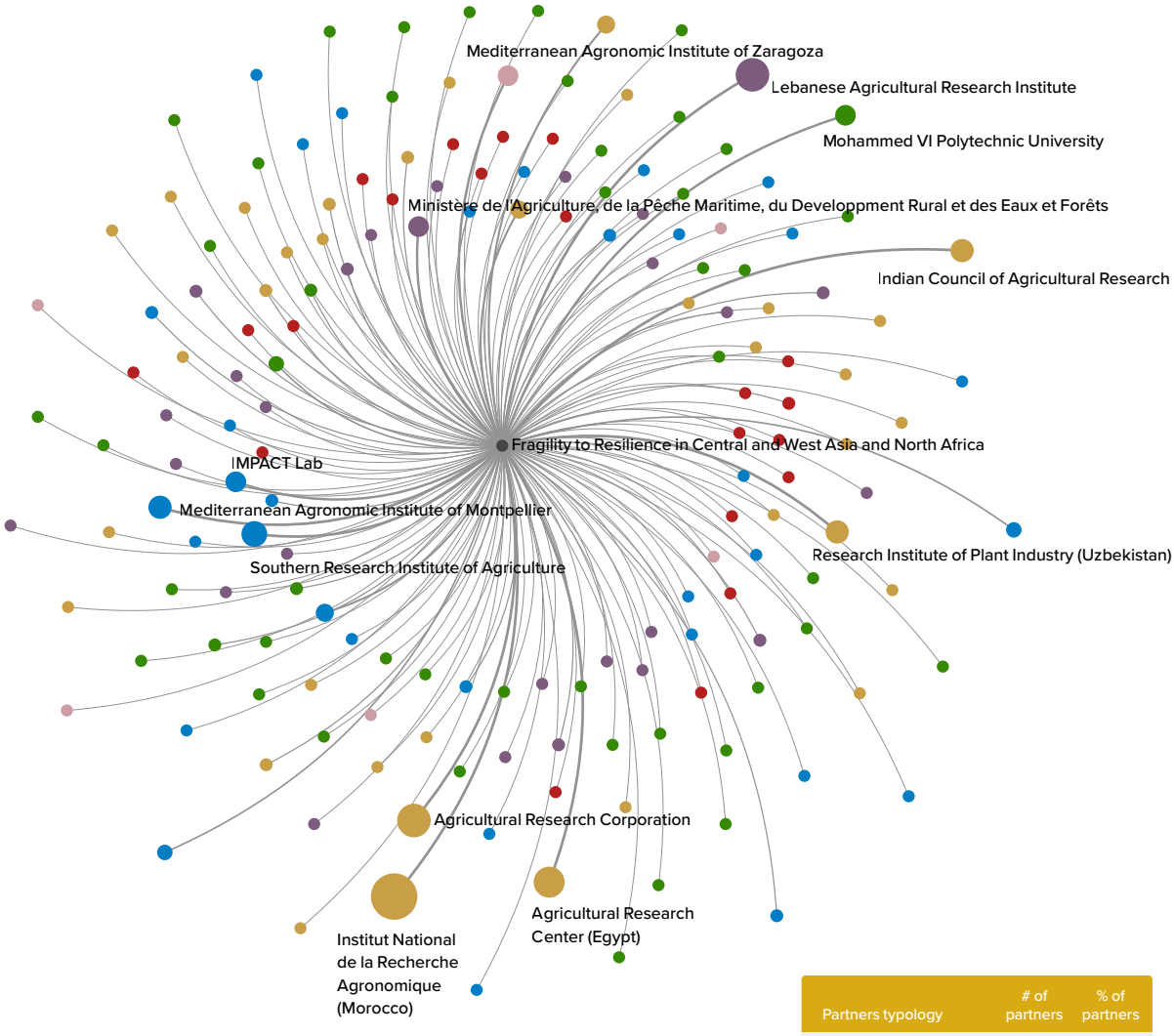
Innovations by readiness level

Pipeline overview
Number of innovations

9	PROVEN INNOVATION – The innovation is validated for its ability to achieve a specific impact under uncontrolled conditions	1
8	UNCONTROLLED TESTING – The innovation is being tested for its ability to achieve a specific impact under uncontrolled conditions	3
7	PROTOTYPE – The innovation is validated for its ability to achieve a specific impact under semi-controlled conditions	1
6	SEMI-CONTROLLED TESTING – The innovation is being tested for its ability to achieve a specific impact under semi-controlled conditions	0
5	MODEL/EARLY PROTOTYPE – The innovation is validated for its ability to achieve a specific impact under fully-controlled conditions	0
4	CONTROLLED TESTING – The innovation is being tested for its ability to achieve a specific impact under fully-controlled conditions	27
3	PROOF OF CONCEPT – The innovation's key concepts have been validated for their ability to achieve a specific impact	0
2	FORMULATION – The innovation's key concepts are being formulated or designed	0
1	BASIC RESEARCH – The innovation's basic principles are being researched for their ability to achieve a specific impact	0
0	IDEA – The innovation is at idea stage	0

Top 20 contributing external partners

Section 5 Impact pathway integration – External partners



Partners typology	# of partners	% of partners
Research organizations and universities (National)	46	27.2%
Research O&U (NARS)	36	21.3%
Government (National)	27	16.0%
Private company (other than financial)	21	12.4%
Research O&U Intl. (General)	6	3.6%
All Other Categories	33	19.5%

Top five institution types

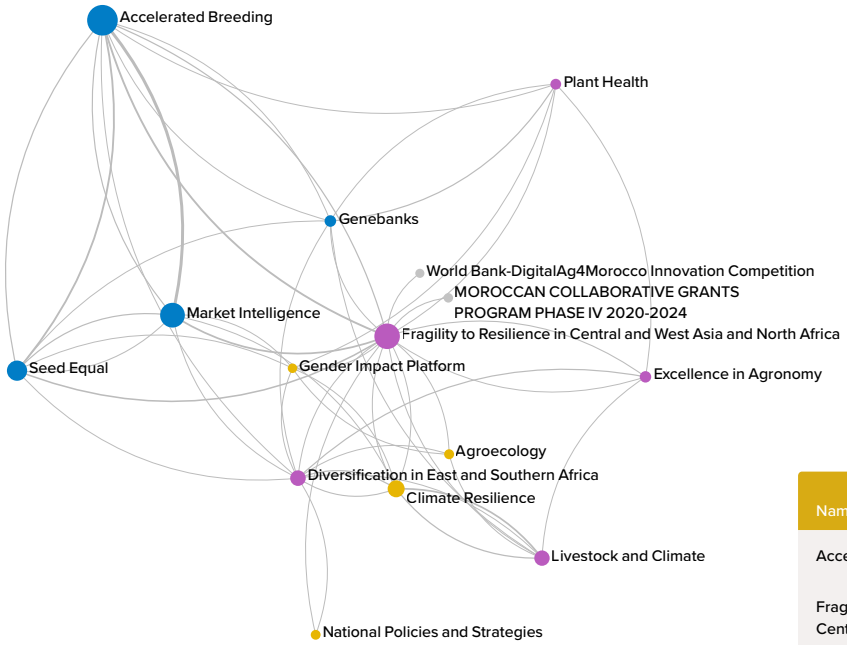
All other categories · Government (National) · Not applicable · Private company (other than financial) · Research O&U Intl. (General) · Research O&U (NARS) · Research O&U (National) (Universities)

Note: CGIAR Centres are excluded from the analysis. Partners and edges are sized by the number of results. Labels are shown for the partners involved in the most results.

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

Fragility to Resilience in CWANA collaborated on 173 results with a total of 213 partners across knowledge products (105 partners), other outputs (68 partners), capacity sharing for development (48 partners), and innovation development (19 partners). NARES from the five target countries were our most common partners being involved across all work packages and output types — especially Institut National de la Recherche Agronomique (INRA, Morocco), Agricultural Research Center (ARC, Egypt), Agricultural Research Corporation (ARC, Sudan), Lebanese Agricultural Research Institute (LARI, Lebanon), and Southern Research Institute of Agriculture (SRIA, Uzbekistan). These NARES are stalwart collaborators of CGIAR and were heavily involved in the design and now the implementation of the Initiative. The Moroccan universities Mohammed VI Polytechnic University, Hassan II University of Casablanca, and Mohammed V University were common partners on knowledge products and in capacity development and stakeholder consultations. The donors, FAO, the World Bank, GIZ, the European Commission, and United Nations Development Programme were common partners involved in capacity development and stakeholder consultations. The Agritech4Morocco Challenge Call brought together a unique mix of partners, stakeholders, and beneficiaries from national and international private companies, including innovation accelerators and innovation development teams, financial institutions, other organizations, and NGOs, in addition to CGIAR, government, research organizations, and university partners.

Section 6 Impact pathway integration – CGIAR portfolio linkages



Name	Action Area	Total connections	Total results
Accelerated Breeding	GI	10	191
Fragility to Resilience in Cent. & W. Asia and N. Africa	RAFS	27	158
Market Intelligence	GI	8	140
Seed Equal	GI	8	101
Climate Resilience	GI	8	73

Action Area

Genetic Innovation · Non-pooled projects · RAFS · Systems Transformation

Note: Initiatives, non-pooled projects, and the connections are sized by the number of results. The table includes the given initiative's top connections and is sorted by Total Results. The network and summary table include all connections for the given initiative, as well as the connections between the given initiative's connections (i.e. the ego network)

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

To progress toward developing strategies and policies to create more efficient, inclusive, and resilient national agrifood systems (EOI outcome 1), we worked with **National Policies and Strategies**, **Climate Resilience**, and the Gender Platform on the regional application of the global issues of the food crises caused by the Russian invasion of Ukraine, COP27, climate change and security, and gender equality. To progress toward governments supporting and facilitating the use of best bet genetic innovations developed for the CWANA region (EOI outcome 2), we worked with **Accelerated Breeding**, **Genebanks**, **Market Intelligence**, and **Seed Equal** on operationalizing this work in the region through our interaction with national partners, work toward forming NASs, and the evaluation, demonstration, and dissemination of genetic innovations at the NIPs in the five countries. We worked with **Livestock and Climate** and **Sustainable Animal Productivity** on the promotion and scaling of cactus pear as a climate-resilient crop that serves the needs of people and livestock. To progress toward governments supporting and facilitating the on-farm and ex-situ conservation of agrobiodiversity in the CWANA region (EOI outcome 3), we worked with **Genebanks** to train regional NARES on the conservation management of plant genetic resources. To progress toward the scaling up of bundled solutions to decompose yield gaps (EOI outcome 4), we worked with **Excellence in Agronomy** on mapping natural resources, calibrating crop growth and climate change models, conservation agriculture in the two countries of

Morocco and Egypt, which also serve as use cases for Excellence in Agronomy, and the digital transformation of Egyptian agriculture and to scaling up innovations and digital tools for FVC climate risk management (EOI outcome 6). Under EOI outcome 6, we worked with **Climate Resilience** on the climate data for the CWANA web-app. To progress toward putting into practice the integrated management of food, land, water, and energy systems (EOI outcome 5), we worked with **Agroecology** on sharing knowledge of integrated agriculture and aquaculture systems between countries. Collaboration with other Initiatives and Platforms has worked best when there is a clear complementarity of outputs in the same country of implementation and the same people working on both, and when Fragility to Resilience in CWANA participates in the development, delivery, and scaling of the global Initiative innovations to the countries and partners we are working with across the region.

A farmer preparing his land for cultivation, Egypt.
Photo credit: Maheshi Adams/IWMI

Section 7 Adaptive management

RECOMMENDATION	SUPPORTING RATIONALE
To hold a monthly online meeting open to all Fragility to Resilience in CWANA and interested colleagues where information can be shared and areas of work discussed in detail with a wider audience.	This will facilitate better communication and knowledge sharing between Fragility to Resilience in CWANA Work Packages and help to ensure cohesion and ongoing alignment to the theory of change. Ultimately, all Work Packages will be connected to one another through the evaluation of innovations at the National Innovation Platforms and by the National Alliance(s) of Stakeholders.
To assess CGIAR activity in the 31 countries of the CWANA region and develop a process for maintaining engagement between all CGIAR stakeholders with an interest in the region.	This will facilitate better communication and knowledge sharing between the Regional Director CWANA, the Fragility to Resilience in CWANA Regional Integrated Initiative, and with Initiatives, Centers, and bilateral projects working in any of the countries in Central and West Asia and North Africa to ensure we maintain an up-to-date awareness of CGIAR activity in the region, link our theories of change where applicable, and help to bring innovations across the entire CGIAR portfolio to scaling readiness.
To assess and revise the Fragility to Resilience in CWANA theory of change considering budget reductions since the original proposal was developed.	This will ensure that we purposefully apply ourselves to the areas of work where outputs, outcomes, and impact can best be achieved with the available resources (financial, human, administrative, technological, etc.).
To hire more scientists with expertise in gender transformative research.	This will increase the dedicated gender expertise in the Initiative from the current number of one scientist and ensure that more gender research can be done across the countries and theory of change, including the implementation of the Gender and Climate strategy for CWANA. This will lead to a higher likelihood of achieving gender-transformative outcomes and impact in a region where gender inequality is high.

Section 8 Key result story

Twenty innovation teams gathered for the AgriTech4Morocco Innovation Challenge three-day capacity development training bootcamp in Meknes, a prime agriculture region of the country.

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

Agri-tech innovations can be powerful vehicles to transform the agriculture industry from a net contributor to climate change to a solution; however, these often get stuck in the commercialization process due to the perceived risk involved. The AgriTech4Morocco Innovation Challenge trained 32 teams to accelerate their high-tech, science-based agrifood solutions by developing an actionable pathway to scale through capacity development, mentorship, and networking. This project was led by the Accelerate for Impact Platform of the Alliance of Bioversity International and CIAT and national partners in Morocco, within the CGIAR Research Initiative on Fragility to Resilience in CWANA.

Agrifood tech innovations are powerful forces for good to transform global agrifood systems and revert the trajectory of the planet's climate. For this to happen, supportive public policy and government involvement are particularly salient to bear the risks of early-stage solutions that the private sector will not. Research from the Organization for Economic Co-operation and Development (OECD) highlights that beyond promoting investment, the public sector plays a major role in creating policy incentives and in the setting of regulatory frameworks for these innovations to scale.

CGIAR, through the Accelerate for Impact Platform of the Alliance of Bioversity International and CIAT and CGIAR Research Initiative Fragility to Resilience in CWANA, are working to create stronger networks between scientists, innovators, and support ecosystem players to ensure science-driven technologies and research advances are scaled past the laboratory and brought to market.

The Accelerate for Impact Platform supports innovators to create optimal impact and overcome roadblocks in the commercialization and scaling processes that are areas of chief concern for them. In doing so, the Accelerate for Impact Platform strives to facilitate the uptake of new technologies and durable solutions amongst value chain actors and intended beneficiaries.

The Accelerate for Impact Platform joined forces with CGIAR Centers with "boots on the ground" in Morocco to support country and regional efforts to foster collaborations with stakeholders operating in the innovation space. As part of Fragility to Resilience in CWANA, it co-designed and implemented the AgriTech4Morocco Innovation Challenge for impact-driven entrepreneurs with agrifood tech solutions in the early stage that can make agriculture in Morocco more efficient, resilient, and greener, while aligning with the goals of the Generation Green 2020–2030 Strategy[1]. The Initiative set out to provide technical assistance, mentoring, and business training to build sustainable business models, strengthen the scientific capacity, and better align with investor expectations.

The AgriTech4Morocco Innovation Challenge attracted 350+ submissions from talented entrepreneurs representing 31 countries, all with solutions applicable to the context of Morocco. After a rigorous selection process, 20 teams, including 32 purpose-driven entrepreneurs, were admitted to the bootcamp phase, where they received training in design thinking, user-centered design, how to conduct participatory evaluation from customers during pilots, and how to successfully pitch their business idea to investors. The nine-week acceleration program that followed involved 10 teams, representing five countries. The program was designed to help these teams test, validate, and adopt their innovations for positive impact, with a focus on developing an actionable pathway to scale and strengthening the scientific validity of their solutions. It adopted a mixed delivery mode, through 30+ hours of workshops, expert talks, and science sessions, 90 hours of one-on-one mentoring, and a blended learning approach that combined business-oriented training and scientific technical assistance from 12 CGIAR researchers. The Accelerate for Impact Platform matched teams with scientists with relevant expertise in Impact Areas to innovators who offered individualized technical assistance and support with regards to the technological development and scientific component of their project. The demo day marked the conclusion of the AgriTech4Morocco Innovation Challenge and the announcement of its three winners. These startups, two of which are women-led, represent three countries. This event offered teams a global platform to pitch their solutions to an audience of ministry agents, scientists, industry players, and investors.

The Accelerate for Impact Platform and the accelerator provided flexible, on-demand post-acceleration support for winners, ensuring that they could continue reaping the benefits of the acceleration program in terms of visibility, fundraising, and networks. The AgriTech4Morocco Innovation Challenge supported winners to leverage capacity building and partnerships established throughout the program for securing up to $1 million in seed funding, accessing new markets, and expanding their client portfolio.

The AgriTech4Morocco Innovation Challenge demonstrated the potential of innovation to offer concrete solutions to address the interwoven challenges of cutting emissions, increasing yields and quality, and protecting business viability. The next step in impact is to incentivize farmers and other value chain actors in the country to adopt these affordable and durable tech solutions that may incur short-term costs but provide significant long-term benefits.

1 Génération Green 2020-2030, Ministère de l'agriculture

“The capacity-building framework of the acceleration program helped us refine our business model, connect with ecosystem players, and strengthen the scientific validity of our innovation. Building bridges between science and entrepreneurship is fundamental to tackling inefficiencies in food systems. Through CGIAR A4IP, we can benefit from world-class scientists’ technical assistance.”

Benjamin Rombaut, Co-founder and CEO, Sand to Green (AgriTech4Morocco Innovation Challenge winner)

LINKS TO IMPACT AREAS

Primary Impact Area:

Other relevant Impact Area(s):

Which collective global targets for the relevant Impact Area(s) from the CGIAR 2030 Research and Innovation Strategy does the key result contribute to?

- Equip 500 million small-scale producers to be more resilient to climate shocks, with climate adaptation solutions available through national innovation systems.
- Offer rewardable opportunities to 267 million young people who are not in employment, education, or training.

GEOGRAPHIC SCOPE

Region: Central and West Asia and North Africa
Country: Morocco

LINK TO CGIAR RESEARCH PROGRAMS

None

KEY CONTRIBUTORS

Contributing Initiative(s): Fragility to Resilience in Central and West Asia and North Africa
Contributing Center(s): The Alliance of Bioversity International and CIAT, ICARDA, IFPRI, ILRI
Contributing external partner(s): The World Bank; Digital Development Partnership; IMPACT Lab; Ministère de l'Agriculture, de la Pêche Maritime, du Developpment Rural et des Eaux et Forêts (MAPMDREF); Le Pôle d'Agriculture Digitale; Jumia; Deutsche Gesellschaft für Internationale Zusammenarbeit / German Society for International Cooperation (GIZ); Agripole Innovation Meknès; Adaptation of African Agriculture Initiative; Les Domaines Agricoles; The World Vegetable Center (AVRDC); Sync; Stenon GmbH; International Chamber of Commerce; Well Advised Co; Dentons; Sida Collective Consulting.
Does this key result build on work or previous results from one or more CRPs? No

We would like to thank all funders who supported this research through their contributions to the CGIAR Trust Fund.

COVER PHOTO: Wheat breeder in a field of wheat in Algeria.
Photo credit: ICARDA