



From Fragility to Resilience in Central and West Asia and North Africa (F2R-CWANA)

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Proposal

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Contents

Summary table	3
1. General information	3
2. Context	4
2.1 Challenge statement	4
2.2 Measurable 3-year (end-of-Initiative) outcomes	4
2.3 Learning from prior evaluations and impact assessments (IA)	5
2.4 Priority-setting	5
2.5 Comparative advantage	7
2.6 Participatory design process	7
2.7 Projection of benefits	8
3. Research plans and associated theories of change (TOC)	12
3.1 Full Initiative Research Plans and TOC	12
3.2 Work Packages research plans and TOCs	14
3.2.1 Work package 1 research plans and TOC	14
3.2.2 Work package 2 research plans and TOC	18
3.2.3 Work package 3 research plans and TOC	22
3.2.4 Work package 4 research plans and TOC	26
3.2.5 Work package 5 research plans and TOC	31
4. Innovation Packages and Scaling Readiness Plan	35
4.1 Innovation Packages and Scaling Readiness Plan	35
5. Impact statements	36
5.1 Nutrition, health and food security	36
5.2 Poverty reduction, livelihoods and jobs	37
5.3 Gender equality, youth and social inclusion	38
5.4 Climate adaptation and mitigation	39
5.5 Environmental health and biodiversity	40
6. Monitoring, evaluation, learning and impact assessment (MELIA)	41
6.1 Result framework	41
6.2 MELIA plan	65
6.3 Planned MELIA studies and activities	66
7. Management plan and risk assessment	68
7.1 Management plan	68
7.2 Summary management plan Gantt table	69
7.3 Risk assessment	71

8. Policy compliance, and oversight	72
8.1 Research governance.....	72
8.2 Open and FAIR data assets	72
9. Human resources	73
9.1 Initiative team.....	73
9.2 Gender, diversity and inclusion in the workplace.....	75
9.3 Capacity development	75
10. Financial resources	76
10.1 Budget	76
10.1.1: Activity breakdown	76

A list of acronyms used in this Proposal can be found [here](#)

Summary table

Initiative name	From Fragility to Resilience in Central and West Asia and North Africa (F2R-CWANA)
Primary Action Area	Resilient Agrifood Systems
Geographic scope	1-Central and West Asia and North Africa (CWANA): EG-Egypt, LB-Lebanon, MA-Morocco, UZ-Uzbekistan, SU-Sudan
Budget	US\$30,000,000

1. General information

Initiative name:	From Fragility to Resilience in Central and West Asia and North Africa (F2R-CWANA)
Primary CGIAR Action Area:	Resilient Agrifood Systems
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2. Context

2.1 Challenge statement

The Intergovernmental Panel on Climate Change (IPCC) Working Group 1 Report (2021)¹ provides clear scientific evidence that the CWANA region is a climate hotspot with increased drying and warming over the last few decades, and prediction that these trends will intensify and increase in frequency in the next. These climatic effects will bring limits to current rainfed agriculture systems, leading to a reduction in the profitability of the farms, an increase in water scarcity, depletion of biodiversity, and accelerated land degradation. The climate adaptation and mitigation challenges identified in the Nationally Determined Contribution reports of the countries of CWANA all highlight that agriculture and water are their key vulnerabilities. The impacts of climate change, already experienced in all the countries, combined with the ongoing fast rate of demographic change, over-urbanization, gender inequality, high unemployment and tendency towards out migration suggest that a perfect storm is brewing on the horizon for the CWANA region.

Rainfall variability is a key concern as rainfed agroecosystems constitute the main source of staple food (cereals and tubers) and proteins (food legumes and animal protein). Overuse of the soil resources combined with frequent droughts are promoting the advancement of desertification and loss of biodiversity, which in turn are prompting competition for land. At the same time, all water systems are already critically stressed for local communities and limiting opportunities to diversify incomes. Competition for water resources is increasing and water quality is a growing concern, especially salinity. Meanwhile, as high-unemployment and rural-urban migration rates of the youth in CWANA increase, fueled by limits to economic opportunities, increased conflict and instability and religious extremism, a perpetual cycle of vulnerability and inequality has asserted itself. One consequence has been the increased “feminization of agriculture”, with women comprising more than half the agricultural labor force today.

The “*From Fragility to Resilience in Central and West Asia and North Africa (F2R-CWANA)*” Initiative will aim at building resilient agrifood systems in the region, primed to withstand the effects of climate change and generate better livelihoods for rural communities. At its core, this Initiative will serve to provide options for climate adaptation and mitigation that respond to, and are effective for, smallholder farmers in CWANA with a view to scaling up and out the best bet solutions. It recognizes the unique biodiversity richness of this center of origin of many species, and it shall promote its conservation of soil, ecology and water resources *in situ* and *ex situ*. It is aware of the complex political interactions between countries in the region, and it shall bridge borders to bring forth technologies that are widely deployable.

2.2 Measurable 3-year (end-of-Initiative) outcomes

EoIO 1 Government, civil society, private sector and INGOs work together to create efficient, inclusive and resilient national agrifood systems.

EoIO 2 Farmers use Best Bet Genetic Innovations developed for CWANA.

¹ IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf

EoIO 3 Farmers adopt best practices for the on-farm conservation of agrobiodiversity.

EoIO 4 Government, civil society and private sector work together to scale up bundled solutions to bridge yield gaps.

EoIO 5 Government, civil society and private sector practice the integrated management of food, land, water and energy systems.

EoIO 6 Government, civil society and private sector scale up innovations and digital tools for food value chain climate risk management.

2.3 Learning from prior evaluations and impact assessments (IA)

F2R-CWANA has learned and assimilated the following lessons from external evaluations of CGIAR-managed Agrifood Systems Projects and Platforms:

We learnt from CRP-PIM that enhancing capacity of researchers and organizations can come through policy outcomes and innovations (*what*) and key factors that enable or constrain results (*how*). Building on this, WP1 will bring together National Alliances of Stakeholders and Innovation Platforms as key drivers for agrifood system transformation.

WP2 capitalizes on work from WHEAT, GLDC, A4NH, LIVESTOCK, GLDC and RTB noting that wheat and legumes are critical for farming system diversification, intensification and sustainable production. They support food and nutrition security to fill nutritional gaps in CWANA farming systems to build sustainable systems for the future climate change scenarios and address critical biofortification targets within crop-livestock farming systems.

Meanwhile WHEAT and WLE informed WP3 with a diverse approach to water, land and environment management, positioning wheat as a dominant crop in the region critical to build sustainable systems for current and future climate change scenarios. F2R-CWANA notes that wheat seed systems, adoption and impact support demand creation of new varieties and scaling remain a critical element.

From WLE, WP4 integrates approaches to water, energy, land and environment identified within the SDGs and wider climate needs. For F2R-CWANA, this underpins the need to build a System-wide basis to strengthen transformational agricultural practices to maintain ecosystem services.

WP5 is key to influence future research agenda and builds on CCAFS. Examining the root causes of challenges, identifying transformative solutions, and including a broader range of levers will help to address questions of political economy, nutrition, pests and diseases, and climate security.

Cross-WP: GENE BANK critical for breeding programs in CWANA. Gennovate was a successful in GENDER identifying the central role of gender needs enabling adoption and shaping outcomes. BIG DATA will support systematization for F2R-CWANA innovations and across WPs and help to scale technologies quickly to farmers.

Annex for section 2.3 Learning from prior evaluations and impact assessments [here](#).

2.4 Priority-setting

CWANA situational prioritization: The major drivers highlighting the need for F2R-CWANA were the DryArc Initiative; the Two Degree Initiative (2DI) and the Grand MENA Challenge; the “Climate-informed priorities for One CGIAR Regional Integrated Initiatives” report; IPCC 6th Assessment Report; and the UNFSS independent dialogues.

Addressing challenges: Of the challenges in CWANA, the following will be addressed through: 1) Innovations in partnerships, policies, and platforms for the efficient, inclusive and climate resilient transformation of agrifood systems to address prohibitive issues and build robust regulation and governance systems to enable success; 2) Genetic innovations, seed systems, and agrobiodiversity conservation for climate resilient food and nutrition security to provide nutritious, climate resilient food and address agrobiodiversity loss; 3) Sustainable intensification of farming systems for climate resilient reduction of yield gaps to close the yield gaps on principal farming systems within planetary boundaries; 4) Integrated food, land, water and energy systems for climate resilient landscapes to address water use, salinization and desertification; and 5) Scaling innovations and digital tools for climate resilient food value chains to address climate risk management. These are structured to address cross-cutting issues of fragility, conflict and the empowerment of women, youth and other disadvantaged groups (e.g. displaced people) who are critical players of the present and future stability and growth of the Region.

Innovations supporting change: From available innovations and earlier CGIAR activities, research challenges were refined to support robust, methodological approaches, outputs, and desired outcomes required for F2R-CWANA transformation. From an initial list of 58 innovations, including 33 “golden eggs” originating from CRPs, nine innovations were prioritized for the Scaling Readiness Plan, based on their maturity and perceived likelihood of success to support CWANA needs. Regular engagement and contact across WP Teams and other Initiatives to identify and align with research priorities was undertaken to ensure a complementary and synergistic approach of incorporation.

Crops: CWANA hosts three Vavilovian centers of origin for many species with wheat-based- and mixed-farming systems at its current core of food and nutritional security. Additionally, lentils, chickpeas, faba bean rotation with wheat supports biofortification to fill important nutritional gaps. Legumes in farming system diversification, intensification and sustainable production for food and nutrition security is critical for future regional stability.

Countries: Critical considerations for country selection included: potential for impact based on the enabling environment (existing national strategies on food and agriculture, land, water, climate change, SDGs, women, youth, and digital adoption); existing CGIAR presence, networks, and Innovation Platforms; biodiversity, agroecology, fresh water sources, and farming system typology present at the national level and the importance and representativeness of this for the region; donor interest; and country needs (income level, challenges present, social issues, fragility/risk-resilience spectrum). Of the initial 12-country long-list, initial operating countries identified as representative of CWANA resulted in: Morocco, Egypt, Sudan, Lebanon and Uzbekistan.

Fragility risk-mitigation: Fragility-risk management is incorporated throughout F2R-CWANA to reflect the reality of the challenges present. The current events in Sudan mean that if the country is not initially accessible by the beginning of the Initiative, other options have been evaluated as potentially appropriate (Syria, Afghanistan, Yemen) of course while also taking into consideration the challenges also present in those countries.

Annex for section 2.4 Priority setting [here](#).

2.5 Comparative advantage

For F2R-CWANA, the CGIAR brings together unrivalled, system-wide, dryland expertise in research-for-development benefitting from a committed presence in CWANA since 1975². Strong partnerships exist with governments, NARS, the private sector, research centers, UN organizations (FAO, WFP, World Bank), universities regionally and globally, and international, local and civil society institutions present across the region and serving farming communities. The CGIAR has the skillset needed to address the challenges of the Region and conveying capacity ensuring the Initiative is fit-for-purpose while building on prior CGIAR projects in CWANA over the past decades.

Communities are at the center of this work taking a systemic approach from farm to region in CWANA. As core actors, smallholder farmers are critical for successful building sustainable and resilient food, land and water systems. With its CWANA experience, CGIAR will co-develop, scale and integrate improved technologies and crop varieties, support improved land and water management, diversification of production systems, climate risk management, digital solutions, capacity development, and policy initiatives that respond to needs and support future solutions unique to the region. This will be undertaken by leveraging robust relationships that integrate, adapt and bundle innovations built on accumulated knowledge and science underpinned by national alliances of stakeholders, supporting evidence-based, inclusive decision-making from farmers to governments, and accelerate the transformation to resilient agrifood systems.

Annex for section 2.5 Comparative advantage [here](#).

2.6 Participatory design process

F2R-CWANA is driven by unique challenges and opportunities presented in CWANA and technical and social capital that can be strengthened through partnerships. A core IDT (12 people across 10 CGIAR Centers and two external members from donor and private sector perspective) ensured the environmental assessment, defined research questions and built the technical proposal. Meanwhile, the extended IDT (10 people across eight CGIAR Centers and two external members from INGO and policy making), helped provided “ground truthing.”

Over 30 subject matter experts engaged as reviewers at pre-concept and full proposal stage to interrogate robustness of proposed methodology. Conversations with other IDTs were undertaken to ensure complementarity, augment impact, and identify core areas to work together to achieved joint CGIAR outcomes. These discussions underlined solutions required to address climate transformations most likely to negatively impact CWANA. The findings from the above informed additional consultations with key regional and national partners confirming demand for a coordinated regional. The Regional NARS Consultation (July 2021) led by the Regional Director helped to formally establish demand by validating challenges and integrate regional perspectives. Twenty-two countries were represented from CWANA and the GCC, with 120 stakeholders attending. A Regional Online Survey was shared with 400 key stakeholders (government, private sector, donors, SMEs, research centers, academia, technology and innovation centers) in five languages (English, French, Arabic, Russian and Georgian) across 12 countries. There were 74 respondents who validated CWANA challenges, shared existing policies/strategies and existing

² One CGIAR center (ICARDA) is headquartered in the region since its establishment in 1975 and several centers (IWMI, IFPRI, WorldFish, CIP) have a strong presence.

in-country capacity, as well as related national/regional initiatives. They also shared information on relevant donor priorities and future plans/strategies.

This survey included those countries already in the F2R-CWANA to ensure correlation across the regional agroecosystems and support country- and CGIAR-readiness for future scaling. This helped to lay the foundation for partnerships on-the-ground inception. This was complemented by ongoing interactions with 10 donors via email and bilateral follow-up to explore and ensure complementarity of priorities.

The Online Survey laid the foundation for online country consultations (Egypt, Morocco, Lebanon, and Uzbekistan)³ to confirm demand and make amendments at WP level to reflect local perspectives into research plans and partnerships. More than 200 stakeholders participated to validate proposed WP outputs and provided input on country-level priorities, sectors, innovations and partnerships. Feedback and contact lists gained during these interactions will guide start-up activities.

Country consultations have been instrumental in shaping the design of F2R-CWANA, with stakeholders confirming need for the work and expressed enthusiasm for collaborating and exchanging experiences across the region. This is confirmed via the partner support letters. This participatory engagement has initiated active stakeholder engagement for implementation of F2RCWANA and strong partnership throughout to ensure research is driven by demand and to support future uptake of recommended innovations and policies.

Annex for section 2.6 Participatory design process [here](#).

2.7 Projection of benefits

The projections below transparently estimate reasonable orders of magnitude for impacts which could arise as a result of the impact pathways set out in the Initiative's Theories of Change. F2R-CWANA *contributes* to these impact pathways, along with other partners and stakeholders.

For each impact area, projections consider breadth (numbers reached), depth (expected intensity of effect per unit) and probability (a qualitative judgement reflecting the overall degree of certainty or uncertainty that the impact pathway will lead to the projected order of magnitude of impact).

Projections will be updated during delivery to help inform iterative, evidence-driven, dynamic management by Initiatives as they maximize their potential contribution to impact. Projected benefits are not delivery targets, as impact lies beyond CGIAR's sphere of control or influence.

Breadth	Depth	Probability
Nutrition, health & food security: 3,500,000 people benefitting from relevant CGIAR innovations	Substantial ⁴	High ⁵
Poverty reduction, livelihoods & jobs: 3,500,000 people benefitting from relevant CGIAR innovations	Substantial ⁶	Medium ⁷

³ Online country consultations were undertaken for four of the five countries (Morocco, Egypt, Lebanon and Uzbekistan) but not for Sudan due to recent instability that included the cutting of internet services.

⁴ 50% permanent impact increase on income.

⁵ 50%–80% probability of achieving these impacts by 2030.

⁶ 50% permanent impact increase on income.

⁷ 30%–50% probability of achieving these impacts by 2030.

Gender equality, youth & social inclusion:		
1,600,000 women benefiting from relevant CGIAR innovations	Substantial ⁸	Medium ⁹
1,200,000 youth benefiting from relevant CGIAR innovations	Substantial ¹⁰	Medium ¹¹
Climate adaptation & mitigation:		
2,400,000 people benefiting from climate-adapted innovations	Substantial ¹²	Medium ¹³
Environmental health & biodiversity:		
5,300,000 ha under improved management	Substantial ¹⁴	Medium ¹⁵
5.75 km ³ consumptive water use	Substantial ¹⁶	High ¹⁷
1,500 plant genetic accessions available and safely duplicated	NA	High ¹⁸

Nutrition, health and food security

We estimate that F2R-CWANA and its Innovations will benefit about 3.5 million people, in the five countries of Morocco, Egypt, Lebanon, Sudan and Uzbekistan (1.4% of the predicted population of 261 million in 2030), many of whom are currently malnourished and below the poverty line. The estimated Depth of the expected benefits is conservatively estimated to be “Substantial” for all indicators and we only included Innovation Packages for which the estimated likelihood of impact is at least “Medium”. The estimates consider the expected impact of the nine Innovation included in the 4.1 Innovation Packages and Scaling Readiness Plan. They account for the direct impact of each Innovation on participating farmers and the indirect impacts that are expected on other farmers from spillover effects from the uptake of technical innovations, tools and policies¹⁹. With an assumed budget of US\$30 million over three years, we estimate that F2R-CWANA will be able to reach around 240,000 farmers and agents directly through community-based approaches, extension systems, private service providers and digital platforms at an average cost of about US\$124 per direct beneficiary. For the “Scale-appropriate Mechanization” Innovation, we assume that each participating agent will reach 200 farmers by 2030²⁰. For the other Innovations, we assume that farmer-to-farmer diffusion factor is 5 on average²¹, based on CGIAR experience with

⁸ The different needs of men and women are identified and differentially met (but the underlying process by which these differing needs are generated are not affected).

⁹ 30%–50% probability of achieving these impacts by 2030.

¹⁰ 50% permanent impact increase on income.

¹¹ 30%–50% probability of achieving these impacts by 2030.

¹² 50% permanent impact increase on income.

¹³ 30%–50% probability of achieving these impacts by 2030.

¹⁴ Where improved management delivers two of the following three benefits: improvements in soil health and fertility, delivers biodiversity gains, and provides additional ecosystem service improvements.

¹⁵ 30%–50% probability of achieving these impacts by 2030.

¹⁶ Reducing water use in areas where agriculture takes 12.5–50% of total renewable freshwater.

¹⁷ 50%–80% probability of achieving these impacts by 2030.

¹⁸ 30%–50% probability of achieving these impacts by 2030.

¹⁹ Spielman David J. and Melinda Smale. 2017. Policy Options to Accelerate Variety Change among Smallholder Farmers in South Asia and Africa South of the Sahara. IFPRI Discussion Paper 01666.

²⁰ As a comparison, extension agent-to-farmer ratio in Africa ranges from 1:3,000 to 1:10,000 ([AGRA 2021](#)).

²¹ Adoption rates and related diffusion factors are crop-specific in the case of seeds and vary widely across technologies and countries. For example, Walker & Alwang ([DIIVA project](#)) find that area under modern varieties increased from 20–25% in 1998 to 35% in 2010 in their crop/country sample, which is an adoption rate of 1.45% per annum. Translating that into an “annual diffusion rate” of 1.45, or a diffusion factor of $1.45^{(t1-t0)}$, where $t1-t0$ is the period of interest (8 years, in F2R-CWANA example) = diffusion factor of 19.5 over 8 years. A similar calculation for

comparable projects and the literature²². When factoring in the diffusion rate, the cost per beneficiary reached is substantially reduced to US\$8.50. We assume that the bundle of Innovation Packages will lead to an average increase in yields of 10% and that while the increase in yield may not fully translate into a corresponding increase in income, that the Depth of the impact will be “Substantial”.

Poverty reduction, livelihoods and jobs

F2R-CWANA targets smallholder farmers who are predominantly the poorest population in the CWANA region. We anticipate that the 3.5 million people projected to benefit from CGIAR Innovations are likely to experience reduced poverty and improved livelihoods.

Gender equality, youth and social

We anticipate that F2R-CWANA will benefit 1.7 million women, and 1.2 million youth. Given the important, but often undervalued role that women play in farming in the CWANA region, the Innovation packages aim to reach a share of women among project beneficiaries between 30–50 %. CWANA has an aging farming population and high rates of youth rural to urban migration. The Innovation packages aim to involve a substantial share of youth with an expected participation rate of 35% among all beneficiaries.

Climate adaptation and mitigation

The F2R-CWANA Initiative is projected to benefit 2.4 million people by using climate adapted innovations and expected to contribute to national climate adaptation and mitigation priorities and targets. Of the nine Innovations, six explicitly promote climate smart innovations and to contribute to climate change adaptation and mitigation strategies. Examples for climate-adapted innovations include the adoption of more drought tolerant seeds, climate-smart farm management practices, conservation agriculture and mechanization services.

Environmental health and biodiversity

We estimate that F2R-CWANA Innovations will result in the improved management of 5.3 million hectares of land by 2030, equivalent to 4.1% of agricultural land, assuming that the average size of land per smallholder farmer across CWANA is 1.5 ha. One of the Work Packages in the F2R-CWANA Initiative focus on water and water saving innovations in a region where agriculture takes more than half of fresh water. Thus, we project that this Initiative will generate significant gains in terms of reducing water usage and improving the efficiency of water. In terms of reducing consumptive water use, we anticipate that the alternative innovations to improve the productivity, efficiency, storage and recycling of water in the CWANA region can increase ratio of non-traditional water resources to total water resources usage by 5–10% in the region. This translates to a 10%–20% reduction (savings) in consumptive water per country across the five countries in the region. Using baseline data (from FAOSTAT) on consumptive water usage for each country, we project that the F2R-CWANA Initiative will achieve a 5.75 BCM reduction in consumptive water usage by 2030. Some of the Work Packages in the F2R-CWANA Initiative focus on genetic

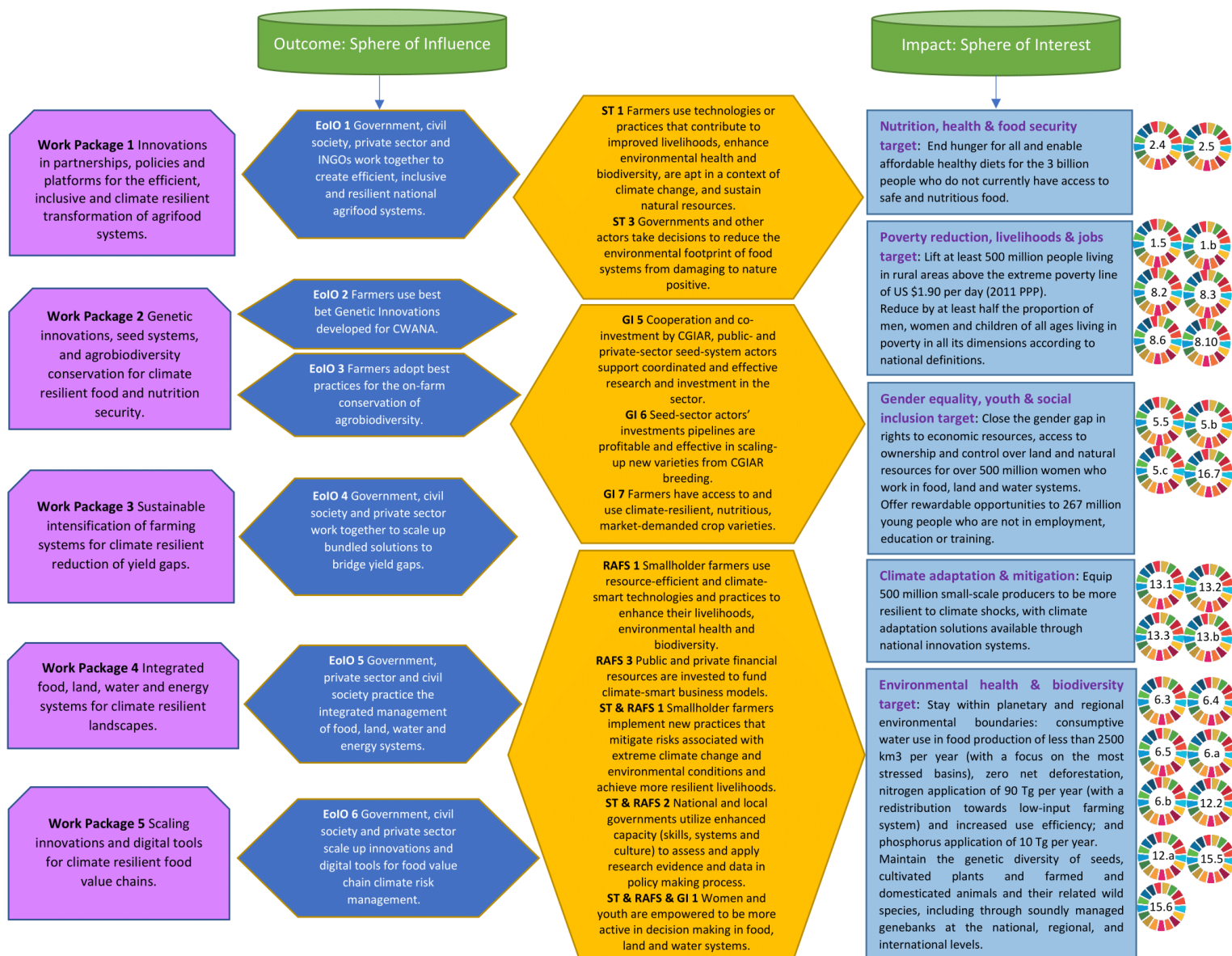
Sudan, where area under modern varieties went from 22% to 40% over 11 years (1998 to 2009) would yield an annual diffusion rate of 1.0837%, or a diffusion factor of $1.0837^8 = 1.9$ until 2030 (Spielman 2021 based on [ASTI](#)).

²² In Egypt, nine different investments in agrifood system innovations lead to productivity increases between 2%–100%. (Thurlow et. al., 2020. Investing in the agrifood system for post-COVID-19 recovery: An economy wide evaluation of public investments in Egypt. MENA POLICY NOTE. International Food Policy Research Institute).

conservation and we anticipate that these activities will generate significant gains in genetic conservation. Based on previous experience, we project that the resource conservation technologies, inclusive of appropriate mechanization and sustainable cropping systems for dryland and irrigated systems, will lead to adoption of conservation agriculture package of practices. Using these pieces of information, we project that the F2R-CWANA Initiative will lead to accession and duplication of 1,500 plant genetics.

3. Research plans and associated theories of change (TOC)

3.1 Full Initiative Research Plans and TOC



F2R-CWANA WPs respond to climate, nutrition, and agrifood challenges most affecting CWANA by applying, scaling and supporting effective resilience-focused solutions and to reduce fragility and conflict, and empower all stakeholders for change.

WP1 will facilitate the creation of new policy pathways to ensure CWANA's agrifood systems are efficient and resilient through partnerships and platforms suiting demand of partners and the unique needs of youth, women, fragile and other marginalized groups. Supporting efforts to create and strengthen national alliances of stakeholders, analysis of policy, regulators, institutional, investment constraints for local decision-making, and opportunities for agrifood systems, we anticipate increased coordination and cross-country and regional engagement. Provision of technology and services will be critical in delivery. Through this, we anticipate strengthened government, civil society, private sector, and INGOs to collaborate more effectively for resilient and inclusive national food systems.

WP2 will drive climate resilience for food and nutrition security in CWANA via best bet genetic innovations, seed systems, and agrobiodiversity conservation. Underpinned by support to and engagement with policymakers, Climate-ready advanced lines and product profiles developed specifically for CWANA stakeholder needs (public, private, farmers, women and youth and others) will respond to current and future needs. Through seed systems diversification, and adoption these products will support innovation use and effective seed system business model development and application. Meanwhile, on-farm conservation will reinforce both climate-readiness and future application.

In **WP3**, reduction of yield gaps will be achieved in CWANA through sustainable intensification of farming systems via climate resilient means. NARS partners and extension staff, alongside farmers, policymakers, public and private sector and farmers, will play a critical role to determine the current gaps and build evidence-based solutions to support effective natural resource base management complemented by agronomic approaches. Scaling of these solutions, supported by government, civil society, and private sector, including women- and youth-led initiatives, will take place through the effective intensification, management, and scaling of bundled solutions for taking forward across the Region.

WP4's approach to climate resilient landscapes focusing on an integrated food, land, water and energy systems approach, will support a CWANA more-ready to incoming climate challenges. With a focus on maintaining or increasing sustainable livelihoods under climate change, and a nexus water-energy-food (WEF) governance approach, the public sector will have increased capacity and tools to develop policy for integrated nexus management. This will include assessment and analysis of water productivity, TWW, and integrated water availability and management, alongside productivity of marginal and saline landscapes. Findings will be streamlined into decision-making, guidelines, increased capacity of partners, and shared through interactive dashboards, to support integrated management of food, land, water and energy systems at all partnership levels.

WP5 will support the acceleration and scaling of digital climate services, financial solutions and technologies to improve climate resilience and risk management of FVCs across CWANA. Creation of climate information services and tools responding to national and regional needs will support more effective decision-making at a local, national and regional levels. It will also create an enabling and scaling environment, providing space for all actors, including youth and women, to prototype and scale best digital bundled services and solutions, for FVC and climate risk management. Additional enabling environment includes the scaling of digital solutions for climate

resilience and capacity development, with supportive policies and business models for inclusive entrepreneurship.

3.2 Work Packages research plans and TOCs

3.2.1 Work package 1 research plans and TOC

Work Package 1 title	Innovations in partnerships, policies and platforms for the efficient, inclusive and climate resilient transformation of agrifood systems.
Work Package main focus and prioritization	Many countries in CWANA experience declining agricultural production as a result of conflict, gender inequalities, youth unemployment, and farmers' struggle to access resources, new agricultural technologies and practices (such as climate smart agriculture (CSA)) and manage risks as they are not adequately supported by policies and institutions. Countries in CWANA are heterogeneous, with public policy processes that are generally complex and not necessarily responsive to emerging development challenges. In fragile contexts in the region, public institutions have limited capacity to address needs on the ground, while even in stable contexts, state institutions do not have strong history of accountability for policy results ²³ . Conversations with policy makers in Egypt, Uzbekistan and Morocco reveal a strong emerging interest in evidence-based policy. This Work Package prioritizes an active engagement with key regional stakeholders through the setting up of National Alliances of Stakeholders, and understanding institutional constraints as a key factor in enabling CGIAR scientific innovations to reach farmers at scale, through setting up new National Innovation Platforms, or strengthening existing ones.
Work Package geographic scope	1-CWANA: EG-Egypt, LB-Lebanon, MA-Morocco, SD-Sudan, UZ-Uzbekistan

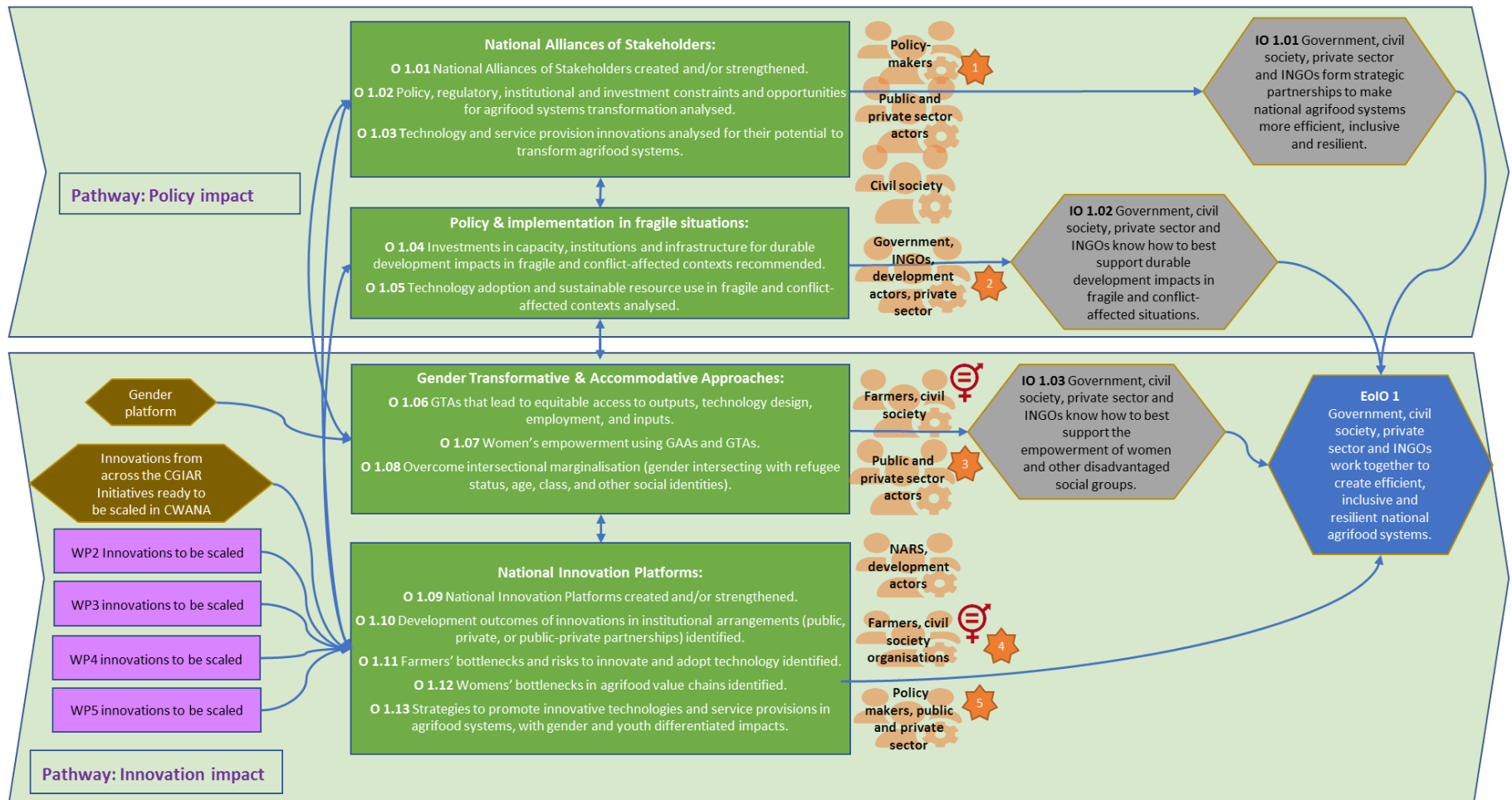
The science:

Research questions	Scientific methods	Key outputs
RQ 1.01 What are the main challenges and opportunities to make national agrifood systems more efficient, inclusive, and resilient?	<p>Analysis of policy constraints and key drivers of policy change in agrifood systems of selected countries using the Kaleidoscope model of policy change, social network analysis, and other qualitative research methods.</p> <p>Evaluation of alternative policy, regulatory, and investment options and their impact on poverty, nutrition, gender inclusion, and climate adaptation using value added production functions, economy-wide and microsimulation models.</p> <p>Cost-benefit analyses and environmental assessments of technological innovations.</p> <p>Networking, engagement, policy dialogue and training activities.</p>	<p>O 1.01 National Alliances of Stakeholders created and/or strengthened.</p> <p>O 1.02 Policy, regulatory, institutional, and investment constraints and opportunities for agrifood systems transformation analyzed.</p> <p>O 1.03 Technology and service provision innovations analyzed for their potential to transform agrifood systems.</p>

²³ Shahjahan Bhuiyan & Ali Farazmand (2020) Society and Public Policy in the Middle East and North Africa, International Journal of Public Administration, 43:5, 373-377, DOI: [10.1080/01900692.2019.1707353](https://doi.org/10.1080/01900692.2019.1707353)

<p>RQ 1.02 How can policy design and implementation in fragile and conflict-affected situations be made more effective, inclusive, and resilient?</p>	<p>Analysis of existing remote sensing, or secondary source data using econometric identification methods to study the relationship between conflict exposure, water and land resource use, and agricultural production choices.</p> <p>Impact evaluation studies on interventions supporting technology adoption in fragility or conflict-affected situations.</p>	<p>O 1.04 Investments in capacity, institutions and infrastructure for durable development impacts in fragile and conflict-affected contexts recommended.</p> <p>O 1.05 Technology adoption and sustainable resource use in fragile and conflict-affected contexts analyzed.</p>
<p>RQ 1.03 What gender-transformative approaches (GTAs) and gender accommodative approaches (GAAs) can lead to the empowerment of women in CWANA and address gender-specific bottlenecks (limited access to technologies, information, land rights)?</p>	<p>Research on gender-transformative and accommodative program design options for smart and inclusive input delivery, credit-linked extension, and other instruments to accelerate uptake of improved (e.g. climate resilient) agricultural practices.</p> <p>Research on institutional changes (or changes in MEL) approaches by NARS, development organizations and the private sector that lead to gender equality and women's empowerment.</p> <p>Research on technologies, extension and land rights policy options to accelerate sustainable food systems transformation, promote and empower women, youth, and marginalized food sector actors.</p>	<p>O 1.06 GTAs that lead to equitable access to outputs, technology design, employment, and inputs developed and tested.</p> <p>O 1.07 Evidence based best practices for women's empowerment using GAAs and GTAs documented.</p> <p>O 1.08 Recommendations to overcome intersectional marginalization (gender intersecting with refugee status, age, class, and other social identities) developed.</p>
<p>RQ 1.04 What institutional innovations are needed to achieve the transformation of efficient, inclusive, and resilient agrifood systems?</p>	<p>Impact evaluation studies (including randomized control trials) that test innovations in institutional arrangements in agrifood systems of the selected countries.</p> <p>Gender disaggregated survey and impact evaluations with farmers and other relevant actors in the agrifood systems about their adoption of innovations and technologies.</p> <p>Impact evaluation studies (including randomized control trials) that assess adoption and impact of innovative technologies.</p> <p>Conduct multi-actor analysis at the early stage of the implementation of the Initiative to design an operational structure, to characterize and/or classify the actors, their roles, and the institutional opportunities and constraints they will bring to the Multi-Actor Platform.</p> <p>Case studies with farmers (including women and youth) that pilot and rigorously assess the potential for scaling up technological and service provision innovations.</p>	<p>O 1.09 National Innovation Platforms created and/or strengthened.</p> <p>O 1.10 Development outcomes of innovations in institutional arrangements (public, private, or public-private partnerships) identified.</p> <p>O 1.11 Farmers' bottlenecks and risks to innovate and adopt technology identified.</p> <p>O 1.12 Women's' bottlenecks in agrifood value chains identified.</p> <p>O 1.13 Strategies to scale innovative technologies and service provisions in agrifood systems, with a focus on gender and youth disaggregated impact, developed.</p>

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



The theory of change:

Work Package 1 hopes to achieve EoIO 1, that government, civil society, private sector and INGOs work together to create efficient, inclusive and resilient national agrifood systems. Working through a policy impact pathway, we hope to achieve two intermediate outcomes to help arrive at this EoIO. IO 1.01, aims for these same actors to form strategic partnerships, which F2R-CWANA will facilitate by providing the enabling conditions for key stakeholders to come together and form new strategic partnerships and further strengthen National Alliances of Stakeholders (O 1.01-1.03). The Alliance of Stakeholders will be the forum by which regional issues, priorities, innovations, and are discussed and worked out. The assumption is (1) that key partners will want to join and participate in the National Alliance of Stakeholders because it will provide them with the opportunity to meet and influence other stakeholders while setting the priorities and direction for important regional issues related to transforming agrifood systems. IO 1.02, aims for these same actors to build capacity to best support durable development impacts in fragile- and conflict-affected situations, which we will facilitate through providing an analysis of policy design and implementation options (O 1.04-1.05), providing these actors with crucial evidence-based guidance to make durable development decisions in region where fragility and conflict are chronic. The assumption is (2) that these actors are willing and able to consider how to effect long lasting positive change in the face of these significant challenges.

Concurrently, working along an innovation impact pathway, EoIO 1 will be achieved through work on gender leading to IO 1.03, that government, civil society, private sector and INGOs know how to best support the empowerment of women and other disadvantaged social groups; and another area of work on National Innovation Platforms leading directly to the EoIO 1. To achieve the IO 1.03, we will provide Gender Accommodative Approaches (GAAs) and Gender Transformative Approaches (GTAs) that, in collaboration with the Gender Platform, have been tested and shown to deliver impact in CWANA local contexts. With this knowledge and toolbox, it is expected that the stated actors will implement these approaches to the best of their abilities, on the assumption that (3) the empowerment of women and other disadvantaged groups (e.g., refugees and displaced persons, poor, youth, elderly) is seen as a crucial step to achieve long lasting, positive and peaceful development outcomes in the region, especially related to climate-resilient food, nutrition, and livelihood security.

In alignment with the above, the final group of outputs within the innovation impact pathway are about setting up/strengthening National Innovation Platforms (O 1.09-1.13, Innovation 1: CGIAR Accelerator and Open Innovation Program) which are physical “Living Labs” situated on the ground in the agro-ecologies, and communities, and partnership networks that are necessary to enable testing of technologies, tools, approaches, and ultimately Innovations, developed by F2R-CWANA and other Initiatives, for the people in CWANA. The Innovation Packages and Scaling Readiness work will be undertaken through Innovation Platforms. By setting up/strengthening National Innovation Platforms, thereby providing excellent conditions for government, private sector, civil society and INGOs to work together, we anticipate these actors will work together to create efficient, inclusive and resilient national agrifood systems because (4) the enabling environment exists; and (5) it is in the interests of all parties – wherever they are along the value chain and impact pathway – providing a synergistic win-win situation for each entity.

3.2.2 Work package 2 research plans and TOC

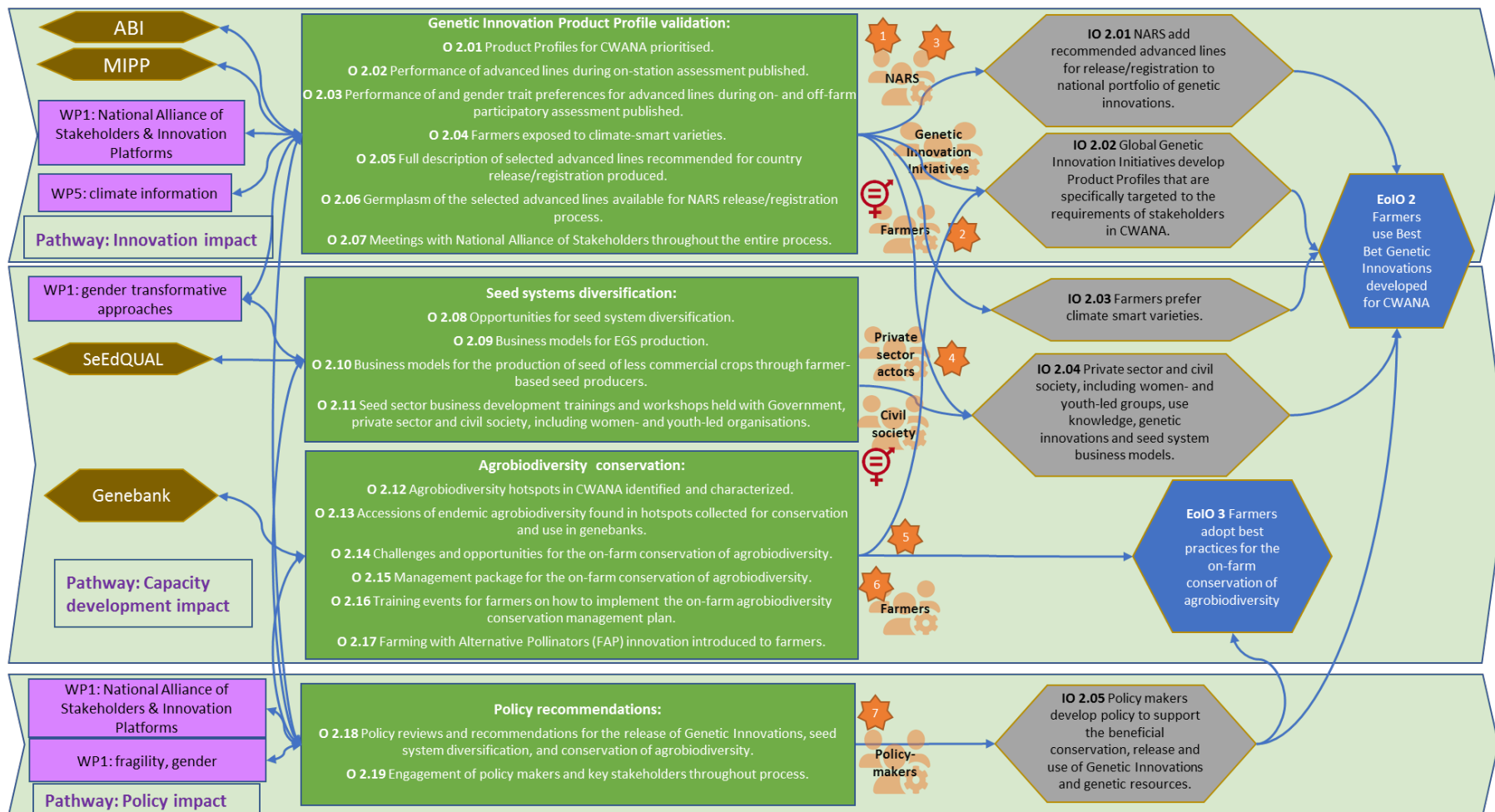
Work Package 2 title	Genetic innovations, seed systems, and agrobiodiversity conservation for climate resilient food and nutrition security
Work Package main focus and prioritization	Work Package 2 focuses on facilitating the availability of Genetic Innovations explicitly developed to meet the demands of the region. This WP focuses on an inclusive and efficient seed system for quick varietal turnover, and on-farm management and ex-situ conservation of agrobiodiversity underpinned by facilitating strengthened and more effective enabling environments. These objectives will be reached through the development of an integrated feedback network of information, tools and innovations between F2R-CWANA and the Global Genetic Innovation Initiatives (ABI, MIPP and SeEdQUAL) to maximize the synergies between Initiatives, and between regional stakeholders using National Alliances of Stakeholders and National Innovation Platforms.
Work Package geographic scope	1-CWANA: EG-Egypt, LB-Lebanon, MA-Morocco, Sudan-SD, UZ-Uzbekistan

The science:

Research questions	Scientific methods	Key outputs
RQ 2.01 How can the Global Genetic Innovations most suitable for CWANA be developed and brought to demand partners?	<p>Consultation with National Alliance of Stakeholders to identify and prioritize Global Genetic Innovation Product Profiles using gender responsive tools for CWANA.</p> <p>On-station (with NARS, women and men farmers and stakeholders) assessment and validation of selected Product Profiles advanced lines.</p> <p>On-farm (with NARS, women and men farmers and stakeholders) and off-farm participatory gender-specific validation activities of Product Profile advanced lines performance and nutritional quality selected during on-station testing.</p> <p>1–3 advanced lines per Product Profile that are best suited to the needs of the countries recommended for release/registration.</p> <p>Participate in feedback loop to National Alliance of Stakeholders, G+ Tools implementation, and Genetic Innovation Initiatives about Product Profile validation results to inform future breeding activities.</p>	<p>O 2.01 Product Profiles for CWANA prioritized.</p> <p>O 2.02 Performance of advanced lines during on-station assessment published.</p> <p>O 2.03 Performance of and gender trait preferences for advanced lines during on- and off-farm participatory assessment published.</p> <p>O 2.04 Farmers exposed to climate-smart varieties.</p> <p>O 2.05 Full description of selected advanced lines recommended for country release/registration produced.</p> <p>O 2.06 Germplasm of the selected advanced lines available for NARS release/registration process.</p> <p>O 2.07 Meetings with National Alliance of Stakeholders throughout the entire process.</p>
RQ 2.02 How can seed systems be made more efficient, inclusive, and resilient?	Analysis of seed system (supply side) and adoption and impact (demand side) to understand the challenges and opportunities of diversification.	<p>O 2.08 Opportunities for seed system diversification identified.</p> <p>O 2.09 Business models for EGS production developed.</p>

	<p>On-farm participatory demonstration of climate-smart varieties, and cost benefit analysis.</p> <p>Comparative analysis of Early Generation Seed (EGS) production models.</p> <p>Feasibility and profitability analysis of alternative models of seed production for less commercial crops (e.g., legumes).</p> <p>Seed sector business development trainings and workshops.</p>	<p>O 2.10 Business models for the production of seed of less commercial crops through farmer-based seed producers developed.</p> <p>O 2.11 Seed sector business development trainings and workshops held with Government, private sector and civil society, including women- and youth-led organizations.</p>
RQ 2.03 How can the unique agrobiodiversity of the CWANA region be better conserved?	<p>GAP analysis for the identification and characterization of agrobiodiversity hotspots.</p> <p>Collecting missions.</p> <p>Participatory assessment with farmers on key challenges and opportunities for on-farm conservation of agrobiodiversity.</p> <p>Testing, validation and participatory promotion of on-farm agrobiodiversity conservation in hotspots.</p> <p>Introduction of Farming with Alternative Pollinators (FAP) package of tools and methods to farmers in Uzbekistan</p>	<p>O 2.12 Agrobiodiversity hotspots in CWANA identified and characterized.</p> <p>O 2.13 Accessions of endemic agrobiodiversity found in hotspots collected for conservation and use in genebanks.</p> <p>O 2.14 Challenges and opportunities for the on-farm conservation of agrobiodiversity documented.</p> <p>O 2.145 Management package for the on-farm conservation of agrobiodiversity developed.</p> <p>O 2.16 Training events for farmers on how to implement the on-farm agrobiodiversity conservation management plan.</p> <p>O 2.17 FAP innovation introduced to farmers.</p>
RQ 2.04 What are the major policy related challenges and opportunities for promoting Genetic Innovations and genetic resources in CWANA?	<p>Analysis of policy and regulatory constraints for the conservation of agrobiodiversity and the adoption of Genetic Innovations in CWANA.</p> <p>Analysis of socioeconomic data on seed system, and variety adoption.</p> <p>Advocacy, policy dialogues.</p>	<p>O 2.18 Policy reviews and recommendations on the release of Genetic Innovations, seed system diversification, and the conservation of agrobiodiversity.</p> <p>O 2.19 Engagement of policy makers and key stakeholders throughout process.</p>

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



The theory of change:

Work Package 2 will work towards achieving two goals for the farmers of CWANA. EoIO 2 (first goal), is that farmers know about, prefer, have access to, and grow the Best Bet Genetic Innovations developed by the Genetic Innovation Initiatives (GI) ABI and MIPP expressly to meet the needs of people in CWANA, given the prevailing climatic and agro-ecological conditions, and gendered trait preferences (O 2.01-2.07, Innovation 4: Participatory Product Profile Performances). This will be achieved through an innovation impact pathway, by many actors – CGIAR, NARS, breeders, farmers, government, private sector and civil society groups - working together through National Alliances of Stakeholders (O 1.01) and National Innovation Platforms (O 1.09, both housed in WP1) to maximize the regional impact of GI technologies and tools. We will prioritize Product Profiles from the perspective of regional stakeholders, validate the performance of advanced lines, including via participatory on-station and on- and off-farm with farmers and other value chain actors, and help to fast-track the best performing and preferred lines with NARS for release/registration. Valuable technical and trait preference knowledge generated during this process will be communicated back to the GI Initiatives ABI and MIPP for future Product Profiles creation based on the needs of CWANA stakeholders.

Concurrently, within a capacity development impact pathway to diversify national seed systems, new business models will be developed to produce seed of commercial, and less commercial, crops that both private companies and community organizations, including youth and women led organizations, can implement (O 2.08-2.11). This will be done in conjunction with SeEdQUAL and provide feedback to the CGIAR Community of Excellence on Seed System Development (CoE SSD). Communication and feedback between all stakeholders will be maintained to develop and deliver to farmers the climate smart genetic innovations needed to sustain agriculture in the region. The assumptions are that (1) within the prioritized Product Profiles (advanced lines) there are ones that will thrive in CWANA conditions and (2) be wanted by farmers and other actors; (3) that NARES undertake the release/registration process; and (4) business models for seed systems are profitable and can be implemented by diverse value chain actors.

EoIO 3 (second goal), is that farmers adopt best practices for on-farm conservation of agrobiodiversity along the capacity development impact pathway. This will be facilitated through a gap analysis, collecting missions to agrobiodiversity hotspots, co-development of on-farm conservation management plans, and farming with alternative pollinators, helping to ensure that endemic crops, crop wild relatives, and associated biodiversity of agroecosystems in CWANA continue to evolve to the prevailing conditions on farm (on-farm conservation) and are kept in genebanks (e.g. Genebank Initiative) for long term safeguarding and available for use in CGIAR breeding programs (O 2.12-2.17, Innovation 4). A wealth of heat and drought-stress adapted genetic resources are vital to breed climate smart varieties. This impact pathway therefore also contributes to EoIO 2. The assumptions are (5) that agrobiodiversity hotspots exist, can be identified, reached and accessions collected; and (6) that the management plan can address all constraints so that farmers see the value in on-farm management/conservation of agrobiodiversity.

Supporting these goals is a policy impact pathway aiming to foresee constraints and provide recommendations to overcome them, working closely with the National Alliance of Stakeholders, Innovation Platforms and policy makers (O 2.18-2.19). The assumptions are (7) that policy makers are willing and able to address these.

Annex for section 3 Partners [here](#).

3.2.3 Work package 3 research plans and TOC

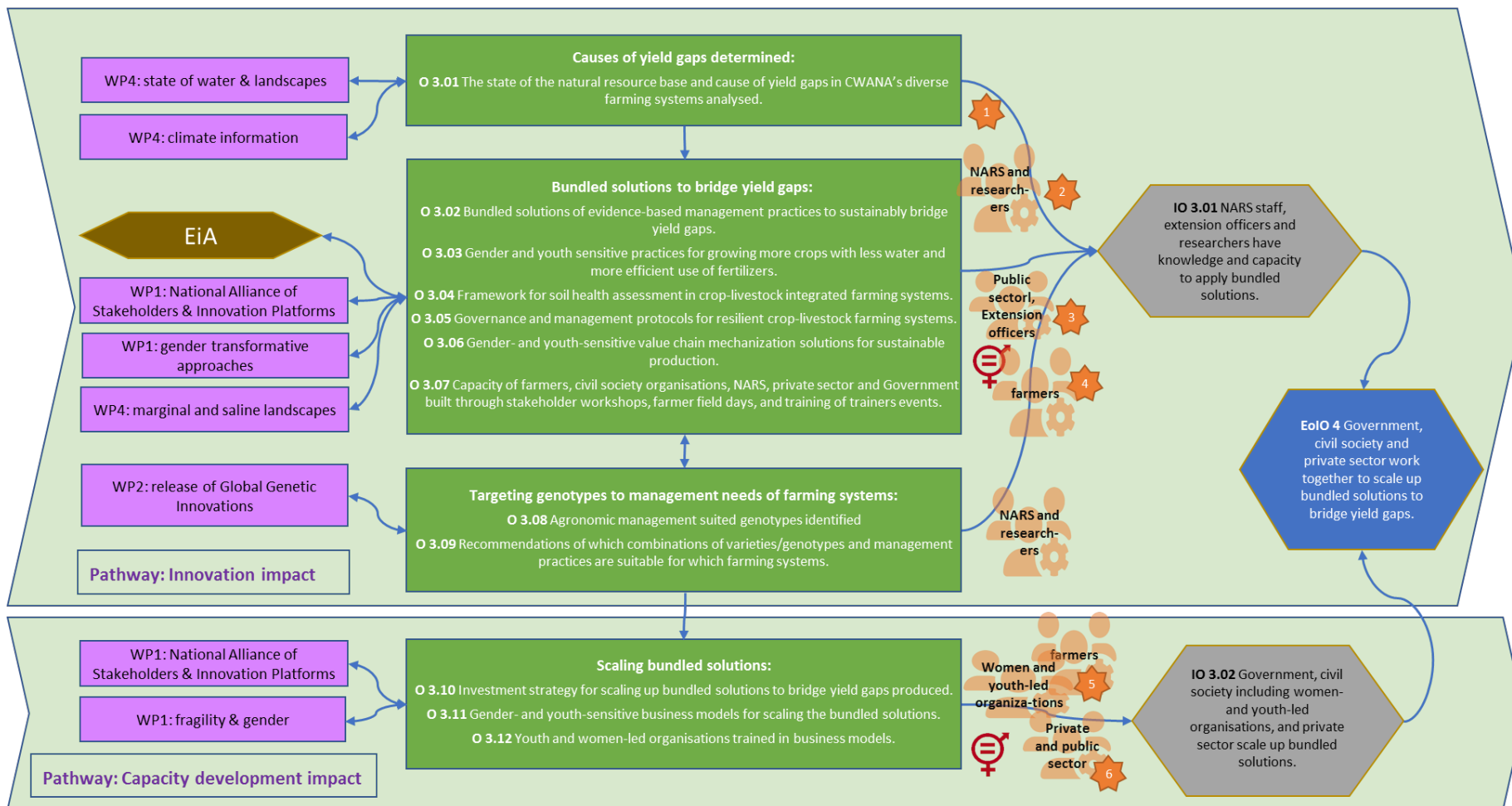
Work Package 3 title	Sustainable intensification of farming systems for climate resilient reduction of yield gaps
Work Package main focus and prioritization	WP3 focuses on the sustainable intensification of principal farming systems to build resilience to climate risks and close the yield gaps within planetary boundaries. CWANA is the most water-stressed region in the world and has large yield gaps resulting associated with poor on-farm agronomic management practices leading to poor resource efficiency, low farm income, and food insecurity resulting in a heavy dependence on imports for major food crops. The region's insufficient knowledge and service delivery infrastructure, capacity and enabling policies are key bottlenecks for producers, SMEs and value chain actors to access resources to manage and mitigate risks.
Work Package geographic scope	1-CWANA region: EG-Egypt, LB-Lebanon, MA-Morocco, SD-Sudan, UZ-Uzbekistan

The science:

Research questions	Scientific methods	Key outputs
RQ 3.01 What is the current state of the natural resource base (soil and water), which act as determinants of yield gaps?	Data simulation modelling. Remote sensing. Web-based coding for online database.	O 3.01 The state of the natural resource base and cause of yield gaps in CWANA's diverse farming systems analyzed.
RQ 3.02 Which evidence-based agronomic management practices, inclusively adapted to different user groups, can be used as bundled solutions to bridge the yield gaps in diverse farming systems?	Use cropping systems optimization tools, field experiments (mother-baby trials), and decision-making tools, and data science. Stakeholder workshops, field days, training of trainers.	O 3.02 Bundled solutions of evidence-based management practices to sustainably bridge yield gaps developed. O 3.03 Gender- and youth-sensitive practices for growing more crops with less water and more efficient use of fertilizers developed. O 3.04 Framework for soil health assessment in crop-livestock integrated farming systems developed. O 3.05 Governance and management protocols for resilient crop-livestock farming systems developed. O 3.06 Gender- and youth-sensitive value chain mechanization solutions for sustainable production developed. O 3.07 Capacity of farmers, civil society organizations, NARS, private sector and Government built through stakeholder workshops, farmer field days, and training of trainers' events.

RQ 3.03 What management-targeted varieties/genotypes are needed to support resilient and sustainable farming systems?	Field experiment (mother- baby trials), crop modelling, choice experiments, participatory approaches, use of geospatial tools.	O 3.08 Agronomic management suited genotypes identified. O 3.09 Recommendations of which combinations of varieties/genotypes and management practices are suitable for which farming systems.
RQ 3.04 What are the challenges and opportunities for scaling sustainable, resilient and gender and youth responsive farming practices?	Participatory approaches, choice experiments, training, policy workshops, stakeholder consultations, use of scaling tools.	O 3.10 Investment strategy for scaling up bundled solutions to bridge yield gaps produced. O 3.11 Gender- and youth-sensitive business models for scaling the bundled solutions. O 3.12 Youth and women-led organizations trained in business models.

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



The theory of change:

Work Package 3 will work towards achieving the goal of EoIO 4, that government, civil society and private sector work together to scale up bundled solutions to bridge yield gaps. In an innovation impact pathway that has the intermediate outcome IO 3.01 of equipping government, NARES and extension agents with knowledge, capacity and innovations – first by determining the causes of yield gaps determined (O 3.01) on the assumption that these are currently unknown and lack of this knowledge hampers efforts to effectively target the causes of yield gaps. Next, a series of agronomic management solutions to overcome these within the boundaries of the natural resource base – using the principles of climate-smart and conservation-agriculture - will be co-developed (O 3.03-3.07) with stakeholders through the National Stakeholder Alliance at the National Innovation Platform sites (O 1.01 and 1.09, housed within WP1). These solutions include the Innovations of mechanization (O 3.06, Innovation 6: Scale-appropriate Mechanization) and selecting the best varieties for resilient food and feed cropping systems, in collaboration with WP2 Participatory Product Profile Performance work (O 3.08-3.09, Innovation 5: Resilient Food and Feed Crops). The co-development of these and other solutions for yield gaps, and capacity development for application on-farm, will be done through regular stakeholder workshops, farmer field days, and training of trainer events (O 3.07), at the National Innovation Platforms and involving the National Alliance of Stakeholders. Partnering with EiA Initiative and the Gender Accommodative and Transformative Approaches of WP1, these solutions will be bundled together to form packages of gender and youth sensitive options adaptable to the range of diverse farming systems found in CWANA (O 3.02). The assumptions are (2) that yield gaps can be bridged using sustainable climate-smart and conservation-agriculture methods; that (3) the bundled solutions are easy to use and will therefore be taken up NARES, extension agents, and so on; and (4) that farmers – the ultimate end user of the bundled solutions to bridge yield gaps – see the value in this conservation and climate-smart agriculture approach and these solutions, over other alternatives.

For the bundled solutions to be widely adopted and have the greatest possible impact on sustainably bridging yield gaps, a capacity development impact pathway that has the intermediate outcome IO 3.02 of government, civil society including youth and women led groups, and private sector scaling up the bundled solutions. By producing investment strategies, youth and gender sensitive business models, and training events (O 3.10-3.12), it is expected that the stated actors, but especially youth- and women-led organizations will have the knowledge and practical capacity to work as service providers to farmers to help implement the bundled solutions in their communities because this would be a profitable line of work with positive contributions to the community and the environment. The assumptions are (5) that these strategies and business models are workable and profitable; (6) that youth and women led groups are (en)able(d) to participate in the process; and (7) that there is the demand for bundled solutions from farmers and other stakeholders.

Annex for section 3 Partners [here](#).

3.2.4 Work package 4 research plans and TOC

Work Package title	Integrated food, land, water and energy systems for climate resilient landscapes
Work Package main focus and prioritization	WP4 will support communities and stakeholders for more sustainable, resilient and inclusive water, energy and landscape management policies, design and practices at the regional, national, and landscape scales. Activities focus on i) diagnostics to clarify limits to growth and improve the long-term potential for sustainable livelihoods; ii) foundations for scaling up access to alternative water resources, including water recycling and re-use; iii) integrated approaches to storing more water in natural and built systems at multiple scales, and increasing the productivity and value of that water; iv) maintaining productivity in saline landscapes; and iv) strengthening inclusive policies and governance for integrated management across the food-land-water-energy nexus.
Work Package geographic scope	1-CWANA region: EG-Egypt, LB-Lebanon, MA-Morocco, SD-Sudan, UZ-Uzbekistan

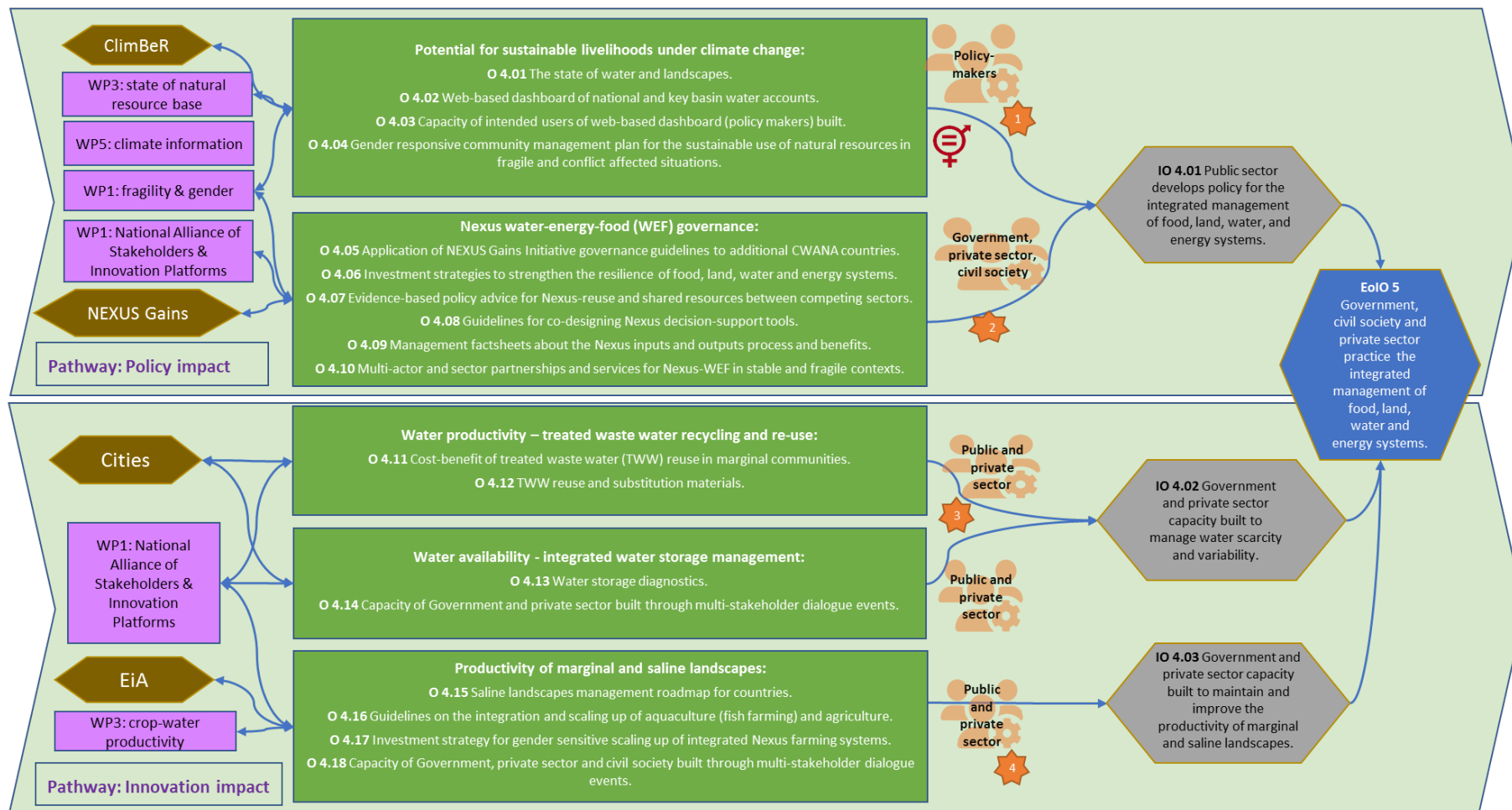
The science:

Research questions	Scientific methods	Key outputs
RQ 4.01 What is the current and long-term potential and extent for sustainable livelihoods at the landscape scale (basin and country) within a climate change context?	<p>Diagnostics to clarify limits to growth and improve the long-term potential for sustainable livelihoods through:</p> <p>Natural resource mapping and analysis largely derived from remote sensing global and regional data.</p> <p>Use of Water Accounting tool such as WA+.</p> <p>Use of Solar Suitability tool.</p> <p>Use of socio-economic qualitative analysis.</p> <p>Coding and web development to make tools and data accessible to stakeholders through web-based dashboard.</p>	<p>O 4.01 The state of water and landscapes analyzed.</p> <p>O 4.02 Web-based dashboard of national and key basin water accounts developed.</p> <p>O 4.03 Capacity of intended users of web-based dashboard (policy makers) built.</p> <p>O 4.04 Gender responsive community management plan for the sustainable use of natural resources in fragile and conflict affected situations developed.</p>
RQ 4.02 How can beyond water (Nexus: water-energy-food (Nexus-WEF)) governance be improved to strengthen resilience of food, land and water systems and improve productivity at country and basin level?	<p>Strengthening inclusive policies and governance beyond water for integrated management across the food-land-water-energy nexus through:</p> <p>Socioeconomic data analysis.</p> <p>Water governance analysis in piloting countries.</p> <p>Policy mapping and analysis.</p> <p>Qualitative analysis.</p> <p>Multi-stakeholders dialogue.</p>	<p>O 4.05 Holistic integrated Nexus governance guidelines and framework developed.</p> <p>O 4.06 Investment strategies to strengthen the resilience of food, land, water and energy systems developed.</p> <p>O 4.07 Evidence-based policy advice for Nexus-reuse and shared resources between competing sectors developed.</p> <p>O 4.08 Guidelines for co-designing Nexus decision-support tools developed.</p>

		<p>O 4.09 Management factsheets about the Nexus inputs and outputs process and benefits.</p> <p>O 4.10 Multi-actor and sector partnerships and services for Nexus-WEF in stable and fragile contexts set up.</p>
<p>RQ 4.03 How can water productivity be improved through water recycling and re-use at country and regional/watershed scale?</p>	<p>Establishing the foundations for scaling up access to alternative water resources, including water recycling and re-use to improve water productivity, at country and watershed level through:</p> <p>Water accounting and assessment analysis.</p> <p>Gender mainstreaming and circular economy analysis.</p> <p>Experimentation site for treated wastewater (TWW) reuse, irrigation systems, practices, crops, etc.</p> <p>Policy mapping and analysis, survey and quantitative methods including economic cost benefit analysis, and qualitative analysis methods.</p> <p>Multi-stakeholder dialogue.</p>	<p>O 4.11 Cost-benefit of treated wastewater (TWW) reuse in marginal communities developed.</p> <p>O 4.12 TWW reuse and substitution materials developed.</p>
<p>RQ 4.04 How can water availability and reliability be sustainably improved through integrated water storage management at country and basin level?</p>	<p>Designing and facilitating integrated approaches to storing more water in natural and built systems at multiple scales, and increasing the productivity and value of that water through:</p> <p>Remote sensing.</p> <p>Integrated hydrological modelling.</p> <p>Socioeconomic data analysis and feasibility study.</p> <p>Policy mapping and analysis.</p> <p>Qualitative analysis.</p> <p>Experiment site for piloting and monitoring.</p> <p>Multi-stakeholders dialogue.</p>	<p>O 4.13 Water storage diagnostics based on NEXUS Gains methodology produced.</p> <p>O 4.14 Capacity of Government and private sector built through multi-stakeholder dialogue events.</p>
<p>RQ 4.05 How can the productivity of marginal and saline landscapes be maintained or improved at watershed and country level?</p>	<p>Maintaining and improving productivity in marginal and saline landscapes through:</p>	<p>O 4.15 Saline landscapes management roadmap for countries developed.</p>

	<p>Remote sensing, and integrated hydrological modelling.</p> <p>Valuation of soil retention.</p> <p>Socioeconomic data analysis.</p> <p>Policy mapping and analysis.</p> <p>Qualitative analysis.</p> <p>Multi-stakeholders dialogue.</p> <p>Monitoring and evaluation.</p>	<p>O 4.16 Guidelines on the integration and scaling up of aquaculture (fish farming) and agriculture developed.</p> <p>O 4.17 Investment strategy for gender sensitive scaling up of integrated Nexus farming systems developed.</p> <p>O 4.18 Capacity of Government, private sector and civil society built through multi-stakeholder dialogue events.</p>
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Work Package 4: Integrated food, land, water and energy systems for climate resilient landscapes.



The theory of change:

Work Package 4 will work towards achieving EoIO 5, that government, civil society and private sector practice the integrated management of food, land, water and energy systems through a policy impact pathway, and an innovation impact pathway. The policy impact pathway works towards IO 4.01 where government develops policy for the integrated management of these systems. It does this, initially, by gathering high quality data from across these sectors (with inputs from ClimBeR) and brings this together with analytical tools into an easy-to-use, accessible, web-based dashboard that can be used by policymakers to help understand complex, cross-sectoral, and often competing issues, and supporting decision-making that leads to the integrated management of food, land, water, and energy systems (O 4.01-4.03). Secondly, the governance of the water-energy-food nexus will be addressed, with inputs from NEXUS Gains, through the National Alliance of Stakeholders and the National Innovation Platforms (O 1.01 and 1.09, both housed in WP1) with a series of outputs such as Nexus governance guidelines, investment strategies, decision support tools, and partnerships (O 4.05-4.10) that are designed to be used by policymakers to support their decision-making process. The assumptions are that (1) policy makers will be motivated to work more collaboratively across sectors when they have easy to use tools that address the complex and competing issues they face, and (2) and provide a framework for Nexus governance.

This innovation impact pathway feeds into the EoIO 5 via two intermediate outcomes. The first is that government and private sector actors have the capacity to manage water scarcity and variability, which we aim to achieve through producing outputs related to treated waste-water recycling and reuse (O 4.11-4.12), and water storage management (O 4.13-4.14). We expect that through these outputs, the stated actors will have the knowledge and capacity to manage water scarcity and variability, which (3) they will put into action to manage these critical issues in communities across CWANA facing extreme water stress; and (4) that the Nexus thinking approach of the integrated management of food, land, water and energy systems will allow these actions to have the greatest effect at landscape scale.

The second IO in the innovation impact pathway, IO 4.03, is that the same actors have the capacity to maintain and improve the productivity of marginal and saline landscapes, through using outputs produced by WP4 including saline landscapes management roadmaps, guidelines, investment strategies for gender-sensitive scaling, and capacity building events (O 4.15–4.18). We assume the same here as above (3), and (4).

The Innovations of WP4 are “Farm to Basin Smart Tools for Water Efficiency and Management” (Innovation 8), which will be co-delivered with WP5 and is made up of O 4.01–4.03 and 4.11–4.18; and “Toolbox of Nature-based Solutions” (Innovation 7) is made up of all the outputs, O 4.01–4.18. The development, testing and scaling readiness of these innovations will be targeted through the National Alliance of Stakeholders and the National Innovation Platforms.

Annex for section 3 Partners [here](#).

3.2.5 Work package 5 research plans and TOC

Work Package 5 title	Scaling innovation and digital tools for climate resilient food value chains
Work Package main focus and prioritization	This Work Package focuses on accelerating and scaling digital climate services, financial solutions and other technologies resulting from this Initiative that improves the climate resilience of food value chains (FVCs). Producers, especially smallholder farmers, often lack access to adequate climate risks information management tools and services are rarely scaled due to the lack of a conducive environment and lack of private sector participation. CWANA lags in its investment in digital infrastructure and lacks the enabling environment to support agricultural innovations. WP 5 seeks to leverage, assess, accelerate, and scale the use of digitally innovative solutions to address climate change induced challenges across FVCs.
Work Package geographic scope	1-CWANA region: EG-Egypt, LB-Lebanon, MA-Morocco, SD-Sudan, UZ-Uzbekistan

The science:

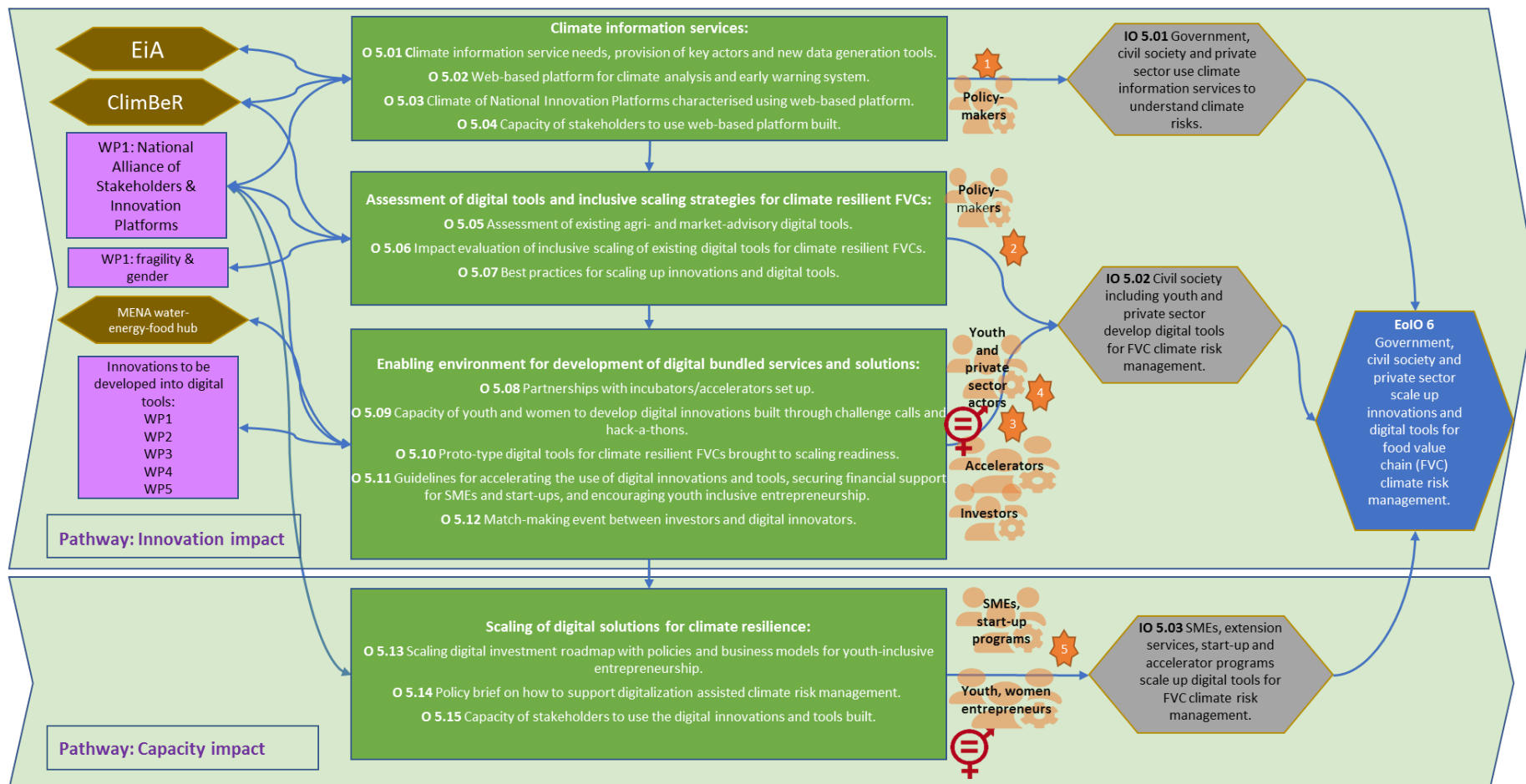
Research questions	Scientific methods	Key outputs
RQ 5.01 What climate information data and services do agricultural food value chain (FVC) actors need to manage climate risks in the CWANA region?	<p>Screening of available climate risk data such as droughts, floods, extreme temperatures, changing rainfall variability already accessible through government agencies or service providers.</p> <p>Focus group discussions, key informant interviews and Delphi studies to understand the climate information systems data needs and the type of service provision of FVC components.</p> <p>Develop climate information services framework that capture the needs for data for FVC actors.</p> <p>Develop, test and trial with the Innovation Platforms set under WP1 key climate/weather data generation tools such as seasonal forecasting, drought and flood alerts, rainfall deficit across the growing season developed using primary and secondary earth observation data for main climate extremes and associated risk variables</p> <p>Dialogue and engagements with key government agencies (e.g. meteorological agencies) and private sector providers.</p>	<p>O 5.01 Climate information service needs, provision of key actors and new data generation tools.</p> <p>O 5.02 Web-based platform for climate analysis and early warning system.</p> <p>O 5.03 Climate of National Innovation Platforms characterized using web-based platform.</p> <p>O 5.04 Capacity of stakeholders to use web-based platform built.</p>
RQ 5.02 How can agri- and market-advisory scaling up strategies for climate-resilient FVCs be socially inclusive, effective and sustainable?	Scoping review of existing agri- and market-advisory digital services and tools and how they might bring inclusivity.	O 5.05 Assessment of existing agri- and market-advisory digital tools.

	<p>Impact evaluation of the previous scaling successes and failures of services and solutions resulting from factors such as policies, institutions, regulatory frameworks and Public Private Partnerships (PPPs).</p> <p>Field survey, scoping missions, interviews with experts and policy consultations.</p>	<p>O 5.06 Impact evaluation of inclusive scaling of existing digital tools for climate resilient FVCs.</p> <p>O 5.07 Best practices for scaling up innovations and digital tools.</p>
<p>RQ 5.03 How can the enabling environment for the efficient and inclusive adoption of the best digital agri-climatic digital bundled services and solutions be improved to accelerated scaling?</p>	<p>Partner with the MENA Water-Energy for Food (WEF) Hub²⁴ and selected incubator/accelerator programs to offer training to youth agri-entrepreneurs to co-develop and build a pipeline of digital solutions (integrating CGIAR science) for climate risk management through challenge calls and hack-a-thons.</p> <p>Bring growth finance to selected innovators on digital climate risk management solutions by co-designing and co-leading matchmaking events with national, regional and global investors.</p> <p>Co-design and co-demonstrate two selected Innovation Packages using the Reach-Benefit-Empower-Transform (RBET) Framework²⁵ and through the WE4F Hub and living labs within Innovation Platforms to build digital inclusion.</p>	<p>O 5.08 Partnerships with incubators/accelerators set up.</p> <p>O 5.09 Capacity of youth/women to develop digital innovations built through challenge calls and hack-a-thons.</p> <p>O 5.10 Proto-type digital tools for climate resilient FVCs brought to scaling readiness.</p> <p>O 5.11 Guidelines for accelerating the use of digital innovations and tools, securing financial support for SMEs and start-ups, and encouraging youth inclusive entrepreneurship.</p> <p>O 5.12 Match-making event between investors and digital innovators.</p>
<p>RQ 5.04 How can digital innovations that support the creation of climate resilient FVCs be scaled out for maximum durable impact?</p>	<p>Co-design and co-demonstrate with governments, IFIs & MDBs, development partners a scaling investment roadmap for digital innovation towards climate resilience value chain in empowering youth entrepreneurship, accelerator grants for SMEs, incubators.</p> <p>Capacity building of different actors on the use of climate smart digital technologies and advisory services for strengthening FVCs.</p>	<p>O 5.13 Scaling digital investment roadmap with policies and business models for youth-inclusive entrepreneurship.</p> <p>O 5.14 Policy brief on how to support digitalization assisted climate risk management.</p> <p>O 5.15 Capacity of stakeholders to use the digital innovations and tools built.</p>

²⁴ [MENA Water-Energy for Food \(WEF\) Hub](#)

²⁵ <https://gender.cgiar.org/tools-methods-manuals/reach-benefit-empower-transform-rbet-framework>

Work Package 5: Scaling innovations and digital tools for climate resilient food value chains.



The theory of change:

Work Package 5 aims to achieve EoIO 6, that government, civil society and private sector scale up innovations and digital tools for food value chains (FVCs) climate risk management via an innovation impact pathway and a capacity development impact pathway. The Innovation impact pathway feeds into EoIO6 via two intermediate outcomes. The first is IO 5.01, that the government, civil society and private sector use climate information services to understand climate risks, which will be achieved by developing data generation systems to increase availability of climate information required for local needs, producing a web-based platform for climate analysis and early warning system, and capacity development activities for the intended users of these (O 5.01–5.04). The assumptions here are that (1) the development of up to date, highly informative and easy to use digital tools to provide a climate information service will be used by the stated partners to be better understand the climate and climate risks for their location of interest.

The second is IO 5.02, that civil society including youth, and private sector develop digital tools for FVC climate risk management, which we will achieve through two related areas of work. The first is about assessing existing digital tools for agri- and market-advisory services and scaling up strategies and developing best practices for both that will facilitate to greatest social inclusion, especially of women, youth, and other disadvantaged social groups (O 5.05-5.07). The assumption here is (2) that by understanding what has been done previously, we can innovate on the process to be more effective when we it comes to developing and scaling our own innovations and digital tools. The second area working towards IO 5.02 is about the enabling environment for the development of digital tools for FVC climate risk management, where we will set up partnerships with incubators/accelerators through the CGIAR Partnerships and Advocacy Unit on Private Partnerships and the MENA Water-Energy-Food (WEF) Hub, develop the capacity of youth and women to create digital tools with the aim that a few proto-types are able to be developed to scaling readiness, and develop guidelines for scaling (O 5.08-5.12). The kinds of proto type digital tools developed will be based on the innovations and bundled solutions developed in all F2R-CWANA Work Packages, and from any other Initiatives using the F2R-CWANA Innovation Platforms. The assumption here is (3) that we will be able to get the right people and organizations participating in these partnerships, and (4) that by facilitating the creation of these partnerships and trainings, we will create a conducive – creative, innovative, exciting, thriving - environment for the capacity development of individuals, civil society organizations, and private sector in the development of digital tools.

The capacity development impact pathway contributes to the EoIO 6 via IO 5.03, that SMEs, extension services, start-up and accelerator programs scale up digital tools for FVC climate risk management. We will achieve this through producing roadmaps for investing in digital scaling, youth-inclusive business models, and capacity building of stakeholders to use the digital innovations and tools (O 5.13-5.15) and through working with the WEF Hub incubator Berytech²⁶ and others such as ImpactLab, LaStartUp Factory, Rockstart, IT-Techno Park²⁷, Start-upFactory²⁸, Agricultural Knowledge and Innovations System²⁹ and IICAS³⁰, private investors, SMEs, government agencies including NARES and other development partners, including the World Bank, GIZ, SDC, FAO and others who are already active in this area. The assumptions

²⁶<https://berytch.org/>

²⁷<https://it-park.uz/en/itpark>

²⁸<http://startupfactory.uz/accelerator/?lang=en>

²⁹<http://akis.agro.uz/u>

³⁰<https://iic-aralsea.org/en/main>

here are (5) that the roadmaps, business models, and so on will be fit for purpose and readily adopted by the stated partners.

Annex for section 3 Partners [here](#).

4. Innovation Packages and Scaling Readiness Plan

4.1 Innovation Packages and Scaling Readiness Plan

The F2R-CWANA Initiative will evaluate and scale a range of proven and well characterized set of Core Innovations generated through CRPs and bilateral projects. The Initiative will use Scaling Readiness as part of WP1 to diagnose and assess the readiness and use of co-identified core innovations under all five WPs; develop scaling strategies, and ensuring a well-designed monitoring, evaluation, and implementation process for the Initiative scaling strategies in close collaboration with EiB, ClimBeR, Cities, Digital Technologies, GeneBank, Plant Health, ABI, and NEXUS Gains. F2R-CWANA will build the needed capacity among the Initiative partners and members to diagnose current readiness and use of F2R-CWANA core innovations, improving the assessment of the scaling readiness, and overcome bottlenecks and to manage the portfolio of Innovation Packages. F2R-CWANA plan to apply the Scaling Readiness framework to 60% of the Core Innovations.

The Initiative will adopt the One CGIAR Wave 2 backstopping commencing through Light Track (profiling, characterization) in Q2-2023 for 4 CI and Standard Track (Innovation Package design and Scaling Readiness assessments) starting in Q1-2024 for 5 Core Innovations, with at least nine Scaling Readiness reports/strategies developed by 2024. The Initiative has allocated US\$3,214,194 to implement the Innovation Packages and Scaling Readiness Plan (2022/2023: US\$964,258; 2023/2024: US\$1,071,398; and 2024/2025: US\$1,178,538). Dedicated activities, deliverables, indicators, and line-items are included in the MELIA, Management Plan and Budget Sections. Additional funds will be devoted to facilitating development, implementation, and monitoring scaling strategies.

Annex for section 4.1 Innovation Packages and Scaling Readiness Plan [here](#).

5. Impact statements

5.1 Nutrition, health and food security

Challenges and prioritization

The CWANA Region has fragile agrifood systems which limits access to healthy diets and increases the double burden of malnutrition. Climate change, COVID-19, conflict, and policy fragmentation, compound malnutrition and food insecurity challenges. Meanwhile, the growing regional population presents additional imbalances between food demand and food production. Addressing these challenges necessitate transformation in agrifood systems. WP1 identifies new pathways, innovations, policy priorities and institutional arrangements for agrifood systems transformation in CWANA, to address the above. WP2 contributes to biodiversity conservation and diffusion of genetic innovations including validation of nutritional and household/industrial end-use quality that contribute to improve food and nutrition security as well as improving marketability in CWANA. WP3 facilitates sustainable intensification of farming systems in CWANA while WP4 supports communities and stakeholders for more sustainable, resilient and inclusive water and agrifood systems. WP5 will help improve climate resilience of food value chains (FVCs) by promoting and scaling-up of digital technologies, to improve access and affordability of healthy diets in the region.

Components of Work Packages (WPs)

WP	Research questions	Outputs	Outcomes	3-year targets and metrics
1	1.01, 1.04	1.01, 1.02, 1.03, 1.04, 1.05, 1.09, 1.10, 1.11, 1.12, 1.13	IO 1.01, IO 1.02, EoIO 1	EoIO 1 Government, civil society, private sector and INGOs work together to create efficient, inclusive and resilient national agrifood systems. → 5 policies, strategies, laws, regulations, budgets, investments modified in design or implementation, informed by CGIAR research, in EG, LB, MA, SD, UZ by 2025.
2	2.01, 2.04	2.01, 2.02, 2.03, 2.04, 2.05, 2.06, 2.07	IO 2.01, IO 2.02, IO 2.05, EoIO 2	EoIO 2 Farmers use best bet Genetic Innovations developed for CWANA. → 2% of beneficiaries using the innovation, disaggregated by gender in EG, LB, MA, SD, UZ by 2025.
3	3.03	3.08, 3.09		

Partners

Please see the Annex of Partners [here](#).

Human resources and capacity development

Team includes agrobiodiversity specialists (taxonomist/on-farm conservationist), specialist in FAP, plant breeders, seed systems and product specialists, as well as socio-economists and policy analysis as well as data management and analysts as well as data modelers and gender and social inclusion specialists. Key capacity development with NARS partners and on-the-ground stakeholders will be critical.

5.2 Poverty reduction, livelihoods and jobs

Challenges and prioritization

According to World Bank indicators (<https://databank.worldbank.org/source/world-development-indicators>), in CWANA, the multidimensional poverty headcount ratio (% of population) ranges between 4.7% for Egypt (2014) to 51.4% for Sudan (2017). Despite rural population-dependence on agriculture, agriculture and rural development is declining. Additionally, the region is facing several converging trends threatening future livelihoods of the poorest with less access to resources and basic services, typically people living in conflict-affected regions, marginal farmers, farm laborers, and women and children. Studies have confirmed high poverty and unemployment levels regionally, but few case studies demonstrated that agricultural innovations can contribute to improve livelihood security, raise incomes and reduce poverty in efficient and inclusive ways. This Initiative targets ways to increase opportunities for farmers with focus on women and youth, and conflict-affected populations (e.g. inclusive business models, fast tracking adoption mechanisms) over identification and promotion of technological innovation packages leading to increase farm profitability and achieving decent jobs.

Components of Work Packages (WPs)

WP	Research questions	Outputs	Outcomes	3-year targets and metrics
2	2.01	2.08, 2.09, 2.10, 2.11	IO 2.04	
3	3.04	3.10, 3.11, 3.12	IO 3.02	
4	4.01	4.01, 4.02, 4.03, 4.04	IO 4.01	
5	5.04	5.13, 5.14, 5.15	IO 5.03	

Partners

Please see the Annex of Partners [here](#).

Human resources and capacity development

Team includes socio-economists, policy analysts, while being underpinned by gender and social inclusion, and fragility specialists, as well as agricultural innovation and scaling specialists, data modelers and data science and GIS specialists. This WP also has a strong capacity development component in policy support and development and digital application.

5.3 Gender equality, youth and social inclusion

Challenges and prioritization

The CWANA region is experiencing increased managerial and labor feminization in agriculture yet have limited access to inputs, information, land rights and technologies. The increased feminization of farming has been associated with low agricultural productivity, low earnings, poor job security and growing food insecurity. This Initiative builds on the premise that addressing these deficiencies offers key entry points to support the empowerment of women – who are set-back by gender norms. To leverage the empowerment potential of women we propose to understand the interaction between technologies, policies, social and biophysical dynamics and local gender dynamics and norms. Following, we will co-design and test gender-transformative approaches that are effective to address these norms support creation and adoption of technology relevant at a country-specific level.

Components of Work Packages (WPs)

WP	Research questions	Outputs	Outcomes	3-year targets and metrics
1	1.03	1.06, 1.07, 1.08	IO 1.03	
5	5.03	5.08, 5.09, 5.10, 5.11, 5.12	IO 5.02	

Partners

Please see the Annex of Partners [here](#).

Human resources and capacity development

Team includes socio-economists, policy analysts, integrated water resources management specialists, as well as water governance and water management, as well as water accounting team, and underpinned by gender and inclusion specialists with a clear inclusion of junior specialists. Capacity development critical to support web-based platforms for sharing information and innovations.

5.4 Climate adaptation and mitigation

Challenges and prioritization

Although a 2°C warming scenario is expected at the global scale, for CWANA, already being the world's hottest and driest region, a 4°C warming seems more likely until the end of the century. Here, a greater share of water resources is used for food production than any other region, and water scarcity is further exacerbated by climate change. This Initiative is built on the premise of the need for active and rapid management and mitigation of in-coming climate challenges, to help prevent against increased desertification, water reduction, and social instability prevalent in the region and which exacerbates challenges of nutrition and health, and more deeply affect marginalized groups. The technologies, approaches and actors highlighted will be “best fit” to support effective decision-making and implementation and scaling for greatest reduction in negative impacts from climate change.

Components of Work Packages (WPs)

WP	Research questions	Outputs	Outcomes	3-year targets and metrics
5	5.01, 5.02	5.01, 5.02, 5.03, 5.04, 5.05, 5.06, 5.07	IO 5.01, EoIO 6	EoIO 6 Government, civil society and private sector scale up innovations and digital tools for food value chain (FVC) climate risk management. à 25 beneficiaries (organizations) using the innovations in EG, LB, MA, SD, UZ by 2025.

Partners

Please see the Annex of Partners [here](#).

Human resources and capacity development

Team includes socio-economists, policy analysts, agrobiodiversity specialists, soil specialists, as well as breeders and seed system and product management, and underpinned by gender and inclusion specialists as well as incubator specialists and sustainable finance experts to support matchmaking in the region. Additionally, GIS and data modelling will form a critical part. Capacity development will be included in web-based and digital platforms, SMEs and support to youth-inclusive entrepreneurship.

5.5 Environmental health and biodiversity

Challenges and prioritization

CWANA encompasses four major centers of diversity (Mediterranean, Abyssinian, Fertile Crescent and Central Asia) for crops and forage species of global and regional importance. Agriculture remains the major activity of rural communities and a pillar in national economies. However, agriculture production is increasingly affected by adverse effects of land degradation, water scarcity and climate change, leading to more degraded environments and farmers being forced to abandon their lands, livestock and crops. Substantial gaps in productivity exist in predominant farming systems calling for well-coordinated efforts to transfer the already existing technologies and substantial additional productivity gains are possible through an integrated approach to ensure sustainable intensification and diversification of the predominant farming systems. An integrated and innovative approach combining technological, institutional and policy options and involving key stakeholders including youth and gender is required to reduce gaps in productivity and to contribute to development of packages for ensure sustainable agricultural development.

Components of Work Packages (WPs)

WP	Research / Activities	Outputs	Outcomes	3-year targets and metrics
2	2.03	2.12, 2.13, 2.14, 2.15, 2.16, 2.17	EoIO 3	EoIO 3 Farmers adopt best practices for the on-farm conservation of agrobiodiversity. à Change in the capacity of 5,000 key individuals in LB, MA, UZ by 2025.
3	3.01	3.01, 3.02, 3.03, 3.04, 3.05, 3.06, 3.07	IO 3.01, EoIO 4	EoIO 4 Government, civil society and private sector work together to scale up bundled solutions to bridge yield gaps. à 100,000 ha land under the innovation in EG, LB, MA, SD, UZ by 2025.
4	4.02, 4.03, 4.04, 4.05	4.05, 4.06, 4.07, 4.08, 4.09, 4.10, 4.11, 4.12, 4.13, 4.14, 4.15, 4.16, 4.17, 4.18	IO 4.01, IO 4.02, IO 4.03, EoIO 5	EoIO 5 Government, private sector and civil society practice the integrated management of food, land, water and energy systems. à 15 policies, strategies, budgets, investments modified in design or implementation, informed by CGIAR research in EG, LB, MA, SD, UZ by 2025.

Partners

Please see the Annex of Partners [here](#).

Human resources and capacity development

Team includes agrobiodiversity and FAP specialists, plant breeders, seed system and product management specialists, cropping modeler, as well as mechanization and geospatial and data scientists and policy specialists. Additionally, integrated water resource management, water governance, treated wastewater, and salinity specialists. These specialists will undertake significant capacity development and support alongside stakeholders.

6. Monitoring, evaluation, learning and impact assessment (MELIA)

6.1 Result framework

CGIAR Impact Areas				
Nutrition, health and food security	Poverty reduction, livelihoods and jobs	Gender equality, youth and social inclusion	Climate adaptation and mitigation	Environmental health and biodiversity
Collective global 2030 targets (The collective global 2030 targets are available centrally here to save space)				
End hunger for all and enable affordable healthy diets for the 3 billion people who do not currently have access to safe and nutritious food.	<p>Lift at least 500 million people living in rural areas above the extreme poverty line of US\$1.90 per day (2011 PPP).</p> <p>Reduce by at least half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.</p>	<p>Close the gender gap in rights to economic resources, access to ownership and control over land and natural resources for over 500 million women who work in food, land and water systems.</p> <p>Offer rewardable opportunities to 267 million young people who are not in employment, education or training.</p>	Equip 500 million small-scale producers to be more resilient to climate shocks, with climate adaptation solutions available through national innovation systems.	<p>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 a redistribution towards low-input farming system) and increased use efficiency; and phosphorus application of 10 Tg per year.</p> <p>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.</p>
Common impact indicators				
<p># people benefiting from relevant CGIAR innovations</p> <p># people meeting minimum dietary energy requirements</p>	# people benefiting from relevant CGIAR innovations	<p># women benefiting from relevant CGIAR innovations</p> <p># youth benefiting from relevant CGIAR innovations</p>	<p># \$ climate adaptation investments</p> <p># people benefiting from climate-adapted innovations</p>	<p># ha under improved management</p> <p># km³ consumptive water use</p> <p># plant genetic accessions available and safely duplicated</p>

SDG targets				
2.4, 2.5	1.5, 1.b, 8.2, 8.3, 8.6, 8.10	5.5, 5.b, 5.c, 16.7	13.1, 13.2, 13.3, 13.b	6.3, 6.4, 6.5, 6.a, 6.b, 12.2, 12.a, 15.5, 15.6
Action Area: Systems Transformation & Resilient Agrifood Systems & Genetic Innovation (Regional Integrated Initiative maps to all three)				
Systems Transformation Action Area outcomes			Systems Transformation Action Area outcome indicators	
ST 1 Farmers use technologies or practices that contribute to improved livelihoods, enhance environmental health and biodiversity, are apt in a context of climate change, and sustain natural resources.			STi 1.1 Number of farmers using climate smart practices disaggregated by gender. STi 1.2 Number of farmers using agroecological practices disaggregated by gender. STi 1.3 Measurable implications of adoptions such as production, profitability, input use, product quality and associated price, environmental and health damage avoided, livelihood, employment and so forth.	
ST 3 Governments and other actors take decisions to reduce the environmental footprint of food systems from damaging to nature positive.			STi 3.2 Area under improved water use plans (or water use efficiency measures – more ambitious and longer term).	
Resilient Agrifood Systems Action Area outcomes			Resilient Agrifood Systems Action Area outcome indicators	
RAFS 1 Smallholder farmers use resource-efficient and climate-smart technologies and practices to enhance their livelihoods, environmental health and biodiversity.			RAFSi 1.1 Number of resource-efficient and climate-smart technologies at stage IV (uptake by next user), disaggregated by type.	
RAFS 3 Public and private financial resources are invested to fund climate-smart business models.			RAFSi 3.1 Total amount (USD) invested in climate smart business models.	
ST & RAFS 1 Smallholder farmers implement new practices that mitigate risks associated with extreme climate change and environmental conditions and achieve more resilient livelihoods.			STRAFSi 1.1 Number of smallholder farmers who have implemented new practices that mitigate climate change risks, disaggregated by gender and type of practice.	
ST & RAFS 2 National and local governments utilize enhanced capacity (skills, systems and culture) to assess and apply research evidence and data in policy making process.			STRAFSi 2.1 Number of policies/ strategies/ laws/ regulations/ budgets/ investments/ curricula (and similar) at different scales that were modified in design or implementation, with evidence that the change was informed by CGIAR research.	
ST & RAFS & GI 1 Women and youth are empowered to be more active in decision making in food, land and water systems.			STRAFSGli 1.2 Number of women, youth and people from marginalized groups who report input into productive decisions, ownership of assets, access to and decisions on credit, control over use of income, work balance, and visiting important locations.	

Genetic Innovation Action Area outcomes						Genetic Innovation Action Area outcome indicators					
GI 5 Cooperation and co-investment by CGIAR, public- and private-sector seed-system actors support coordinated and effective research and investment in the sector.						Gii 5.1 Number of genetic innovations commercialized through public/private sector cooperation agreements.					
GI 6 Seed-sector actors' investments pipelines are profitable and effective in scaling-up new varieties from CGIAR breeding.						GII 6.2 Production volumes of seed or clones by Seed system actors.					
GI 7 Farmers have access to and use climate-resilient, nutritious, market-demanded crop varieties.						GII 7.1 Number of farmers who grow climate-smart crop varieties, disaggregated by gender.					
ST & RAFS & GI 1 Women and youth are empowered to be more active in decision making in food, land and water systems.						STRAFSGII 1.3 Number of farmers who grow climate-smart crop varieties, disaggregated by gender.					
Initiative and Work package outcomes, outputs and indicators											
Result type (outcome or output)	Result	Indicator	Unit of measurement	Geographic scope	Data source	Data collection method	Frequency of *data collection	Baseline value (outcome only)	Baseline year (outcome only)	Target value	Target year
Outcome	EoIO 1 Government, civil society, private sector and INGOs work together to create efficient, inclusive and resilient national agrifood systems.	Number of policies, strategies, laws, regulations, budgets, investments modified in design or implementation, informed by CGIAR research	Number	EG, LB, MA, SD, UZ	Primary	Key informant interviews, stakeholder consultations	Annual	Not available	Not available	5	2025
Outcome	IO 1.01 Government, civil society, private sector and INGOs form strategic partnerships to	Change in the capacity of key networks	Number	EG, LB, MA, SD, UZ	Primary	Key informant interviews, stakeholder consultations	Annual	Not available	Not available	5	2025

	make national agrifood systems more efficient, inclusive and resilient.										
Output	O 1.01 National Alliances of Stakeholders created and/or strengthened.	Number of Alliances of Stakeholders created	Number	EG, LB, MA, SD, UZ	Primary	Key informant interviews, stakeholder consultations	Annual			5	2022
Output	O 1.02 Policy, regulatory, institutional and investment constraints and opportunities for agrifood systems transformation analyzed.	Number of other information products (report, briefs)	Number	LB, SD, UZ,	Primary	CGIAR and other data repositories	Semi-annual			7	2023
Output	O 1.03 Technology and service provision innovations analyzed for their potential to transform agrifood systems.	Number of other information products (report)	Number	EG, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2024
Outcome	IO 1.02 Government, civil society, private sector and INGOs know how to best support durable development impacts in fragile and conflict-affected situations.	Change in the capacity of key organizations	Number	LB, SD	Primary	Key informant interviews, stakeholder consultations	Annual			10	2025

Output	O 1.04 Investments in capacity, institutions and infrastructure for durable development impacts in fragile and conflict-affected contexts recommended.	Number of other information products (briefs)	Number	LB, SD	Primary	CGIAR and other data repositories	Semi-annual			2	2024
Output	O 1.05 Technology adoption and sustainable resource use in fragile and conflict-affected contexts analyzed.	Number of other information products (reports)	Number	LB, SD	Primary	CGIAR and other data repositories	Semi-annual			2	2023
Outcome	IO 1.03 Government, civil society, private sector and INGOs know how to best support the empowerment of women and other disadvantaged social groups.	Change in the capacity of key organizations	Number	LB, MA	Primary	Key informant interviews, stakeholder consultations	Annual	Not available	Not available	8	2025
Output	O 1.06 GTAs that lead to equitable access to outputs, technology design, employment, and inputs.	Number of other information products (report)	Number	LB, MA	Primary	CGIAR and other data repositories	Semi-annual			2	2025

Output	O 1.07 Women's empowerment using GAAs and GTAs.	Number of other information products (report)	Number	LB, MA	Primary	CGIAR and other data repositories	Semi-annual			2	2025
Output	O 1.08 Overcome intersectional marginalization (gender intersecting with refugee status, age, class, and other social identities).	Number of other information products (report)	Number	LB, MA	Primary	CGIAR and other data repositories	Semi-annual			2	2025
Outputs	O 1.09 National Innovation Platforms created and/or strengthened.	Number of Innovation Platforms created	Number	EG, LB, MA, SD, UZ	Primary	Initiative Annual Report	Annual			5	2022
Output	O 1.10 Development outcomes of innovations in institutional arrangements (public, private, or public-private partnerships) identified.	Number of other information products (briefs)	Number	MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			2	2023
Output	O 1.11 Farmers' bottlenecks and risks to innovate and adopt technology identified.	Number of other information products (brief)	Number	EG, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2023

Output	O 1.12 Women's bottlenecks in agrifood value chains identified.	Number of other information products (report)	Number	EG, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2024
Output	O 1.13 Strategies to promote innovative technologies and service provisions in agrifood systems, with gender and youth differentiated impacts.	Number of other information products (report)	Number	EG, UZ	Primary	CGIAR and other data repositories	Semi-annual			2	2023
Outcome	EOIo 2 Farmers use Best Bet Genetic Innovations developed for CWANA	Number of beneficiaries using the innovation, disaggregated by gender	Percentage	EG, LB, MA, SD, UZ	Primary	Initiative Annual Report	Annual	Not available	Not available	2	2025
Outcome	IO 2.01 NARS add recommended advanced lines for release/registration to national portfolio of genetic innovations	Number of beneficiaries using the innovation, disaggregated by gender	Number	EG, LB, MA, SD, UZ	Primary	Key informant interviews; Stakeholder consultations	Annual	Not available	Not available	5	2025
Outcome	IO 2.03 Farmers prefer climate smart varieties.	Change in the capacity of key individuals	Number	EG, LB, MA, SU, UZ	Primary	Knowledge, attitude & practice surveys	Annual	Not available	Not available	20,000	2025
Output	O 2.01 Product Profiles for CWANA prioritized.	Number of other information	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			5	2022

		products (report)									
Output	O 2.02 Performance of advanced lines during on-station assessment published.	Number of peer reviewed journal papers	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			1	2025
Output	O 2.03 Performance of and gender trait preferences for advanced lines during on- and off-farm participatory assessment published.	Number of peer reviewed journal papers	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			1	2025
Output	O 2.04 Farmers exposed to climate-smart varieties.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, LB, MA, SD, UZ	Primary	Demonstration and field days reports	Annual			10,000	2025
Output	O 2.05 Full description of selected advanced lines recommended for country release/registration produced.	Number of other information products (report)	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			5	2025
Output	O 2.06 Germplasm of the selected advanced lines available for NARS release/	Number of innovations	Number	EG, LB, MA, SD, UZ	Primary	Initiative Annual Report	Annual			10	2025

	registration process.										
Outcome	IO 2.02 Global Genetic Innovation Initiatives develop Product Profiles that are specifically targeted to the requirements of stakeholders in CWANA.	Number of beneficiaries using the innovation, disaggregated by gender	Number	EG, LB, MA, SD, UZ	Primary	Key informant interviews; Stakeholder consultations	Annual	Not available	Not available	15	2025
Output	O 2.07 Meetings with National Alliance of Stakeholders throughout the entire process.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, LB, MA, SD, UZ	Primary	Meeting report	Annual			200	2022-2025
Outcome	IO 2.04 Private sector and civil society, including women- and youth-led groups, use knowledge, genetic innovations and seed system business models.	Change in the capacity of key organizations	Number	EG, MA, SD, UZ	Primary	Key informant interviews; Focus group discussions; Stakeholder consultations	Annual	Not available	Not available	12	2025
Output	O 2.08 Opportunities for seed system diversification.	Number of other information products (report, brief)	Number	EG	Primary	CGIAR and other data repositories	Semi-annual			2	2025

Output	O 2.09 Business models for EGS production.	Number of other information products (report)	Number	EG, SU	Primary	CGIAR and other data repositories	Semi-annual			2	2023
Output	O 2.10 Business models for the production of seed of less commercial crops through farmer-based seed producers.	Number of other information products (reports)	Number	MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			2	2025
Output	O 2.11 Seed sector business development trainings and workshops held with Government, private sector and civil society, including women- and youth-led organizations.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, MA, SD, UZ	Primary	Training event reports	Annual			50	2025
Outcome	EoIO 3 Farmers adopt best practices for the on-farm conservation of agrobiodiversity.	Change in the capacity of key individuals	Number	LB, MA, UZ	Primary	Key informant interviews; Stakeholder consultations	Annual	Not available	Not available	5,000	2025
Output	O 2.12 Agrobiodiversity hotspots in CWANA identified and characterized.	Number of other information products (report, maps, other GIS outputs,	Number	LB, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			7	2023

		data and databases)									
Output	O 2.13 Accessions of endemic agrobiodiversity found in hotspots collected for conservation and use in genebanks.	Number of plant accessions input into genebanks	Number	LB, MA, UZ	Primary	Initiative Annual Report	Annual			1,500	2024
Output	O 2.14 Challenges and opportunities for the on-farm conservation of agrobiodiversity.	Number of other information products (report)	Number	LB, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			2	2023
Output	O 2.15 Management package for the on-farm conservation of agrobiodiversity.	Number of innovations	Number	LB, MA, UZ	Primary	Initiative Annual Report	Annual			3	2023
Output	O 2.16 Training events for farmers on how to implement the on-farm agrobiodiversity conservation management plan.	Number of people trained, long-term and short-term, disaggregated by gender	Number	LB, MA, UZ	Primary	Training event report	Annual			150	2022-2024
Output	O 2.17 Farming with Alternative Pollinators (FAP) innovation introduced to farmers.	Number of innovations	Number	UZ	Primary	Initiative Annual Report	Annual			1	2024

Outcome	IO 2.05 Policy makers develop policy to support the beneficial conservation, release and use of Genetic Innovations and genetic resources.	Number of policies modified in design or implementation, informed by CGIAR research	Number	EG, LB, MA, SD, UZ	Primary	Key informant interviews; Stakeholder consultations	Annual	Not available	Not available	5	2025
Output	O 2.18 Policy reviews and recommendations for the release of Genetic Innovations, seed system diversification, and conservation of agrobiodiversity.	Number of other information products (report)	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			7	2024
Output	O 2.19 Engagement of policy makers and key stakeholders throughout process.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, LB, MA, SD, UZ	Primary	Engagement event report	Annual			50	2024
Outcome	EoIO 4 Government, civil society and private sector work together to scale up bundled solutions to bridge yield gaps.	Area of land (ha) under innovation.	Number	EG, LB, MA, SD, UZ	Primary	Initiative Annual Report	Annual	Not available	Not available	100,000	2025

Outcome	IO 3.01 NARS staff, extension officers and researchers have knowledge and capacity to apply bundled solutions.	Change in the capacity of key individuals	Number / percentage	EG, LB, MA, SD, UZ	Primary	Key informant interviews; Stakeholder consultations	Annual	Not available	Not available	150	2025
Output	O 3.01 The state of the natural resource base and cause of yield gaps in CWANA's diverse farming systems analyzed.	Number of other information products (reports, data and databases, web-based services)	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			10	2023
Output	O 3.02 Bundled solutions of evidence-based management practices to sustainably bridge yield gaps.	Number of other information products (reports, training content, data and databases, web-based services)	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			25	2023
Output	O 3.03 Gender and youth sensitive practices for growing more crops with less water and more efficient use of fertilizers.	Number of peer reviewed journal papers	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			5	2024
Output	O 3.04 Framework for soil health assessment in	Number of peer reviewed	Number	EG, LB,	Primary	CGIAR and other data repositories	Semi-annual			3	2024

	crop-livestock integrated farming systems.	journal papers		MA, SD, UZ							
Output	O 3.05 Governance and management protocols for resilient crop-livestock farming systems.	Number of other information product (report, training content)	Number	LB, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2024
Output	O 3.06 Gender and youth sensitive value chain mechanization solutions for sustainable production.	Number of other information product (report, training content)	Number	EG, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2024
Output	O 3.07 Capacity of farmers, civil society organizations, NARS, private sector and Government built through stakeholder workshops, farmer field days, and training of trainers events.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, LB, MA, SD, UZ	Primary	Training event report	Annual			400	2024
Output	O 3.08 Agronomic management suited genotypes identified.	Number of other information products (report)	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			10	2024

Output	O 3.09 Recommendations of which combinations of varieties/genotypes and management practices are suitable for which farming systems.	Number of other information products (report)	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			5	2024
Outcome	IO 3.02 Government, civil society including women- and youth-led organizations, and private sector scale up bundled solutions.	Change in the capacity of key organizations	Number / percentage	EG, LB, MA, SD, UZ	Primary	Key informant interviews; Focus group discussions; Stakeholder consultations	Annual	Not available	Not available	25	2025
Output	O 3.10 Investment strategy for scaling up bundled solutions to bridge yield gaps produced.	Number of other information products (briefs)	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			5	2024
Output	O 3.11 Gender- and youth-sensitive business models for scaling the bundled solutions.	Number of other information products (reports)	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			5	2024
Output	O 3.12 Youth and women-led organizations trained in business models.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, LB, MA, SD, UZ	Primary	Training event report	Annual			200	2024

Outcome	EoIO 5 Government, private sector and civil society practice the integrated management of food, land, water and energy systems.	Number of policies, strategies, budgets, investments modified in design or implementation, informed by CGIAR research	Number	EG, UZ, MA, SD, UZ	Primary	Key informant interviews; Focus group discussions; Stakeholder consultations	Annual	Not available	Not available	15	2025
Outcome	IO 4.01 Public sector develops policy for the integrated management of food, land, water, and energy systems.	Number of policies, strategies, budgets, investments modified in design or implementation, informed by CGIAR research	Number	EG, LB, MA, SD, UZ	Primary	Key informant interviews; Focus group discussions; Stakeholder consultations	Annual	Not available	Not available	15	2025
Output	O 4.01 The state of water and landscapes analyzed.	Number of other information products (report, datasets and database)	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			10	2023
Output	O 4.02 Web-based dashboard of national and key basin water accounts developed.	Number of other information products (web-based services)	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			1	2023

Output	O 4.03 Capacity of intended users of web-based dashboard (policy makers) built.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, LB, MA, SD, UZ	Primary	Training event report	Annual			100	2023
Output	O 4.04 Gender responsive community management plan for the sustainable use of natural resources in fragile and conflict affected situations.	Number of other information products (report, training materials)	Number	EG, LB, MA	Primary	CGIAR and other data repositories	Semi-annual			3	2023
Output	O 4.05 Application of Nexus Gains Initiative governance guidelines to additional CWANA countries.	Number of other information products (report)	Number	EG, LB, MA	Primary	CGIAR and other data repositories	Semi-annual			3	2025
Output	O 4.06 Investment strategies to strengthen the resilience of food, land, water and energy systems.	Number of other information products (report)	Number	EG, UZ	Primary	CGIAR and other data repositories	Semi-annual			2	2025
Output	O 4.07 Evidence-based policy advice for Nexus-reuse and shared resources between	Number of other information products (report)	Number	EG, UZ	Primary	CGIAR and other data repositories	Semi-annual			2	2025

	competing sectors.										
Output	O 4.08 Guidelines for co-designing Nexus decision-support tools.	Number of other information products (report, training materials)	Number	EG, UZ	Primary	CGIAR and other data repositories	Semi-annual			2	2025
Output	O 4.09 Management factsheets about the Nexus inputs and outputs process and benefits.	Number of other information products (report, training materials)	Number	EG, UZ	Primary	CGIAR and other data repositories	Semi-annual			2	2025
Output	O 4.10 Multi-actor and sector partnerships and services for Nexus-WEF in stable and fragile contexts.	Change in the capacity of key networks	Number	EG, UZ	Primary	Initiative Annual Report	Annual			2	2023
Outcome	IO 4.02 Government and private sector capacity built to manage water scarcity and variability.	Change in the capacity of key organizations	Number	EG, LB, MA	Primary	Key informant interviews; Stakeholder consultations	Annual	Not available	Not available	3	2025
Output	O 4.11 Cost-benefit of treated wastewater (TWW) reuse in marginal communities.	Number of other information products (report, briefs)	Number	EG, LB, MA	Primary	CGIAR and other data repositories	Semi-annual			3	2024

Output	O 4.12 TWW reuse and substitution materials.	Number of other information products (report, training materials)	Number	EG, LB, MA	Primary	CGIAR and other data repositories	Semi-annual			6	2024
Output	O 4.13 Water storage diagnostics based on NEXUS Gains methodology.	Number of other information products (report)	Number	EG, LB, MA	Primary	CGIAR and other data repositories	Semi-annual			3	2025
Output	O 4.14 Capacity of Government and private sector built through multi-stakeholder dialogue events.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, LB, MA,	Primary	Training event report	Annual			125	2024
Outcome	IO 4.03 Government and private sector capacity built to maintain and improve the productivity of marginal and saline landscapes.	Change in the capacity of key organizations	Number	EG, LB, MA	Primary	Key informant interviews; Stakeholder consultation	Annual	Not available	Not available	3	2025
Output	O 4.15 Saline landscapes management roadmap for countries.	Number of other information products (report)	Number	EG, MA	Primary	CGIAR and other data repositories	Semi-annual			2	2023
Output	O 4.16 Guidelines on the integration and scaling up of aquaculture (fish	Number of other information products (report,	Number	EG, MA	Primary	CGIAR and other data repositories	Semi-annual			2	2024

	farming) and agriculture.	training materials)									
Output	O 4.17 Investment strategy for gender sensitive scaling up of integrated Nexus farming systems.	Number of other information products (report)	Number	EG, UZ	Primary	CGIAR and other data repositories	Semi-annual			2	2024
Output	O 4.18 Capacity of Government, private sector and civil society built through multi-stakeholder dialogue events.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, UZ	Primary	Training event report	Annual			60	2024
Outcome	EOIO 6 Government, civil society and private sector scale up innovations and digital tools for food value chain (FVC) climate risk management.	Number of beneficiaries using the innovation, disaggregated by gender	Number	EG, LB, MA, SD, UZ	Primary	Initiative Annual Report	Annual	Not available	Not available	25	2025
Outcome	IO 5.01 Government, civil society and private sector use climate information services to understand climate risk.	Number of beneficiaries using the innovation, disaggregated by gender	Number	EG, MA, UZ	Primary	Initiative Annual Report	Annual	Not available	Not available	3	2025
Output	O 5.01 Climate information service needs, provision of key	Number of other information products	Number	EG, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2023

	actors and new data generation tools.	(report, data and databases)									
Output	O 5.02 Web-based platform for climate analysis and early warning system.	Number of other information products (web-based services)	Number	EG, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			1	2023
Output	O 5.03 Climate of National Innovation Platforms characterized using web-based platform.	Number of other information products (report)	Number	EG, LB, MA, SD, UZ	Primary	CGIAR and other data repositories	Semi-annual			5	2024
Output	O 5.04 Capacity of stakeholders to use web-based platform built.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, MA, UZ	Primary	Policy dialogue event reports	Annual			150	2023
Outcome	IO 5.02 Civil society including youth and private sector develop digital tools for FVC climate risk management.	Change in the capacity of key organizations	Number	EG, MA, UZ	Primary	Knowledge, attitudes, and practices survey	Annual	Not available	Not available	300	2025
Output	O 5.05 Inventory of existing agri- and market-advisory digital tools.	Number of other information products (report)	Number	EG, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2023

Output	O 5.06 Impact evaluation of existing digital tools for climate resilient FVCs.	Number of other information products (report)	Number	EG, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2024
Output	O 5.07 Best practices for scaling up innovations and digital tools.	Number of other information products (report)	Number	EG, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2024
Output	O 5.08 Partnerships with incubators/accelerators set up.	Number of partnerships set up	Number	EG, MA, UZ	Primary	Initiative Annual Report	Annual			3	2023
Output	O 5.09 Capacity of youth/women to develop digital innovations built through challenge calls and hack-a-thons.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, MA, UZ	Primary	Training event report	Annual			60	2023
Output	O 5.10 Proto-type digital tools for climate resilient FVCs brought to scaling readiness.	Number of innovations	Number	EG, MA, UZ	Primary	Initiative Annual Report	Annual			6	2025
Output	O 5.11 Guidelines for accelerating the use of digital innovations and tools, securing financial support for SMEs and	Number of other information products (report,	Number	EG, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2024

	start-ups, and encouraging youth inclusive entrepreneurship.	training materials)									
Output	O 5.12 Match-making event between investors and digital innovators.	Number of people trained, long-term and short-term, disaggregated by gender	Number	EG, MA, UZ	Primary	Matchmaking event report	Annual			24	2024
Outcome	IO 5.03 SMEs, extension services, start-up and accelerator programs scale up digital tools for FVC climate risk management.	Change in the capacity of key organizations	Number	EG, MA, UZ	Primary	Key informant interviews; Focus group discussions; Stakeholder consultations	Annual	Not available	Not available	12	2025
Output	O 5.13 Scaling digital investment roadmap with policies and business models for youth-inclusive entrepreneurship.	Number of other information products (report)	Number	EG, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2025
Output	O 5.14 Policy brief on how to support digitalization assisted climate risk management.	Number of other information products (briefs)	Number	EG, MA, UZ	Primary	CGIAR and other data repositories	Semi-annual			3	2024
Output	O 5.15 Capacity of stakeholders to use the digital	Number of people trained, long-term and short-term,	Number	EG, MA, UZ	Primary	Training event report	Annual			45	2024

	innovations and tools built.	disaggregated by gender									
Innovation Packages and Scaling Readiness											
Output (Light Track)	CGIAR and partner capacity on innovation and scaling strengthened.	Number of Core Innovations	Number	EG, MA, UZ, SD, LB	Primary	Initiative Annual Report	Annual			4	2023
Output (Standard Track)	Resource allocation, prioritization and scaling strategy at Innovation Package level are evidence-based.	Number of Innovation Packages	Number	EG, MA, UZ, SD, LB	Primary	Scaling Readiness Assessment Study	Annual			5	2025

6.2 MELIA plan

MEL plans – The F2R-CWANA Initiative will develop performance indicators to measure its progress towards achieving the stated Outputs, Intermediate Outcomes, and the End of Initiative Outcomes; as well as its contributions to the Action Area Outcomes, and Collective Global Targets under the five CGIAR Action Areas. The Management Team (MT) will ensure annual and quarterly work plans are developed and monitor whether those activities are on schedule. Data needed for MEL purposes will be periodically collected and reported through CGIAR's management information system (MIS). The Initiative's MELIA focal point will regularly update the MEL database and inform the MT whether progress towards achieving the Outputs and Outcomes is on track. MT will course correct as necessary. Annual meetings, including stakeholders, will assess progress towards both output goals and outcomes. It will also evaluate whether the Initiative and WP level TOCs must be adapted.

Key learning questions for the evaluation process in the Initiative and Work Package TOCs, include:

- Is the Initiative engaging and bringing together key stakeholders and designing the innovation and technology packages to ensure uptake and underpin scaling readiness for efficient, inclusive and sustainable agrifood systems transformation in CWANA?
- Has the Initiative created credibility and trust concerning the effectiveness and scaling readiness of innovations and technologies promoted, and did it manage to engage policymakers to create enabling environment for fast-tracking technology adoption?
- Do outputs and outcomes of WPs align with their respective TOCs, or is course correction needed, and do the Initiative researchers effectively work as a team and exploit synergies across five WPs and relevant 1CG Initiatives?

The Initiative may facilitate an independent external review to assess its progress, credibility, relevance, and the scaling readiness of promoted policy, institutional, and technological innovations.

Impact assessment (IA) research plans – Impact assessment research is embedded in five work packages of the Initiative. Relevant innovations and technologies are identified in each work package. Researchers will design causal impact assessments to measure impacts attributable to the promoted innovations and technologies and determine their scaling readiness. These studies will provide evidence on the validity of the Initiative and WP TOC and contribute to their improvement by examining both the adoption of institutional and technological innovations and their impacts across the relevant impact areas. The evidence produced by these assessments will inform the direction of the Initiative's future phases, including what sections need to be corrected and which innovations and technologies are ready for scaling.

To assess outcomes and impacts of an innovation platform and CGIAR innovation accelerator, we will conduct a Qualitative Outcome Study to substantiate their contribution to fast-tracking technology adoption. The stakeholder dialogues and follow-up to those dialogues will document feedback on policy advising activities and the influence of policy and investment options analyses on policy decisions in the selected countries. In collaboration with scaling partners, the Initiative will develop a plan for monitoring activities and data collection to document where and how the promoted innovations and technologies are used. The Initiative will use CGIAR's MIS to trace scaling activities.

6.3 Planned MELIA studies and activities

Type of MELIA study or activity	Result or indicator title that the MELIA study or activity will contribute to.	Anticipated year of completion (based on 2022-24 Initiative timeline)	Co-delivery of planned MELIA study with other Initiatives	How the MELIA study or activity will inform management decisions and contribute to internal learning
6. Ex-ante, baseline study (Gender disaggregated baseline study of beneficiaries' needs for innovations and new technologies in selected countries-WP1)	O 1.11, O 1.12, O 1.13	2022	Potentially with the following thematic Initiatives: Rethinking Food Markets and VCs, NEXUS Gains, Delivering Genetic Gains in Farmers' Fields	Will inform Initiative and individual WPs research plans by identifying the main bottlenecks and risks faced by farmers relevant to innovation and technology adoption.
4. Qualitative Outcome Study (WP1)	O 1.01, O 1.02, O 1.02 IO 1.01	2023	No	Will substantiate contributions of CGIAR Innovation Accelerator and Innovation Platforms to policies and technology adoption by farmers; can help adjust the setup of the innovation accelerator and support the Initiative innovation portfolio management system.
1. Causal Impact Assessment learning study (Assessment of the impact of innovations aiming to build inclusive seed systems-WP2)	O 2.01, O 2.02, O 2.03, O 2.04 IO 2.01	2025	Potentially with SeEdQUAL: Delivering Genetic Gains in Farmers' Fields	Will help to identify key bottlenecks in the landscape seed systems and ascertain priorities and opportunities for building robust and inclusive seed systems in the region; may help make corrections in the WP TOC.
3. Tracing of scaling activities & policy advice (Compilation of genetic innovations tested, and product profiles validated for CWANA-WP2)	O 2.06, O 2.07, O 2.08, O 2.09 IO 2.02	2024	SeEdQUAL: Delivering Genetic Gains in Farmers' Fields	Will contribute to monitoring and assess progress towards outputs and outcome indicators; create a base for long-term, large scale impact assessment study.
2. Adoption or diffusion study (Bundled solutions of evidence-based management practices to sustainably bridge yield gaps-WP3)	O 3.01, O 3.02, O 3.03 IO 3.01, IO 3.03	2023	TBD	Will contribute to better understanding policy and investment decisions concerning adoption of bundled management practices that make farming systems sustainable and boost productivity, employment, and income

				generation; can help adjust interventions if needed.
1. Causal Impact Assessment learning study (Assessment of the impact of gender- and youth-sensitive business models for scaling the bundled management practices -WP3)	O 3.10, O 3.11, O 3.12 IO 3.02	2024	None	Will assess the impact of the gender- and youth-sensitive business models on technology adoption and productivity; may adjust if adoption is not sufficient and impact is not significant.
4. Qualitative Outcome Study ("Toolbox of Nature-based Solutions"-WP4)	O 4.15, O4.16, O 4.17, O 4.18 IO 4.03	2023	Potentially with NEXUS Gains	Will demonstrate contributions of the "Toolbox of Nature-based solutions" on the capacity to maintain and improve the productivity of marginal and saline landscapes, through using management roadmaps, guidelines, investment strategies for gender-sensitive scaling, and capacity building.
1. Causal Impact Assessment learning study (Assessment of the impact of "Farm to Basin Smart Tools for Water Efficiency and Management" -WP4)	O 4.01, O 4.02, O.4.03, O 4.07, O 4.08 IO 4.01, IO 4.02	2025	Potentially with NEXUS Gains and Harnessing Digital Technologies	Expecting the implementation of Farm to Basin Smart Tools for Water Efficiency and Management improves the capacity to manage water scarcity and variability and thus benefit farmers' efficiency; will inform scaling up strategy and help adjust interventions if necessary.
1. Causal Impact Assessment learning study (Experimental assessment of the impact of Weather-based irrigation advisory systems-WP5)	O 5.12, O 5.13, O 5.14 IO 5.04	2025	Harnessing Digital Technologies and NEXUS Gains thematic Initiatives	Expecting the implementation of weather-based irrigation advisory systems will boost farmers' productivity and resiliency; will inform scaling up strategy and help adjust interventions if necessary.
7. Scaling readiness assessment study	O 1.08, O 1.09, O1.10, O 1.11 IO 1.03	2024	TBD	Will be used in developing and implementing the Initiative scaling strategy; scaling readiness metrics will feed the Initiative innovation portfolio management system.
8. Other MELIA activity (Activities, outputs, and outcomes tracker and Initiative Management	All outputs and outcomes	Quarterly	No	Will help regularly monitor whether activities, outputs, and outcomes are on track, assess challenges, and

Team quarterly meetings)				consider course correction if necessary.
8. Other MELIA activity (Initiative Annual Meetings)	All outputs, outcomes and Action Area targets	Annually	No	Will assess progress towards output goals and Action Area targets, and support decisions on whether the Initiative and WP level TOCs must be adapted.

7. Management plan and risk assessment

7.1 Management plan

F2R-CWANA's management plan is guided by a management structure for partnerships for inclusiveness, feedback and learning, and future planning.

1. The **management structure** will have a Management Team (MT) and the Steering Committee (SC).
 - a. The MT will be led by two senior scientists as Initiative co-leads. The MT will include the WP Leaders, and specialists in MELIA, Innovation Scaling, gender, and fragility. This is in addition to administrative and communications and outreach anticipated from CGIAR or CGIAR Regional/Country level. Coordination with in-country CGIAR and in-country partners will inform engagement with WP Leaders. Annual work plan and budget progress will be monitored via ongoing regular interactions, and quarterly meetings where planning will be right-sized, problems addressed, and risks monitored and mitigated.
 - b. The SC will meet twice-yearly and consist of MT leaders, GD RAFS, RD CWANA, NARES representatives, invited donor representatives and independent external experts and Impact Area leaders to ensure Initiative streamlining across CGIAR and global environment.
2. A nimble approach to delivery and right-sizing innovations through a constant flow of **feedback and learning**. Active and regular engagement from members of the MT with Country Managers, and partners will be key. Regular interactions both in-person and online will ensure a two-way flow to gather and utilize information and data to strengthen outputs and ensure timely delivery of outcomes.
3. Stakeholder engagement from across the spectra of demand, innovation and scaling will inform **future planning** for growth, resilience and adaptability for F2R-CWANA. This will be supported by implementing actors at CGIAR level, a detailed Results Framework, scaling and readiness, and MELIA plans, so course-correction can be made to identify emerging priorities.

7.2 Summary management plan Gantt table

Initiative start date	Timelines												Description of key deliverables
	2022			2023				2024				2025	
Work Packages	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	
Work package 1:			1	2					3				1. Policy, regulatory, and institutional constraints and opportunities for agrifood systems transformation analyzed. 2. Strategy to scale up innovations in technology and service provisions, with a focus on gender and youth differentiated impact. 3. Overcome intersectional marginalization (gender intersecting with refugee status, age, class, and other social identities).
Work package 2:		1							2		3		1. Agrobiodiversity hotspots in CWANA identified and characterized. 2. Policy reviews and recommendations for the release of Genetic Innovations, seed system diversification, and conservation of agrobiodiversity. 3. Germplasm of the selected advanced lines available for NARS release/registration process.
Work package 3:			1				2				3		1. The state of the natural resource base and cause of yield gaps in CWANA's diverse farming systems analyzed. 2. Bundled solutions of evidence-based management practices to sustainably bridge yield gaps. 3. Youth and women-led organizations trained in business models.
Work package 4:			1			2					3		1. Web-based dashboard of national and key basin water accounts. 2. Cost-benefit of treated wastewater (TWW) reuse in marginal communities. 3. Investment strategies to strengthen the resilience of food, land, water and energy systems.

Work package 5:			1						2		3	1. Climate risk profiles of FVC components and actors. 2. Capacity of youth/women to develop digital innovations built through challenge calls and hack-a-thons. 3. Scaling digital investment roadmap with policies and business models for youth-inclusive entrepreneurship.	
Innovation Packages & Scaling Readiness							1		2		3	1. Nine documented scaling ambition, vision of success and roadmap for use of Scaling Readiness for selected priority Core Innovations. 2. Nine evidence-based Scaling Readiness assessment reports and related scaling strategies for Innovation Package; 3. One Initiative innovation portfolio management system that uses scaling readiness metrics.	
MELIA				1			2				3	1. Gender disaggregated ex-ante baseline study of beneficiaries' needs for innovations and new technologies in selected countries. 2. Two qualitative outcome studies to substantiate contributions of innovation accelerator and learning by reflection framework to policy and fast-tracking technology adoption. 3. Four causal impact assessment learning studies on selected innovations and technologies.	
Project management	1		1	2	1		1	2	1		1	2, 3	1. Project meetings. 2. Planning and reporting (including Annual Plan of Work and Budget, Technical and Financial reporting). 3. Finalizing Initiative period 2022–2024 and preparing for next Initiative period 2025–2027.

7.3 Risk assessment

The Initiative design team undertook a risk assessment exercise to identify and evaluate the main risks and mitigating actions for the Initiative. Risks considered included around science, cohesion (including intended and unintended consequences of technologies/innovations for natural resources, GHG emissions, and social and economic aspects), legacy work, partnerships, talent, operational, ethical and legal and other. At this phase the risk assessment is used to highlight areas of concern and improvement recommendations for the Initiative. It also provides visibility to different bodies that is needed from a good governance perspective in line with the Risk Management Framework of the CGIAR System. Following the Initiative's approval, the risk assessment will be integrated into the Initiatives work plan for continuous monitoring and management.

Main risks identified are set out as follows:

Top 5 risks to achieving impact (note relevant Work Package numbers in brackets)	Description of risk (50 words max each)	Likelihood	Impact	Risk score Likelihood x Impact	Mitigation
		Rate from 1-5	Rate from 1-5		
Business interruption or delays due to pandemic, war, natural disaster or other incident affecting the Initiative or key dependencies. [all WPs]	Fragility and instability are key features of CWANA, due to conflict and social unrest, social and economic inequalities, and high vulnerability to climate change, water scarcity and other environmental challenges. These issues have previously caused interruptions of CGIAR activities in Syria, Libya, Iran, Iraq, Sudan and Afghanistan.	5	4	20	The cross-cutting theme of fragility has been integrated throughout F2R-CWANA Initiative. The Initiative work plan includes awareness of fragile institutional settings and building strong local and regional partnerships to allow for the possibility of remotely coordinated work to continue. Similarly, it prioritizes the reliance digital tools and remote sensing data.
Influencing and advancing policy and regulatory environment implications not adequately understood or accounted for by the Initiative, hindering the uptake of innovations. [WP 2, 3, 4, 5]	The policy and regulatory environment of CWANA is well understood but can be difficult to influence because of highly centralized government decision-making, frequent Government reshuffles, a lack of process for coherent and long-term policy planning and implementation, strong competition among various sectors for scarce resources, and issues not prioritized despite their critical importance.	4	4	16	The F2R-CWANA Initiative plans to proactively create a space for ongoing policy engagement and appreciation of the value of the evidence-based policy support the CGIAR can provide (WP1). The Initiative will further mitigate risk by building on previously established successful Innovation Platforms (IP's).
Funding uncertainty, budget insecurity or delay due to	Donors have not traditionally focused on CWANA region for on-going long-term investments in food, water, land, and energy systems'	4	3	12	The Initiative is organized to reflect a humanitarian-development-peace nexus approach, which donors now understand

geopolitical events /disasters shifting funders' priorities. [all WPs]	transformation. Much of the aid coming to the region is targeted at short-term humanitarian objectives in fragile countries and is highly sensitive to political considerations.				as necessary to address the root causes of instability, rather than focusing on short-term crisis responses only. We intend to broaden the funding base by engaging regional donors into the CGIAR portfolio.
Failure to attract, engage, develop and retain talent. [all WPs]	It is difficult to develop and retain talent in CWANA due to chronic underfunding of research in the public sector, lack of engagement with the private sectors, and the frequency of migration to richer countries in the region, and beyond. This challenge is faced both by our partners and potentially with CGIAR itself, depending on the salary structure	4	2	8	The FR2-CWANA Initiative mitigates this risk within our partner organizations by focusing on capacity building and partnering with the private sector. Within CGIAR, the key will be providing challenging, rewarding and equitable professional opportunities.
Inappropriate balance between private and public goods generated by the portfolio may affect Initiative objectives. [WP 2, 3, 4, 5]	Goods in CWANA region are predominantly generated by the public sector as the enabling environment for public-private partnerships is not well developed and it is difficult for the private sector to attract investment and thrive while having to bear the financial risks of operating in this fragile region on their own.	4	1	4	The inclusion of a strong focus on the private sector is envisioned as a corrective to previous reliance on the public sector. This is seen especially in WP 2 with seed systems; WP 4 with water recycling and re-use; and WP 5 with digital climate change and agricultural risk management tools.

8. Policy compliance, and oversight

8.1 Research governance

Researchers involved in the implementation of this Initiative will comply with the procedures and policies determined by the System Board to be applicable to the delivery of research undertaken in furtherance of CGIAR's 2030 Research and Innovation Strategy, thereby ensuring that all research meets applicable legal, regulatory and institutional requirements; appropriate ethical and scientific standards; and standards of quality, safety, privacy, risk management and financial management. This includes CGIAR's [CGIAR Research Ethics Code](#) and to the values, norms and behaviors in CGIAR's [Ethics Framework](#) and in the [Framework for Gender, Diversity and Inclusion in CGIAR's workplaces](#).

8.2 Open and FAIR data assets

Researchers involved in the implementation of this Initiative shall adhere to the terms of the [Open and FAIR Data Assets Policy](#).

The From Fragility to Resilience in Central and West Asia and North Africa (F2R-CWANA) Initiative will align with the OFDA Policy's Open and FAIR requirements, ensuring:

- Rich metadata conforming to the [CGIAR Core Schema](#) to maximize findability, including geolocation information where relevant.
- Accessibility by utilizing unrestrictive, standard licenses (e.g. [Creative Commons](#) for non-software assets; General Public License ([GPL](#))/Massachusetts Institute of Technology ([MIT](#)) for software), and depositing assets in open repositories.
- Wider access through deposition in open repositories of translations and requiring minimal data download to assist with limited internet connectivity.
- Interoperability by annotating dataset variables with ontologies where possible (controlled vocabularies where not possible).
- Adherence to [Research Ethics Code](#) (Section 4) relating to responsible data (through human subject consent, avoiding personally identifiable information in data assets and other data-related risks to communities).

9. Human resources

9.1 Initiative team

	Area of expertise	Short description of key accountabilities
Management	Strategic management	Initiative Leadership, lead Annual Workplan Budget (AWBP), delivery, monitoring and reporting, links across other Initiatives and CGIAR, external Initiative representation.
	WP strategic management	Lead WP AWPB and implementation within and across WPs; manage research and research support staff.
	MELIA	Support Initiative Leadership to coordinate Results Framework and manage delivery of Outputs and contributions to Outcomes.
	Gender / social inclusion	Coordination and leadership of Reach-Benefit-Empower-Transform (RBET) strategy for F2R-CWANA.
	Fragility	Lead on impact of conflict exposure/fragility; lead/monitor situation in-country and advise adjustments responsive to new sources of risk.
	Communications / outreach	Lead transformation from research to information, communications tools and policy practice and outreach under guidance of Initiative leadership (Research support).
	Administrative	Administrative, financial and HR leadership under the guidance of Initiative Management (Research Support).
WP1	Socio-economics	Lead development of tools for adoption and impact assessments of innovations and monitor socio-economic surveys.
	Policy	Lead on partner cooperation and strengthening institutional capacity, support and engagement with policies and instruments.
	Agricultural innovation and technology	Lead and coordinate technical assistance for innovations and impact and develop sustainable road maps for wide scale adoption in-field; assess capacity building opportunities; and development of joint knowledge sharing activities.
	Data management and analysis specialist	Support survey design, sampling, collection, analysis and visualization; Support development of data collection instruments, recoding, reporting and disseminating findings and recommendations and lessons learned.
WP2	Agrobiodiversity	Lead on status/threats assessment; development and demonstration of management plan, training; technical backstopping and training.
	FAP	Introduction and demonstration of “Farming with alternative pollinators”.
	Plant breeders	Design experiments to support release/registration of adapted and farmer/industry/consumer preferred varieties for crops and facilitate dissemination/adoption.

	Seed systems and product management	Lead seed system research; studies on early generation seed production models; provide data to support updated policies and regulatory frameworks for functioning of seed systems at national and regional levels; and strengthen the capacity of seed value chain actors.
	Socio-economics and policy	Lead research and analysis of seed production / marketing models; adoption/impact of genetic innovations; and policy for biodiversity and seed systems.
	Data management	Ensure data collected in various research activities are collected, managed and analyzed.
WP3	Systems agronomy / Cropping systems	Cropping systems optimization, conservation agriculture (CA) based sustainable intensification, G x E x M x S interaction and recommendation domains of agronomic management targeted crop varieties, business models and science evidence-based policies, capacity development on CA.
	Water management / hydrology	On-farm water management – designing/targeting precision water management tools/techniques; improving crop water productivity; state of the natural resource base.
	Soil scientist	Develop soil health frameworks for crop-livestock systems across participatory research and innovation platforms.
	Cropping system simulation	Coordinate scenario analysis for designing cropping systems, management practices for diverse biophysical and socio-economic environment.
	Mechanization specialist	Designing/ scaling appropriate mechanization solutions appropriate for dryland systems and innovation platforms.
	Geospatial and data	Geospatial analysis and mapping state of natural resources, yield gap analysis.
	Farming systems modelling	Farming systems analysis, designing climate resilient farming systems and landscapes options with synergies and trade-offs, and targeting.
	Socio-economics and policy	Lead management practices to solutions; recommendation for management practices and varieties/genotypes suitable to specific farming systems.
WP4	IWRM	Plan, design, and manage the coordinated development and management of water, land and related resources.
	Hydrology and agricultural water management	Integrated assessments; quantitative and qualitative field experiments (incl. design, data collection, analysis).
	Water governance	Co-Design the water governance guidelines including tailoring to local conditions and conduct water governance analysis to support scaling.
	TWW	Lead the TWW socio-economic feasibility study and facilitate the group discussion and inform policy development.
	Water accounting	Support integrated assessments and policy activities including policy development/coherence; design / conduct water accounting.
	Policy analysts	Support scaling; knowledge synthesis; cooperation to support policy / decision-making process; outreach / science-policy activities' development, and assessments.
	Remote sensing data / GIS	Support the data acquisition and lead the co-design the dashboard's development.
	DSS and model integration	Lead the integrated assessment including coding and integrated modelling analysis and assessment.
WP5	Climate science, crop and climate hazard modelling	Lead climate risk analyses of selected value chains in CWANA; climate analytics and early warning systems to characterize innovation platforms.
	Economics	Identify, evaluate, prioritize digital solutions for climate risks management in value chains; assess business case; lead financial/impact evaluation of digital solutions.
	Data science/augmentation	Support development and integration of digital solutions for climate risk management. Facilitates digitalization of agriculture, tools and data management.

Incubation/acceleration	Lead incubator/accelerator programs on digital solutions; develop pipelines of bankable digital solutions to be brought to market and scaled (Research support).
Sustainable finance	Lead strategy and digital investment roadmaps with public/private investors to connect with national/regional/global public and private investors (Research support).

9.2 Gender, diversity and inclusion in the workplace

The Initiative team is unlikely to meet CGIAR's gender target of a minimum of 40% women in professional roles and/or will not be comprised of individuals from diverse backgrounds. To address this, we will *(for example, consciously consider diversity when we recruit/ follow the guidance outlined in CGIAR's [GDI Inclusive Recruitment Toolkit](#) mindfully include diverse voices into all our project activities etc.)*.

Women, minorities, and other under-represented groups will hold leadership roles in the Initiative team. This will be seen in the composition of our senior team and will extend to the fair allocation of leadership activities and accountabilities.

9.3 Capacity development

1. Initiative team leaders and managers will complete training on inclusive leadership within 3 months of launch.
2. Within 6 months of launch, Initiative team members will complete training on gender, diversity and inclusion, including on whistleblowing and how to report concerns.
3. The Initiative kick-off will include an awareness session on CGIAR's values, code of conduct and range of learning opportunities available within CGIAR.
4. Development opportunities will be made available for junior level Initiative team members, partners and stakeholders, including mentorship, internships/scholarships with representation of emerging professionals from under-represented groups, conference attendance, trainings, etc.

10. Financial resources

The total aspirational budget of US\$30 million for F2R-CWANA Initiative from Q2 2022–Q1 2025 and covers work in the five countries of Egypt, Lebanon, Morocco, Sudan and Uzbekistan. The budget was calculated based on the identified funding needs of the five WPs, the Innovation Packages & Scaling Readiness plan, and MELIA which has been included in the Cross-cutting across Work Packages.

10.1 Budget

10.1.1: Activity breakdown

USD	2022/2023	2023/2024	2024/2025	Total
Crosscutting across Work Packages	1,163,136	1,299,442	1,463,341	3,925,919
Work Package 1	1,400,596	1,572,738	1,746,883	4,720,217
Work Package 2	1,567,196	1,744,168	1,924,399	5,235,763
Work Package 3	1,487,477	1,775,215	2,005,457	5,268,149
Work Package 4	1,432,436	1,569,948	1,715,870	4,718,254
Work Package 5	1,445,348	1,593,385	1,742,965	4,781,698
Innovation packages & Scaling Readiness	588,659	481,764	279,577	1,350,000
Total	9,084,848	10,036,660	10,878,492	30,000,000

10.1.2: Geographic breakdown

USD	2022/2023	2023/2024	2024/2025	Total
Egypt	2,544,779	2,815,976	3,058,032	8,418,788
Lebanon	1,262,802	1,392,586	1,504,767	4,160,155
Morocco	2,218,014	2,458,373	2,667,553	7,343,940
Sudan	1,205,408	1,334,610	1,454,601	3,994,619
Uzbekistan	1,853,845	2,035,115	2,193,538	6,082,499
Total	9,084,848	10,036,660	10,878,492	30,000,000