

Science Program | Annual Technical Report 2025

Sustainable Farming



Women farmers harvesting their potato crop near Patna in Bihar, India.
Credit: Suresh Kakraliya/CIP

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Collaborating Centers



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CGIAR Technical Reporting 2025

This 2025 Annual Technical Report forms part of CGIAR's first reporting cycle under the System Council-approved 2025–2030 Portfolio. It is grounded in the [CGIAR Research and Innovation Strategy Program/Accelerator proposals](#) and Plan of Results and Budget (PORBs) that establish each Program's and Accelerator's scope and objectives. It aligns with the [Performance and Results Management Framework](#) (PRMF 2022–2030), and the [Technical Reporting Arrangement](#) (TRA 2025–2030).

A [Program inception report](#) was developed in 2025 to document initial Program design, scope, and implementation arrangements. This report provides important context for interpreting early progress and implementation choices reported in this Annual Technical Report.

Pooled ([Window 1/Window 2, or W1/W2](#)) results are presented alongside mapped Window 3 (W3) and bilateral results. All pooled (W1/W2) results undergo [quality assurance](#) according to established standards. W3 and bilateral results are quality-assured at Center level and reviewed by Programs/Accelerators.

All data presented in this report reflect the status as of 30 March 2026 and draw on quality-assured results in the [Results Dashboard](#), unless otherwise stated. While every effort has been made to ensure data accuracy, note that further refinements are taking place and updates will be available via the CGIAR Results Dashboard.

1. Overview for 2025

Program title	Sustainable Farming
Program director	Oscar Ortiz
Start–end date	2025-2030
Centers involved	AfricaRice, Alliance of Bioversity International and CIAT, CIMMYT, CIP, ICARDA, ICRISAT, IFPRI, IITA, ILRI, IRRI, IWMI
Targeted Impact Areas	Poverty Reduction, Livelihoods and Jobs; Nutrition, Health and Food Security; Climate Adaptation and Mitigation; Environmental Health and Biodiversity; Gender Equality, Youth and Social Inclusion
Geographic focus	Global, with emphasis on Africa and Asia
Mapped W3/bilateral projects	The detailed list of W3/bilateral projects mapped to Sustainable Farming is available on pages 13–19 of the 2025 Plan of Results and Budget .
2025 budget	US\$71.3M (W1/2: US\$25.1M, W3/bilateral: US\$46.2M)

About the Program

The Sustainable Farming Program addresses critical demographic, environmental, economic, and social challenges facing smallholder farmers in low- and middle-income countries. Building on three CGIAR Research Initiatives (Excellence in Agronomy, Plant Health, and Sustainable Mixed Farming Systems), Sustainable Farming helps farmers transform their farming systems to achieve agronomic gain — boosting productivity, resource use efficiency, soil and crop health, and climate resilience. Working through strategic partnerships across prioritized farming systems, the Program delivers integrated agronomic, plant health, and farm management solutions with a focus on women and youth. As part of the broader CGIAR Portfolio, Sustainable Farming contributes directly to food systems transformation across South Asia, Africa, and beyond. In 2025, Sustainable Farming reorganized the Program's Areas of Work (AoWs), reducing them from eight — used during 2025 — to five to guide the 2026-2030 work plan. This change will enhance coherence and operational efficiency, and strengthen national and regional partnerships, ultimately leading to more targeted and impactful delivery.

Executive summary

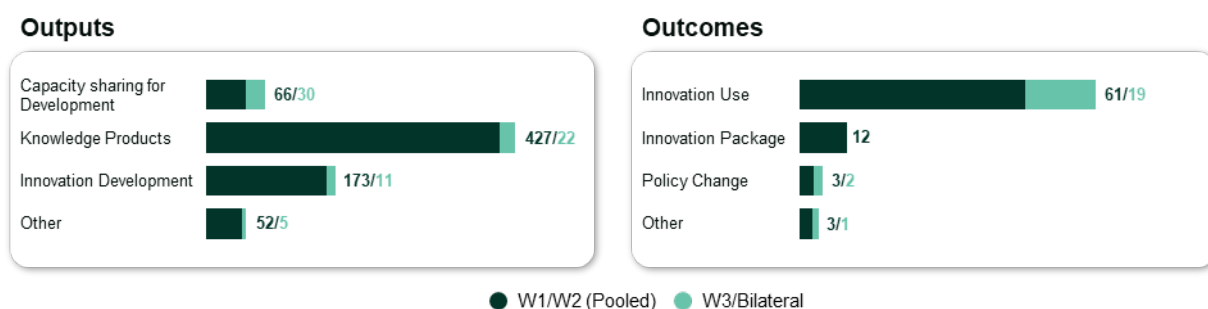


Figure 1. Overview of Sustainable Farming's 2025 results, by result level and category. Based on data accurate as of 30 March 2026.

In 2025, the Sustainable Farming Program made strong progress toward its mission of innovative, integrated farm management for productivity, profitability, and climate resilience. Despite funding constraints, the Program achieved notable results (Figure 1), deepened partnerships, and accelerated adoption of scalable innovations, while reorganizing eight AoW into five integrated AoW for the 2026 Plan of Results and Budget (PORB).

Generating evidence and scaling innovations for climate-resilient farming (AoW1)

In 2025, AoW1 advanced on two fronts: building the evidence base and scaling proven innovations from research plots to national systems. The [Evidence for Resilient Agriculture \(ERA\) dataset](#) — a harmonized repository of 198,310 agronomic observations from 2,916 studies across Africa — and the [Climate Extremes Analytics Toolkit](#) now underpin climate risk diagnostics toward climate smart farm management. These analytical tools, in turn, informed the scaling of climate-smart innovations at multiple levels: [optimized sowing windows](#) in Bihar improved rice-wheat yields; [zero-tillage potato production](#) in India and Bangladesh reduced water use by 50 percent; and the [AKILIMO advisory platform](#) reached over 238,000 farmers in Nigeria.

In Cambodia, the government formally adopted climate-resilient rice innovations through a national Tonle Sap program, supported by a [US\\$240 million International Fund for Agricultural Development \(IFAD\)–Green Climate Fund \(GCF\)–Asian Infrastructure Investment Bank \(AIIB\) investment](#) in climate-adaptive irrigation.

Scaling digital and data-driven advisory services (AoW2)

The AgWise platform — a modular, artificial intelligence (AI)-powered agronomic recommendation system — was expanded and deployed across multiple countries, generating site-specific fertilizer and management recommendations for crops such as maize, wheat, potato, and beans.

Adoption is underway across Ethiopia, [Kenya](#), [Rwanda](#), Ghana, [Nigeria](#), and Malawi, with AgWise institutionalized in Ethiopia for national-scale advisories. Capacity building included training national experts in [Rwanda](#) and developing [extension manuals](#) in the Democratic Republic of Congo (DRC), alongside dashboards and digital tools for lime recommendations.

Supporting resilient soil systems and sustainable intensification (AoW3)

The Program expanded its unified soil health assessment and monitoring framework, harmonizing indicators and methodologies across regions and partners. In Morocco, high-resolution mapping of [soil organic carbon](#), [phosphorus](#), and [potassium](#) provided new baselines for sustainable land management and fertilization strategies. Integrated soil fertility management and conservation agriculture approaches, including the use of organic amendments, and crop rotations, demonstrated substantial gains in productivity and soil health through [integrated soil management in Ethiopia](#), [conservation agriculture in Morocco](#), and [multi-crop suitability mapping in Ethiopia](#).

Strengthening plant health and integrated pest management (AoW4)

The Program continued to develop digital and AI-powered diagnostic and management tools for key plant health threats. Innovations included [AI-powered disease detection systems](#), molecular diagnostic protocols for seed-borne pathogens, and validated pest management packages for [rice](#), potato, and legumes.

Building on these efforts, Aflasafe biocontrol technology continued to be scaled through public–private partnerships reaching thousands of farmers across Nigeria, Kenya, Mozambique, Senegal, and other countries, with measurable reductions in aflatoxin contamination and improvements in food safety and market access.

Strengthening integrated water management (AoW5)

The Program generated evidence on water risks and management practices, including [water productivity gains](#) in direct-seeded rice across eight Indian states, post-season [legume assessments in Ethiopia](#), and [water dynamics mapping in Kenya](#) — alongside country-specific irrigation and drought monitoring tools under the WaPOR project.

An AI-powered drought advisory chatbot ([SukhaRakshak](#)) was co-developed with Indian partners, providing real-time recommendations to farmers and officials. Capacity-sharing reached 840 partners, including over 80 extension officers and farmers in [Ethiopia and Ghana](#). Findings from 23 experimental studies are being institutionalized in Pakistan, and one revised government strategy on agricultural water management was recorded.

Accelerating innovation in mechanization and digital agriculture (AoW6)

The global Scale Appropriate Mechanization (SAM) dashboard was launched, to offer country-level mechanization status and help visualize intervention areas where mechanization can have large impacts. New prototypes, including a two-wheel-tractor-powered maize combine harvester and a [precision rice hill seeder in Bangladesh](#) were developed and evaluated for smallholder use. Additionally, digital platforms for farm monitoring, machinery management for service provision, and data sharing improved operational efficiency and resource allocation in Central America, North Africa and South Asia.

Bundling innovations for whole-farm transformation (AoW7)

The Program developed and scaled bundled innovation packages combining agronomic, digital, and institutional components. Solutions for [soybean bundling in Egypt](#), [maize–cowpea intercropping and site-specific fertilization in Ghana](#), and climate-smart rice systems in Viet Nam demonstrated significant gains in yield, water use efficiency, and profitability. Whole-farm bundling approaches, validated through participatory workshops on [whole-farm bundling in Malawi](#) and [home garden intensification in Ethiopia](#), showed promise for more inclusive and sustainable adoption, especially among women and youth.

Strengthening data sciences and partnership approaches (AoW8)

[GARDIAN](#) was expanded with new repository harvesting and a large language model (LLM)-based search tool. The [Carob project](#) contributed approximately 200 AI-ready findable, accessible, interoperable and reusable (FAIR) datasets, bringing the total to 2,300 datasets and over 2 million observations.

The Partnerships for Advancing Agricultural Solutions at Scale (PAASS) approach matured in 2025, producing a [playbook](#) and scaling innovations across [Nigeria](#), [Ghana](#), [Ethiopia](#), [Rwanda](#), and other geographies, supported by policy briefs and capacity-building materials for multiple stakeholders.

Challenges and adaptive responses

Significant funding reductions required reprioritization, with a focus on core research in soil, pest and disease, and water management. System integration, field experimentation, and high-cost surveillance were scaled back in favor of desktop analysis, digital tool development, and existing data resources. In response, the team also restructured from eight discipline-oriented to five integrative AoW for 2026, reflecting stakeholder demand for more integrated, results-focused approaches.

Contribution to Program objectives

Sustainable Farming's 2025 achievements advanced its vision of participatory, data-driven solutions for sustainable intensification, climate adaptation, and gender inclusion. From 2026, the updated AoW structure prioritizes digital and AI-enabled advisory systems, soil and plant health management, and emerging farm shock response, with stronger national partnerships and embedded learning systems to scale impact for millions of smallholder farmers toward 2030.

2. Annual progress

2.1. Progress along the theory of change

The Program advanced its [theory of change](#) (ToC) in 2025 by delivering innovation, capacity sharing, and policy change along three interconnected pathways: deployment of context-specific agronomic solutions, capacity sharing with partners and farmers, and policy engagement to facilitate broader adoption (Figure 2).

Area of Work	Indicators	Met Annual Target	Achievement	Total Results
● AoW1 Climate Adaptation and Mitigation	7	7	100%	106
● AoW2 Precision Nutrient Management	8	8	100%	143
● AoW3 Resilient Soils	9	9	100%	75
● AoW4 Plant Health and Mycotoxin Safe Crops	9	8	89%	179
● AoW5 Integrated Water Management	6	5	93%	65
● AoW6 Scale-appropriate Mechanization	8	8	100%	45
● AoW7 System Integration through Co-creation	10	7	79%	99
● AoW8 Program Efficiency and Delivery	11	10	91%	159
Total	68	62	91%	865

● **On track**
 (≥80% of target achieved)
 ● **Moderate**
 (50–79% of target achieved)
 ● **Behind**
 (<50% of target achieved)

Ratings are based on annual target achievement of standard indicator categories within the Theory of Change (ToC). AI-generated ratings were reviewed and adjusted as needed by the Accelerator, with any updates accompanied by justifications.

Figure 2. Sustainable Farming's 2025 progress against ToC indicator targets. Based on data accurate as of 30 March 2026.

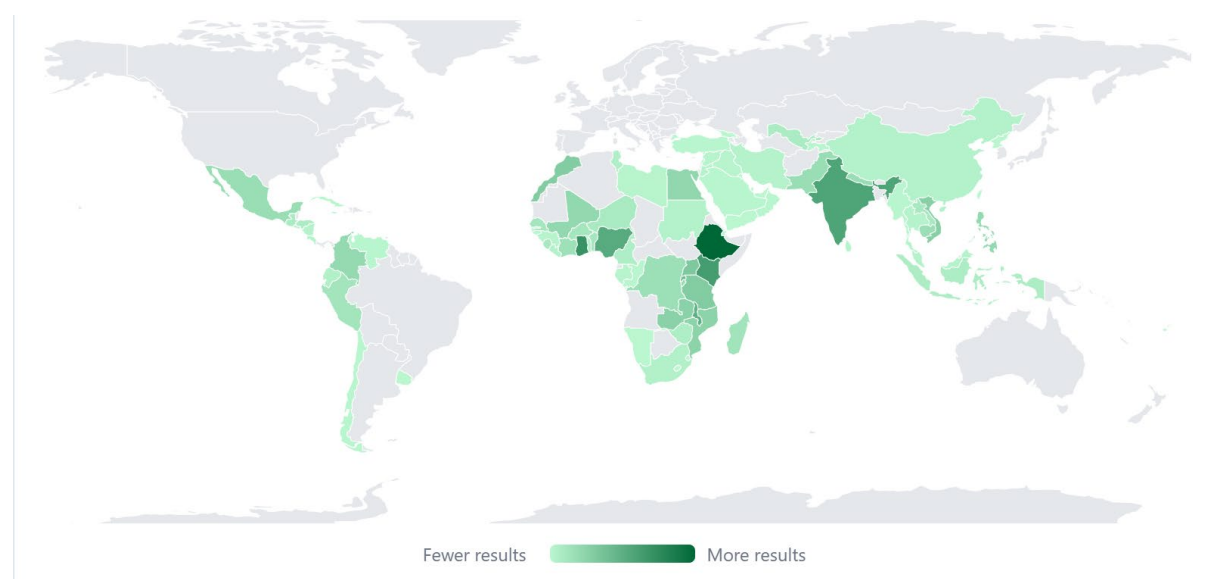


Figure 3. Sustainable Farming Program results by country in 2025 (note the map includes location of partners).

Central to the Program's innovation pathway was the broad deployment of digital, data-driven decision support tools that tailored agronomic recommendations to local conditions. In [Ethiopia](#), the harmonized agro-advisory framework (HaFAS) and its Localized Agronomy and Fertilizer Advisory (LAFA) system delivered site-specific fertilizer recommendations, reaching more than 1,400 piloting sites and expanding the national agronomy and soil dataset to over 90,000 records. This shift has been institutionalized through government and research partnerships, with delivery channels including FarmerChat and bundled advisory-finance-insurance systems.

Digital advisory solutions were complemented by FAIR and AI-ready data infrastructure ([Carob](#), [GARDIAN](#)) and compute capacity (CG Labs). AgWise delivered climate-informed recommendations across several African countries, and [RiceAdvice Lite](#) reached over 59,000 farmers through extension agents in West Africa. The [Multi-Dimensional Digital Inclusivity Index](#) (MDII) was piloted to ensure digital innovations are accessible to marginalized groups.

Sustainable Farming also made significant progress in scaling integrated whole-farm innovation bundles. In Malawi, the Mbili Mbili intercropping system and feed and forage innovations were bundled with improved seed, soil health management, and advisory services, increasing productivity and resilience for smallholders. In Morocco, the Regional Agronomy Community of Practice and co-design labs accelerated the adoption of [no-till practices](#), supporting the national target of one million hectares under conservation agriculture. The Program also advanced bundled solutions for irrigated wheat and soybean in Egypt, demonstrating yield and resource-use efficiency gains among participating farmers.

The capacity sharing pathway was reinforced by the establishment and operation of multi-stakeholder platforms (PAASS) in [Ethiopia](#), [Ghana](#), Rwanda, and Tanzania, which aligned national institutions, research, and extension systems to co-develop, pilot, and scale bundled agronomic innovations.

The African Fertilizer and Soil Health Action Plan was operationalized in Ghana through policy briefs and stakeholder engagement, supporting the adoption of Aflasafe biocontrol and wider food safety governance. In [Ethiopia](#), [institutionalization of digital fertilizer advisory systems](#) was anchored in government and national research partnerships, with coordinated validation and scaling processes.

Progress was enabled by strong partnerships, digital infrastructure, and data standardization. Cross-Program linkages with the Scaling for Impact Program, Digital Transformation Accelerator, and Gender Accelerator [reinforced scaling strategies](#), inclusivity, and responsible innovation.

Budget reductions constrained some activities, shifting focus toward digital and analytical work. Persistent challenges including last-mile delivery, input affordability, and digital advisory sustainability were taken into consideration in the design of the updated AoWs.

Sustainable Farming's 2025 progress directly contributed to all five CGIAR Impact Areas. Climate adaptation and mitigation were advanced through climate-smart digital advisories, [water management innovations](#), and conservation agriculture.

Environmental and [soil health restoration](#) were strengthened via integrated soil fertility management, regenerative agriculture bundles, and policy support. Food security and poverty reduction were driven by yield gains, profitability improvements, and market integration such as the case of [bundled innovations in Ghana](#). Social inclusion was addressed through [gender-responsive training](#), digital inclusivity tools, and [multi-stakeholder platform participation](#).

Sustainable Farming's 2025 progress demonstrates strong delivery across digital innovation, capacity sharing, and policy engagement in priority locations across Africa and Asia (Figure 3), building the foundation to accelerate impact toward CGIAR's 2030 goals.

2.2. Area of Work progress

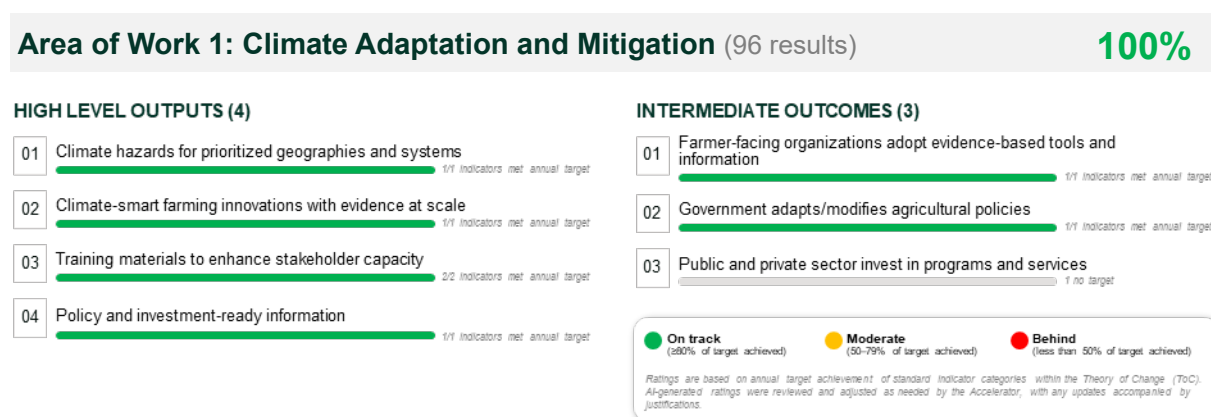


Figure 4: AoW1 progress toward 2025 ToC indicator targets.

In 2025, AoW1 delivered across four priority topics.

Identification of climate hazards for prioritized geographies and systems

Targeting adaptation and mitigation effectively requires the capacity to diagnose which climate hazards threaten which farming systems, and where the evidence gaps lie. This was the most distinctive contribution of AoW1 in 2025. The [Evidence for Resilient Agriculture \(ERA\) dataset](#) — a harmonized, machine-ready repository of 198,310 agronomic observations from 2,916 studies across Africa, covering 364 management practices and 87 outcome indicators — now underpins climate hazard mapping, modelling, and evidence synthesis within the Sustainable Farming Program and is useful across CGIAR's Portfolio. The [Climate Extremes Analytics Toolkit](#) translates raw climate data into decision-relevant indicators of precipitation and temperature extremes across the Program's priority geographies. A [synthesis of 177 climate hazard studies and 197 remote sensing-machine learning applications](#) identified methodological strengths and critical evidence gaps in data-scarce regions.

Additional outputs include [Adaptation Atlas analytical notebooks](#), a farm-level [prioritization tool prototype](#), [analysis of hydroclimatic extremes](#) in West Africa, and [research on rainfall variability](#) in coastal Bangladesh.

Climate-smart farming innovations with evidence at scale

With climate risks diagnosed, the Program developed and validated climate-smart innovations across diverse farming systems and geographies. In India and Bangladesh, [zero-tillage potato production with rice straw mulch](#) reduced water use by 50 percent and increased gross margins by 15 percent, with 2,000 farmers targeted for adoption.

In Peru, [regenerative practices](#) combining reduced tillage, mulching, and organic fertilization were validated for small potato farmers. In Ethiopia, [dynamic cereal mixtures](#) demonstrated productivity gains in highland systems.

Two outcome-level results illustrate the transition from innovation to adoption at scale: the [AKILIMO decision support tool](#) was adopted by cassava and maize farmers across 27 Nigerian states, reaching 238,470 unique farmers with 43 percent women's participation.

Training materials to strengthen stakeholder capacities

Sustained climate action depends on national systems having the tools and knowledge to continue beyond direct Program support.

AoW1 produced training materials and knowledge products including a [field experiment on advisory delivery modalities](#) in Bihar, a [pilot report for the AI-powered Paddy Mitra Chatbot](#) in India in collaboration with the Digital Transformation Accelerator, and advisory tools and [research on livestock](#) and [manure management](#) in Ethiopia and Nepal. Capacity-sharing events reached researchers, extension agents, and farmers in Egypt, Lao PDR, and across South and Southeast Asia.

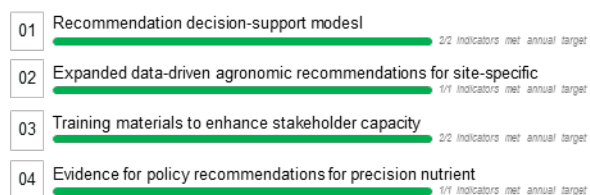
Policy and investment-ready information

In India, a policy brief on adapting Bihar's rice-wheat systems to climate uncertainty and a companion brief on women farmers and climate adaptation provided actionable guidance for state-level decision-makers, documenting how women's self-help groups serve as effective institutions for building resilience. In Mexico, research on climate change impacts on family farming in Chiapas and the Yucatán Peninsula supported local adaptation planning. In Kenya, a study on climate risk perception and adoption of sustainable practices provided evidence on determinants of farmer decision-making.

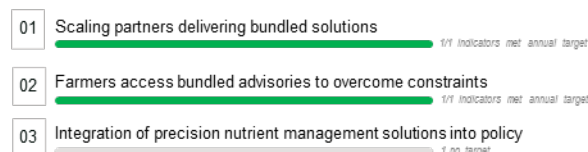
Area of Work 2: Precision Nutrient Management (143 results)

100%

HIGH LEVEL OUTPUTS (4)



INTERMEDIATE OUTCOMES (3)



● **On track** (≥80% of target achieved)
 ● **Moderate** (50-79% of target achieved)
 ● **Behind** (less than 50% of target achieved)

Ratings are based on annual target achievement of standard indicator categories within the Theory of Change (ToC). AI-generated ratings were reviewed and adjusted as needed by the Accelerator, with any updates accompanied by justifications.

Figure 5: AoW2 progress toward 2025 ToC indicator targets.

In 2025, AoW2 generated evidence, tools, and advisory innovations for precision soil nutrient management across Africa, Asia, and Latin America, advancing on three fronts: analytical and modeling infrastructure, scaling through national platforms, and strengthening partner capacity.

Advancing decision-support models and digital advisory tools

The AgWise modular recommendation framework continued to serve as a core engine for generating spatially explicit, data-driven fertilizer and agronomic recommendations. A new fertilizer recommendation module offering three alternative modeling pathways — machine learning, machine learning combined with crop modeling, and a hybrid approach — was developed to generate site-specific nutrient recommendations for key crops and regions, providing flexibility to partners depending on data availability.

In [Ethiopia](#), a next-generation decision support tool validated across 59 on-farm fields demonstrated that site-specific fertilizer recommendations consistently outperformed district-level local recommendations in grain yield and partial fertilizer profitability. In [Egypt](#), a plot-specific fertilizer advisory tool validated against 2,042 wheat fields showed that tool-generated nitrogen rates averaged 176 kilograms per hectare compared with farmers' average of 246 kilogram per hectare, indicating a potential 28 percent reduction in nitrogen overuse without yield penalty. In [India](#), a precision nitrogen management strategy developed using survey data from 8,705 wheat fields indicated that reductions of 9 percent in nitrogen use and 16 percent in nitrous oxide emissions could be achieved without compromising yields, saving an estimated US\$28 million per year in subsidies in Bihar state alone.

Scaling advisory platforms and multi-stakeholder partnerships

Advisory tools reached farmers at scale through national platforms. In [West Africa](#), RiceAdvice Lite reached more than 59,000 farmers through 603 trained extension agents. In [Rwanda](#), fertilizer application rates exceeded 98 percent among supervised farmers with improved yields. In Ethiopia, the Harmonized Agro-Advisory Framework was tested as a minimum viable product through a multi-stakeholder platform convening the Ministry of Agriculture, research institutes, and private sector partners.

Nigeria's AKILIMO platform

The AKILIMO Nigeria platform achieved strong women's participation across multiple states, demonstrating that digital advisory systems can be designed to reach women farmers at scale through nationally anchored, multi-stakeholder institutions.

Strengthening national capacity

Capacity-sharing training in [Rwanda](#) equipped national experts to develop site-specific fertilizer recommendations using machine learning. A disability-inclusive agriculture framework identified barriers to information access and proposed mechanisms for equitable scaling. In Odisha, India, bilaterally funded activities covered 44,500 hectares, reaching 82,000 farmers with a 40–60 percent increase in cropping intensity.

Area of Work 3: Resilient Soils (75 results)

100%

HIGH LEVEL OUTPUTS (4)

01	Soil health monitoring and assessment framework is operationalization	2/2 indicators met annual target
02	Establish long term monitoring sites	1/1 indicators met annual target
03	Quantifying and cataloguing impact of agriculture practices	1/1 indicators met annual target
04	Translating evidence based information on the critical role of health soil	1/1 indicators met annual target

INTERMEDIATE OUTCOMES (4)

01	Deployment of science based tools and methods	1/1 indicators met annual target
02	Implementation of science based soil health practice	1/1 indicators met annual target
03	Farmers implement practices that restore and enhance soil health	1/1 indicators met annual target
04	Member state's soil health targets integration	1/1 indicators met annual target

● **On track** (80% of target achieved)
 ● **Moderate** (50–79% of target achieved)
 ● **Behind** (less than 50% of target achieved)

Ratings are based on annual target achievement of standard indicator categories within the Theory of Change (ToC). AI-generated ratings were reviewed and adjusted as needed by the Accelerator, with any updates accompanied by justifications.

Figure 6: AoW3 progress toward 2025 ToC indicator targets.

Soil degradation at farm, community and landscape levels remains one of the most pressing constraints to smallholder productivity across low- and middle-income countries. In 2025, AoW3 advanced on three fronts: developing a standardized soil health assessment framework, generating evidence on agricultural practices and soils, and translating findings into accessible formats for decision-making and policy.

Developing tools and frameworks for soil health monitoring

A central achievement this year was progress toward a unified, scalable approach to soil health assessment and monitoring. The Program developed a coherent **soil health assessment and monitoring framework** designed to harmonize methods across participating centers, integrating physical, chemical and biological soil indicators within a modular system adaptable to diverse farming contexts. Complementing this, in collaboration with the Digital Transformation Accelerator, a **digital platform for soil health monitoring and management** was designed to convert soil test data into actionable outputs — including district-level nutrient maps and fertilizer recommendations — with offline mobile data entry to reach areas with limited connectivity. Additionally, a **tool was calibrated and validated** to support rapid scanning of soil organic carbon in dryland soils in Morocco.

A notable methodological advance was the development of **SHAPE-SSA**, a region-specific soil health assessment protocol for sub-Saharan Africa, drawing on more than 28,000 georeferenced samples to establish context-aware benchmarks that evaluate soils relative to their ecological potential — a significant improvement over frameworks originally designed for temperate regions.

Generating evidence on agricultural practices and soil resilience

The Program produced a substantial body of evidence quantifying the impacts of agricultural practices on soil health across diverse geographies. In Morocco, conservation agriculture increased wheat yields by up to 75 percent and water productivity by 50 percent. Spatial analysis identified 334,000 hectares favorable for no-till adoption, supporting the national target of one million hectares under conservation agriculture by 2030, with a locally adapted **no-till seeder** developed with national partners and in collaboration with the Scaling for Impact Program.

In Ethiopia, **integrated soil fertility management** was validated across wheat and teff systems with national partners, demonstrating cost-reducing options including organic inputs that maintain productivity. Science-based assessment methods were adopted nationally to inform fertilizer recommendations. **Modeling projected soil organic carbon dynamics** through 2070 in the Abbay Basin, guiding policymakers on soil carbon management.

A **meta-analysis of regenerative agriculture practices** across India synthesized results from 147 peer-reviewed studies, finding that biochar and organic amendments yielded the highest soil organic carbon gains, particularly over durations exceeding five years.

Translating evidence into policy and practice

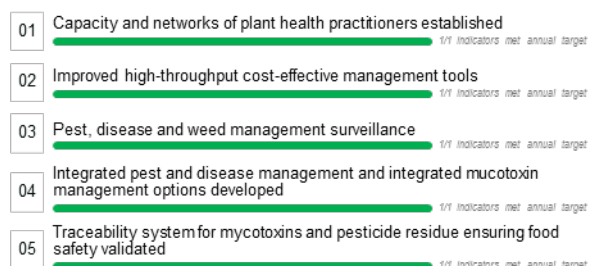
The Program made meaningful contributions to translating soil health evidence into policy-relevant formats. A **policy brief on the cost of soil erosion in sub-Saharan Africa** highlighted losses of approximately US\$68 billion annually, making the economic case for complementary soil management interventions. Multiple knowledge products supported implementation of the African Fertilizer and Soil Health Action Plan endorsed at the 2024 Africa Fertilizer and Soil Health Summit, including a **commentary outlining five strategic levers for transformative implementation** and an interactive **workshop on inclusive strategies** for the action plan. Baseline **high-resolution maps of soil organic carbon and available phosphorus and potassium** for Moroccan croplands were produced and made freely available, providing foundational data for evidence-based fertilizer recommendations and precision farming at national scale.

In Niger and Nigeria, a bilateral project developed an **extension agents training guide on soil health** and supported cascade trainings on integrated soil fertility management, reaching smallholders and extension agents with practical guidance on compost production and soil and water conservation along watersheds.

Area of Work 4: Plant Health and Mycotoxin Safe Crops (178 results)

89%

HIGH LEVEL OUTPUTS (5)



INTERMEDIATE OUTCOMES (3)

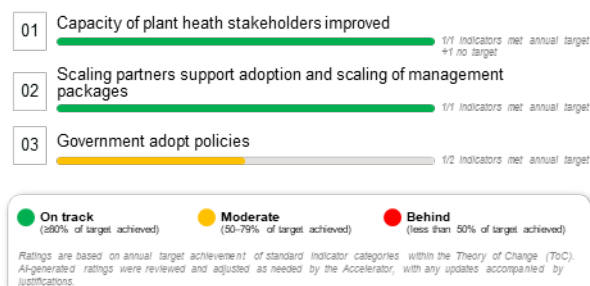


Figure 7: AoW4 progress toward 2025 ToC indicator targets.

In 2025, AoW4 advanced across three fronts: building practitioner capacity, advancing diagnostics and surveillance, and scaling integrated management solutions for pests, diseases, and mycotoxins.

Building capacity and strengthening networks

Capacity-sharing activities reached practitioners across multiple regions and disciplines. A [regional workshop at ILRI in Addis Ababa](#) brought together 16 participants from seven Eastern and Southern African countries to strengthen forage disease surveillance and produce a harmonized pest and disease list. In Latin America, a workshop in Colombia convened specialists from six national plant protection organizations to strengthen diagnostic capacities for quarantine pathogens.

In Central, West Asia and North Africa, 29 graduate students and 42 [national plant protection experts received training](#) on integrated pest and disease management for food legumes in Morocco, Lebanon, and Ethiopia, with 69 percent of graduate participants being women. Bilateral-funded work also contributed to capacity building, including training of lead farmers and government officials in Burundi on pest and disease management and a bioinput quality assurance workshop in Nigeria and Tanzania.

Advancing diagnostics, surveillance, and early warning

Significant progress was made in developing cost-effective, high-throughput diagnostic tools. In collaboration with the Genebank Accelerator, new [diagnostic protocols for cowpea mosaic virus](#) and [cowpea aphid-borne mosaic virus](#) were developed and validated for large-scale germplasm screening.

On the surveillance front, [three wheat stem rust races were identified](#) in Morocco during the 2025 season, confirming the absence of the virulent Ug99 lineage and informing regional preparedness. Systematic rust surveillance was conducted across more than 70 wheat fields in Morocco and Lebanon, even under severe drought conditions.

Scaling integrated management solutions

On Ukerewe Island, Tanzania, where banana bunchy top disease had devastated local production — with infection rates exceeding 85 percent and yield losses above 90 percent — a coordinated recovery effort led by IITA, the Tanzania Plant Health and Pesticides Authority, and the Tanzania Agricultural Research Institute produced and distributed more than 4,200 [certified disease-free banana plantlets](#), prioritizing women and youth. Demonstration plots showed no disease re-emergence, offering a replicable model for community-embedded clean seed systems. Complementing this, advocacy by IITA in collaboration with Uganda's Ministry of Agriculture catalyzed the development of bylaws governing the movement of banana planting materials, translating surveillance evidence into policy action.

Aflasafe continued to scale through public-private partnerships, protecting more than 20,000 hectares in Senegal (160,000 farmers), 16,000 hectares in Nigeria, and 1,400 hectares in Mozambique. In India, 80,000 hermetic storage bags reached 25,000 farmers in Odisha. In Ghana, policy engagement supported operationalization of a national aflatoxin control policy.

Across rice systems, 77 producers and extension agents in the Philippines strengthened their knowledge on integrated rice pest management through the Rice Master Training Program. In Viet Nam, field trials demonstrated that the banana cultivar Formosana showed [Fusarium wilt incidence of 8.5 percent on average, compared with 70 percent in the susceptible local variety](#), providing evidence for practical disease management options for smallholder banana producers.

Area of Work 5: Integrated Water Management (65 results)

93%

HIGH LEVEL OUTPUTS (4)

- 01 Practices to address water-related risks to and from farming systems 1/1 indicators met annual target
- 02 Socially inclusive water management solutions integrated into sustainable farming 1/1 indicators met annual target
- 03 Training materials and capacity sharing activities to co-create and co-deliver integrated water management solutions 1/1 indicators met annual target
- 04 Evidence developed for informing policy recommendations 1/1 indicators met annual target

INTERMEDIATE OUTCOMES (3)

- 01 Farmer-facing organizations incorporate the research evidence, tools and frameworks on innovative water technologies 1 no target
- 02 Governments use evidence to modify agricultural water management policies and strategies 2 no target
- 03 International financial institutions, private sector and public sector use the evidence of innovative water solutions 1/1 indicators met annual target

● On track (≥80% of target achieved)
 ● Moderate (50–79% of target achieved)
 ● Behind (less than 50% of target achieved)

Ratings are based on annual target achievement of standard indicator categories within the Theory of Change (ToC). AI-generated ratings were reviewed and adjusted as needed by the Accelerator, with any updates accompanied by justifications.

Figure 8: AoW5 progress toward 2025 ToC indicator targets.

In 2025, AoW5 generated evidence, practical tools, and capacity-sharing activities spanning water risk assessment, management practices, and policy-relevant knowledge across Africa, Asia, and Latin America.

Building the evidence base for water risk and management

A significant portion of efforts in 2025 focused on generating spatially explicit knowledge to understand and address water-related risks. Research in Morocco used satellite-based remote sensing to monitor how crop choice and tillage systems influence soil moisture dynamics in rainfed drylands, finding that no-tillage systems consistently retained higher average soil moisture than conventional tillage. Complementing this, [conservation agriculture combined with supplemental irrigation](#) was evaluated for its effects on wheat yield and water productivity under drought conditions. In Ethiopia, spatially explicit frameworks were developed to assess the [potential of residual soil moisture for supporting post-season legume production](#) across diverse rainfed environments, providing a practical basis for crop selection and planting strategies. A parallel study [mapped agricultural water dynamics across Kenya's Central Highlands](#), revealing that the primary challenge is improving timing and efficiency of existing water resources rather than expanding supply — and demonstrating that small-scale on-farm storage ponds can significantly enhance intra-seasonal water reliability.

Bilaterally funded work under the Remote Sensing for Water Productivity (WaPOR) project extended this evidence base further, delivering country-specific irrigation performance assessment [tools for Ethiopia, Mozambique, and Mali](#), alongside [drought monitoring systems for Mali](#), and a [water availability and demand tool for Kenya](#). These tools, developed with support from the Netherlands Ministry of Foreign Affairs, enable water managers and farmers to make more informed, data-driven decisions.

Scaling practical innovations on the ground

Beyond diagnostics, the Program delivered concrete innovations tested with farmers. In Egypt, working with the Agricultural Research Center and Central Administration for Agricultural Extension Services, and in collaboration with the Scaling for Impact Program, 26 farmer-led demonstration fields across five governorates promoted an integrated agronomic bundle for soybean in irrigated wheat-based systems, achieving grain yields of 3.6–4.3 tonnes per hectare — representing [productivity increases of 27–53 percent over baseline conventional practices](#).

In India, [field evidence on water savings and improved water productivity](#) in direct-seeded rice was generated across eight states in collaboration with the Indian Council of Agricultural Research (ICAR) and state agricultural university partners — work that also links to the Climate Action Program's methane reduction agenda.

Capacity sharing and policy engagement

Capacity-sharing activities reinforced technical progress. In Ethiopia, structured training for local experts, development agents, and academics covered [integrated water management solutions for climate-resilient smallholder farming](#). In Ghana, 10 extension officers and 74 cocoa farmers were trained in standardized agronomic and irrigation monitoring in partnership with the Ghana Cocoa Board. In collaboration with the Climate Action Program and ICAR, the [SukhaRakshak](#) AI chatbot was developed to provide real-time drought information and management recommendations to farmers and officials in India.

On the policy side, and with contribution from bilateral projects, findings from 23 experimental studies are being institutionalized through formal government and research partnerships in Pakistan to inform updated irrigation and agronomy guidelines — a tangible example of evidence translating into policy uptake.

Area of Work 6: Scale-appropriate Mechanization (65 results)

93%

HIGH LEVEL OUTPUTS (4)

- 01 Socially inclusive scale appropriate mechanization (SAM) tools that improve labor productivity within prioritized farming systems 1/1 indicators met annual target
- 02 Business models for the delivery of services to sustain the use of SAM options validated 1/1 indicators met annual target
- 03 Training materials for context-specific SAM options 2/2 indicators met annual target
- 04 Evidence developed for informing policy on scale-appropriate mechanization, recognizing diversity within farming communities 1/1 indicators met annual target

INTERMEDIATE OUTCOMES (3)

- 01 Stakeholders in different social groups use the acquired knowledge 1/1 indicators met annual target
- 02 Stakeholders and partner use scale appropriate mechanizations (SAMs) 1/1 indicators met annual target
- 03 Policy interventions and scale appropriate mechanization (SAM) support actions 1 no target

● On track (≥80% of target achieved)
 ● Moderate (50–79% of target achieved)
 ● Behind (less than 50% of target achieved)

Ratings are based on annual target achievement of standard indicator categories within the Theory of Change (ToC). AI-generated ratings were reviewed and adjusted as needed by the Accelerator, with any updates accompanied by justifications.

Figure 9: AoW6 progress toward 2025 ToC indicator targets.

In 2025, AoW6 generated evidence, prototypes, and digital tools across multiple regions, advancing mechanization as an enabler of labor productivity, lower production costs, and climate-resilient farming.

New knowledge products characterized mechanization landscapes and service provision systems in [Ethiopia](#), northern [Ghana](#), [Honduras](#) and [Mexico](#), informing mechanization gap analysis and suitability mapping.

Mechanization innovation: Prototypes, tools, and digital platforms

On the innovation side, the Program developed and tested a range of field- and postharvest-level mechanization tools. A multi-crop millet planter prototype was validated for use across dryland farming systems, and a small-scale two-wheel-tractor-powered maize harvester was developed and field-tested through an iterative design process identifying key performance improvements for smallholder conditions. Benchmarking of maize-shelling methods demonstrated that low-cost mechanical designs can dramatically increase shelling capacity compared with manual methods. In Egypt, a technical specification was developed for a multi-crop raised bed planter suited to small, fragmented holdings, complementing a broader review of mechanization pathways for the country.

Digital service delivery for machine services also advanced. In Mexico, a digital third-party platform was piloted across four states and a network of 59 machinery service points was monitored covering 39,691.7 hectares and reaching 30,832 producers across [Mexico](#), [Guatemala](#), and [Honduras](#). In Viet Nam, the [EasyFarm](#) platform reached 1,676 registered users, including 1,118 farmers and 435 service providers, connecting farmers to machinery rental, inputs, and field management services. These results were co-developed with the Scaling for Impact Program, reflecting an active Portfolio linkage.

Mechanized direct seeding advancing at scale in Viet Nam

A standout achievement was the scaling of mechanized direct-seeded rice in Viet Nam. Evidence from 17 pilot fields across four provinces confirmed higher nutrient use efficiency over conventional practice. A dry direct-seeding prototype demonstrated up to 50 percent water savings and 30 percent lower greenhouse gas emissions. This feeds into Viet Nam's national One-Million-Hectare Low-Emission Rice Program, with the Ministry of Agriculture and Rural Development establishing pilot models across 12 Mekong Delta provinces.

Policy uptake and gender-responsive evidence

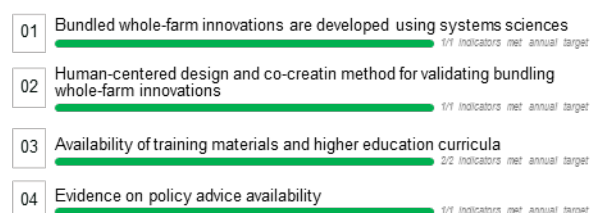
Policy-relevant results were also recorded. In Morocco, the government officially declared 160,000 hectares under direct-seeding conservation agriculture in 2024/2025 — up from 15,000 hectares in 2019/2020 — supported by CGIAR work on no-till seeders. Research in [Bangladesh](#) analyzed gendered outcomes of mechanized fodder chopper adoption among 373 livestock producers, providing nuanced evidence on trade-offs between labor savings for women and potential shifts in decision-making authority — evidence that is directly relevant to designing inclusive mechanization programs. W3- and bilaterally funded work further contributed to this evidence base, including a [precision rice seeder](#) evaluation demonstrating a 25 percent reduction in operational costs per hectare and a 7.7 percent increase in crop yield compared with manual drum seeding.

Area of Work 7: System Integration through Co-creation (98 results)

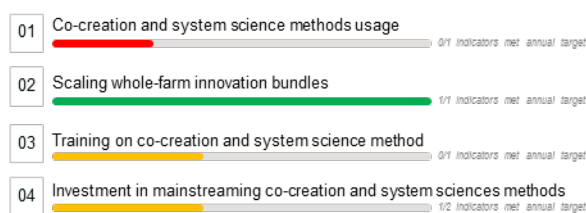
79%

AoW7 made progress on whole-farm innovation bundling but was significantly affected by budget reductions, which hampered institutionalization and partner engagement targets (Figure 10).

HIGH LEVEL OUTPUTS (4)



INTERMEDIATE OUTCOMES (4)



● **On track** (≥90% of target achieved)
 ● **Moderate** (50–79% of target achieved)
 ● **Behind** (less than 50% of target achieved)

Ratings are based on annual target achievement of standard indicator categories within the Theory of Change (ToC). AI-generated ratings were reviewed and adjusted as needed by the Accelerator, with any updates accompanied by justifications.

Figure 10: AoW7 progress toward 2025 ToC indicator targets.

In 2025, AoW7 delivered analytical work on systems modeling, participatory approaches, and integrated solutions, co-designed with farmers, national partners, and implementing organizations.

A central achievement was the development of structured frameworks for systems integration through co-creation and whole-farm bundling. In [Malawi](#), a national multi-stakeholder workshop produced a concrete roadmap for prioritization, institutional integration, and scaling of integrated innovation bundles. The roadmap assigned institutional leadership to the Department of Agricultural Extension Services and the Department of Land Resources Conservation, and identified three to four learning districts for piloting. This work was grounded in [innovation readiness and scaling analysis](#), including gender perspectives, showing that Malawi's agricultural innovation system is often technically more prepared than actual farmer uptake — particularly for commercial and digital innovations — providing an evidence base for sequenced, context-specific bundle design. A companion report [synthesized Program evidence and stakeholder inputs](#) to frame scaling as a systemic challenge requiring coordination across technical, institutional, financial, and social components.

Co-creation methods and systems science tools

Systems science methods were applied across multiple geographies. In [Ethiopia](#), focus group discussions with researchers and extension experts generated a systems synthesis of mixed crop–livestock systems in highland farming contexts, using a Drivers, Pressures, States, Impacts, and Responses framework to identify leverage points for integrated management. In [Ghana](#), a [system dynamics model](#) and dashboard was developed to evaluate the resilience of maize-cowpea intercropping, providing a quantitative tool for policymakers and scaling experts to assess the effects of agricultural technologies and policy interventions across multiple sustainability dimensions.

In collaboration with the Digital Transformation Accelerator, [UXtools4ag](#) attracted a growing user community and added a new Human-Centered Design training course for researchers and practitioners.

Complementing this, a result documented that CGIAR researchers and partners across multiple organizations — including the Food and Agriculture Organization of the United Nations, One Acre Fund, and national research institutes — increasingly applied human-centered design in digital innovation processes, spanning Colombia, Nigeria, and beyond.

Scaling adapted whole farm innovations

In [Ethiopia](#), high-yielding faba bean varieties reached 1,585 farmers (including 182 women) through farmer-to-farmer seed exchange, with disease management and early generation seed production supporting further expansion. Improved oat varieties and apple seedlings contributed to diversification. These results demonstrate that integrated solutions enable broader scaling than isolated interventions.

Capacity sharing and Portfolio linkages

Capacity-sharing activities reinforced the AoW's reach. In [India](#), [ICRISAT launched an international training program](#) for decision-makers on systems approaches to climate-resilient and sustainable farming, supported by the Indian Technical and Economic Cooperation program and emphasizing South–South collaboration. In [Lao PDR and Cambodia](#), a [blended workshop](#) convened by the Alliance of Bioversity International and CIAT and CIMMYT introduced government stakeholders and development partners to decision-support tools for regenerative agriculture, initiating discussions on a regional community of practice. The [Community of Practice on Systems Analysis](#) continued to consolidate, contributing to the Program's institutional infrastructure for systems-based learning.

Area of Work 8: Program Efficiency and Delivery (155 results)

91%

AoW8 advanced across four functions in 2025: data infrastructure, monitoring and evaluation, multi-stakeholder scaling platforms, and capacity sharing (Figure 11).

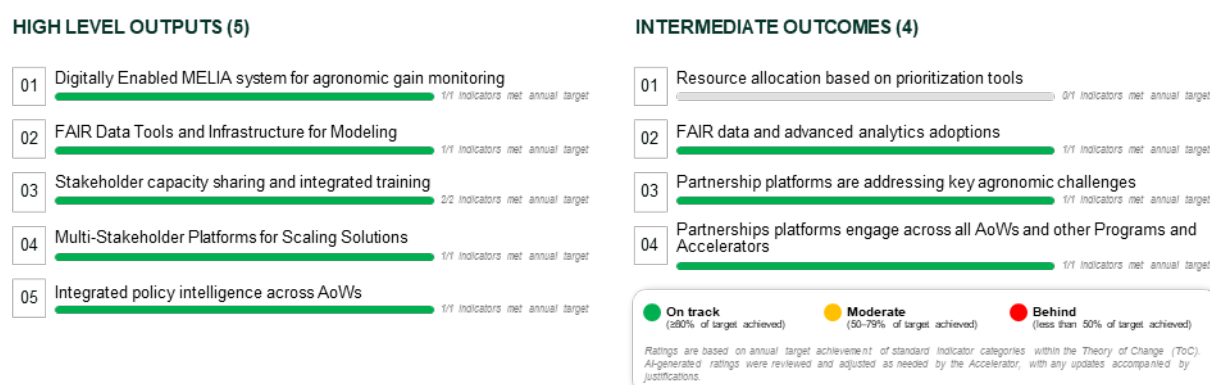


Figure 11: AoW8 progress toward 2025 ToC indicator targets.

Data infrastructure and FAIR data adoption

A cornerstone achievement in 2025 was the maturation of the [Carob data](#) standardization framework, which enabled the harmonization of 2,296 original datasets containing more than 2 million records that can be directly compared and analyzed together. Carob was reorganized and implemented across multiple country use cases in Kenya, Zambia, and Ethiopia, as well as bilateral projects including the West Africa Fertilizer Hub and iSPARK.

Complementary tools including the [File Manager platform](#) (51 researchers) and the upgraded GARDIAN data discovery platform advanced open, findable, and reusable data practices.

In West Africa, working with the Digital Transformation Accelerator, government institutions in Sierra Leone, Togo, Liberia, Nigeria, and Ghana adopted [standardized trial protocols for collecting data](#) suitable for artificial intelligence applications, following a training workshop organized jointly with the Hub for Fertilizer and Soil Health.

Monitoring, evaluation, and learning systems

[Standardized monitoring, evaluation, and learning tools](#) were deployed across all AoWs, covering innovation uptake, capacity sharing, and agronomic performance. The agronomic gain key performance indicator (KPI) framework assessed productivity, profitability, and inclusivity outcomes in [Rwanda](#) via the Program's [Impact Dashboard](#). A full [MELIA plan](#) was finalized for near-real-time results tracking.

Multi-stakeholder scaling platforms

The Partnerships for Accelerating Agricultural Solutions at Scale (PAASS) approach advanced significantly in 2025. A [practical guide to implementing PAASS platforms](#) was published, and active platforms were operationalized or strengthened in Ethiopia, Ghana, Rwanda, Nigeria, and Tanzania. In Ethiopia, more than 1,430 geo-referenced on-farm piloting trials were conducted, [with digital advisory queries reaching 15,167 through FarmerChat and more than 32,000 farmers](#) profiled through bundled advisory-finance-insurance services. A regional PAASS for Southeast Asia was initiated, linking mechanized direct-seeded rice scaling across Cambodia, Viet Nam, and the Philippines, with Cambodia's scaling embedded in a US\$240 million blended investment.

Capacity sharing and policy influence

AoW8 delivered a broad range of capacity-sharing activities, including a Carob training for CGIAR members in collaboration with the Digital Transformation Accelerator, a [data management workshop](#) for nine West African countries conducted in both English and French, and master classes on scaling readiness for eight innovation teams across nine countries. The [Open Learning Portal](#) — developed in collaboration with Makerere University — was updated with new features and hosts courses on sustainable agriculture, gender equity, and climate resilience. Policy influence outputs included a [brief on soil health policy options for sub-Saharan Africa](#) and a [policy note on gender, communication, and integrated pest management adoption in Uganda](#), both contributing evidence to national and regional policy processes.

Ethiopia's harmonized advisory system reaches national scale

A notable achievement in collaboration with AoW2 illustrates the AoW's impact in practice: Ethiopia's Localized Agronomy and Fertilizer Advisory system — developed through the PAASS platform with the Ministry of Agriculture, national research institutes, Digital Green, and GIZ — transitioned from a technical innovation to a nationally embedded advisory system, with evidence drawn from more than 1,430 piloting trials and substantial digital delivery. This result demonstrates how AoW8's integrative functions — data infrastructure, monitoring systems, and multi-stakeholder platforms — combine to enable responsible scaling of agricultural innovations.

3. Partnerships

In 2025, Sustainable Farming's results reflect the strategic value of partnerships across the CGIAR Portfolio and with external partners, supporting inclusive innovation, scaling, and adaptation for smallholder farmers, particularly women and youth.

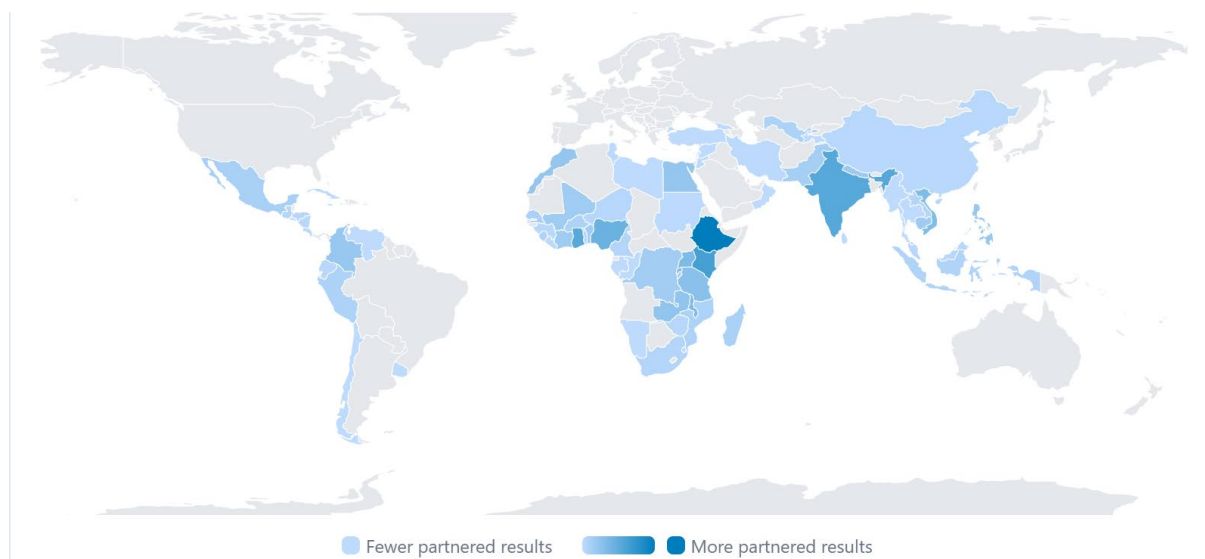


Figure 12: Geographical coverage of Program partners and contribution to 2025 results.

The Sustainable Farming's collaborative landscape in 2025 was both wide and deep, encompassing CGIAR Research Centers, national agricultural research and extension systems (NARES), government agencies, private sector actors, farmer organizations, and development partners. Partnerships were not limited to project implementation, and emphasized co-design, joint validation, and shared learning processes.

Critical to the Program approach was the co-development of innovations with NARES and government partners, ensuring that new tools, practices, and digital platforms were responsive to local contexts and scalable through existing extension systems. The [Smart Nkunganire System in Rwanda](#) exemplifies this approach, in which digital fertilizer advisory tools were developed and piloted in partnership with the Ministry of Agriculture and Animal Resources and the Rwanda Agriculture and Animal Resources Development Board, engaging both [extension agents and farmers to facilitate effective capacity sharing and context-specific refinement](#).

Private sector collaboration also played a significant role, particularly in scaling and commercializing technologies. For instance, the adoption and deployment of Aflasafe biocontrol technology to reduce aflatoxin contamination in maize, groundnut, and sorghum was achieved through coordinated public-private sector engagement and direct partnerships with local manufacturers and distributors in several African countries.

Regional learning alliances in [Southeast Asia](#) enabled multi-country collaboration on rice straw circular economy practices, while technical working groups and field days in Ethiopia and Malawi fostered [systems-level crop-livestock integration](#) with active participation from women and youth.

Sustainable Farming's results in 2025 demonstrate extensive integration with other CGIAR Programs and Accelerators. Strategic linkages with the Digital Transformation Accelerator underpinned advances in data standardization (ensuring uniform formats and definitions), AI-ready data (datasets organized for machine learning), and innovation analytics. The adoption of and training on the Carob data standardization framework, a shared set of protocols for data consistency, enabled harmonized data management and interoperability across multiple Centers and projects.

Collaboration with the Scaling for Impact Program was instrumental in [refining scaling models, developing responsible scaling toolboxes](#), and embedding scaling science into programmatic design and delivery. The Gender Accelerator partnership reinforced gender-responsive research, exemplified by [the Gender and Plant Health Webinar Series](#) and gender-transformative approaches in community-based breeding and innovation delivery.

Building on the recognition that soils host a large share of global biodiversity and that livestock is integral to farm sustainability and soil health, the Multifunctional Landscapes and the Sustainable Farming Programs have been collaborating to develop integrated agro-ecological strategies that restore soil organic matter, enhance nutrient cycling, and improve nutrient use efficiency across scales. By aligning landscape-level planning with farm-level innovations, they jointly support resilient soil systems that underpin sustainable agricultural productivity.

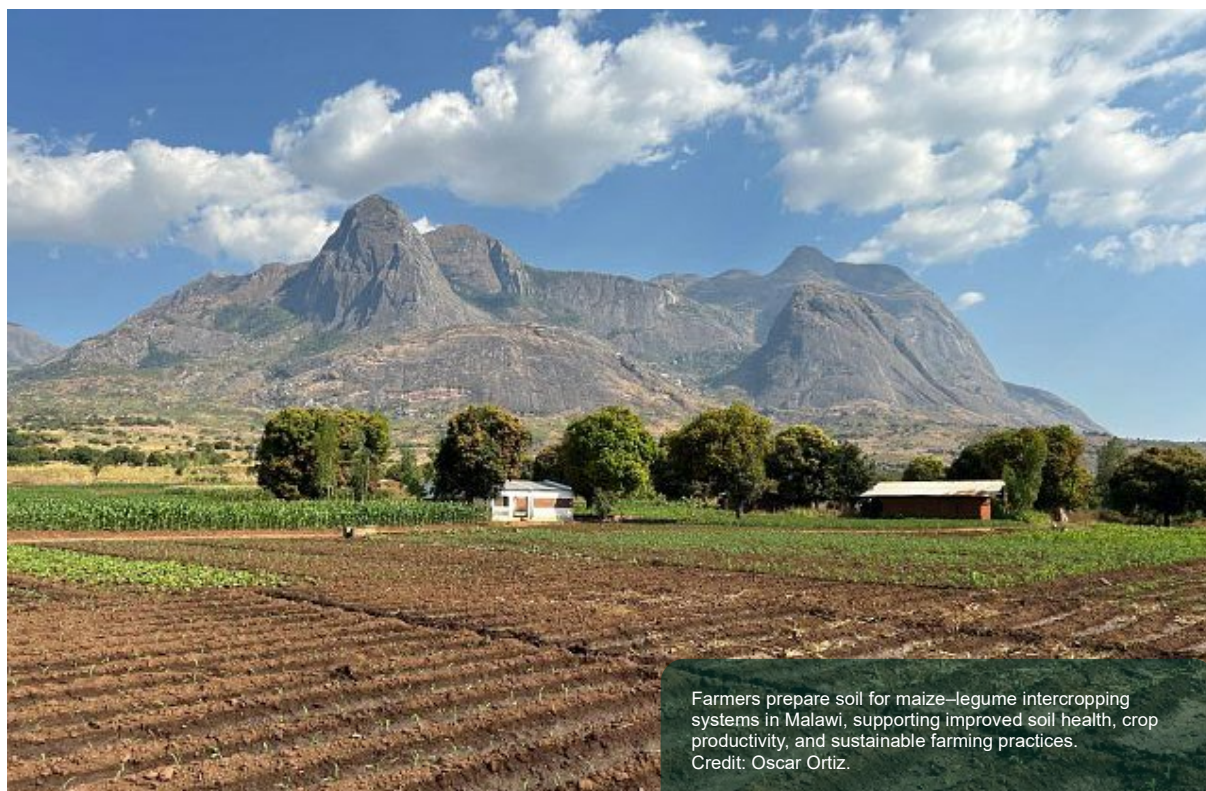
Geographically, the Program's PAASS platforms provided a foundation for aligning multiple CGIAR activities and bilateral projects within shared regions, such as the integration of farm-level and landscape-level approaches in [Kenya's Central Highlands](#), and the co-location of digital advisory scaling, mechanization, and sustainable intensification in Ethiopia, Ghana, and [Malawi](#).

A key feature of the Program's partnership approach was the emphasis on iterative learning, adaptation, and co-design. Innovations such as the [AgWise advisory platform](#) were developed and refined through cycles of stakeholder engagement, field piloting, and user feedback, involving both research and demand partners in Ethiopia, Kenya, Rwanda, and Zambia. The Prioritizing Agronomy in Changing Environments (PAiCE) toolkit was applied in 19 workshops across 18 countries, drawing on input from more than 270 experts to identify climate adaptation and sustainable intensification priorities that directly shaped Sustainable Farming's research agenda and AoW restructuring.

Partner-driven feedback and adaptive management were further supported by the MELIA framework and standardized monitoring tools, which enabled real-time tracking, learning, and evidence-based decision-making across projects and geographies. This continuous feedback loop was critical for adjusting implementation strategies and ensuring that innovation packages remained relevant and effective under local conditions.

Sustainable Farming's partnership and Portfolio integration approach in 2025 was characterized by a commitment to inclusivity, context specificity, and systems thinking. Targeted support and capacity building for women, youth, and marginalized groups were embedded in innovation design and delivery, [from gender-responsive advisory models and leadership training to disability-inclusive extension services](#). Socio-technical innovation bundling and multi-actor platforms ensured that solutions addressed diverse farmer types, segments and agroecological zones. This approach strengthened resilience and sustainability.

Sustainable Farming's partnership-driven model — grounded in co-design, joint validation, and adaptive learning — delivered integrated and scalable innovations in 2025, directly contributing to CGIAR's 2030 outcomes.



4. Adaptive management

Adaptive management remained central to the operation of the Sustainable Farming Program in 2025, enabling timely and proactive responses to evolving scientific priorities and operational realities. In line with the CGIAR adaptive management framework, the Program applied iterative cycles of planning, implementation, review, and adjustment to strengthen coherence, delivery effectiveness, and long-term impact.

Applied as a continuous approach to decision-making rather than a one-off process, adaptive management was particularly critical in a year marked by significant structural transitions, compressed planning timelines, and increasing financial pressures. The adaptive management practices, including structured dialogue, prioritization frameworks, and regular engagement were critical in sustaining delivery momentum. These mechanisms enabled the Program to balance competing demands while maintaining focus on strategic objectives.

Evidence and learning

Informed by the 2025 Pause and Reflect sessions, including engagement with key funders and stakeholders who provided feedback on both existing and new Program proposals through various fora — such as the Program launch, webinars, CGIAR Science Week, and the proposal review process — the Program redesigned and consolidated its framework into a more integrated, mission-oriented delivery model of five AoWs, which will start to be implemented in 2026, down from the original eight largely disciplinary research AoWs implemented in 2025. This redesign required aligning activities initiated during the 2022–2024 Initiatives with the Program's theory of change. The resulting framework provides a clearer strategic direction and strengthens alignment across science, operations, and delivery going forward.

Another key adaptive management milestone was the refinement of the Program's geographic focus, informed by a structured prioritization process and stakeholder feedback, including the need to focus on countries with strong partnerships and alignment with CGIAR priorities. This resulted in the identification of 20 priority countries to drive impact and focus investment across Africa and Asia and will strengthen the Program's delivery of integrated solutions at scale.

2025 performance reporting provided evidence of significant overachievement across several AoW targets. While these results reflect strong delivery momentum, they also highlight that some outputs from 2022–2024 Initiative activities, implemented through to 2025, were not fully captured in the initial 2025 target setting. This was partly due to a conservative target-setting approach driven by budget uncertainty. In addition, the mapping of bilateral and W3 projects contributed to higher-than-anticipated performance, as AoW teams set cautious, achievable targets to mitigate delivery risks. These learnings highlight the need to strengthen target-setting processes to ensure future performance frameworks more accurately reflect the full scope of activities and expected results.

W1/2 funding and financial planning

Financial uncertainty and budget cuts — including the closure of USAID — required significant reprioritization, most notably a reduction in AoW7 activities. The Program also recalibrated its strategic focus with more emphasis on efficiency, sharper prioritization, and concentration of effort in high-impact geographies and interventions. These adjustments have directly informed 2026 planning and the deliverables and indicators of the redefined five AoW, including stronger country prioritization and streamlined delivery models.

Looking ahead: deepening adaptive management

Looking ahead and building on lessons from 2025, the Program will continue to strengthen adaptive management in 2026. Priorities include refining target-setting approaches, deepening country prioritization by introducing country representatives, enhancing cross-AoW coordination, and strengthening data-driven decision-making.

By embedding continuous learning and responsive management across all levels, the Program is well positioned to navigate a more constrained resource environment while maintaining focus on delivering sustainable and scalable impact.

Risk management

All five identified risks materialized in 2025, with consequences including team disruption, partnership challenges, and delays in implementation. Mitigation measures were activated as planned, with most progressing on track. These actions significantly reduced the likelihood of the risks affecting the Program in 2026.

Read Sustainable Farming's [Risk Register](#), which includes the top five submitted risks for 2025 and related actions and controls to manage those risks.

5. Key result story

Science into practice: How Ethiopia built a national digital fertilizer advisory system

Site-specific guidance through the Harmonized Fertilizer and Agronomy Solutions (HaFAS) advisory system improves yields, incomes, and resilience for 49,000 Ethiopian farmers.



In 2025, 49,000 Ethiopian farmers increased productivity and incomes through the HaFAS advisory system, implemented by the Ministry of Agriculture and EIAR, in partnership with CGIAR's Sustainable Farming Program. Validated through more than 2,700 on-farm trials across wheat, maize, tef, and sorghum, and delivered via extension services and digital platforms including FarmerChat and LERSHA's finance platform, HaFAS drove wheat yield gains of 16–25 percent and is now embedded in Ethiopia's national extension system.

For years, Ethiopian farmers received blanket fertilizer recommendations that overlooked differences in soils, rainfall, field history, and management. Farmers often applied inputs without achieving desired harvests, eroding trust in extension services. Multiple projects issued inconsistent, sometimes conflicting advice, leaving farmers and extension workers unsure which guidance to follow.

The Ministry of Agriculture and EIAR sought to unify fertilizer advisory services under a nationally managed system offering site- and season-specific guidance. Using evidence generated by the Sustainable Farming Program, a Localized Agronomy and Fertilizer Advisory (LAFA) within the HaFAS framework was developed. Powered by the NextGen Decision Support Tool, the system merges soil, climate, and agronomy data with AI and machine learning analytics to produce farm-specific recommendations. CGIAR Centers, including the Alliance of Bioversity International and CIAT and ICRISAT, ensured scientific rigor through validation, model calibration, and field trials. A continuous feedback loop between farmers, extension agents, government, and partners enables real-time learning and refinement. HaFAS is now being adopted within Ethiopia's national extension system, with plans to reach 2 million farmers by 2030.

In 2025, 49,000 farmers received tailored recommendations through a blended analog and digital delivery model. Digital Green's FarmerChat handled more than 15,000 queries, while LERSHA's bundled finance platform reached 32,000 farmers, linking 8,000 to credit and insurance including 1,300 women.

Farmers saw concrete benefits: wheat yields grew by 16-25 percent, maize yields rose by 10.5-17.6 percent, and profitability increased by US\$412-580 per hectare for wheat and US\$195-230 per hectare for maize. Improved fertilizer use cut input costs by 20 percent.

HaFAS replaces fragmented advice with a single, trusted, evidence-based recommendation per site and season, strengthening extension credibility and enabling consistent decision-making. Embedded feedback loops linking farmers, digital platforms, and national systems ensure the advisory evolves with changing conditions. Optimized input use also reduces emission intensity per ton of produce, contributing to climate-smart agriculture. The system represents a shift from project-based advisory to a nationally owned, data-driven platform with the foundation for long-term agricultural transformation.

Key activities enabling success

- MoA-led partner alignment and National Decision Support Tools Coordination Platform co-chaired with EIAR.
- Capacity building for NARS researchers in data management, artificial intelligence and machine learning analytics, and system administration (2024-2025).
- Expansion of the national soil and agronomy database to more than 100,000 multi-year records.
- Migration of core scripts and databases onto the MoA infrastructure for long-term sustainability.
- National validation standards and quality assurance protocols for HaFAS.
- Sustainable Farming Program scientific backstopping with the participation of the Alliance of Bioversity International and CIAT and ICRISAT.

“ Before, farmers received different fertilizer messages from different projects. Now HaFAS gives one nationally validated recommendation we can stand behind and improve each season.

Dr. Birru Yitaferu, Senior Soil Scientist, Ethiopian Institute of Agricultural Research (EIAR)

Contributing Centers: Alliance of Bioversity International and CIAT, ICRISAT

Contributing external partners: Ministry of Agriculture (MoA), Ethiopia, Ethiopian Institute of Agricultural Research (EIAR), Regional Agricultural Research Institutes (RARIs), GIZ-Ethiopia with SSHI-project, Coalition of the Willing (CoW) Ethiopia, Digital Green Ethiopia, Green Agro Solution PLC (LERSHA), ORG-Self Help Africa, Bureaus of Agriculture in Ethiopia (zonal, regional, and district)

