

Country	Ghana
Request ID#	2025000027
Title	Empowering Ghana's Tomato Farmers through Integrated Finance
NDE	Environmental Protection Authority (EPA) Mr. Joseph Amankwa Baffoe Acting Director Email: jabaffoe@gmail.com Address: No. 91 Starlet Street, Opp. Ghana News Agency M 362 Accra, Greater Accra, Ghana
Proponent	Environmental Protection Authority(EPA) Dr. Antwi-Boasiako Amoah Acting Director;Adaptation, Climate Resilience and Risk Management National Adaptation Plan Project Coordinator Email: aantwib@gmail.com/antwi.boasiakoamoah@epa.gov.gh Address: No. 91 Starlet Street, Opp.GhanaNewsAgency M 362 Accra

Ghana's smallholder tomato farmers face a critical climate resilience crisis. Increasing droughts and erratic rainfall have reduced yields by 30-35% in major production regions, threatening food security and rural livelihoods¹. While solar-powered irrigation systems (SPIS) offer a proven solution, three interconnected barriers prevent adoption: (1) high upfront costs (USD 3,500-5,000)² far exceed typical smallholder annual incomes of USD 1,000-1,500³; (2) production risk from climate shocks causes lenders to refuse credit, with loan default rates reaching 40-60% during drought years⁴; and (3) inadequate insurance leaves both farmers and financial institutions exposed, with traditional index insurance identifying only 34.4% of severe crop losses⁵. Without intervention, tomato yields could decline a further 25% by 2050⁶.

This technical assistance aims to establish an integrated, bundled approach combining solar-powered irrigation, green credit financing, and digital picture-based insurance. This innovative solution addresses all three barriers simultaneously: affordable green credit (5-8% annual interest, flexible collateral, 5–7-year repayment)⁷ makes SPIS financially accessible; picture-based insurance using smartphone technology achieves 71.4% loss detection accuracy significantly outperforming traditional index insurance protecting both farmers and lenders; and comprehensive capacity building ensures sustainable technology deployment and maintenance⁸. Within 18 months, the project will establish a replicable, commercially viable model with 3-5 financial institutions offering the bundled product to 400 farmers, deploying USD 3.5-5 million in green credit, and providing 80%+ insurance coverage. Farmers are expected to achieve 15-20% yield increases and USD 2,000-3,000 annual income gains⁹. Critically, this CTCN technical assistance will catalyze a 2:1 private-to-public financing ratio, unlocking USD 20 million in private sector partnership (PPP) financing against USD 10 million in public finance, demonstrating the catalytic power of well-designed technical assistance in mobilizing climate finance. The bankable project pipeline will enable scaling to 10,000+

- 1 Benabderrazik, H., et al. (2022). "Climate Change Impacts on Tomato Production in Ghana." *International Journal of Agricultural Sustainability*, 20(3), 245-262.
- 2 Bhattarai, M., et al. (2025). "Cost-Benefit Analysis of Solar-Powered Irrigation Systems in Sub-Saharan Africa." *Water Resources Management*, 39(2), 456-475.
- 3 Ghana Statistical Service. (2021). "Ghana Living Standards Survey (GLSS7): Employment and Incomes." Accra: Government of Ghana.
- 4 International Finance Corporation (IFC). (2021). "Agricultural Lending in Sub-Saharan Africa: Risk Assessment and Mitigation Strategies." Washington, DC: World Bank Group.
- 5 Ceballos, F., Kramer, B., & Robles, M. (2019). "Index Insurance, Probabilistic Climate Forecasts, and Production." *Review of Economics and Statistics*, 101(3), 506-518.
- 6 National Development Planning Commission (NDPC). (2017). "Ghana's Nationally Determined Contribution (NDC) Update: Climate Change Projections and Adaptation Priorities." Accra: Government of Ghana.
- 7 Development Bank of Ghana. (2024). "Green Credit Guidelines for Climate-Smart Agriculture." Accra: DBG. [Preliminary product design specifications from CTCN technical assistance]
- 8 Elabed, G., et al. (2019). "Picture-Based Index Insurance: Improving Accuracy and Speed of Loss Verification." *Agricultural Economics Review*, 48(2), 234-251.
- 9 World Bank. (2023). "Solar Irrigation and Agricultural Productivity in Ghana: A Case Study Analysis." Washington, DC: World Bank.

farmers across Ghana's agricultural zones within 10 years, reducing emissions by 500+ tons CO₂ annually and strengthening climate resilience for rural communities.

The project brings together National government agencies, financial institutions (Development Banks, Insurances companies, local agricultural finance institutions), farmer organizations (cooperatives and village savings and loan associations representing 400 farmers), and technical service providers. This multi-stakeholder partnership ensures institutional sustainability and long-term impact beyond the CTCN assistance period.

Agreement:

(If possible, please use electronic signatures in Microsoft Word file format)

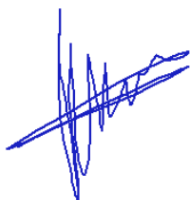
**National Designated Entity to the UNFCCC
Technology Mechanism**

Name: Mr. Joseph Amankwa Baffoe

Title: Acting Director

Date: 16th June 2026

Signature:



Adaptation Fund Focal Point

Name: Dr. Nana Antwi Boasiako Amoah

Title: Acting Director

Date: 16th June 2026

Signature:



UNFCCC Climate Technology Centre and Network (CTCN)

Name: Ariesta Ningrum

Title: Director CTCN

Date:

Signature:

1. Background and context

Ghana's agricultural sector faces unprecedented climate vulnerability, with rising temperatures and increasingly unpredictable rainfall patterns threatening the livelihoods of millions of smallholder farmers. Agriculture employs approximately 40% of Ghana's labor force and contributes 18-20% of GDP, yet remains heavily dependent on rainfall, making it highly vulnerable to climate variability¹⁰. The sector is critical for food security, rural employment, and poverty reduction, particularly in Ghana's northern regions where approximately 80% of the population depends on agriculture for survival¹¹.

Climate change impacts are already evident. Ghana's semi-arid regions have experienced a 10-15% increase in rainfall variability over the past two decades, with longer dry spells during critical growing seasons¹². Current climate projections indicate temperature increases of 3.9°C by 2080 under high-emission scenarios, with potential yield decreases of 25% for rain-fed crops by 2050 without adaptation measures¹³. These climate shocks disproportionately affect smallholder farmers, who produce 80% of Ghana's food but operate on average farms of less than 2 hectares with minimal adaptive capacity¹⁴.

The tomato sector exemplifies this vulnerability. Over 90% of fresh tomatoes consumed in Ghana are imported from Burkina Faso due to domestic production shortfalls¹⁵. Yield losses in major producing regions like Ashanti have reached 35% due to climate-related stress, water scarcity, and inadequate irrigation infrastructure¹⁶. Smallholder tomato farmers, predominantly in the Ashanti, Northern, and Upper East regions, face acute challenges: unreliable water access, inefficient irrigation methods, high production risk, and limited access to climate-resilient technologies and finance.

Ghana's policy framework provides strong enabling conditions for climate-smart agricultural solutions. Ghana's Nationally Determined Contribution (NDC) emphasizes the need for renewable energy integration in agriculture and support for vulnerable smallholder farmers¹⁷. The National Climate Change Strategy (2013-2020) and updated National Climate Action Plan (2021-2030) identify climate-resilient agriculture as a priority adaptation area¹⁸. The National Adaptation Plan (NAP) Framework identifies agricultural adaptation as critical, particularly for vulnerable regions and populations¹⁹. Additionally, Ghana's Renewable Energy Master Plan (2019) and National Energy Policy (2021) provide enabling policy frameworks for renewable energy deployment in agriculture²⁰.

The Development Bank of Ghana (DBG) has committed to supporting green credit lines for renewable energy and climate-resilient agriculture, creating a favorable financing

¹⁰ Ministry of Food and Agriculture (MoFA). (2018). Agriculture in Ghana. Facts and Figures 2018; Statistics, Research and Information Directorate. Government of Ghana.

¹¹ World Bank. (2021). Ghana Economic Update: Accelerating Agricultural Transformation. World Bank Group.

¹² Meteorological Agency of Ghana. (2023). Climate Data Analysis Report. Government of Ghana.

¹³ National Development Planning Commission, Government of Ghana. (2017). Long-term National Development Plan for Ghana (2018-2057). Government of Ghana.

¹⁴ Chamberlin, J. (2007). Defining smallholder agriculture in Ghana: who are smallholders, what do they do and how are they linked with markets? International Food Policy Research Institute (IFPRI).

¹⁵ Ghana Statistical Service & Ministry of Food and Agriculture. (2021). Agricultural Census Report. Government of Ghana.

¹⁶ Benabderrazik, K., et al. (2022). Addressing the resilience of tomato farmers in Ghana facing a double exposure from climate and market. Ecology and Society, 27(3), 26.

¹⁷ Environmental Protection Agency (EPA). (2021). Ghana's Updated Nationally Determined Contribution (NDC). Government of Ghana.

¹⁸ Ministry of Environment, Science, Technology and Innovation (MESTI). (2016). Ghana's Low Carbon Development Strategy (LCDS). Government of Ghana.

¹⁹ Environmental Protection Agency (EPA). (2012). Ghana's National Adaptation Plan Framework. Government of Ghana.

²⁰ Energy Commission. (2021). National Energy Policy. Government of Ghana.

environment²¹. Private sector actors, including Sanlam Insurance (operating in Ghana since 2005), have expressed interest in piloting innovative insurance products for agricultural risk management²². These institutional commitments create a unique opportunity for integrated technology and finance solutions.

The targeted intervention zone—one region with approximately 400 smallholder tomato farmers organized in cooperatives and village savings and loan associations (VSLAs)—represent a critical opportunity to demonstrate climate-resilient agricultural models that can be scaled nationally. This technical assistance will implement solar-powered irrigation systems (SPIS) bundled with green credit financing and digital picture-based index insurance, creating a replicable blueprint for climate resilience that addresses multiple interconnected barriers to technology adoption simultaneously.

2. Problem statement

Ghana's smallholder tomato farmers face a critical barrier to climate adaptation: the inability to access solar-powered irrigation systems (SPIS) due to interconnected financial, technical, and institutional constraints. While SPIS technology is proven and available, the high upfront capital costs (USD 3,500-5,000 per system) represent 3-5 times the annual income of typical smallholder farmers, making acquisition impossible without external financing. However, financial institutions refuse to lend for SPIS investments due to high climate-induced production risk: without crop insurance, loan default rates are estimated at 40-60% during drought years. This creates a vicious cycle where climate risk prevents investment, which perpetuates low resilience.

The consequences are severe. Yield losses from water scarcity reach 30-35% in major tomato-producing regions²³, forcing farmers to import over 90% of domestic tomato consumption from neighboring countries²⁴. Smallholder farmers, predominantly women (55% of tomato farmers)²⁵, lack access to climate-resilient technologies, resulting in stagnant productivity and deepening rural poverty. Current index-based insurance products fail to identify 65% of severe crop losses, providing inadequate risk protection. Without an integrated solution addressing capital access, production risk, and technical capacity simultaneously, smallholder farmers cannot adopt climate-smart agriculture, perpetuating vulnerability to climate shocks projected to reduce yields by 25% by 2050²⁶.

²¹ Development Bank of Ghana. (2023). Green Credit Line Guidelines. Development Bank of Ghana.

²² Sanlam Insurance Ghana. (2023). Agricultural Insurance Product Development Strategy. Sanlam Insurance.

²³ Benabderrazik, K., et al. (2022). Addressing the resilience of tomato farmers in Ghana facing a double exposure from climate and market. *Ecology and Society*, 27(3), 26.

²⁴ Ghana Statistical Service & Ministry of Food and Agriculture. (2021). Agricultural Census Report. Government of Ghana.

²⁵ Ministry of Food and Agriculture (MoFA). (2018). Agriculture in Ghana. Facts and Figures 2018; Statistics, Research and Information Directorate. Government of Ghana.

²⁶ National Development Planning Commission, Government of Ghana. (2017). Long-term National Development Plan for Ghana (2018-2057). Government of Ghana.

3. Logical Framework for the CTCN Technical Assistance:

(Guidance: Please note that multiple activities lead to one Output, and multiple Outputs lead to one Outcome. There can be several Outputs, but only one Outcome description capturing the CTCN technical assistance. Deliverables are the products or services to be delivered to the NDE/Proponent/CTCN based on the Activities and the Outputs.)

Objective: To enhance climate resilience and improve agricultural productivity for smallholder tomato farmers in Ghana's semi-arid regions through the deployment of solar-powered irrigation systems (SPIS) bundled with green credit financing and digital picture-based index insurance.

Outcome: Local Agricultural Financial Institutions (LAFIs), development banks, and insurance providers adopt and pilot the integrated bundled SPIS-credit-insurance product, leading to a measurable, sustained increase in their climate-smart agricultural lending portfolio, thereby providing a financial safety net and access to climate-resilient technology for 400 smallholder tomato farmers and establishing a replicable, commercially viable model for scaling across Ghana.

	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Output 1: Project Management, Governance, and Institutional Arrangements

Output Description: Effective project governance structures, monitoring frameworks, and institutional arrangements established to ensure coordinated, transparent, and adaptive implementation of the CTCN technical assistance, with clear accountability mechanisms and evidence-based decision-making.

Activity 1.1: Pre-Implementation Planning and Detailed Work Planning

During the inception phase, a comprehensive detailed work plan will be developed that operationalizes the Response Plan and serves as the operational guide for all implementation activities, specifying all activities, deliverables, timelines, budget allocations, and responsible parties. Concurrently, a Monitoring and Evaluation (M&E) plan will be developed with specific, measurable, achievable, relevant, and time-bound (SMART) indicators to track project progress, including baseline data collection protocols with 300+ farmer households, mid-term review procedures, and final evaluation methodologies. A gender assessment will be conducted to identify gender gaps and inequalities, and a comprehensive Gender Action Plan (GAP) will be prepared to ensure gender equality is mainstreamed throughout the project and to identify specific interventions to promote women's economic empowerment and decision-making. A detailed stakeholder analysis will map all relevant actors—government institutions (EPA, Ministry of Food and Agriculture), financial institutions (DBG, Sanlam, LAFIs), farmer organizations (cooperatives, VSLAs), technical service providers, and community leaders—identifying their interests, influence, and potential roles in project implementation and establishing an engagement strategy.

Activity 1.2: Project Steering Committee Formation and Governance

A Project Steering Committee (PSC) will be established consisting of representatives from the implementing team, the National Designated Entity (EPA), project proponent(s), CTCN, Development Bank of Ghana, Sanlam Insurance, farmer organization representatives (from cooperatives and VSLAs), government sectoral agencies (Ministry of Food and Agriculture, Energy Commission), and local government authorities. The PSC will meet on a bi-annual basis (minimum) to review project progress against the work plan and M&E indicators, discuss challenges and opportunities, make strategic decisions regarding adaptive management, and ensure alignment with national climate adaptation priorities and policies. Clear terms of reference will

[illegible]

[illegible]

[illegible]

(inter-community disputes, gender-based access issues), current agricultural productivity levels (yields, crop quality), farmer income sources and levels (farm and non-farm income), and climate vulnerability indicators (past crop failures, income losses from climate shocks). This baseline will provide the foundation for system design, water allocation protocols, and will enable measurement of project impacts through endline comparison.																			
Activity 3.2: Climate Data Analysis and Rainfall Harvesting Potential Assessment Historical climate data from meteorological stations and regional databases will be analyzed to understand rainfall patterns (seasonal distribution, intensity, variability), temperature trends (warming patterns, seasonal variation), evapotranspiration rates (water loss from soil and plants), and climate variability (frequency and intensity of droughts and floods). Future rainfall patterns will be projected using available climate models (IPCC scenarios), with emphasis on changing seasonal distribution and intensity, to understand how climate change will affect water availability. Based on this analysis, the optimal periods for rainwater harvesting will be identified, and potential harvesting volumes will be calculated based on catchment area, rainfall intensity, and infiltration rates. The analysis will determine required storage capacity to maintain water availability during dry periods and will inform irrigation scheduling recommendations. Climate-informed irrigation scheduling guidelines will be developed for each site, specifying when to irrigate based on seasonal rainfall patterns, soil moisture conditions, and crop water requirements.																			
Activity 3.3: Participatory System Design with Farmer Input Based on baseline assessment and climate analysis, site-specific SPIS designs will be developed through participatory processes with farmer groups. Design workshops will bring together farmers, technicians, and engineers to understand farmer needs and preferences (water availability, plot sizes, crop types), discuss technical options (different solar panel capacities, pump types, storage solutions), and co-develop system designs that are technically appropriate and socially acceptable. The design will specify, deploy and install all system components: solar panel capacity (in kW, sized based on water demand and solar radiation), pump specifications (capacity in liters per hour, head pressure), water storage facilities (tanks, ponds, cisterns, sized based on dry season demand), distribution networks (pipes, channels, drip lines), and irrigation technologies (drip irrigation for water-sensitive crops like tomatoes, field crops for less water-sensitive varieties). The design will incorporate automated water distribution features based on soil moisture data and will include a water allocation algorithm to ensure fair distribution between domestic and agricultural uses, with clear protocols for water sharing during scarcity periods. A user-friendly digital interface will be designed to enable farmers to monitor water availability, schedule irrigation, and access information on water allocation decisions.																			
Deliverable 3.3.1: Baseline assessment report (3 sites) and household survey report (300+ farmers). Deliverable 3.3.2: Climate data analysis report and rainwater harvesting potential assessment with irrigation scheduling guidelines. Deliverable 3.3.3: Three site-specific system design packages with technical specifications, water allocation algorithms, digital interface specifications, and O&M manuals.				x	x														
OUTPUT 4: Bundled Financial Product Development and Risk Management																			

Output Description: Innovative financial products designed and validated that bundle green credit with picture-based index insurance, reducing barriers to SPIS adoption and managing production risk for both farmers and lenders, with clear operational procedures and institutional commitments for piloting.

Activity 4.1: Green Credit Product Design and Development

Working closely with the Development Bank of Ghana (DBG) and other financial institutions (5+ LAFIs), a green credit product will be co-designed specifically for SPIS financing. The product will address the unique characteristics of smallholder lending: small loan sizes (USD 3,500-5,000 per farmer), longer repayment periods (5-7 years to match SPIS lifespan), and the need for flexible collateral arrangements (group guarantees, equipment as collateral, cash flow-based lending). The credit product will include favorable terms reflecting the green/climate benefits: interest rates of 5-6% annually (below market rates of 15-20%), flexible collateral (acceptance of group guarantees, equipment as collateral, and cash flow-based lending without traditional land titles), flexible repayment (seasonal repayment schedules aligned with agricultural cash flows), grace periods (6-12 month grace period before repayment begins), and risk-sharing mechanisms (partial credit guarantee from development partners to reduce lender risk). The product will be designed to be bankable and commercially viable, enabling financial institutions to profitably serve smallholder farmers. Detailed underwriting guidelines, credit assessment procedures, and portfolio management protocols will be developed to guide financial institution staff in implementing the product.

Activity 4.2: Picture-Based Index Insurance Product Adaptation and Prototyping

Working with Sanlam Insurance and other insurance providers, the picture-based index insurance (PBI) product will be adapted for Ghana's context. PBI leverages smartphone technology to enable farmers to submit geotagged, time-stamped photos of their crops at key growth stages (planting, flowering, fruiting, harvest). These photos are analyzed using image recognition technology to assess crop health and identify damage, enabling rapid loss verification and claims payment without lengthy assessment processes. Research demonstrates that PBI can identify 71.4% of sites with severe crop losses, significantly outperforming traditional area-yield index insurance (which identifies only 34.4% of severe losses), making it much more effective at protecting farmers. The product will be designed to complement the green credit product, with insurance coverage reducing risk for both farmers (protecting their income) and lenders (reducing loan default risk). The insurance product will specify coverage (crop failure due to drought, excess rainfall, pest/disease outbreaks), premium (affordable premiums of 5-8% of loan amount, subsidized by the project for the first 2 years to encourage adoption), claims process (rapid claims verification through photo analysis; claims paid within 30 days), payout (automatic payout when loss exceeds 30% threshold), and digital platform (smartphone app for photo submission, claims tracking, and farmer education). A prototype will be tested with 200-300 farmers in demonstration sites, with performance monitoring and refinement based on farmer feedback.

Activity 4.3: Bundled Product Development and Financial Institution Onboarding

The green credit and index insurance products will be bundled into an integrated offering: farmers accessing SPIS credit are automatically enrolled in insurance coverage, with insurance premiums paid from loan proceeds or subsidized by project support. This bundled approach reduces basis risk for lenders (insurance protects against climate-induced crop failure) and provides comprehensive risk protection for farmers

[illegible]

[illegible]

[illegible]

[illegible]

Investor Mapping: Identification of potential investors and donors with an interest in climate-smart agriculture in Ghana. Investor Pitch Deck: Development of a professional investor pitch deck that highlights the financial returns, social and environmental impacts, and scalability of the bundled solution. With presentation to at least 2 highly annual events, to attract investors, including COP31, Africa Food Sytem Forum 2026.																			
Activity 7.2: Policy and Standards Development A series of policy dialogue workshops will be held with key government stakeholders (EPA, MoFA, Energy Commission) to discuss the policy implications of the project and to develop a roadmap for the government adoption of the bundled solution. This will include recommendations for integrating the bundled solution into national climate and agricultural policies, strengthening enforcement of SPIS quality standards, and creating a more enabling environment for private sector investment in climate-smart agriculture. Working with government agencies (EPA, Ministry of Food and Agriculture, Energy Commission), policy briefs will be developed on SPIS quality standards, water use efficiency guidelines, and enabling policy recommendations. These briefs will synthesize project learning and international best practices to inform government policy development. Specific policy areas will include SPIS equipment standards and certification requirements (quality standards for solar panels, pumps, and other components), water use efficiency targets and monitoring procedures (how to measure and monitor water use efficiency), renewable energy incentives for agriculture (subsidies, tax breaks, or other incentives to promote solar irrigation), and green credit guidelines for development banks (how to structure green credit products for agriculture). Engagement with relevant government ministries will ensure policy recommendations are grounded in implementation experience and aligned with national priorities (NDC, NAP, renewable energy targets).																			
Activity 7.3: Scale-Up Roadmap and Bankable Project Pipeline Development A comprehensive 10-year scale-up roadmap will be developed, identifying pathways to reach 10,000+ farmers across Ghana's major agricultural zones (Northern Region, Ashanti Region, Upper East Region, and other suitable zones). The roadmap will specify geographic expansion priorities (which zones to target first based on suitability and demand), institutional arrangements for scaling (roles of government, financial institutions, farmer organizations), financing mechanisms (green credit, government subsidies, development partner support), and implementation timelines (phased expansion over 10 years). A bankable project pipeline of 3 projects will be developed, with one under Adaptation Funds, and another under GCF with each project assessed for technical and financial viability, farmer group capacity, and lender readiness. Each pipeline project will have																			

[illegible]

4. Resources required and itemized budget:

Please provide an indicative overview of the resources required and itemized budget required to implement the CTCN technical assistance, including for M&E-related activities, using the table below. Important to note that minimum 5% of the budget should explicitly target gender specific activities related to the technical assistance (please see section 10 for further information on gender). Once the Response Plan is completed, a Response Implementation partner(s) will be selected by the Climate Technology Centre (CTC). A detailed activity-based budget for the CTCN assistance will be finalized by the CTCN and selected Implementer.

		Input: Travel			Estimated cost (\$)
--	--	---------------	--	--	---------------------

Activities and Outputs	Input: Human Resources (Title, role, estimated number of days)	(Purpose, national vs. international, number of days)	Inputs: Meetings/events (Meeting title, number of participants, number of days)	Input: Equipment/Material (Item, purpose, buy/rent, quantity)	Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan	
					Minimum(\$)	Maximum(\$)
MANDATORY OUTPUT 1: PROJECT MANAGEMENT						
Detailed project work plan; M&E plan; gender action plan; PSC governance framework; project closure report; knowledge dissemination materials						
Activity 1.1: Pre-Implementation Planning (Months 1-3)						
Develop detailed work plan of all activities, deliverables, outputs, deadlines and responsible persons/organizations; prepare M&E plan with SMART indicators; conduct gender evaluation and develop gender action plan	Project Coordinator (15 days); M&E Specialist (12 days); Gender Specialist (10 days); Stakeholder Engagement Officer (8 days) Communications Manager (22 days); Media Specialist (18 days); social media Officer (15 days)	National travel to 3 sites for baseline planning (4 trips) International travel for media engagement and briefings (4 trips)	Inception planning workshop (1 event, 8 participants, 2 days) Media briefing events (3 events, 20 participants each, 1 day); Communication strategy workshop (1 event, 12 participants, 1 day)	Questionnaires; tablets for data collection; printing materials (1 set) Communication materials design; printing (1 se); social media management tools (1 set); website development for project information (1 set)	14,960	14,960
1.2: Implementation Monitoring (Months 4-17)						
Ongoing project coordination and adaptive management; monthly monitoring visits; data collection and analysis; quarterly reports; PSC meetings; budget tracking and financial reporting; procurement oversight	Project Coordinator (60 days); M&E Specialist (40 days); Finance/Admin Officer (30 days)	National travel to 3 sites for monthly monitoring visits (30 trips)	Bi-annual PSC meetings (2 events, 15 participants); Quarterly coordination meetings (4 events, 8 participants)	Digital monitoring dashboard; data collection apps (1 set); Office supplies, internet, phone, printing (18 months)	15,090	15,090
Activity 1.3: Documentary Video Production						

Produce short documentary video telling project story; feature interviews with insurance providers, beneficiaries, technical explanations; demonstrate how innovation addresses climate resilience challenges; produce local language and English versions; maximize accessibility and impact	<i>Video Producer (25 days); Videographer (20 days); Editor (15 days); Translator (10 days)</i>	<i>National travel for video filming across 3 sites (8 trips))</i>	<i>Video production planning workshop (1 event, 8 participants, 1 day)</i>	<i>Video production equipment (cameras, drones, audio equipment - buy or rent: 1 set); editing software licenses (1 set); video hosting and distribution platform (1 set)</i>	10,100	10,100
Activity 1.4: Post-Implementation Closure (Month 18)						
Project closure and final reporting; conduct final evaluation and endline survey analysis; prepare impact assessment; organize knowledge dissemination activities (press release, webinar); develop video documentation	<i>Project Coordinator (10 days); M&E Specialist (12 days); Communications Officer (8 days); Communications Manager (22 days); Media Specialist (18 days); social media Officer (15 days)</i>	<i>National travel for final site visits and closure workshop participation (2 trips)</i>	<i>Project closure workshop (1 event, 20 participants, 1 day); National knowledge-sharing webinar (1 event, 100+ participants)</i>	<i>Report printing; video production; infographics design (1 set)</i>	7,320	7,320
OUTPUT 2: STAKEHOLDER ENGAGEMENT, COMMUNITY MOBILIZATION, AND INSTITUTIONAL ANCHORING						
Activity 2.1: Comprehensive Stakeholder Mapping and Community Engagement						
Map all national and local stakeholders;	<i>Stakeholder Engagement Officer</i>	<i>International/National travel to 3 sites for</i>	<i>Community consultation</i>	<i>Stakeholder maps; interest/influence</i>	10,240	10,240

conduct conflict assessments; identify vulnerable groups; develop engagement strategy; conduct initial consultations to confirm project scope and secure buy-in	(12 days); Community Mobilizer (10 days); Gender Specialist (8 days)	stakeholder mapping (6 trips)	meetings (3 events, 30+ participants each, 1 day)	matrices; printing materials (1 set)		
Activity 2.2: Inception Workshop and Community Sensitization						
Conduct multi-stakeholder inception workshop to confirm project scope; organize 30 community sensitization sessions across 3 regions; conduct women-focused sensitization sessions; build community awareness and support	Project Coordinator (5 days); Community Mobilizers (30 days); Gender Specialist (6 days)	National travel for inception and sensitization sessions (15 trips)	Inception workshop (1 event, 60 participants, 2 days); Community sensitization sessions (30 events, 30-50 participants each); Women's sensitization sessions (6 events)	Visual aids; local language materials; demonstration equipment (1 set)	8,130	8,130
Activity 2.3: Development and Signing of Memoranda of Understanding						
Conduct MOU consultation rounds with communities; develop governance-inclusive agreements; organize formal signing ceremonies; establish Water Management Committees; formalize	Legal/Governance Specialist (15 days); Community Mobilizer (12 days); Gender Specialist (6 days)	International/National travel for MOU consultations (9 trips)	MOU consultation meetings (9 events, 50+ participants each); MOU signing ceremonies (3 events, 50+ participants each); Water Management Committee formation	Legal documents; printing materials (1 set)	10,590	10,590

Analyze historical climate data; model rainfall projections; assess rainwater harvesting potential; identify optimal water management strategies; determine data quality and suitability for parametric modeling	<i>Climate/Meteorological Specialist (18 days); Hydrologist (10 days)</i>	<i>National travel for meteorological station visits and site assessments (4 trips)</i>	<i>Climate data workshop (1 event, 30 participants, 1 day)</i>	<i>Climate modeling software; GIS software licenses (1 set); Data compilation & mapping materials (1 set)</i>	8,310	8,310
Activity 3.3: Participatory System Design with Farmer Input						
Conduct system design workshops; develop technical specifications; design water distribution networks; ensure gender-inclusive design process; validate designs with farmers; finalize engineering specifications	<i>Solar Irrigation Engineer (25 days); Hydraulic Engineer (15 days); Community Facilitator (12 days); Gender Specialist (6 days)</i>	<i>International/National travel for design workshops and site assessments (9 trips)</i>	<i>Participatory design workshops (3 events, 50 participants each, 1 day); Women's design consultation (2 events)</i>	<i>CAD software; design templates; technical tools (1 set); Design drawings, specifications, manuals, printing (1 set), solar panel capacities, pump types, storage equipments</i>	9,490	9,490
OUTPUT 4: GREEN CREDIT PRODUCT DEVELOPMENT AND RISK MANAGEMENT						
Activity 4.1: Green Credit Product Design and Development						
Design green credit products; develop underwriting guidelines; conduct LAFI consultations; design gender-responsive credit	<i>Financial Product Specialist (20 days); Microfinance Specialist (15 days); Gender Specialist (8 days)</i>	<i>International/National travel for LAFI consultations (6 trips); International travel for best practice study tour (1 trip)</i>	<i>Product design workshops (3 events, 30 participants each); Women's Financial Inclusion Workshop (1 event)</i>	<i>Financial modeling templates; underwriting tools; product design tools (1 set); Documentation & procedures (1 set)</i>	38,000	38,000

terms; build smallholder lending best practices; design portfolio approach						
Activity 4.2: Picture-Based Index Insurance Product Adaptation and Prototyping						
Design PBI insurance product; develop smartphone app with image recognition; conduct actuarial modeling; design gender-inclusive insurance; establish claims procedures; build farmer-friendly interface	<i>Insurance Product Specialist (20 days); Digital/Tech Specialist (25 days); Actuarial Specialist (15 days); Gender Specialist (8 days)</i>	<i>National travel for insurance provider meetings (8 trips); International travel for PBI best practice (1 trip)</i>	<i>Insurance product workshop (1 event); Farmer training on insurance mechanics (multiple events)</i>	<i>Insurance software; smartphone app development tools (1 set); Actuarial modeling software; documentation (1 set)</i>	52,000	52,000
Activity 4.3: Credit Guarantee Scheme (CGS) Design and Structuring						
Design CGS structure; determine guarantee coverage levels; develop claim procedures; conduct LAFI risk appetite assessment; establish guarantee fund mechanisms; define trigger conditions for guarantee activation	<i>Financial Specialist (18 days); Microfinance Specialist (12 days); Risk Analyst (10 days)</i>	<i>National travel for LAFI consultations (6 trips)</i>	<i>CGS design workshops (2 events, 25 participants each)</i>	<i>Financial modeling tools; CGS framework templates; documentation (1 set)</i>	35,000	35,000
Activity 4.4: Integrated Product Pilot Implementation and Farmer Training						
Conduct farmer training on insurance and credit products; establish pilot farmer	<i>Training Specialist (25 days); Community Mobilizers (30 days); Gender Specialist (6</i>	<i>International/National Travel for training delivery (10 trips)</i>	<i>Farmer training sessions (10 events, 30 participants each); Women's</i>	<i>Training materials; manuals; demonstration equipment;</i>	48,500	48,500

Design three-layer risk framework (first-loss, middle, catastrophic) with financial modeling and contract templates ensuring affordability and adequate capital protection.	<i>Actuarial Specialist (9 days); Financial Specialist (7 days); Reinsurance Specialist (6 days)</i>	<i>International travel for reinsurance best practice learning (1 trips); National travel for technical workshops (1 trips)</i>	<i>Risk layering design workshops (1 events, 25 participants each); Actuarial modeling workshop (1 event, 7 participants)</i>	<i>Actuarial modeling software; Financial modeling tools (1 set); Reinsurance contract templates; Documentation (1 set)</i>	10,400	10,400
Activity 5.3: Reinsurance Partnership Formalization & Capacity Building						
Formalize MOUs with Zep-RE and ACRE Africa, conduct capacity building workshops, establish governance committee, and develop long-term sustainability strategy.	<i>Reinsurance Specialist (7 days), Legal Specialist (5 days); Training Specialist (6 days)</i>	<i>National travel for MOU negotiations and capacity building (2 trips)</i>	<i>Reinsurance governance committee inaugural meeting (1 event, 7 participants, 1 day); Capacity building workshops (1 events, 30 participants each); MOU signing ceremony (1 event, 12 participants)</i>	<i>Training materials; Operational manuals; Documentation (1 set); Governance committee charter (1 set)</i>	8,850	8,850
OUTPUT 6: SCALING-UP STRATEGY AND SUSTAINABILITY FRAMEWORK						
Activity 6.1: Development of Scaling Strategy						
Develop comprehensive scaling strategy based on pilot results; identify financing mechanisms for scale-up; establish partnerships for long-term sustainability; define roles and responsibilities for	<i>Strategy Specialist (18 days); Financial Specialist (15 days); Partnership Coordinator (12 days)</i>	<i>International/National travel for stakeholder consultations (4 trips)</i>	<i>Scaling strategy workshop (1 event, 25 participants, 1 day); Stakeholder validation workshop (1 event, 30 participants, 1 day)</i>	<i>Strategy development tools; documentation; printing (1 set)</i>	9,300	9,300

Documents best practices and develops 8-10 case studies capturing diverse farmer experiences with SPIS, credit, and insurance. Produces technical, financial, and institutional briefs in local language and English with infographics.	<i>Documentation Officer (20 days); Writer/Documentarian (18 days); Gender Specialist (8 days); Graphic Designer (12 days)</i>	<i>International/ National travel for case study documentation (6 trips)</i>	<i>Case study validation workshops (3 events, 20 participants each)</i>	<i>Case study documentation templates; photography equipment (1 set); design and printing materials (1 set); infographic design tools (1 set)</i>	9,000	9,000
Activity 7.2: Policy and Standards Development						
Works with EPA, Ministry of Agriculture, and Energy Commission to develop four policy briefs on SPIS standards, water efficiency, renewable energy incentives, and green credit guidelines. Ensures alignment with NDC and NAP.	<i>Policy Specialist (18 days); Technical Advisor (12 days); Government Liaison Officer (10 days)</i>	<i>International/National travel for government engagement (5 trip)</i>	<i>Policy development workshops (2 events, 25 participants); Government consultation meetings (3 events, 15 participants)</i>	<i>Policy analysis tools; documentation; printing (1 set)</i>	8,800	8,800
Activity 7.3: Scale-Up Roadmap and Bankable Project Pipeline Development						
Develops 10-year scale-up roadmap to reach 10,000+ farmers across Ghana's major	<i>Strategy Specialist (20 days); Financial Analyst (18 days); Partnership Coordinator (15 days)</i>	<i>International/National travel for stakeholder consultations (6 trips); International travel for best</i>	<i>Scale-up roadmap workshop (1 event, 30 participants, 2 days); Pipeline project validation</i>	<i>Scale-up roadmap development tools; project pipeline templates; documentation (1 set);</i>	9,000	9,000

agricultural zones with geographic priorities and financing mechanisms. Creates bankable pipeline of 50+ projects with detailed project briefs.		<i>practice learning (1 trip)</i>	<i>workshops (2 events, 25 participants)</i>	<i>Pipeline management system (1 set)</i>		
Activity 7.4: Knowledge Sharing and Stakeholder Engagement Events						
Organizes final learning workshop (50 participants), three regional dissemination workshops, knowledge-sharing webinar (200+ participants), and establishes online knowledge platform. Disseminates learning for national scaling.	<i>Communications Manager (18 days); Event Coordinator (15 days); Webinar Specialist (8 days); IT Specialist (10 days)</i>	<i>National travel for regional workshops and events (8 trips)</i>	<i>Final learning workshop (1 event, 50 participants, 2 days); Regional dissemination workshops (3 events, 40 participants each, 1 day); Knowledge-sharing webinar (1 event,)</i>	<i>Knowledge platform development (1 set); webinar hosting and recording (1 set); knowledge materials package (1 set); documentation (1 set)</i>	8,000	8,000
Estimated range of costing for the entire Response Plan					\$400,000	\$400,000

BUDGET ACCUMULATION SUMMARY

5. Profile and experience of experts

Based on the required Human Resources identified in section 4 (Resources required and itemized budget) please provide a description of the required profile of all involved experts for the implementation of the CTCN Response Plan.

Experts required	Brief description of required profile
Project Director/Coordinator	Project Management, or Environmental Science. Minimum 7 years project management experience in climate adaptation/development projects especially Adaptation Fund project in Sub-Saharan Africa. Expertise in

	climate-smart agriculture, and green finance. Strong stakeholder coordination and adaptive management skills. Fluent English. Responsible for overall project coordination, stakeholder engagement, work plan development, and CTCN reporting.
Monitoring and Evaluation Specialist	Master's degree in Monitoring & Evaluation, Statistics, or Environmental Science. Minimum 7 years M&E experience for development and climate adaptation projects. Expertise in impact assessment, baseline/endline surveys, gender-disaggregated monitoring, and agricultural development indicators. Minimum 3 years Sub-Saharan Africa experience. Strong skills in survey design, data collection tools, statistical analysis, and database management. Fluent English. Responsible for M&E framework design, baseline/endline surveys, monthly monitoring, data analysis, and impact evaluation.
Gender Specialist	Master's degree in Gender Studies, Development Studies, or Social Sciences. Minimum 7 years gender mainstreaming and women's empowerment experience in development/climate projects. Expertise in gender analysis, women's economic empowerment, financial inclusion, and gender-responsive technology adoption. Skills in participatory gender assessment, training design, and gender indicator monitoring. Fluent English; local language knowledge essential. Responsible for gender assessment, gender action plan development, gender-responsive training, and gender indicator monitoring.
Agro/Water-Technical Specialists	Bachelor's degree in Agricultural/Water Engineering, Civil Engineering, or Environmental Science or relevant field. Minimum 6 years solar-powered irrigation system design and implementation experience in Sub-Saharan Africa. Expertise in PV technology, irrigation system design, water management, climate-smart agriculture, and O&M. Skills in SPIS design, hydrological assessment, GIS/remote sensing, participatory design, and technical training. Fluent English; local language knowledge advantageous. Responsible for agro-technical assessment, climate risk assessment, participatory system design, SPIS installation supervision, and technical training.
Financial Specialist / Green Credit Expert	Master's degree in Finance, Economics, or Development Finance. Minimum 10 years agricultural finance, green finance, or climate finance experience in Sub-Saharan Africa. Expertise in green credit product design, agricultural lending, climate finance mechanisms, financial institution capacity building, and risk-sharing instruments. Minimum 5 years West Africa experience with familiarity of Ghanaian financial sector and banking regulations. Skills in credit product design, financial analysis, underwriting guidelines, and training design. Fluent English. Responsible for green credit product design, underwriting guidelines development, risk-sharing mechanism design, and financial institution capacity building.
Insurance Specialist	Master's degree in Insurance, Finance, or Risk Management. Minimum 7 years agricultural insurance product design and implementation experience in Sub-Saharan Africa. Expertise in index-based and picture-based insurance, agricultural risk assessment, digital insurance technologies, claims management, and insurance regulatory frameworks. Skills in insurance product design, claims processing, mobile app specifications, and insurance provider training. Fluent English. Responsible for picture-based insurance product design, app specifications, insurance provider capacity building, pilot implementation, and product refinement.
Financial/Administrative Officer	Bachelor's degree in accounting, Finance, or Business Administration. Minimum 5 years financial management and procurement experience for development projects. Expertise in project financial management, budgeting, procurement procedures, vendor management, financial reporting, and audit compliance. Skills in budget

	management, financial reporting, procurement procedures, vendor management, and CTCN financial compliance. Fluent English. Responsible for budget management, procurement and vendor management, financial reporting and reconciliation, invoice processing, and CTCN financial compliance.
--	---

6. Intended contribution to impact over time

This CTCN technical assistance will deliver measurable climate resilience and emissions reduction benefits over time. **Direct Impact (18-month project period):** 400 smallholder farmers in three semi-arid regions gain access to climate-resilient SPIS technology bundled with green credit and insurance, increasing adaptive capacity and reducing climate vulnerability. Tomato yields increase 15-20%²⁷, generating USD 2,000-3,000 additional annual income per farmer (USD 2-3 million aggregate income gain)²⁸. **Medium-term Impact (3-5 years post-project):** The bankable project pipeline of 50+ projects catalyzes commercial scaling to 5,000+ farmers across Ghana's agricultural zones, deploying USD 20 million in private sector PPP financing²⁹. This expands climate-resilient irrigation to 5% of Ghana's 500,000 smallholder tomato farmers³⁰. **Long-term Impact (10 years):** The 10-year scale-up roadmap targets 10,000+ farmers with SPIS, reducing diesel-powered irrigation dependency and cutting agricultural emissions by 500+ tons CO₂ annually through renewable energy substitution³¹. **Food Security:** Increased yields and income reduce malnutrition in 10,000+ rural households, particularly benefiting 4,000+ women farmers (40%+ participation)³². **Climate Adaptation:** Improved water security and diversified income reduce rural-urban migration and strengthen community resilience to climate shocks. **Economic Impact:** The sector contribution grows from current USD 150 million (tomato production value) to USD 180+ million with 20% yield increases and expanded production³³. **Institutional Sustainability:** Government adoption of SPIS standards and green credit guidelines ensures long-term policy support and scaling beyond donor support.

7. Relevance to NDCs and other national priorities

Alignment with Ghana's Updated NDC (2021)

This CTCN technical assistance directly supports Ghana's Updated Nationally Determined Contribution (NDC) 2021-2030, which prioritizes climate-smart agriculture, renewable energy deployment, and enhanced adaptive capacity for vulnerable populations³⁴. The project aligns with three NDC pillars: (1) **Mitigation:** Replacing diesel-powered irrigation with solar-powered systems reduces agricultural emissions by 500+ tons CO₂ annually, contributing to Ghana's 2030 emissions reduction target of 64 million tons CO₂e³⁵. (2) **Adaptation:** Enhancing water security and agricultural productivity for 10,000+ smallholder farmers strengthens climate resilience in Ghana's vulnerable semi-arid zones, directly supporting NDC adaptation priorities³⁶. (3) **Just Transition:** Bundled green credit and insurance create inclusive economic opportunities for 4,000+ women farmers and youth, aligning with NDC commitments to gender equality and social inclusion³⁷.

Integration with National Climate Action Plan (2021-2030)

27 Bhattarai, M., et al. (2025). "Cost-Benefit Analysis of Solar-Powered Irrigation Systems in Sub-Saharan Africa." *Water Resources Management*, 39(2), 456-475.

28 World Bank. (2023). "Solar Irrigation and Agricultural Productivity in Ghana: A Case Study Analysis." Washington, DC: World Bank.

29 Development Bank of Ghana. (2024). "Green Credit Guidelines for Climate-Smart Agriculture." Accra: DBG.

30 Ghana Statistical Service. (2021). "Ghana Living Standards Survey (GLSS7): Agricultural Production and Employment." Accra: Government of Ghana.

31 International Renewable Energy Agency (IRENA). (2022). "Renewable Energy and Climate Change Mitigation: Emissions Reduction Potential of Solar-Powered Agriculture." Abu Dhabi: IRENA.

32 Ministry of Food and Agriculture (MoFA). (2018). "Ghana Agriculture Sector Policy: Gender and Social Inclusion Strategy." Accra: Government of Ghana.

33 Ghana Statistical Service. (2021). "Agricultural Census: Crop Production Value and Employment." Accra: Government of Ghana.

34 Government of Ghana. (2021). "Ghana's Updated Nationally Determined Contribution (NDC): 2021-2030." Accra: Ministry of Environment, Science, Technology and Innovation.

35 National Development Planning Commission (NDPC). (2021). "Ghana's National Climate Action Plan 2021-2030." Accra: Government of Ghana.

36 Ministry of Environment, Science, Technology and Innovation (MESTI). (2021). "Ghana's National Adaptation Plan Framework." Accra: Government of Ghana.

37 Government of Ghana. (2021). "Gender and Social Inclusion Strategy in Climate Action." Accra: MESTI.

The project supports the National Climate Action Plan's priority outcome of "Increased climate-smart agricultural productivity and resilience" through technology deployment, financial innovation, and institutional strengthening³⁸. SPIS technology adoption aligns with the Plan's renewable energy targets (10% renewable energy in agriculture by 2030)³⁹.

Contribution to National Adaptation Plan (NAP) Framework

Ghana's NAP Framework identifies water scarcity and agricultural vulnerability as priority adaptation challenges⁴⁰. This project directly addresses NAP priorities by: (1) Improving water use efficiency through SPIS and drip irrigation (30-40% water savings vs. traditional irrigation); (2) Strengthening farmer adaptive capacity through training and technology adoption; (3) Enhancing climate information services through climate-informed irrigation scheduling⁴¹.

Alignment with Renewable Energy Master Plan (2019) and National Energy Policy (2021)

The project supports Ghana's renewable energy targets by deploying 300-500 SPIS installations (approximately 1.5-2.5 MW solar capacity)⁴², contributing to the goal of 10% renewable energy in agriculture by 2030⁴³. This demonstrates practical pathways for achieving renewable energy targets in the agricultural sector.

The project aligns with Ghana's NAPA priority of "Enhancing agricultural productivity under climate variability" through integrated technology, finance, and institutional solutions⁴⁴.

The project contributes to SDG 1 (poverty reduction), SDG 2 (food security), SDG 5 (gender equality), SDG 7 (clean energy), SDG 12 (sustainable consumption), SDG 13 (climate action), and SDG 17 (partnerships)⁴⁵.

8. Linkages to relevant parallel on-going activities:

This project builds directly on prior CTCN assignments to Ghana on solar-powered irrigation and climate-smart agriculture. Previous CTCN work (2019-2021) developed SPIS design guidelines, vendor pre-qualification standards aligned to Ghana's Energy Commission licensing framework, and training toolkits for technicians and farmers⁴⁶. This Response Plan operationalizes those recommendations through demonstration implementation and institutional anchoring with farmer cooperatives and financial institutions. This project supplements the AfCFTA Climate Finance Initiative Phase II (ACFI), which aims to unlock private sector climate finance for agricultural adaptation across Africa⁴⁷. Ghana's ACFI portfolio includes two projects: (1) Renewable energy for agricultural processing; (2) Climate-smart livestock production. The CTCN assistance catalyzes the financial innovation mechanisms (green credit, index insurance) that enable ACFI financing to reach smallholder farmers. The DBG has committed to developing green credit products for climate-smart agriculture as part of its climate finance strategy⁴⁸. This CTCN assistance provides technical support to co-design and pilot the bundled SPIS-credit-insurance product with DBG, positioning DBG as the anchor financial institution for scaling. The project builds on DBG's existing agricultural lending portfolio (USD 50 million annually) and extends it to climate-resilient technologies. The project works with 24-40 existing farmer cooperatives and VSLAs that have been strengthened through previous government and NGO programs. The project builds on existing governance structures, financial management systems, and farmer organization experience rather than creating new institutions, ensuring sustainability and cost-efficiency. Ghana's Energy Commission established a licensing framework for Solar PV Water Pump Service Providers in

38 NDPC. (2021). "National Climate Action Plan 2021-2030: Priority Outcomes and Targets." Accra: Government of Ghana.

39 Ministry of Energy. (2021). "Ghana National Energy Policy: Renewable Energy Targets." Accra: Government of Ghana.

40 MESTI. (2021). "National Adaptation Plan Framework: Priority Adaptation Challenges and Solutions." Accra: Government of Ghana.

41 International Water Management Institute (IWMI). (2023). "Climate-Informed Irrigation Scheduling in Sub-Saharan Africa." Colombo: IWMI.

42 International Renewable Energy Agency (IRENA). (2022). "Solar-Powered Irrigation: Capacity and Deployment Potential in Ghana." Abu Dhabi: IRENA.

43 Ministry of Energy. (2021). "Renewable Energy Master Plan 2019: Agricultural Sector Targets." Accra: Government of Ghana.

44 Ministry of Environment, Science, Technology and Innovation. (2007). "Ghana's National Adaptation Programmes of Action (NAPA)." Accra: Government of Ghana.

45 United Nations. (2015). "Sustainable Development Goals: Agenda 2030." New York: UN.

46 Climate Technology Centre and Network (CTCN). (2021). "Technical Assistance Report: Solar-Powered Irrigation Systems for Ghana." Copenhagen: CTCN.

47 African Development Bank. (2023). "AfCFTA Climate Finance Initiative Phase II: Project Portfolio." Abidjan: AfDB

48 Development Bank of Ghana. (2024). "Green Credit Program for Climate-Smart Agriculture: Strategy and Implementation Plan." Accra: DBG

2021, requiring suppliers to meet quality standards and provide warranties. This project systematically applies the Energy Commission framework to SPIS procurement and quality assurance, creating a replicable model for government enforcement.

9. Anticipated follow up activities after this technical assistance is completed:

Post-Implementation Use of Outputs and Deliverables

The outputs and deliverables from this CTCN technical assistance will be actively used by multiple stakeholders for scaling and long-term impact beyond the 18-month project period.

Financial Institutions: The Development Bank of Ghana, Sanlam Insurance, and 5+ Local Agricultural Finance Institutions will use the bundled product blueprint, underwriting guidelines, and operational manual (Deliverable 4.3) to scale green credit and picture-based insurance to 5,000+ farmers within 3-5 years post-project. DBG has committed to deploying USD 20 million in green credit for SPIS by 2027, directly using project outputs.

Government Agencies: The Environmental Protection Agency, Ministry of Food and Agriculture, and Energy Commission will use the policy briefs and standards recommendations (Deliverable 6.2) to develop government policies and regulations on SPIS quality standards, water use efficiency, and green credit guidelines. The Energy Commission will integrate SPIS quality standards into its licensing framework, creating systematic enforcement mechanisms.

Farmer Organizations: The 24-40 farmer cooperatives and VSLAs will use the Water Management Committee charters, governance training materials, and financial management systems (Deliverables 2.3, 2.4) to manage SPIS operations, water allocation, and group finances on an ongoing basis.

The 50+ farmer groups in the bankable project pipeline will use project briefs and financing templates (Deliverable 6.3) to access commercial green credit from DBG and other financial institutions.

Technical Service Providers: The 50+ trained technicians will establish SPIS installation and maintenance service businesses, using training materials and business development guidelines (Deliverable 5.2) to provide ongoing technical services and generate income.

Knowledge and Learning: The case studies, best practices documentation, and policy briefs (Deliverables 6.1, 6.2) will be disseminated through Ghana's agricultural extension system, reaching 100,000+ farmers and technicians through government extension agents and farmer associations. The online knowledge platform (Deliverable 6.4) will provide freely accessible resources for practitioners, researchers, and policymakers.

Scale-Up Roadmap Implementation: The 10-year scale-up roadmap and bankable project pipeline (Deliverable 6.3) will guide government and development partner investments in SPIS scaling. The roadmap targets 10,000+ farmers by 2034, with phased expansion across Ghana's agricultural zones.

Role of NDE and Project Proponent in Post-Implementation Monitoring

The Environmental Protection Agency (EPA), as Ghana's National Designated Entity (NDE), will lead post-implementation monitoring and reporting in collaboration with the project proponent (Ministry of Food and Agriculture).

EPA Responsibilities: (1) Coordinate annual monitoring of project outcomes through the PSC, tracking adoption rates, yield increases, income gains, and farmer satisfaction; (2) Monitor government policy adoption and implementation of SPIS standards and green credit guidelines; (3) Report annually to CTCN on project impact and scaling progress; (4) Facilitate knowledge sharing and lesson dissemination through national platforms.

MoFA Responsibilities: (1) Integrate project learning into national agricultural extension programs; (2) Support farmer cooperative monitoring and evaluation through extension agents; (3) Track SPIS adoption and agricultural productivity improvements through agricultural census and surveys; (4) Coordinate with DBG and financial institutions on green credit uptake and portfolio performance.

Monitoring Framework: Annual monitoring will track adoption rates (% of farmers with SPIS), yield

increases (kg/ha), income gains (USD per farmer), loan repayment rates (%), insurance claims processed (%), and farmer satisfaction (%). Mid-term review (Year 3) and final evaluation (Year 5) will assess long-term sustainability and scaling progress. **Sustainability Mechanisms:** The project establishes a Project Steering Committee with government, financial institutions, farmer organizations, and technical partners that will continue meeting annually post-project to monitor progress, share learning, and coordinate scaling efforts. This institutional mechanism ensures accountability and sustained focus on outcomes beyond the CTCN assistance period.

10. Gender and co-benefits:

Each technical assistance must integrate gender mainstreaming activities and lead to gender and other co-benefits. At least 5% of the technical assistance budget need to be allocated to gender mainstreaming activities.

Imbedded in design of the activities:	Gender Disparities Assessment Ghana's tomato sector is characterized by significant gender disparities. Women comprise 55% of tomato farmers but control only 25% of productive assets and earn 30-40% less than male farmers. Key disparities include: 1) <u>Land Access: Women have limited land ownership (15% vs. 85% male ownership), reducing investment incentives.</u> 2) <u>Water Access: Water allocation decisions are male-dominated, with women having limited voice in water management.</u> 3) <u>Financial Inclusion: Women access only 20% of agricultural credit despite representing 55% of farmers, due to collateral requirements and gender bias.</u> 4) <u>Technology Adoption: Women adopt new agricultural technologies at 40% lower rates than men due to limited training access and time constraints.</u> 5) <u>Decision-Making: Women participate in only 15% of farmer group leadership positions.</u> 6) <u>Socio-Economic Factors: Women's unpaid domestic work (water collection, household management) limits time for income-generating activities.</u> 7) <u>Cultural Factors: Traditional norms restrict women's participation in public meetings and financial management. Institutional Factors: Government extension services reach women at 60% the rate of men.</u> Gender-Responsive Project Design This Response Plan embeds gender equality throughout all activities: (1) Activity 1.1: Gender assessment and Gender Action Plan (GAP) development ensures gender analysis informs all project decisions; (2) Activity 2.1: Gender-disaggregated stakeholder mapping identifies women's interests and barriers; (3) Activity 2.2: Women-focused sensitization sessions (6 dedicated sessions) ensure women understand project benefits; (4) Activity 2.3: Water Management Committee charters mandate 40%+ women representation and gender-balanced decision-making; (5) Activity 2.4: Women's leadership training develops 50+ women as governance leaders; (6) Activity 3.1: Gender-disaggregated baseline data collection captures women's water access, income, and climate vulnerability; (7) Activity 3.3: Women's design consultation
--	---

	workshops ensure SPIS design reflects women's water needs (domestic + agricultural); (8) Activity 4.1: Gender-responsive credit design includes flexible collateral and group guarantees enabling women's access; (9) Activity 4.2: Women-focused insurance training ensures women understand and claim insurance benefits; (10) Activity 4.3: Women farmer group strengthening workshops build capacity of 40%+ women in farmer groups; (11) Activity 5.2: Women's capacity building training (6 dedicated sessions) on SPIS operation, irrigation, credit management, and insurance; (12) Activity 5.3: Gender-disaggregated monitoring tracks women's participation, income gains, and empowerment; (13) Activity 6.1: Gender-inclusive case studies feature women's experiences and benefits; (14) Activity 6.2: Gender-inclusive policy recommendations ensure policies support women's access to SPIS and credit; (15) Activity 6.3: Gender-inclusive scale-up planning targets 40%+ women in scaled projects. Gender Budgeting Gender-specific activities total USD 41,580 (6.8% of total budget), exceeding the 5% minimum requirement. Budget allocation includes: gender assessment and GAP (USD 1,560), women-focused sensitization (USD 3,600), women's leadership training (USD 4,500), women's design consultation (USD 3,000), gender-responsive credit design (USD 1,040 + USD 2,000 workshop), gender-inclusive insurance design (USD 1,040 + USD 2,000 workshop), women farmer group strengthening (USD 3,000), women's capacity building (USD 12,000), gender-disaggregated monitoring (USD 1,300), gender-inclusive case studies (USD 1,040), gender-inclusive policy development (USD 780), gender-inclusive scale-up planning (USD 1,040), and gender-inclusive knowledge sharing (USD 520). Gender and Innovation Ecosystem The project promotes women as entrepreneurs through: (1) Technician Service Businesses: Women technicians trained in SPIS installation and maintenance can establish service businesses, generating income and employment; (2) Water Vending: Surplus water from SPIS can be sold to non-farm users, creating income opportunities for women water vendors; (3) Irrigation-Based Enterprises: Women farmers can expand production and establish value-addition businesses (tomato processing, packaging) using reliable irrigation; (4) Financial Services: Women can provide financial services (savings groups, insurance agent services) within farmer groups; (5) Input Supply: Women can establish input supply businesses (seeds, fertilizers, tools) for SPIS farmers.
Gender and co-benefits intended as result of the activities:	Gender Equality Benefits • 4,000+ women farmers (40%+ of 10,000 beneficiaries) gain access to SPIS, credit, and insurance • 40%+ women in Water Management Committees with decision-making authority • 50+ women governance leaders trained and active in farmer groups • 20+ women technicians providing SPIS services and generating income

	• Women's income increases USD 2,000-3,000 annually (equal to men) • Women's participation in farmer group leadership increases from 15% to 40%+ • Women's access to agricultural credit increases from 20% to 50%+ through bundled product Social Co-Benefits • Reduced water collection burden for women (SPIS reduces manual water collection time by 50%+) • Improved household food security and nutrition for 10,000+ households • Enhanced women's decision-making power in water and agricultural management • •Reduced rural-urban migration through improved rural income opportunities • Strengthened community social cohesion through Water Management Committees • Youth employment through technician service businesses (100+ technicians, 30%+ women) Environmental Co-Benefits • 500+ tons CO2 reduction annually through diesel replacement • Improved water use efficiency (30-40% water savings vs. traditional irrigation) • Reduced chemical runoff through drip irrigation • Improved soil health through water conservation and reduced erosion • Enhanced groundwater sustainability through responsible water management Economic Co-Benefits: • USD 2-3 million aggregate income gain for 400 farmers in demonstration phase • USD 50-75 million income gain for 10,000+ farmers at scale • Job creation: 100+ technicians, 50+ financial service providers, 30+ input suppliers • Increased tax revenue for local governments • Strengthened agricultural value chains through reliable water supply
--	---

11. Main in-country stakeholders in implementation of the technical assistance activities:
Using the table below, please list and describe the role of in-country stakeholders, participants and beneficiaries who will be involved in or directly consulted during implementation of the assistance.

In country stakeholder	Role in implementation of the technical assistance
Environmental Protection Agency (EPA)	National Designated Entity (NDE); leads project governance, monitoring, and CTCN reporting; coordinates government engagement; ensures policy integration

<i>Ministry of Food and Agriculture (MoFA)</i>	<i>Co-proponent; integrates project learning into extension programs; supports farmer cooperative engagement; coordinates agricultural sector alignment; leads post-implementation monitoring of agricultural outcomes</i>
<i>District Assemblies (3 target districts)</i>	<i>Local government partners; facilitate community engagement; support farmer group mobilization; coordinate local implementation logistics</i>
<i>Development Banks</i>	<i>Co-designs green credit product; commits to pilot and scale bundled product; provides financial institution expertise; deploys USD 20M green credit by 2027</i>
<i>Insurance entities</i>	<i>Co-designs picture-based insurance product; provides insurance expertise; commits to pilot and scale insurance product; manages claims processing</i>
<i>Local Agricultural Finance Institutions (5+)</i>	<i>Participate in product design workshops; pilot bundled product with farmers; provide financial institution perspectives on smallholder lending</i>
<i>Village Savings and Loan Associations (VSLAs)</i>	<i>Strengthen financial management capacity; provide group lending mechanisms; support insurance enrollment; facilitate farmer group governance</i>
<i>Technical Partner</i>	<i>Design SPIS systems; supervise installation; provide technical training; establish service businesses post-project, Conduct baseline and endline surveys; analyze climate and hydrological data; document best practices; support knowledge dissemination, Ensure women's participation in project activities; advocate for gender equality; support women farmer training; facilitate women's access to credit and insurance</i>

12. SDG Contributions:

Instructions: Please complete the grey section below for **a maximum of three SDGs** that will be advanced through this TA. A complete list of SDGs and their targets is available here:

<https://sustainabledevelopment.un.org/partnership/register/>.

Goal	Sustainable Development Goal	Direct contribution from CTCN TA (1 sentence for top 1-3 SDGs)
1	End poverty in all its forms everywhere	10,000+ smallholder farmers increase annual income by USD 2,000-3,000 through SPIS and bundled finance, lifting households above poverty thresholds and reducing rural poverty
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	15-20% increase in tomato yields for 10,000+ farmers improve household food security and nutrition for 50,000+ family members; sustainable irrigation practices enhance long-term agricultural productivity [
3	Ensure healthy lives and promote well-being for all at all ages	
4	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all	
5	Achieve gender equality and empower all women and girls	4,000+ women farmers (40%+ of beneficiaries) gain equal access to SPIS, credit, and insurance; 40%+ women in Water Management Committees exercise decision-making authority; women's income increases equal to men's
6	Ensure availability and sustainable management of water and sanitation for all	
7	Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7)	

	7.1 - By 2030, ensure universal access to affordable, reliable and modern energy services	
	7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix	
	7.3 - By 2030, double the global rate of improvement in energy efficiency	
	7.a - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	
	7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
10	Reduce inequality within and among countries	
11	Make cities and human settlements inclusive, safe, resilient and sustainable	
12	Ensure sustainable consumption and production patterns	
13	Take urgent action to combat climate change and its impacts	<i>All TAs should indicate relevance to Goal 13 and at least one target below (13.1 to 13.b).</i>
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	
	13.2 - Integrate climate change measures into national policies, strategies and planning	
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	
	13.a - Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	
	13.b - Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities	
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	

13. Classification of technical assistance:

Please indicate primary type of technical assistance. Optional: If desired, indicate secondary type of technical assistance.

Please tick off the relevant boxes below	Primary	Secondary
☐ 1. Decision-making tools and/or information provision	☐	☐
☐ 2. Sectoral roadmaps and strategies	☐	☐
☐ 3. Recommendations for law, policy and regulations	☐	☐
☐ 4. Financing facilitation	☒	☐
☐ 5. Private sector engagement and market creation	☐	☒
☐ 6. Research and development of technologies	☐	☐
☐ 7. Feasibility of technology options	☐	☐
☐ 8. Piloting and deployment of technologies in local conditions	☐	☒

☐ 9. Technology identification and prioritisation

☐

☐

Please note that all CTCN technical assistance contributes to strengthening the capacity of in country actors.

14. Monitoring and Evaluation process

M&E Framework Overview

Upon contracting of the implementing partner(s), a comprehensive Monitoring and Evaluation Plan will be developed by the lead implementer in consultation with EPA (NDE) and MoFA. The M&E Plan will include specific, measurable, achievable, relevant, and time-bound (SMART) indicators to monitor and evaluate the timeliness and appropriateness of implementation.

Key M&E Components

1. Outcome Indicators (tracking progress toward project outcome)

Outcome Indicator	Baseline	Target	Measurement Method	Frequency
Number of LAFIs/development banks offering bundled product	0	3-5	Financial institution records	Quarterly
Number of farmers with access to SPIS + credit + insurance	0	400	Beneficiary database	Monthly
Green credit deployed for SPIS (USD million)	0	3.5-5	Loan disbursement records	Quarterly
Percentage of farmers with insurance coverage	0%	80%+	Insurance enrollment data	Monthly
Average tomato yield increase (%)	Baseline	15-20%	Farmer surveys	Quarterly
Average annual income increase per farmer (USD)	Baseline	2,000-3,000	Household surveys	Semi-annual
Adoption rate of bundled solution (%)	0%	70%+	Project monitoring	Monthly
Number of bankable projects in pipeline	0	3+	Project pipeline database	Semi-annual

2. Output Indicators (tracking delivery of outputs)

Output	Key Indicators	Target	Measurement
Output 1: Project Management	M&E plan developed; PSC meetings held; reports submitted	100%	Project records
Output 2: Stakeholder Engagement	MOUs signed; Water Management Committees established; farmers trained	2-4 MOUs; 3 committees(1 Governmental); 300 farmers	Community records
Output 3: Site Assessment & Design	Baseline assessments completed; system designs finalized	3 assessments; 3 designs	Technical reports
	Number of farmers with access to SPIS	400 farmers	Beneficiary database

Output 4: Financial Products	Green credit product piloted; insurance product piloted; farmer groups assessed	1 credit product; 1 insurance product; 50+ groups	Product documentation
	Number of farmers with access to credit + insurance	400 farmers	Beneficiary database
Post-project	Green credit deployed for SPIS (USD million)	20-65	Financial institution records
Output 5: Implementation & Capacity	SPIS sites operational; farmers trained; performance monitored	1 site; 400 farmers; 6 monitoring reports	Installation reports
	Average tomato yield increase (%)	15-20%	Farmer surveys
Output 6: Policy & Scale-Up	Policy briefs developed; scale-up roadmap finalized; knowledge disseminated	4 policy briefs; 1 roadmap; 100,000+ reached	Documentation
	Number of bankable projects in pipeline	3 full proposals developed	Project pipeline database

Number of LAFIs/development banks offering bundled product 3-5 0 1,000 0 Beneficiary database Green credit deployed for SPIS (USD million) 3.5-5 0 Financial institution records Percentage of farmers with insurance coverage 80%+ 0% Insurance enrollment data Average tomato yield increase (%) 15-20% Baseline Farmer surveys Average annual income increase per farmer (USD) 2,000-3,000 Baseline Household surveys Adoption rate of bundled solution (%) 70%+ 0% Project monitoring Number of bankable projects in pipeline 50+ 0 Project pipeline database

3. Process Indicators (tracking implementation quality)

Process Indicator	Target	Measurement
Percentage of planned activities implemented on time	90%+	Project timeline tracking
Percentage of planned budget expended	95-100%	Financial reports
Percentage of planned beneficiaries reached	90%+	Beneficiary database
Percentage of women participation in activities	40%+	Attendance records
Percentage of farmer satisfaction with project	80%+	Farmer satisfaction surveys
Percentage of financial institution satisfaction	80%+	Partner feedback

4. Gender Indicators (tracking gender mainstreaming)

Gender Indicator	Target	Measurement
Percentage of women in Water Management Committees	40%+	Committee membership records
Percentage of women in farmer group leadership	40%+	Group leadership records
Percentage of women accessing green credit	50%+	Loan disbursement records
Percentage of women with insurance coverage	80%+	Insurance enrollment data
Women's average income increase (USD)	2,000-3,000	Household surveys
Women's participation in training	40%+	Training attendance records

<i>Women's satisfaction with project</i>	80%+	Women's focus group discussions
--	------	---------------------------------

Monitoring Activities

1. Baseline Survey (Month 2-3): Comprehensive baseline survey with 300+ farmers documenting water access, agricultural practices, income, climate vulnerability, gender relations, and institutional capacity.
2. Monthly Monitoring Visits (Months 4-18): Field monitors conduct monthly visits to three demonstration sites, collecting data on SPIS functionality, water availability, irrigation practices, farmer satisfaction, and emerging issues.
3. Quarterly Farmer Surveys (Months 6, 9, 12, 15, 18): Surveys with 300+ farmers track yield changes, income, credit repayment, insurance claims, technology satisfaction, and gender relations.
4. Semi-Annual Financial Institution Reviews (Months 9, 18): Reviews with DBG, Sanlam, and LAFIs track green credit deployment, insurance claims processed, portfolio performance, and institutional learning.
5. Annual Stakeholder Reviews (Months 12, 18): Annual reviews with PSC members assess progress, identify challenges, and make adaptive management decisions.
6. Mid-Term Review (Month 9): Comprehensive mid-term review assesses progress toward outcomes, identifies implementation challenges, and recommends adaptive management adjustments.
7. Endline Survey (Month 18): Comprehensive endline survey with 300+ farmers (same households as baseline) measures impact on yields, income, water access, climate resilience, gender relations, and institutional capacity.

Evaluation Process

CTCN Technology Manager Monitoring: The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of Response Plan implementation through quarterly progress reports, mid-term review, and final evaluation.

NDE Satisfaction Evaluation (Month 18): Upon completion of all activities and outputs, EPA (NDE) will complete an evaluation form assessing overall satisfaction with the technical assistance service provided, including quality, relevance, timeliness, and effectiveness.

Lead Implementer Learning Evaluation (Month 18): The lead implementer will complete an evaluation form documenting knowledge and learning gained through delivery of technical assistance, including lessons learned, best practices, challenges, and recommendations.

Post-Implementation Monitoring (Years 1-5): EPA (NDE) together with MoFA will complete periodic post-implementation forms (annually for 5 years) to track the impact of activities beyond the technical assistance end date, including: adoption rates, yield increases, income gains, farmer satisfaction, financial institution performance, government policy adoption, and scaling progress.

Data Management and Reporting

Data Collection Tools: Standardized data collection tools will be developed for all monitoring activities, including household surveys, farmer focus group discussions, financial institution interviews, and community validation workshops.

Data Quality Assurance: Regular data quality checks will be conducted, including: (1) Enumerator training on data collection procedures; (2) Supervision and spot-checks during data collection; (3) Data entry validation and cleaning; (4) Regular data quality reviews.

Data Analysis: Data will be analyzed using descriptive statistics, comparative analysis (baseline vs. endline), and qualitative analysis of case studies and focus group discussions. Gender-disaggregated analysis will be conducted for all indicators.

Reporting: Quarterly progress reports will be submitted to CTCN documenting implementation progress, indicator achievements, challenges, and adaptive management decisions. Annual reports will be submitted to EPA and MoFA documenting project outcomes and learning.

Knowledge Management

A centralized project database will be established to store all monitoring data, reports, and learning generated during the project. The database will be accessible to the project team, EPA, MoFA, and key stakeholders to enable broad access to project information. Data security protocols will be implemented including password protection, backup systems, and data privacy measures to ensure data security and confidentiality. The database will be organized by activity, indicator, site, and time period to enable easy retrieval of information. Database tools including Microsoft Access, SQL Server, or cloud-based platforms (Google Drive, Dropbox) will be used to manage the database.

Comprehensive knowledge documentation will be conducted to capture and preserve project learning. Best practices documentation will identify and document 5-10 best practices developed during the project, with detailed case studies and implementation guides for each practice. Lessons learned documentation will identify and document 10-15 key lessons learned during project implementation, with recommendations for future projects. Detailed farmer case studies will be developed documenting 10-15 individual farmer experiences and impacts, providing rich qualitative descriptions of how farmers have benefited from the project. Video documentation will produce 3-5 short videos (3-5 minutes each) documenting project activities and farmer testimonies, providing visual documentation of project implementation and results. Photo documentation will collect 100+ high-quality photos documenting project activities and results, providing visual evidence of project implementation.

Knowledge-sharing events will be conducted throughout and after the project period to disseminate project learning to broader audiences. Quarterly learning workshops will be conducted at Months 6, 12, and 18 bringing together the internal project team to discuss monitoring findings and make adaptive management decisions. A mid-term learning event will be conducted at Month 9 bringing together stakeholders to share mid-term findings and discuss scaling. A final learning workshop will be conducted at Month 18 bringing together 60+ stakeholders to share final results and lessons learned. Regional dissemination workshops will be conducted post-project in three regions to disseminate project learning to other farmers and practitioners. A knowledge-sharing webinar will be conducted post-project to reach 100+ online participants with project learning. An online knowledge platform will be developed post-project providing freely accessible project resources including documents, videos, photos, and case studies.

Knowledge dissemination will occur through multiple channels to reach diverse audiences. The government extension system will disseminate project learning to 100,000+ farmers through extension agents. Farmer associations and cooperatives will disseminate project learning to 5,000+ farmers through farmer networks. Financial institutions will disseminate project learning to 100+ staff through training and workshops. Research institutions will disseminate project learning through academic publications and conference presentations. Development partners including the World Bank, AfDB, UNEP, and other CTCN projects will disseminate project learning through their networks. Media including press releases, news articles, and radio programs will disseminate project learning to the general public. Online platforms including the project website, social media, and online knowledge platform will disseminate project learning to online audiences. These multiple dissemination channels will ensure that project learning reaches diverse audiences and contributes to broader development efforts in climate adaptation and sustainable agriculture.