

ANNEX 11

Monitoring and Evaluation Plan

Version 4



2024

RE-GAIN: Scaling Solutions for Food Loss in Africa

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1 Introduction

1.1 PROGRAMME BACKGROUND

A great deal of attention has been paid in recent decades to the impacts of climate change on crop production, i.e., on growing risks to agricultural productivity. Scholarly investigations and public and private research have invested heavily in identifying and – where feasible – quantifying the ramifications of climate change on crop yields, yield stability over seasons, and in exploring plausible management options for the emerging challenges (CGIAR, 2023). As governments and societies look at how to minimize the risks of climate change, the impact of these changes on food production is increasing, fuelling concerns about food security and livelihoods for current and future generations.

Food security, however, is affected not only by changes in crop production but by changes occurring throughout the crop value chain, including during post-harvest phases (Akoth, 2020). It is therefore crucial to examine the impacts of climate change on a crop’s value chain, including production, aggregation, storage, transportation, processing, and distribution. Each stage comprises several sub-processes, and climate change may plausibly affect many or all of the sub-processes too.

With the lion’s share of research and resources for resilience interventions in the agricultural sector having been focused on production, the RE-GAIN project is an effort to give dedicated focus to harvest and post-harvest stages of the value chain – specifically, harvesting, post-harvesting handling and storage, processing, transportation, and logistics. As summarized in **Error! Reference source not found.**, the International Fund for Agricultural Development (IFAD) report highlights a range of climate change concerns in the post-production stages of value chains and potential adaptation interventions that could increase resilience against such climate change concerns (IFAD, 2015).

Table 1-1 - Illustrative climate change risks and climate change risk management interventions in post-production value chain processes (adapted from IFAD, 2015)

Value Chain Components	Climate Risk Issues	Risk Management Interventions
Post-harvest management	Rising losses in harvest volume; declining safety, market quality and nutritional value due to increasing temperatures, humidity, pests and diseases.	Improve knowledge sharing on harvesting techniques to reduce losses. incentivize waste reduction measures and value addition for by-products; provide renewable energy sources to cover changing requirements for cooling, drying, milling, and threshing.
Siting of processing facilities	Extreme climate events (such as, floods, heatwaves, and storms) may damage processing facilities; shifting climatic conditions may render some sites redundant or increase transportation costs. It could create sustainable environment to pests and diseases, affecting both product quality and its suitability for consumption	Use hazard exposure and crop suitability maps to inform the siting of processing facilities; retrofit processing facilities with protective features; insure processing facilities against extreme climate events.
Energy in processing	High dependence on local bioenergy (wood, charcoal, dung, crop residues) has trade-offs with better soil management; rising temperatures require more energy for cooling.	Provide renewable energy sources (such as solar photovoltaic panels for cooling/drying/milling/heating, wind, biogas); equip processing facilities with energy-saving appliances (e.g., solar lighting, solar charging, efficient cook stoves); adopt pollution control measures.

Value Chain Components	Climate Risk Issues	Risk Management Interventions
Water in processing	Declining and more irregular water supplies; growing competition with other domestic or industrial users.	Re-site facilities closer to more suitable water sources; increase water storage and distribution capacity (water harvesting, communal ponds, groundwater recharge); introduce demand-side water efficiency measures; support conflict resolution for different water users (e.g., water user groups).
Packaging materials and methods	Rising temperatures and humidity may increase or decrease post-harvest losses and waste, as well as impact food safety, particularly if current packaging materials are impacted by high temperatures leading to produce damage or poor quality.	Design suitable packaging materials in parallel with waste and storage management strategies.
Processing infrastructure	Buildings and roads are exposed to higher peak rainfall, winds, and heat stress.	Introduce protective features and reinforcements into the design of critical infrastructure to handle run-off and higher temperatures; improve ventilation in buildings; harvest surplus water and energy from rooftops and appliances; use early warning systems.
Transport hubs and routes	Routes may become seasonally or permanently impassable (or open up); extreme events will disrupt logistics.	Re-site hubs; develop contingency plans for road, rail, water, and air transport; co-design value addition, storage, and transport components to avoid high-risk transport routes and seasons; upgrade docks, jetties, roads, and railways.
Refrigeration and cold chains	Temperature rises increase requirements for and costs of refrigeration; rising energy requirements increase greenhouse gas emissions.	Conduct cost-benefit analyses of dependency on refrigerated cold chains to assess best routes; introduce renewable energy sources for cooling and ventilation; optimize storage and transport management.
Just-in-time logistics	Extreme climate events (floods, storms, heatwaves) can make it impossible to comply with “just-in time” requirements.	Develop contingency plans for climate shocks and extreme events; create contingency storage opportunities; link into regional markets to avoid over-dependence on high-value export markets.
Demand from retail and consumers	Shifts in quantity and quality requirements and seasonality with climatic trends; disruptions in demand with climate variability, hence higher price fluctuations.	Assess market risks and opportunities before value chain implementation, including likely climatic impacts on high-value markets; strengthen and diversify storage to buffer price fluctuations; diversify into “off-season” crops.
Commodity labelling and certification	Increased consumer awareness as climate change may create new markets for sustainably produced and processed commodities with a low carbon footprint.	Explore opportunities for sustainable procurement, green labelling, and certification.

AGRA is a continental institution working in 15 African countries addressing food systems focussing on smallholder farmers’ production, marketing and nutrition. In the countries where AGRA operates, which are highly diverse in terms of climate, soils, crop choices and institutional capacity, neither all of these climate-related concerns may be applicable, nor all of these potential interventions possible. **Even within the range of what may be applicable, this programme is likely to look at a subset of risks that may be viable to address, and – given resource constraints – only a limited number of high-priority resilience interventions may be feasible to design and deploy.** RE-GAIN is an effort to identify the most salient risks, select the most impactful solutions, and implement the priority interventions through a well-structured, strategic, multi-country programme.

1.2 BRIEF PROGRAMME DESCRIPTION

There is a clear gap in knowledge, data and interventions designed to target the impacts of climate change at the harvest and post-harvest stages of the value chain, despite the mounting evidence of the ramifications on food loss and the impact this has on land use changes and associated climate change mitigation. The majority of the current programmes designed to tackle climate-induced food loss focus on the pre-harvest stages of the value chain.

To address the pressing need for broader implementation of solutions aimed at reducing climate-related harvest and post-harvest food loss, the proposed programme is designed to raise awareness and build capacity to promote the adoption of Food Loss Reduction Solutions (FL-RS). It will do this by creating institutional capacity, facilitating the uptake of FL-RS by end users and service providers, increasing options of solutions' availability, and enabling practical application through policy interventions. This will include enhanced financial access for farmers and Micro, Small, and Medium Enterprises (MSMEs), empowering them to invest in climate-friendly FL-RS and incentivising vendors, manufacturers, and suppliers of climate-adapted FL-RS, fostering a robust market ecosystem.

A key focus is on strengthening the capabilities of countries to develop climate-resilient post-harvest infrastructure, both through providing physical solutions alongside capacity building along the value chains. This includes investing in strategic frameworks and implementation plans, including a regulated quality-based pricing system and tax exemptions on imports, for reducing food loss. By enhancing access to markets, the programme will encourage farmers to adopt FL-RS products and services, thereby boosting their climate and economic resilience.

1.2.1 Target Countries Overview

During the 2023–2027 period, AGRA plans to target 28 million farmers across 15 Sub-Saharan African countries, 40% of which will be women. The RE-GAIN Programme focuses on AGRA's activities in seven target countries, as shown in **Error! Reference source not found.** below. The RE-GAIN Programme is designed to combat food loss during the post-harvest stages and to boost climate resilience by fostering awareness and by building capacity for the adoption of Food Loss Reduction solutions (FL-RS). The programme aims to transfer these solutions to end users and service providers for practical application while facilitating financial access to farmers and Micro, Small, and Medium Enterprises (MSMEs) to invest in climate-resilient FL-RS. The programme plans to incentivize vendors, manufacturers, and suppliers to adopt these solutions and enhance the capacity of countries to develop climate-resilient post-harvest food handling infrastructure.

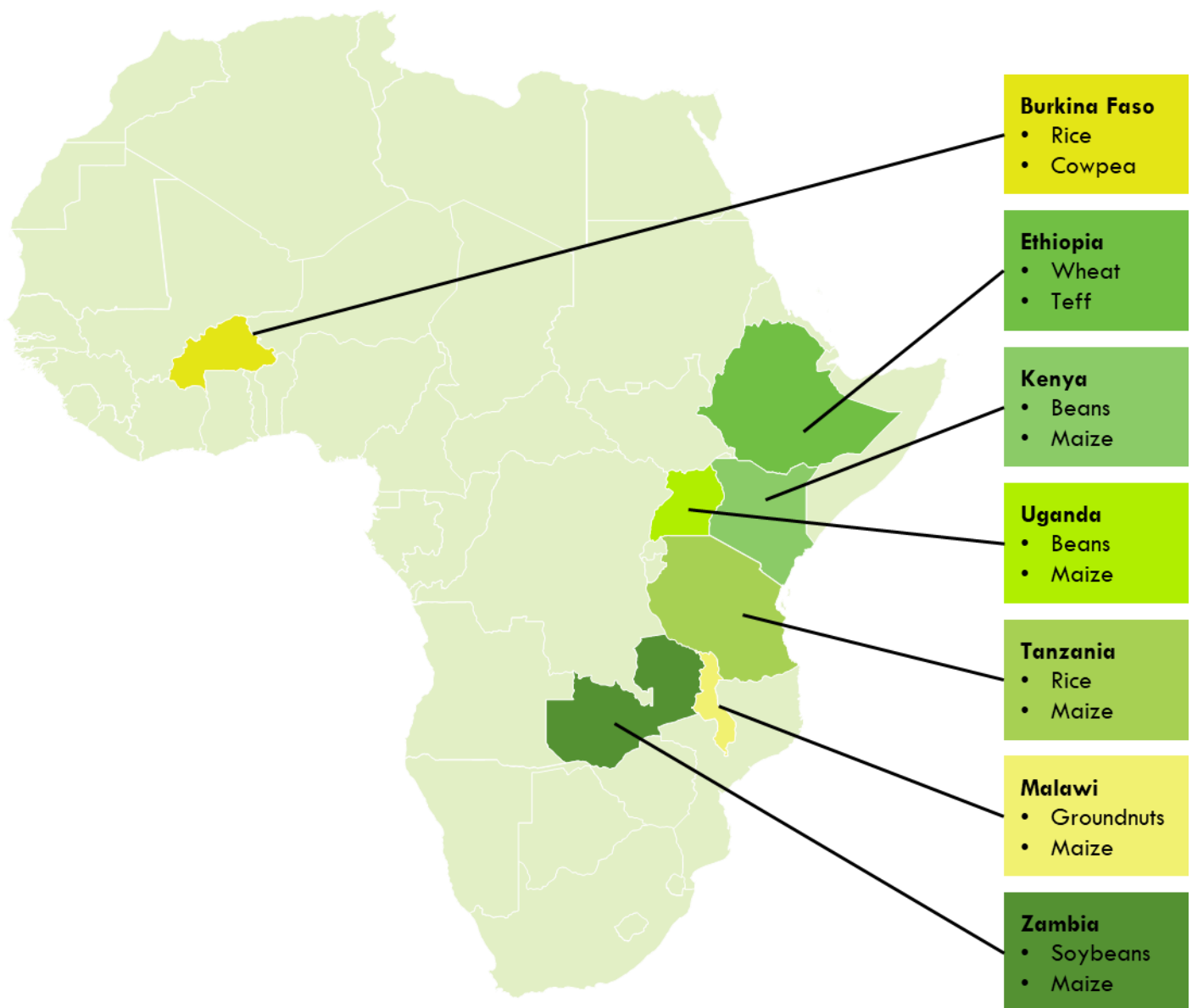


Figure 1-1 Focus Geographies for AGRA (2023-2027)

1.2.2 Crop selection

Key crops were identified by major stakeholders in the respective countries and expert assessments, supported by AGRA and the National Designated Authority (NDA) of each target country. Two major crops per target country were selected, based on area coverage, importance for food security and income, and climate vulnerability, to ensure that sufficient resources would be available for the crafting and execution of targeted solutions. Selected crops are representative of the agricultural dynamics of each country and aligned with the specific needs and strategic agricultural goals of the nation. In addition, these crops hold substantial importance to the country's food security and/or experience particularly high rates of loss within the value chain. Finally, these crops are produced in large parts of the respective countries by a significant number of smallholder farmers. The key crops, therefore, reflect the agronomic and economic realities of each country and provide opportunities for targeted enhancement of food security and sustainable agricultural practices. Additionally, the improved management of these crops is also expected to significantly reduction of GHG emissions contributing to the NDC targets of the countries involved. **Error! Reference source not found.** highlights the key crops selected for each of the countries within the programme.

1.2.3 Harvesting and Post Harvesting Definition

For the RE-GAIN programme, the key value chain stages considered are shown in **Error! Reference source not found.**



Figure 1-2 Strategic value chain stages included in the RE-GAIN Programme

The harvesting process within this RE-GAIN Programme proposal is defined as the interval between the culmination of agricultural production, marked by the crop reaching its maturity, and the initiation of post-harvest treatment. This process encompasses the identification of the optimal harvesting time and is further delineated into four distinct stages:

1. Removal of contaminated seeds, heads or cobs of matured crops at harvest
2. Reaping, which involves cutting, pulling, or gathering the mature crops.
3. Threshing, the process of separating the grain from the rest of the plant.
4. Cleaning, such as winnowing, to remove chaff and other impurities.
5. Hauling, which entails the transportation of the harvested produce to storage or processing facilities.

The post-harvest handling and storage stage commences once the crop exits the field and is typically conducted on the farm¹.

This stage encompasses several key operations, including:

1. Threshing, which can be performed manually or with mechanical threshing machines.
2. Drying, utilizing cribs, tarpaulins, and similar methods.
3. Cleaning and sorting, such as through winnowing, to remove impurities.
4. On-farm storage, which includes the use of granaries, hermetic bags, ordinary bags, stacks, metal silos, and plastic silos.
5. In some instances, primary processing activities, such as grinding, hulling, pounding, milling, drying, and sieving, are also conducted during this stage.

The processing, transportation, and logistics stage involves farmers selling their harvested crops either directly to traders, who collect the produce from the farm, or to collection centres and processors. These market participants then undertake the tasks of product accumulation, initial processing, quality control, grading, packaging, and transportation to wholesale buyers.

¹ In this instance, a field is where the crops are grown, and a farm consists of the whole small holding including the small aggregation site.

1.3 REASONING FOR REQUESTED FUNDING

Africa's food insecurity challenge has been exacerbated by climate change. Sub-Saharan Africa stands at a crossroads with an unprecedented opportunity for food systems transformation, driven by the demands of a rapidly growing population of 1.5 billion and the pressures of a changing climate (World Bank, 2023) (Worldometer, n.d.). The continent faces significant development challenges including food insecurity, resource degradation, poverty, gender inequality, and social exclusion. The vicious cycle of poverty and environmental degradation in Africa is evident in low crop productivity, deforestation, land degradation, conflict, migration, and vulnerability to climate shocks, which perpetuate persistent food insecurity and poverty. The effects of climate change are expected to be severe in Africa, where the capacity to adapt and respond to a changing climate is weak.

The impacts of climate change have increased over the past decades in Africa, manifesting in more frequent, intense, and prolonged extreme weather events, such as floods, droughts, heatwaves, locust outbreaks, desertification, and sandstorms. These extreme weather events have resulted in increased temperatures and humidity, shifts in precipitation patterns, water stress, and soil erosion. Most African countries already face recurrent droughts that affect growing seasons, often leading to short growing periods reducing the viability of farming in marginal agricultural areas. Projected reductions in crop yields in some countries could reach as much as 50% by 2030, and crop net revenues may fall by up to 90% by 2100, with smallholder farmers being the most affected (IPCC, 2018).

Therefore, the RE-GAIN programme aims to enhance the climate resilience and adaptive capacity of smallholders by promoting the widespread adoption of FL-RS in seven African countries. According to the World Bank estimates, a one percent reduction in post-harvest losses in Sub-Saharan Africa could lead to economic gains of \$40 million each year, and most of the benefits would go directly to smallholder farmers (World Bank, 2011). Moreover, food loss and waste are the result of an extremely inefficient use of resources and account for about 3.3 gigatonnes of greenhouse gas emissions globally (FAO, 2013). Large amounts of water and fertilizer also go into the production of food that never reaches human mouths. Recovering the food that is lost during harvest and post-harvest handling some can help close that calorie gap in Africa while strengthening livelihoods and improving food security— without imposing any additional environmental cost. Therefore, facilitated by the Green Climate Fund (GCF) investment, RE-GAIN will roll out a suite of physical interventions alongside capacity building and enhanced financial and market access. Not only will this benefit the respective countries as whole, but it also has the potential to benefit the region and the wider planet.

1.4 PROGRAMME GOAL STATEMENT

IF the capacity of the target countries and communities to respond to climate-triggered food losses is strengthened through improved and inclusive access to financing, promotion of context-specific and gender-responsive innovations to reduce food losses, and better enabling conditions for public and private investments, **THEN** smallholder farmers will have enhanced food security and livelihood resilience, **BECAUSE** the widespread use of food loss-reduction technologies will reduce food loss and reduce the carbon footprint of food systems, while increasing household income and building the resilience of smallholder farmers, MSMEs and rural communities to climate shocks.

1.5 PURPOSE AND STRUCTURE OF THE REPORT

This Annex sits within the context of the broader funding proposal and should be read as such. Section 2 outlines the Monitoring and Evaluation (M&E) Plan for the GCF-funded programme. It provides an overview of the data source, collection tool, frequency, indicator and indicative budget for each project output and outcomes, as outlined in Section E of the Funding Proposal. This M&E plan is to be undertaken by the M&E officer for the duration of GCF funding.

1.6 ROLES AND RESPONSIBILITIES

The monitoring of RE-GAIN will be entrusted to a dedicated M&E officer, who will be employed under AGRA. This will ensure continued monitoring of GCF-funded project during the implementation period. The M&E system for RE-GAIN will be validated and finalised by the AGRA Board, in collaboration with the larger AGRA M&E Team, during the programme's inception phase. The Plan will be updated as the programme progresses and after the completion of the baseline survey. The AGRA Board and M&E Team will work with the M&E officer to evaluate the interplay between project indicators and results to assess the effectiveness of the M&E plan and amend it where appropriate.

The responsibilities of the M&E officer include:

- Facilitate the implementation of the GCF M&E Plan by working with project intermediaries, and relevant departments to collect data on, but not limited to: non-financial fund metrics; Site-specific baselines; Economic activity; Market share; Production; Sales volume and value; Human resources
- Conducting periodical country/ region visits to verify the information provided by intermediaries.
- Regularly assessing performance, and recommending corrective action, in line with the predetermined outcomes, outputs and targets.
- Coordinate reporting including to the GCF annually on the performance of RE-GAIN against its outcome and output KPIs.

2 GCF project Monitoring and Evaluation Plan

A monitoring and evaluation framework for GCF-funded projects has been provided in Section E of the Funding Proposal. This section presents the plan for this framework. Table 2-1 and Table 2-2 below outline the method for collecting and analysing project outputs, outcomes and impacts, and the indicative budget to do so.

The dedicated M&E Officer will be responsible for monitoring the programme's outputs and outcomes, including on-going data collection and baseline reviews as necessary. A programme-level monitoring budget has been provided for the staffing budget (M&E personnel) and associated activities. This includes the M&E officer and any additional capacity required to undertake tasks such as country/region visits, surveys and regular reporting. The M&E officer will be closely aligned with the AGRA M&E Team (and AGRA technical specialist where applicable), particularly at inception to conduct surveys for outcomes which require on-the-ground baseline assessments.

While the monitoring of the programme will be undertaken on an on-going basis, its evaluation will take place at two points. The overall project performance will be evaluated at the midterm point, in year 3, and its final stages in year 5. These evaluations will be conducted by an independent evaluation consultant, under the oversight of AGRA, with the associated budget detailed in the evaluation plan below (see Table 2-2).

Table 2-1 GCF project monitoring plan

Monitoring				
Data/Source	Collection Tool	Frequency	Indicator	Indicative Budget
GCF Outcome level: Reduced emissions and increased resilience				
Farmer Surveys AGRA implementation partner reports	Field observation visits Document review Survey/questionnaire	Annual	Core indicator 2 for ARA1: Number of direct and indirect beneficiaries reached	Included as part of the M&E budget
Agreements under Model 2 AGRA implementation partner reports	Survey/questionnaire Document review	Annual	Supplementary 2.1: Beneficiaries (female/male) adopting improved and/or new climate-resilient livelihood options	Included as part of the M&E budget
Farmer surveys AGRA implementation partner reports	Field observation visits Document review Survey/questionnaire	Annual	Supplementary 2.5: Beneficiaries (female/male) adopting innovations that strengthen climate change resilience	Included as part of the M&E budget
Farmer surveys using FIES methodology AGRA implementation partner reports	Field observation visits Document review Survey/questionnaire	Annual	Core indicator 2 for ARA2: Number of direct and indirect beneficiaries reached	Included as part of the M&E budget
Farmer surveys using FIES methodology	Survey/questionnaire	Annual	Supplementary indicator 2.2: Beneficiaries (female/male) with improved food security	Included as part of the M&E budget
GCF Outcome level: Enabling environment				

Assessment of the contribution of the project towards enabling environment using scorecards (as per the IRMF Results Handbook)	Government data/records Key informant interviews Survey/questionnaire Document review	Baseline, mid term and final evaluations	Core Indicator 5: Degree to which GCF investments contribute to strengthening institutional and regulatory frameworks for low emission climate-resilient development pathways in a country-driven manner	Included as part of the M&E budget
Assessment of the contribution of the project towards enabling environment using scorecards (as per the IRMF Results Handbook)	Government data/records Key informant interviews Survey/questionnaire Document review	Baseline, mid term and final evaluations	Core Indicator 6: Degree to which GCF investments contribute to technology deployment, dissemination, development or transfer and innovation	Included as part of the M&E budget
Assessment of the contribution of the project towards enabling environment using scorecards (as per the IRMF Results Handbook)	Government data/records Key informant interviews Survey/questionnaire Document review	Baseline, mid term and final evaluations	Core indicator 7: Degree to which GCF Investments contribute to market development/transformation at the sectoral, local, or national level	Included as part of the M&E budget
Assessment of the contribution of the project towards enabling environment using scorecards (as per the IRMF Results Handbook)	Government data/records Key informant interviews Survey/questionnaire Document review	Baseline, mid term and final evaluations	Core indicator 8: Degree to which GCF investments contribute to effective knowledge generation and learning processes, and use of good practices, methodologies and standards	Included as part of the M&E budget
Project/programme-specific indicators (project outcomes and outputs)				
Annual outcome survey reports	Survey/questionnaire	Annual	Outcome indicator 1: Number of targeted smallholder farmers adopting one or more FL-RS	Included as part of the M&E budget
AGRA implementation partner reports	Field observation visits Document review	Annual	Output indicator 1:1 Number of targeted smallholder farmers trained and receiving support on the use of climate-resilient FL-RS interventions	Included as part of the M&E budget

	Survey/questionnaire			
AGRA implementation partner reports	Field observation visits Document review Survey/questionnaire	Annual	Output Indicator 1.2: Percentage of targeted smallholder farmers' harvest sold into structured market linkages	Included as part of the M&E budget
Affordability Index	Survey/questionnaire	Annual	Outcome Indicator 2: Increased affordability and accessibility of FL-RS to targeted smallholder farmers	Included as part of the M&E budget
Annual implementation partner reports	Survey/questionnaire	Annual	Output Indicator 2.1 Number of smallholder farmers through MSMEs engaging with service models that enable shared access to larger, more expensive FL-RS equipment	Included as part of the M&E budget
AGRA audits Annual implementation partner reports	Document review	Annual	Output Indicator 2.2: Number of smallholder farmers, MSMEs and other relevant players who engage with Model 1 and Model 2 financial mechanisms introduced to develop the market for FL-RS	Included as part of the M&E budget
AGRA baseline surveys	Government data/records Document review	Annual	Outcome Indicator 3 Number of FL-RS and gender and youth responsive enabling policies, reforms, regulations, certifications, standards supported that are passed	Included as part of the M&E budget
AGRA implementation partner report	Key informant interviews Survey/questionnaire Document review	Annual	Output Indicator 3.1 Number of national and regional bodies/institutions provided with technical support, secondment, and/or policy analysis and inter-intra-sector coordination tools and frameworks, and joint sector reviews	Included as part of the M&E budget
Co-benefit indicators				
Farmer surveys National food quality reports	Survey/questionnaire Government data/records	Annual	Co-benefit indicator 1: Percentage of produce meeting quality standards	Included as part of the M&E budget
AGRA implementation partner reports	Survey/questionnaire Document review	Annual	Co-benefit indicator 2: Percentage of employment opportunities made available particularly for women and youth through the RE-GAIN programme	Included as part of the M&E budget

	Field observation visits			
AGRA implementation partner reports	GIS data		Co-benefit indicator 3: GHG emissions (tCO2e) reduced, avoided, or sequestered through improved land use practices	
FAO ExACT Tool	Document review	Annual		Included as part of the M&E budget
Agro-Chain Greenhouse gas Emissions (ACE) tool				

Table 2-2 GCF project evaluation plan

Evaluation			
Type	Timing	Independent/Self-evaluation	Indicative Budget
Outcome	Baseline data collection at the start of the project	Self-Assessment	US\$400,000 for an independent evaluator
Process	Data collection support beginning 0.5 years after the start of the project implementation, and reoccurring annually.	Self-Assessment	Included as part of the M&E budget
Summative	Mid term evaluation in year 3.	Independent	US\$450,000 for an independent evaluator
Summative	Final evaluation within 6 months to the end of project implementation in year 5.	Independent	US\$650,000 for an independent evaluator

Evaluation Budget Allocation	
Type	Amount
M&E Officer (HQ) – 1 FTE	US\$382,929 over 5 years
M&E In-Country Officers (3 for the programme)	US\$842,775 over 5 years
Baseline Evaluation (Y1)	US\$400,000 for an independent evaluator
Mid-Term Evaluation (Y3)	US\$450,000 for an independent evaluator
Final Evaluation (Y5)	US\$650,000 for an independent evaluator
AGRA Surveys (Y2 and Y4)	US\$300,000 each, totaling US\$ 600,000 and as part of AGRA's co-financing

Evaluation-related data-collection and maintenance activities	Included as part of the remaining of the M&E budget of US\$2,502,533 over 5 years
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As noted in the above M&E plan, we have a number of tools used to guarantee an accurate M&E process. In this case, we see the below as the years of implementation of the different tools:

- A baseline (Y1), mid-term (Y3) and final evaluations (Y5) which will include household/farmer surveys – the budget for these are highlighted above and part of the cost is part of the AE Fees Budget and part – including data collection – as part of the M&E Budget for the RE-GAIN programme
- The AGRA Surveys will be conducted on Y2 and Y4 and are part of the AGRA institutional activities. These are included in the AGRA co-financing amount for the M&E activities with the full budget above.