



Green Climate Fund (GCF) Proposal

Women-Adapt: Enhancing the climate change adaptive capacity of smallholder farmer communities in Poro Region, focusing on vulnerable women and youth

OPERATION & MAINTENANCE PLAN

1. Background

This Operation and Maintenance (O&M) plan is developed in consultation with relevant project stakeholders and contains detailed procedures for carrying out activities necessary to guarantee the proper functioning, productivity, and durability of most common equipment, infrastructures, and systems requiring standard operating procedures and timely management. The plan will serve as a written commitment by project stakeholders and executing entities to ensure that all project assets, that are going to be purchased, built, or rehabilitated, by WFP, the Government of Côte d'Ivoire and GCF will remain in continued compliance with applicable regulations (health and safety) during and after the implementation timeline. The plan outlines important considerations and needs for the operation, instrumentation/calibration, monitoring, inspection, and maintenance per relevant project components and related activities. Where applicable, the plan will specify key operating parameters, limits, maintenance procedures, schedules, data collection, and necessary documentation methods. The terms "O&M," used in this document shall include operation, ground maintenance, general repairs, and replacement activities. The O&M for relevant project asset shall be presented in terms of similar type/category of assets project for which significant project funds will contribute to their realization. For each category of targeted assets, the O&M will outline (i) assets' relevance, (ii) main challenges/threats and other factors that can deteriorate/degrade assets, and (iii) a set of good pro-active/preventative practices/mechanism/strategies to enable assets to withstand identified challenges/threats and remain in good and safe working conditions.

2. Operation and maintenance plan of soil and water conservation assets

The project seeks to enable targeted rural communities to develop strong adaptation capacities to address, respectively, the causes and the impacts of climate change. Project will invest in sustainable and climate-resilient ecosystems and productions systems, construction, or rehabilitation of adapted physical/ productive assets to improve soil and water conservation and agroforestry practices throughout targeted communities. The O&M under this project component will guide the development, management, and evaluation of the following assets.

Asset description & Relevance	Challenges/Threats against assets	Targets and recommended /good practices/systems
<p>Objective 1: Improvement of the agroecosystems adaptive capacity while increasing their resilience to climate shocks and enhancing carbon stocks and carbon sequestration capacity (as co-benefit). Specifically, focus will be posed on the restoration of degraded community lands into productive assets (for example improved farm, grazing and wooded lands) for food security and enhanced climate change adaptation.</p>	<p>Floods and dry spells increasing land degradation and soil losses, deforestation, bushfires, and Slash& burn methods of clearing and preparing land, excessive soil tilling, over-grazing, hunting, residue burning and other unsustainable farming practices.</p>	<p>Project plans to encourage and promote the adoption of best practices that can help smallholder farmers and targeted rural communities restore the adaptive capacity of land ecosystems (Farm and off-farm) while increasing their resilience to climate shocks. The project plans to restore approximately 140 hectares of off-farm degraded lands and 200 hectares of degraded farmlands in 70 vulnerable villages. The following are priority activities under the O&M plan for this Objective 1.</p> <p>Land restoration through tree planting and intercropping techniques:</p> <ul style="list-style-type: none"> ○ Plant species selection and design/layout of the project to be done in a participatory manner with guidance from Ministry of Environment and Sustainable Development (MINEDD), MINADER and the buy-in from communities ○ Seeds/seedlings to be acquired from authorized/certified sources ○ Tree nurseries set and management to follow standard horticultural and agroforestry crops protocol ○ Planting to be done at the appropriate stage of plant cycle of development ○ Care will be taken to respect the planting depths, spacing, and orientation prioritizing the promotion of agroecological practices ○ A dedicated team to ensure proper care of planted seedlings (watering, fertilizing, pruning, protection from human and animal devastation, create fire buffer around the plantation ○ Maintenance and fencing of trees to be provided by community-based committees
<p>Objective 2: Integrated physical and biological soil and water conservation and agroforestry for food security and climate change adaptation</p>	<p>Recurrent and increased dry spells, heavy rainfall, strong winds, mechanization, wildlife hunting, foraging, farm-animal grazing, sloped lands etc.</p>	<p>Project plans to encourage and promote the adoption of best practices as they relate to (i) Physical and biological Soil and Water Conservation (SWC) and (ii) agroforestry. The following are priority activities under the O&M plan for this Objective 2.</p> <p>Soil and Water Conservation:</p> <ul style="list-style-type: none"> ○ The project seeks to implement best SWC practices across the 70 targeted communities with an estimated 500 hectares (community/farmland) to benefit from a combination of practices such as (i) stone and contour bunds, (ii) mulching & crop residue management, (iii) soil amendment through compost and manuring (iv) Zai-holes (v) half-moons, (vi) grass strips, especially vetiver grass & bamboo and other soil protecting native grasses and shrubs. For all SWC, the project technical implementing partners will be encouraged to follow the FAO's manuals on integrated soil management as well as other FAO's publications including "A Study Guide for Farmer Field

		<p>Schools and Community-based Study Groups- SOIL AND WATER CONSERVATION- With a Focus on Water Harvesting and Soil Moisture Retention.”</p> <ul style="list-style-type: none"> ○ Greater community mobilization will be required to provide needed labour to collect, transport of crucial materials such as stones, woods, and vegetative planting materials. <p>This activity calls for technical expertise in land management and determination of contours. Similarly, the project will rely on technical extension services from the MINADER and MINEEDD to guide the establishment of erosion control plants.</p> <p>Agroforestry:</p> <ul style="list-style-type: none"> ○ The project seeks to implement best agroforestry practices across the 70 targeted communities with an estimated 500 hectares (community/farmland) to benefit from a combination of agroforestry practices such (i) alley cropping (cajanus cajun, acacia), (ii) living hedges with multi-purpose trees and shrubs (moringa, ziziphus), (iii) vegetative windbreaks/shelter breaks, (iv) fruit trees/orchards (banana and papaya), and (v) fodder/forage production. ○ For all agroforestry practices, the project technical implementing partners will be encouraged to follow the agroforestry handbooks and training manuals by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and FAO. ○ Greater community mobilization will be required to provide needed labour to collect, transport of crucial materials vegetative planting materials and provide labour for establishing tree nurseries, seedling plating and management. <p>This activity calls for technical expertise in land management and determination of contours. Similarly, the project will rely on technical extension services from the MINADER and MINEEDD to guide the establishment of erosion control plants.</p>
<p>Objective 3: Water harvesting and distribution schemes.</p>	<p>Floods, heavy rainfalls, water-runoff, drought, extreme heat, evaporation, strong winds, soil erosion, topography, soil textures and soil structures, heavy rainfalls, floods, water-runoff, drought, extreme heat, evaporation, strong winds, soil erosion</p>	<p>Project will invest in the creation of physical assets to enable farmers and communities to harvest, store and or distribute (rainfall, underground, surface-water, and runoff). The following are priority activities under the O&M plan for this Objective 3.</p> <ul style="list-style-type: none"> ○ 20 solar surface wate pumping and drip irrigation (drip irrigation kits) ○ Rehabilitation of existing water irrigation infrastructure and waterworks (up to 20 structures) ○ Rainfall water catchment mini ponds/reservoirs dams’ rehabilitation (10 mini-dams) <p>The project will encourage the establishment of a Water Management Committee (WMC) made up of Lead-farmers, community-level technical advisors, and local artisans to protect and service assets. WMC will meet regularly, assess the productivity of water harvesting and distribution schemes. They will follow a routine well Deeping procedures, solar panels cleaning and address leaks and other water-runoff issues.</p>

3. Operation and Maintenance plan of farm-level and community-level market-driven storage structures and facilities

The project seeks to improve smallholder farmers' storage capacity to reduce post-harvest losses due to climate shocks. The development of storage structures and facilities shall be done in consultation with extension services, communities and other private sector and market actors.

Description and Relevance of asset	Challenges/Threats against asset	Targets and recommended /good practices
<p>Objective 4: Farm-level traditional storage solutions: Traditional/improved granaries are highly adaptive, cost-efficient, ecological solutions to safe storage of household-level harvest.</p>	<p>Farm-level storage structures and infrastructures can be damaged by fires bad weather conditions (heat, heavy rainfall, strong winds and storms, floods) rodents, and termites.</p>	<p>Project will invest in the construction and rehabilitation of 70 farm-level traditional storage solutions (1 to 5 metric tonnes each). Lead farmers, technical community-level advisors will work closely with Local artisans, tradition granary builders to document the process of building or rehabilitating traditional granaries. This will include amount and type of materials and appropriate loading capacities.</p>
<p>Objective 5: Farm-level improved storage technologies: Traditional/improved granaries are highly adaptive, cost-efficient, ecological solutions to safe storage of household-level harvest.</p>		<p>Project will invest in the establishment of one of WFP's "zero food loss," initiative which consist of working with government entities, private sector container and storage manufacturers to replicate local production of hermitic plastic and metallic silos by organizing study visits to several WFP country offices and engaging local manufacturer and distribution outlets to make this technology readily available and affordable. O&M plan for these activities will be guided by the protocols developed by WFP Global Post-harvest Knowledge and Operations Centre (KOC) of Uganda.</p>
<p>Objective 6: Community-level market-driven (storage structures and facilities; post-harvest handling instruments and accessories; and market access – Information-Communication-Technologies)</p>		<p>Project will invest in the construction and rehabilitation of 10 mini-warehouses (30 metric tonnes each) to support WFP's market building programme across targeted communities. These mini-warehouses will operate like satellite storage units which will be linked to centralized located market-place warehouses. Each mini warehouse will be equipped with post-harvest handling instruments and accessories such as Scales, pallets, ladders, bag, stitching machines, temperature/humidity measurement instruments. With respect to the building's stability and safety, a Team of warehouse management will be trained to undertake routine preventative actions by taking into consideration all safety and health hazards when climbing, cleaning, inspecting, loading, unloading. The team will look for signs of possible weak areas on the structures, holes, cracking, water leaks in the ceiling or roofs and ensure water collected on the roof is properly channelled through appropriate downspouts and other drainage components which divert water away from the building. Warehouses operators will be trained in the proper storage and utilization of fire-extinguishers. Project will seek the support of various public/private extensions services for the calibration and repair of metrology instruments. Safety, security, and privacy features will be activated on all project-related deceives such Mobile phones, electronic notepad, servers etc.</p>

4. Operation and maintenance plan of agri-food processing assets

The project seeks to empower rural women through food processing entrepreneurship. Food processing supports women livelihoods and is one of the ways to reduce post-harvest losses. Project assets in this component two essential areas: community-level staple grains milling units and market-driven food processing (drying, milling & blending) packaging, and distribution enterprises operated by women.

Description and Relevance of asset	Challenges/Threats against asset	Targets and recommended /good practices
<p>Objective 7: Community Mills for Women (CMM): Mechanical mills managed by women constitute labour-saving and time-saving technology that can improve women socio-economic conditions in the community.</p>	<p>Mechanical mills are machines made up of several parts and require certain inputs to function properly. In addition, they require installation according to specific rules and standard for safety, sanitary security. Similarly, entities specialized in commercial food processing (drying, milling, blending, fortification, packaging, and distribution) require even stricter standards. The following are potential challenges and hazards that must be considered in setting up community mills for women: bad weather conditions, technical know-how, appropriate equipment, pollutants, heavy metals, chemical and microbiological/toxins contaminations. Units should be set up to protect assets against fire and food poisoning.</p>	<p>Food processing regardless of size of operation should be done in manner to guarantees physical safety of those involved, quality and sanitary security for the end-user/consumer. Food processing units are made up of infrastructures/building, machines/equipment and are powered by a source of energy. To ensure their proper functioning and productivity the following O&M shall be followed across 20 CMM and 10 MFP project sites:</p> <ul style="list-style-type: none"> - Facilities housing processing units must meet the minimum safety requirements (aeration/ventilation, natural lighting) - Trained operators in charge of different components and aspects of food processing units - Thorough and regularly scheduled inventory and risk assessments - Manufacturer’s guide to be followed strictly including maintenance schedule - Standard Operating Procedures (SOP) written out and clearly displayed for easy access - Personnel or team responsible for food safety - Essential spare parts, fluids, lubricants to be prepositioned - Detailed maintenance and repair records are kept - inspection and proof of compliance with regulations - Regular general ground maintenance in and around food processing facilities - Professional cleaning and sanitization of food processing appliances
<p>Objective 8: Market-driven food processing for women’s empowerment (MFP): the project will pursue the socio-economic of women through (i) supporting adoption of Air/Solar drying technologies and (ii) milling & blending, fortification, packaging, and distribution enterprises operated by women.</p>		

5. Operation and maintenance plan for automated weather stations and manual rain-gauges

Partnership with Societe d'Exploitation et de Developpement Aeroportuaire Aeronatique et Meteorologique (SODEXAM) is essential for the « Women-Adapt, » project success. Involved in the early stages of consultations for the proposal development, SODEXAM will leverage its meteorological department to provide reliable climate data to inform agricultural production activities in the good year context and a basis for developing climate index insurance as an important tool to facilitate adaptation to climate risks. Project resources will be committed to enable SODEXAM to customize weather and climate services and products to meet the resilience needs of the targeted communities. This project will further enhance SODEXAM capacity to continue to build upon its existing database comprised of historical time series data and gather community level at much smaller scale to complete satellite level data. Project funds will enable SODEXAM enhance the efficiency of its current Automatic Weather Stations (AWS) network and acquire and distribute and trained beneficiaries on the use of georeferencing, weather and climate-related instruments such as GPS and

Manual Rain Gauges. SODEXAM has already deployed across the 4 departments of Poro region (AWS), however coverage can only yield metadata (10km between two data points). Instruments such as Manual Rain Gauges can complement weather data by providing additional localized data.

Description and Relevance of asset	Challenges/Threats against asset	Targets and recommended /good practices
<p>Manual rain-gauges are instruments designed to measure with precision and accuracy the amount of rainfall in the area where they are installed.</p>	<p>The following are elements that can damage and alter the performance of manual rain gauges. They include Soil and dust build up, leaves, debris, and insects.</p>	<p>The project plans to procure 70 units and distribute them equally across the 4 districts where the project will be implemented. Prior to their distribution, WFP and SODEXAM through a participatory farmer-field-school approach will develop a simple step by step illustrated guide and conduct hands-on training and demonstration with community technical advisors on how install, collect information from, and maintain the device. While most are built to withstand severe weathers and elements, user must have a good understand of tips to keep the instrument safe for use. Parameters to look for carefully to avoid damaging these instruments include power source (proper voltage). Generally, no calibration is needed. Avoid moving the device frequently and prevent the device. Follow instruction in case device requires user to empty water collecting bucket.</p>
<p>Automated Weather Station (AWS) is composed of various sophisticated equipment and sensitive instruments designed to measure atmospheric conditions such as temperature, atmospheric pressure, direction, and speed of winds. AWS are useful for forecasting weather events and broadcasting climate information. Potential products and services to be provided by AWS include real-time and spatial data to generate rainfall forecasts & temperature forecasts, develop crop advisory and models of climate data to predict droughts, floods, and land degradation throughout specified agroecological zones.</p>	<p>The following are elements that can damage and or alter the performance of AWS. They include dust, lightning, debris, fires, and other landscape related hazards, and telecommunication networks disturbances.</p>	<p>The project plans to support the operation and maintenance of 3 new AWS across the Poro region. SODEXAM will include in the O&M toolbox for AWS across project targeted regions:</p> <ul style="list-style-type: none"> - Secured fencing and general ground maintenance - Updated training manuals and technical brochures on good practices - Calendar for inspecting, cleaning, and servicing when applicable: solar radiation shields, solar panels, batteries, wind, temperature, and humidity sensors - Weather-proofing communication terminals and other digital data management devices.