



Building climate resilience by linking climate adaptation and social protection through decentralised planning in Mozambique (LINK)

Annex 13: Operations and Maintenance Manual

Accredited Entity: Save the Children Australia

Version B.39: 2024/06/14

Contents

1. Scope for Operation and Maintenance Activities	1
2. Management System for Undertaking O&M Activities	1
2.1 Main Stakeholders and Responsible Parties	2
2.2 Roles and Responsibilities of the Stakeholders and Responsible Parties.....	2
2.3 Other project activities focused on establishing the long-term O&M framework.....	3
2.4 Technical Support During the Project for Setting up the O&M Framework	3
3. Maintenance of upgraded WASH systems, climate-resilient agriculture and fisheries initiatives, and water resource management	4
3.1 Maintenance tasks	4
3.2 Maintenance of tablets for the Climate Resilience Information Management System	5
O&M Schedule	5
4. Design Lifespan and replacement assumptions for equipment.	6

1. Scope for Operation and Maintenance Activities

The operation and maintenance plan for the proposed GCF funded LINK Project, whose goal will be achieved via three Outcomes, focusses specifically on equipment procured for activities in the project's Outcome 2 (Priority locally-led adaptation actions and social protection support identified in LAPs implemented by communities and local governments) of the project. The LINK project will work to strengthen the technical, institutional, and organisational capacities of local organisations and community members (including children's groups, women and other vulnerable groups), as well as government representatives to enable the effective implementation of adaptation measures and increase the resilience of the most vulnerable population in the target districts. The project will also prioritise the implementation of Local Adaptation Plans (LAPs) in the nine target districts. LAP interventions will be selected from a menu of investments including interventions that contribute to increasing food and nutrition security of vulnerable households to enable them to become more resilient to climate change. Lastly, the project will strengthen the policy framework and institutional capacity to promote climate adaptation in Mozambique and support climate knowledge and information sharing.

The project activities that include equipment purchased requiring maintenance are:

- Outcome 2: Priority locally led adaptation actions and social protection support identified in LAPs implemented by communities and local governments:
 - **Activity 2.1.1** - 2.1.1 - IGA1 - Drought tolerant agriculture implemented and supported by agricultural groups - Agro-processing machines (for drying, milling, and food preservation);
 - **Activity 2.1.2** - IGA2 – Climate resilient livestock management implemented through the establishment and operation of livestock (small animals) groups - Livestock shelters;
 - **Activity 2.1.4** - IGA4 - Climate resilient food production supported by efficient hydroponic techniques -1000 hydroponic systems;
 - **Activity 2.1.5** - IGA5 –Sustainably grown and harvested non-timber forest products implemented through Non-Timber Forest Products (NTFP) groups - 40 kits for pre-processing equipment (solar dryers, scales - including digital scales);
 - **Activity 2.1.6** - IGA6 - Sustainable honey production and management practices implemented through honey production groups - Beekeeping equipment such as beehives, frames, hive tools, bee suits, smokers, and feeders;
 - **Activity 2.2.1** - Strengthen water security through retrofitting small-scale water points climate-resilient infrastructure - in a minimum 3 water points and 10 rainwater harvesting tanks per district.
 - **Activity 2.2.2** - Locally-led adaptation investment (public asset investments)

2. Management System for Undertaking O&M Activities

The O&M plan has been developed based on the project's community-based approach, ensuring ownership and the mainstreaming of climate-resilient best practices within the local community. Accordingly, O&M for the project will be carried out through a predominantly community-centred system, with support from the Mozambique Government.

During the procurement process, O&M will be addressed through exploring extended warranties and including O&M as part of the procurement specifications for individual project inputs. The ongoing management of O&M will be tailored to each specific location in consultation with the schools and communities and included in the adaptation plans (Outcome 1, Activities 1.2.1, 1.2.21.2.3, 3.3.4 and 3.3.5) and planning for the handover of project equipment to the project beneficiaries for long-term sustainability.

2.1 Main Stakeholders and Responsible Parties

The following stakeholders shall play a significant role in ensuring the effective implementation and sustainability of the climate resilient O&M practices. Stakeholder engagement is a key part of LINK activity development and implementation process, including effective operation and management.

The O&M plan for the project is centred around the following key stakeholders:

1. National, Provincial and District authorities: have established networks into communities, can influence management interventions and benefit from development activities in their areas.
2. Community Resilient Networks: District level community-led groups comprised of gender-balanced and inclusive representation of the households benefiting from project activities. Each District is mandated to have a CRN to plan for disaster management and climate risk reduction, including assessing risks and vulnerabilities, and implementing disaster risk reduction (DRR) and climate change adaptation activities.
3. School based environmental clubs: comprised of gender-balanced representation including youth representatives from the schools benefiting from project activities.
4. Community beneficiaries: have been identified as extremely vulnerable to climate variability and extremes, which is impacting their food security and DRR effectiveness and demonstrating a deficit in adaptive capacity. Remote communities receive limited training and support.

Other participants involved in O&M:

The private sector will help to validate relevant national and local skills and capacity building mechanisms and provide market access for smallholder producers.

Suppliers will be accountable for O&M as per the contracts (including extended warranties) on the goods that are purchased from them.

2.2 Roles and Responsibilities of the Stakeholders and Responsible Parties

1. Provincial and District authorities: will play a lead role in several O&M activities. Project activities will facilitate training of local authorities and beneficiaries who will also be supported in accordance with O&M best practices. Site selection for implementation of income generating activities and small- scale water infrastructure will include a capacity assessment by Eduardo Mondlane University. The project activities will also facilitate the development and dissemination of pictorial and local language O&M guidance notes and manuals. The Ministry of Land and Environment will provide on-going technical support to the Provincial and District authorities throughout the project timeframe and after.
2. Community Resilient Networks: (CRNs): These networks will receive equipment to enhance connectivity and early warning system infrastructure where gaps exist and support to establish systems to on-sell data capacity to cover costs. Project activities include training in the basic use and maintenance of this equipment. The rules and regulations for the use, management and O&M of CRN equipment will be proposed, adopted and enforced by the members themselves, through majority agreement and ensuring gender equality and inclusiveness. The CRNs will also be responsible for ongoing monitoring of the communities' O&M of project equipment including rainwater tanks and agricultural tools.
3. School based environmental clubs: will be responsible for O&M activities for the upgrades to schools including small-scale water infrastructure/waterpoints in schools. This includes planning, selection, and appointment of members for monitoring and effective management of school assets. Project activities will include training on the use and maintenance of this equipment. Procurement of the equipment will

consider maintenance schedules with suppliers and extended warranties to support long-term O&M after the project.

4. *Community beneficiaries:* These will include all communities benefiting from improvements to early warning systems, food security, water resource management, seeds/ seedlings, and tools. They will significantly contribute to the implementation of climate-resilient agriculture, livestock management, food, fruits and honey production that are suited to their local environmental and socioeconomic conditions through participatory methods to ensure that all proposed activities are entered into voluntarily and with broad community support. Provincial and District authorities, CRNs, local NGOs and CSOs, will support communities to ensure high quality maintenance and management of project-related improvements.

2.3 Other project activities focused on establishing the long-term O&M framework

During the five-year implementation period, the activities undertaken will aim to establish a long term, 'beyond life of project' O&M framework, including the development of Standard Operating Procedures (SOPs) for O&M on all durable goods, setting-up of systems, and building the capacity of stakeholders as well as communities for ensuring the sustainability of climate-resilient O&M practices.

The approach chosen and used will be discussed and agreed with CRNs, School based environmental clubs, District and Provincial Authorities, Ministry of Land and Environment (MTA) and relevant technical line ministries to ensure the approach is consultative and participatory, as well as technically robust and reflects the needs and desires of the end users – the schools and communities.

Specifically, the project will help establish and train Provincial and District authorities, CRNs and school committees, as well as the community members; government extension workers to provide technical expertise to help communities with development, facilitation, and assistance in designing, costing and ensuring the establishment of appropriate O&M systems. Communities will be trained in planning and implementation of effective O&M of equipment, and community groups will build their organizational capacities to utilise and manage equipment, monitor usage, and develop O&M mechanisms for any community-held or shared equipment, including capitalization strategies.

2.4 Technical Support During the Project for Setting up the O&M Framework

During the project period, technical specialists supported by both suppliers providing equipment and the Project Management Unit (PMU), will assist schools and communities in establishing and operationalizing O&M management plans. These teams will establish the basic roles and responsibilities of those managing project equipment, as well as formulate specific SOPs, where appropriate, to ensure effective implementation of O&M plans.

The shared resources include:

- Drysat application and Technology tools management and maintenance will be the responsibility of the provincial and district authorities.
- Small scale water infrastructure, irrigation tools, livestock shelters hydroponic systems and bee keeping equipment and other agricultural tools management and maintenance responsibilities to beneficiary households/communities, monitored by CRNs
- hydroponics site selection to include a biodiversity assessment by a technical specialist and ongoing monitoring by government provincial staff. Establishing management and maintenance responsibilities with beneficiary communities, monitored by **CRNs**.
- Policy/SOP for usage and disposal of tablets.

3. Maintenance of small-scale water infrastructure, climate-resilient agriculture, food, fruit and honey production and livestock management

The LINK project will work with highly vulnerable communities to engage in safety assessments and participatory, locally led adaptation planning processes, to develop climate resilience-adaptation plans. For communities with key activities identified in local adaptation plans (LAPs) to increase food security and water resource management; a range of low-tech equipment and/or tools will be provided to support climate-resilient agriculture initiatives, and water resources. The high priority adaptation actions identified via the community-level adaptation planning processes, will be supported by government technical line ministries. Inputs will include:

- Agro-processing machines
- Livestock shelters
- Hydroponic systems
- Solar dryers, scales - including digital scales);
- Beekeeping equipment such as beehives, frames, hive tools, bee suits, smokers, and feeders;
- Irrigation tools for fruit production
- Small scale water infrastructure
- Other public asset investments

Accordingly, during the project period,

- i) Technical specialists and local authorities will be responsible for:
 - Survey community needs for accompanying equipment
 - Biodiversity assessment for hydroponics site selection and ongoing monitoring
 - Quick and timely disbursement of input equipment to beneficiary communities
 - Training and support towards long-term use, O&M of materials and equipment
 - Monitoring the implementation of the use of equipment for the right purpose.
- ii) Target communities will be supported with replacement parts, refresher training and upskilling as needed.
- iii) Demonstration training on O&M will also be done by the equipment providers during installation and the subsequent warranty period.
 - Communities will be supported to take responsibility for ownership and sustainability of the equipment to officially cover the O&M cost themselves, which are expected to be negligible, post-project.

3.1 Maintenance tasks

Technical specialists supported by the government ministries will assist District and Province officials in establishing basic O&M management plans. These plans will establish the basic roles and responsibilities of those managing project equipment, as well as formulate SOPs, where appropriate, to ensure effective implementation of O&M plans. The expected tasks towards the maintenance of the equipment include:

- Regular maintenance and monitoring of equipment
- Regular maintenance and monitoring of hydroponics
- Preventive maintenance for all equipment to manage wear and tear.
- Replacement parts for damaged or faulty equipment/tools
- Refresher training and upskilling for O&M of equipment

Operations and maintenance schedule detailing tasks and frequency for activities.

Task	Description/Details	Frequency
------	---------------------	-----------

Biodiversity assessment for site selection	To identify any critical or natural habitats and establish baseline for any sites in natural habitats.	Before any hydroponics installation
Repair or replacement parts for equipment	For any damaged or faulty equipment/tools.	As required
Regular maintenance and monitoring of water tanks and irrigation systems	WASH systems and rainwater storage – operation and maintenance as specified by the manufacturer/supplier. Monitoring of correct usage.	Quarterly or as specified
Preventive maintenance of all equipment	Inspection of equipment for potential corrosion, damage, accumulation of unwanted materials.	Monthly
Refresher training and upskilling	For equipment O&M and correct usage	As required

3.2 Maintenance of tablets for the Climate Resilience Information Management System

To support the use of the Climate Resilience Information Management System for data-driven community climate adaptation planning and decision-making, the LINK project will provide tablets to identified community Resilient Networks.

Maintenance tasks

- Regular software updates for tablets
- Repair or replacement for tablet - broken screens, malfunctioning device
- SOP for usage and disposal of tablets

O&M Schedule

While O&M schedules will be developed during project initiation with the support of CRNs and DRCs, the below table provides an estimate of the types and frequency of tasks that will be included to ensure proper O&M of the tablets during the project period.

O&M schedule detailing tasks and frequency for activities to be undertaken

Task	Description/Details	Frequency
Software update for tablets	Alert on tablet settings – internet connection required	As required by manufacturer
Repair or replacement for tablets	For broken screens or malfunctioning devices	As required
Monitoring usage of tablet	Ensure usage policies are agreed and followed	Quarterly
Disposal after useful life	SOP to be developed for the project	Every three years

4. Design Lifespan and replacement assumptions for equipment.

The following table provides details on expected equipment lifespan for the project and estimated major replacement expenses expected to be incurred post-project implementation up to 2034.

Equipment Type	Expected Useful Life (Years)
Agro-processing machines	10
Livestock shelters	10
Hydroponic systems	10
Solar dryers, scales - including digital scales);	7
Beekeeping equipment such as beehives, frames, hive tools, bee suits, smokers, and feeders;	5
Irrigation tools for fruit production	5
Small scale water infrastructure	5
Motorbikes	5

The table below shows the replacement plan over the life of the project and beyond.

Item to be Replaced	Expected time to Include in new budgets (Years)	Financing Assumption
Agro-processing machines	9	Long term use equipment -The agro-processing machines, like grinders, used in the project are small-scale and easy to maintain. The community will have access to technical support and spare parts. The project's target group will pay a maintenance fee to keep the machines in good condition, and this fee can also be extended to other community members.
Livestock shelters	9	
Hydroponic systems	9	Small producers' groups or formed cooperatives will establish a maintenance fee mechanism to maintain a fund for equipment maintenance and replacement parts as needed.
Solar dryers, scales - including digital scales);	6	Small producers' groups or formed cooperatives will establish a maintenance fee mechanism to maintain a fund for equipment maintenance and replacement as needed.
Beekeeping equipment such as beehives, frames, hive tools, bee suits, smokers, and feeders;	4	Small producers' groups or formed cooperatives will establish a maintenance fee mechanism to maintain a fund for equipment maintenance and replacement parts as needed.

Irrigation tools for fruit production	4	Warrant Period to cover and thereafter community to cover the cost. - Small producers' groups or formed cooperatives will establish a maintenance fee mechanism to maintain a fund for equipment maintenance and replacement parts as needed.
Small scale water infrastructure	4	Community to cover the cost of replacement. - Community water committees will be established to ensure that a maintenance fee is applied to users, following the customary practice in Mozambique. The project will train technical capacity within the community to ensure timely maintenance according to the established schedule.

Financial Summary

The estimated O&M plan costs have been proposed for a time span of 10 years, which includes the 5-year project implementation period (2024-2028) and a 5-year period after project completion (2029-2034) for practical considerations. O&M activities are expected to be undertaken both during project implementation and post project completion.

During the implementation period, O&M expenses will be incurred for equipment procured for activities 2.1.1, 2.1.2, 2.1.4, 2.1.5, 2.1.6 and 2.2.1. Post project activities, which include regular O&M and major repairs/replacement, are expected to be carried out by the respective stakeholders on a regular basis or as per the planned schedule. Post-project replacement costs are expected to be incurred based on the lifespan of the equipment.

Financing for the O&M plan during project implementation will be determined through the procurement process, exploring extended warranties, service agreements and including O&M as part of the procurement for individual project inputs. GCF financing will be employed for the effective implementation of the climate resilient O&M practices. The ongoing cost of O&M will be included in the local adaptation plans, to be tailored to each specific location.

Co-financing and post project commitment: The government line ministries have agreed to establish robust and sustainable O&M plans in consultation with the Provinces, Districts, CRNs and school committees, ensuring the needs of the end users are met. The relevant line ministries have committed to including, if needed, an ongoing ministry budget to support recurrent costs.

Community financing: Community contributions will be in the form of cash (i.e., recurring costs for minor repairs, regular maintenance, and sharing of replacement costs) as well as in-kind (i.e., labour costs for undertaking monitoring and repairs, installation and replacement, peer-to-peer cooperative support). Community financing will be mobilized through the DRCs that will drive the implementation and monitoring of the O&M activities.

The table below shows the year-wise forecasts for the annual O&M costs associated with the LINK activities.

	Activity Description	%	Funding Source	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Project Period Total	Post Project Total	Project Duration Total
2.1.1	Agro-processing machines	50%	GCF		2,400	3,432	3,744	4,056							13,633	-	13,633
		50%	Match		2,400	1,848	2,016	2,184	6,721	7,201	7,681	8,161	8,641	9,121	8,449	47,525	55,974
2.1.2	Livestock shelters	80%	GCF		4,040	4,444	4,848	5,252							18,585	-	18,585
		20%	Match		1,010	1,111	1,212	1,313	8,585	7,575	8,080	8,585	9,090	9,595	4,646	51,513	56,159
2.1.4	Hydroponic systems	80%	GCF		15,782	17,361	18,939	20,517							72,599	-	72,599
		20%	Match		3,946	4,340	4,735	5,129	33,537	29,592	31,565	33,537	35,510	37,483	18,150	201,225	219,374
2.1.5	Solar dryers, scales - including digital scales);	80%	GCF		3,602	3,962	4,322	4,682							16,568	-	16,568
		20%	Match.		900	990	1,081	1,171	7,654	6,753	7,204	7,654	8,104	8,554	4,142	45,923	50,065
2.1.5.	Irrigation tools for fruit production	80%	GCF		2,188	2,407	2,625	2,844							10,064	-	10,064
		20%	Match.		547	602	656	711	4,649	4,102	4,376	4,649	4,923	5,196	2,516	27,894	30,410
2.1.6	Beekeeping equipment beehives, frames, hive tools, bee suits, smokers, and feeders;	80%	GCF		7,057	7,763	8,468	9,174							32,462	-	32,462
		20%	Match.		1,764	1,941	2,117	2,293	14,996	13,232	14,114	14,996	15,878	16,760	8,115	89,975	98,091
2.2.1.	Small scale water infrastructure	80%	GCF		1,327	1,459	1,592	1,725							6,103	-	6,103
		20%	Match.		332	365	398	431	2,819	2,488	2,654	2,819	2,985	3,151	1,526		1,526
	Motor bikes		GCF		8,956	35,825	53,738	71,651	15,226	13,435	14,330	15,226	16,121	17,017	170,171		170,171
	Regular O&M activities including		Community		5,625	8,785	11,049	13,313	9,419	8,438	9,000	9,563	10,125	10,688	38,773		38,773

	minor repair works, replacement – tablets																
				-	61,877	96,635	121,542	146,448	103,606	92,815	99,003	105,190	111,378	117,566	426,501	464,055	890,556