

Operations and Maintenance (O&M) Plan for 7 years

Overview

Operations and Maintenance (O&M) related expenses are required both during project implementation period and post-project for the remaining project lifespan. The O&M costs for the seven-year project and remaining eight years lifespan are as summarized in the table below.

Table 1: Summary of O&M costs and sources of finance during and post project implementation.

Output	Activities for which O&M is needed	Description of O&M Activities	O&M during the project implementation period		O&M post-project for remaining lifespan	
			Funding sources	Cost (USD)	Funding sources	Cost (7 Years)
Output 1.1 : Critical production systems sustain productivity under droughts and heatwave, farmers have enhanced, food-secured and adapted livelihoods	Activity 1.1.2 Install 13 hydro-meteorological monitoring equipment for drought to inform climate resilient agricultural management strategies.	Preventive maintenance	KOICA	984	Small farmers associations	1,124
		Corrective maintenance	KOICA	1400	Small farmers associations	2,400
	Activity 1.1.3 Disseminate climate information and response adaptation measures using locally-relevant delivery mechanisms as virtual platforms, electronic means, telecommunication and visits of the extension workers.	Preventive maintenance of servers and operating systems	Small farmers **	700	Small farmers associations	800
		Corrective maintenance	Small farmers **	700	Small farmers associations	1,600
Output 1.2: Adaptation measures adopted to foster the resilience of coffee, cocoa and basic grain production systems	Activity 1.2.1 Fund the implementation of the adaptation practices and gender-sensitive technology packages for staple crops, coffee and cocoa in 6,195 family farms	Preventive maintenance	Small farmers **	314,776	Small farmers	314,776
Output 1.3: Promotion of the resilience of livelihoods through productive diversification and market access	Activity 1.3.1 Promote diversification of productive units in home gardens for 3,300 farm families and install 370 greenhouses micro-tunnel facilities for vegetables and poultry	Preventive maintenance	Small farmers **	3,245,760	Small farmers	3,245,760
		Corrective maintenance	Small farmers **	771,429	Small farmers	771,429
Output 2.3: Local water collection and irrigation farm systems implemented to secure water supply for resilient livelihoods	Activity 2.3.2 Install farm-level drip irrigation system for using harvested water on 250 ha of farm land	Preventive maintenance	Small farmers **	1,229,455	Small farmers	1,229,455
		Corrective maintenance	Small farmers **	192,857	Small farmers	192,857
Operation of the project and implementation of actions in the field	Operation of the project and implementation of actions in the field	Operating costs (operational centers)	GCF	382,628	FAO	
		Maintenance of vehicles O&M (Including insurance, gasoline, O&M)	GCF	163,636	MAGA	112,208
			KOICA	191,345	Small farmers associations	112,207
Total				6,495,670		5,984,616

* Preventive and corrective maintenance activities are described in Figure 2.

** The rationale behind promoting that smallholders farmers pay for O&M costs of the equipment and productive infrastructure is to ensure the appropriation of climate-resilient practices and the sustainability of the project since its inception. In Guatemala, this approach was used by the project “Reducción de Vulnerabilidades para Contribuir al Desarrollo Rural en cinco Municipios de las Cuencas de los Ríos Coatán y Alto Suchiate en el Departamento de San Marcos” implemented from 2010 to 2014. Lessons learned from this project have been incorporated in two on-going projects: “Prácticas resilientes and Mesoamerica sin hambre”. In these two projects, smallholder farmers were provided with macro-tunnels facilities and rainwater collection bins for drip irrigation. The initiatives started in 2015, and since then, the small farmers have been paying for preventive and corrective maintenance of the infrastructure and equipment. RELIVE draws on lessons learned from these projects aiming to replicate sustainability aspects that are at the same time accompanied by extension and capacity building activities (workshops and trainings) to strengthen local technical capacities and allow producers to be able to operate and maintain the equipment not only during the life of the project but also after the project finishes.

O&M costs during project implementation will be shared by the GCF as well as KOICA, and the small farmers and will be incurred mainly for beginning the 3th year of the project (further details are presented on Table 2).

Section 1: O&M Costs During the 7-year project implementation period

Table 2: O&M for each type of equipment during the 7-year project implementation period

O&M of the equipment purchased during the project and in the post project implementation	O&M activities	Entities responsible for carrying out the O&M activities
Hydro-meteorological monitoring equipment (Activity 1.1.2)	Preventive maintenance: cleaning, wiring check, overall supervision Corrective maintenance: sensor calibration, repairing of wires, battery, power source and sensors	FAO – INSIVUMEH
Virtual platforms and servers (Activity 1.1.3)	Preventive maintenance of servers and operating systems: cleaning, computer equipment review, operation monitoring, system update, security update, backups. Corrective maintenance: sensor calibration, wiring repairation.	FAO-MAGA
Macro-tunnels Activity (1.3.1)	Preventive maintenance: cleaning and revision Corrective maintenance: change antivirus mesh	Small farmers
Coffee pulping machines (Activity 1.2.1)	Preventive maintenance: cleaning, oil change and greasing	Small farmers
Coffee dryers (Activity 1.2.1)	Preventive maintenance: changing nylon, cleaning, cleaning cocoa fermenter)	Small farmers
Cocoa dryer (Activity 1.2.1)	Preventive maintenance: cleaning	Small farmers
Cocoa fermenter (Activity 1.2.2)	Preventive maintenance: cleaning	Small farmers
Drip irrigation system (Activity 2.3.2)	Preventive maintenance: cleaning, supervision of pipes, collection structures and water storage tanks) Corrective maintenance: filter change	Small farmers
Operation of the project and implementation of actions in the field	Preventive maintenance: Operating costs (operational centers) and Vehicles O&M (Including insurance, maintenance)	FAO

Section 2: O&M Costs for the post-project period

The project is designed to guarantee the operation and maintenance of the project outputs. Post-project O&M will be ensured for the next eight years, with funds from MAGA, Small farmers, and Small farmers associations (further details are presented on Table 3)

Table 3: O&M for each type of equipment after projects lifespan.

O&M of the equipment purchased during the project and in the post project implementation	O&M activities	Entities responsible for carrying out the O&M activities
Hydro-meteorological monitoring equipment (Activity 1.1.2)	Preventive maintenance: cleaning, wiring check, overall supervision Corrective maintenance: sensor calibration, repairing of wires, battery, power source and sensors	Small farmers associations
Virtual platforms and servers (Activity 1.1.3)	Preventive maintenance of servers and operating systems: cleaning, computer equipment review, operation monitoring, system update, security update, backups. Corrective maintenance: sensor calibration, wiring reparation.	Small farmers associations
Macro-tunnels Activity (1.3.1)	Preventive maintenance: cleaning and revision Corrective maintenance: change antivirus mesh	Small farmers
Coffee pulping machines (Activity 1.2.1)	Preventive maintenance: cleaning, oil change and greasing	Small farmers
Coffee dryers (Activity 1.2.1)	Preventive maintenance: changing nylon, cleaning, cleaning cocoa fermenter)	Small farmers
Cocoa dryer (Activity 1.2.1)	Preventive maintenance: cleaning	Small farmers
Cocoa fermenter (Activity 1.2.2)	Preventive maintenance: cleaning	Small farmers
Drip irrigation system (Activity 2.3.2)	Preventive maintenance: cleaning, supervision of pipes, collection structures and water storage tanks) Corrective maintenance: filter change	Small farmers
Operation of the project and implementation of actions in the field	Preventive maintenance: Oil and filters change, brake check and adjustment.	MAGA Small farmers associations

Institutional arrangements for watershed management

The most important policies and guidelines for watershed management includes the Forestry Law, the Municipal Code, the Law of protection and improvement of the environment, and the Ministry of Environment and Natural Resources (MARN) Ministerial Agreement 335-2016 (Rules to Promote Integrated Watershed Management through the Creation and Operation of the Inventory of Users of Water Resources in the Watersheds of the Republic of Guatemala) and the Ministerial Agreement 252-18 (Reforms to Ministerial Agreement 335-2016).

Given the importance of the Ministerial Agreement 335-2016 and Ministerial Agreement 252-18, RELIEVE will use the institutional arrangements proposed in this political framework. The stakeholders considered in this framework are:

Technical advisory committee: is in charge of providing technical and scientific support to individuals and legal entities, public or private, who voluntarily participate in the evaluation, control, and monitoring of integrated watershed management.

Basin coordinating board: this is the coordinating and executing body responsible for proposing, promoting evaluating, controlling, and monitoring the activities and projects deemed necessary in the integrated management of the basin.

Users Committee, or Basin Association: it comprised of all users of the water of each basin.

User, users of the water: they are individual or legal persons, public or private, that use the water of the basin.

The roles of each of these actors and the way they will be integrated are described below:

Technical Advisory Committee.

Functions:

- Attend the calls made by the Basin coordinating board.
- Develop the activities assigned to the members of the Technical Advisory Committee.
- Prepare technical reports of the results obtained from the assigned activities.
- Carry out training activities for water users on issues related to water resource management.
- Perform periodic studies on flows to maintain updated records in the rainy and the dry season.
- Develop minimum flow studies for each river basin to preserve the ecological values in the river.

How it will be integrated:

- A representative of the Department of Water Resources and Basins of MARN, who will coordinate the Technical Advisory Committee.

- A representative of the Department of Environmental Management and Natural Resources of MARN.
- A representative of the Seismology, Volcanology, Meteorology and Hydrology Institute (INSIVUMEH)
- A representative of the Ministry of Agriculture, Livestock, and Food (MAGA).
- A representative of the National Coordinator for Disaster Reduction (CONRED).
- A representative of research and Study Centers related to water resources.
- Any other experts or specialist entities, which are required for specific topics.

Basin coordinating board:

There will be a Basin Coordinating Board for each of the 14 basins in which the project will work.

Functions:

- Keep updated the Inventory of Users of the Water within the basin;
 - Promote the voluntary participation of stakeholders interested in the sustainable management of watersheds.
 - Promote and execute plans, programs, and projects aimed at integrated basin management and sustainable water management.
 - Ensure strict compliance with the technical provisions proposed for watershed management.
 - Formulate and execute the Work Plan of the Board.
 - Participate in fundraising efforts that contribute to the integrated basin management.
 - Request scientific and technical information from the members of the Technical Advisory Committee and evaluate the data generated.

How it will be integrated:

- The Minister of Environment and Natural Resources, or the person appointed by him, will chair the meeting.
- A representative of the Unit of Basins and Strategic Programs of MARN, who will act as secretary.
- A representative of the Unit of Environmental Management and Natural Resources of MARN.
- Representative of the departmental government that has more municipalities in the basin.
- Mayors of the municipalities that are in the basin.
- A representative of the Office of the Human Rights Prosecutor.
- Representatives of community organizations and representatives of the productive sectors.

Users Committee or Basin Association:

Water users or representatives of water user groups will integrate this group. They will designate a directive board that will coordinate the committee or association of each of the 14 basins in which RELIVE will work.

This directive board will be democratically elected by water users (except the president who will be the mayor or a representative of the mayors of the municipalities of the basin). The directive board will be in charge of promoting and facilitating the strengthening of the basin committee and the activities aimed at the sustainable management of the basin, as well as supporting the integration of the stakeholders interested in this topic. The directive board will be integrated as follows:

- Chairman
- Vice chairman
- Treasurer
- Secretary
- Officer I
- Officer II
- Officer III

Once the directive board is established, it will develop the internal regulations for its operation, as well as a work plan (which must be updated periodically), and the annual operating plans.