



Mid-term evaluation

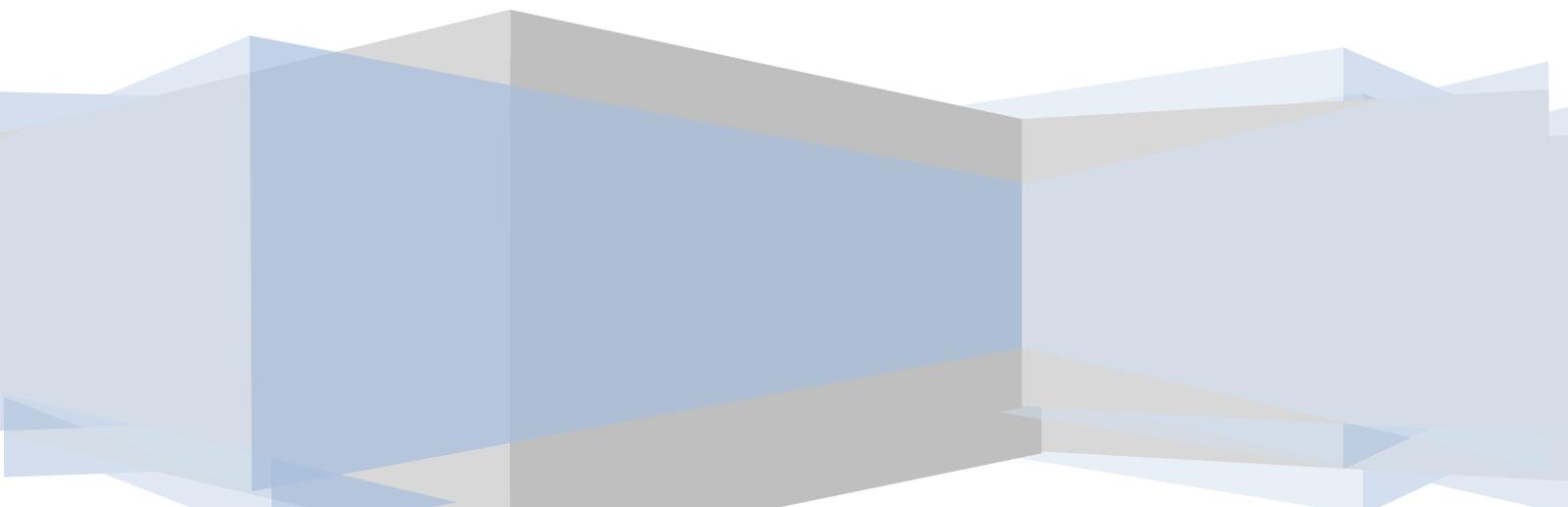
“Community empowerment for efficient production, use and access of renewable and sustainable energy in rural areas in Malawi”

FED 2011/266-54

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Foreword

The present mission report represents the second study delivered as part of the consultancy study that Fondazione Politecnico, supported by the Department of Energy of Politecnico di Milano and the UNESCO Chair in Energy for Sustainable Development, is carrying out in the framework of the EU funded Energy Facility project 'Community empowerment for efficient production, use and access of renewable and sustainable energy in rural areas in Malawi' FED 2011/266-546, under implementation by the Italian NGO COOPI. In order to perform this study, a second mission in the target areas of Malawi has been accomplished.



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1. Objectives of the mission

The main objective of the second mission has been to perform the mid-term evaluation of the project, as part of the activity of Lot 1. Based on the Monitoring and Evaluation (M&E) methodology structured at the beginning of the activities and after the Baseline Evaluation (June 2012), this mission aimed to measure and analyze the outcomes after 2 years of project, in terms of performed activities and achieved results.

Specifically, the mission has aimed to:

- Compare the current situation with the one recorded during the Baseline Evaluation;
- Check the status of the performed activities and implemented technologies with respect to the project Logical Framework Matrix (LFM);
- Measure and assess already established project indicators within the M&E methodology;
- Perform meeting with local staff and interviews with recipients in order to better interpret the achieved results;
- Re-adapt the M&E methodology and revise indicators in light of the new needs and relevant issues.

All these objectives have been reached during the mission and are analyzed and explained below. In addition to this activity envisaged by the Lot 1, the mission has also been functional to set the other two planned studies: an Ecological study (Lot 2) and a Financial study / viability (Lot 3).

2. Performed Activities

The second mission has been carried out from 15th to 23rd November 2014 and it has been supported by the local COOPI staff. It has been conducted through several visits, meetings and interviews in the COOPI project field office, based in Kasungu, and target intervention areas within the Kasungu District. Project documents, such as the Baseline Evaluation, had been previously analyzed in preparation to the mission and have been furthermore studied in the light of the mission activities. All the collected information and data related to project recipients have been gathered by means of interviews, mainly plenary meetings with the committees (village natural resources committees, schools, agricultural association, etc.) or beneficiaries groups and village representatives. Some of these groups had been already met and interviewed during the first mission (July 2012), allowing in this way to compare the baseline situation (July 2012) with the current one (November 2014).

Table 1 summarizes the accomplished meetings (interviewed category, meeting date, location and baseline situation to compare):

Table 1 - Meetings accomplished during the mission

Category	Meeting date	Location [District, Village]	Baseline situation
VNRC and village households	17/11/2014	Kasungu, <i>Mphampha</i>	
	18/11/2014	Kasungu, <i>Malanda</i>	
	20/11/2014	Kasungu, <i>Kamzati</i>	
	20/11/2014	Kasungu, <i>Phoka</i>	x
Agricultural committees	19/11/2014	Kasungu, <i>Chamkango</i>	
	19/11/2014	Kasungu, <i>Chioza</i>	
ESS makers	18/11/2014	Kasungu, <i>Demela</i>	
	19/11/2014	Kasungu, <i>Chamkango</i>	x
Primary schools	18/11/2014	Kasungu, <i>Demela</i>	x
Total	9		



Following the methods of interviews performed during the Baseline Evaluation, also these meetings have been structured with a participatory discussion by addressing four main topics, each of them properly diversified as for the specific beneficiaries and project interventions:

- **Basic information**, including context features, main local activities, recipients' needs and considerations on the original situation before the project;
- **Project implementation**, with data regarding the performed interventions, project results, implemented technologies, new created businesses, energy-related information such as energy uses, energy needs in terms of sources, quantities and expenditures, etc.;
- **Project Impact**, with first consideration on the extent the project has improved people livelihoods, beyond the specific objectives and dimensions of the project;
- **Opportunities and remarks**, including ideas from beneficiaries related to the forthcoming increase in access to energy, possible project improvements, and proposals for the future concerning how will be managed the new available electricity and how will be shared the new income among the committee members.

Hereafter a summary with the main information and target beneficiaries' characteristics collected during the interviews of the mid-term evaluation is proposed.

2.1. Village Natural Resources Committees (VNRC) and village households

VNRCs activities aim to conserve and manage natural heritage, in particular national forests/parks. These committees, made up of village people that receive indications from Department of Natural Parks and Wildlife, also support all those activities which prevent over exploitation of local resources, trying to provide alternatives to local people (forest maintenance, community and/or HHs nursery trees for firewood production, timber production, bee breeding, etc.). VNRC committee members are elected among the village community each 2.5 years with no limits of mandate. Usually there are 12 members.

Mphampha VNRC

(Interviewed 7 people, 4 males and 2 females)

Basic information

50 of the 511 households in the village are involved in the project. The village performs agriculture as main activity.

Project implementation

Training was provided by technical experts to 10 committee members (5 male and 5 female). The committee is in charge to manage the electricity supply, taking also care of the cleaning of the panels. A guardian is also hired to watch over the provided PV system (Figure 1).

50 ESSs have been distributed by COOPI, one to each household. Torches have been also distributed and are currently used for around 20 hours per week for studying and lighting.

Electricity supplies different buildings, for lighting purposes and for business activities. Businesses currently running in the village are: barber shop, TV showroom, phone charging.

The VRNC is also performing the forestation activity with 15000 planted trees per year.

Project impact



The project has brought improvements in the livelihood of the village, especially to women and children. Women have experienced a reduction in the firewood collection time and reduction in the wood consumption and costs, with an induced situation of higher safety and increase availability in the agriculture activities. On the other hand, children have improved their studying performances, thanks to the increase of hours of study.

Opportunities and remarks

The committee is well aware of the necessity to continue the activity beyond the project timeframe and avoid any stop to the action. At the same time people, acknowledging the value and opportunities brought by the electricity, are requesting more power to the PV system.



Figure 1 - PV panels installed within the Mphampha village

Malanda VNRC

(Interviewed 6 people, 3 males and 3 females)

Basic information

Before the project implementation, no real business was present. People used to do farming, burning wood to produce charcoal or hunting animals in the park, despite it is forbidden by the law.

Project implementation

Training was provided to the committee members (4 males and 6 females) and was about the installation, management and use of the PV system. The committee is in charge to manage the electricity supply, taking also care of the cleaning of the panels. A guardian is also hired to watch over the PV system.

25 ESSs have been distributed by COOPI. Torches have been also distributed and are currently used for studying and lighting in the night time.

Electricity supplies 12 users, for lighting purposes in 9 households and for business activities in 3 households. Businesses currently running in the village are: barber shop, TV showroom (Figure 2) and a small bottle store.



The VRNC is also performing the forestation activity with 23000 planted trees in total (20000 until 2013 and 3000 in 2014).

Project impact

The committee acknowledges the improvement that electricity has brought in the life of the village, providing more economic means, more time available for studying, and creating a social market that has led the people from other villages to come. Women have also experienced an improvement in the indoor quality of the air, with a reduction of the smoke during cooking activity, and a reduction in the consumption and collection time of wood. Moreover, by means of solar torches, it is possible to save money before used to buy batteries.

Opportunities and remarks

The committee would like to have more power available, in order to propose new business and activities and increase committee incomes.

Trainings on agriculture and on maintenance of PV panels are also requested.



Figure 2 - TV showroom within the Malanda village

Kamzati VNRC

(Interviewed 7 males and 4 females)

Basic information

Before the project implementation, people used to do agriculture, firewood collection, burning wood to produce charcoal or hunting animals in the park.

Project implementation

The committee (Figure 3), which was already established for protecting the national park, is composed by 6 males and 4 females. It received an initial training on reforestation and forest protection.

29 ESSs have been distributed by COOPI and training on how to use them was done; however, 7 of these are currently damaged. Torches have been also distributed and are currently used for studying and lighting in the night time.



Electricity supplies different buildings for business activities. Businesses currently running in the village are: barber shop, TV, radio, phone charging, bottle store.

The VRNC is also performing the forestation activity with 5000 planted trees.

Project impact

The project has brought improvements in the livelihood of the village. Women have experienced a reduction in the firewood collection time and reduction in the wood consumption, with an induced situation of higher safety and an improved quality of indoor air. Children have improved their studying performances, thanks to the increase of hours of study. The project has also allowed reducing the distance to charge mobile or batteries, and saving money for the batteries thanks to the solar torches. Business has also brought more sociality to the village.

Opportunities and remarks

The committee has expressed the request to have a technical training on the maintenance of PV panels, more electric power available, as well as more solar torches. It recognizes the importance to continue after the project end, highlighting the challenges to face in the maintenance of the plant and stoves, and in the decision process mainly for the incomes management (admitting possible conflicts).



Figure 3 - Meeting with committee of the Kamzati village

Phoka VNRC

(Interviewed 4 males and 4 females)

Basic information

The agriculture has been the main activity of the village, with cultivation of tobacco, maize, beans and nuts. People were also used to go to the national park for firewood collection.

Project implementation



The committee is composed by 10 members (5 males and 5 females), whose principal tasks are the management of the plant (2 members are responsible for the panel cleaning and 1 for special maintenance), incomes and reforestation.

33s ESS have been distributed by COOPI and no one is currently damaged. Torches have been also distributed and are currently used for studying and lighting in the night time.

The PV system supplies different buildings for lighting and for business activities. Businesses currently running in the village are: barber shop, phone charging and TV showroom.

The VRNC is also performing the forestation activity with 4000 planted trees (Figure 4).

Project impact

Electricity has brought an overall improvement to the village, with the creation local-scale business, a higher availability of night time for studying and new entertainment.

Agriculture productivity has increased, with higher revenues from the tobacco selling.

Women have experienced a reduction in the consumption and expenses for wood, in the indoor smoke and in the time necessary for the wood collection. They can also save time useful for agriculture and family.

Opportunities and remarks

The committee has expressed the request to have more electric power available and more solar torches. It also remarks the interest to continue the activities after the project end; however, challenge in maintenance and costs of batteries may represent an issue, as well as possible conflicts for the future management of the plant.



Figure 4 - New trees cultivation within the Phoka village



2.2. Agricultural committees

Agricultural committees consist in farmers groups to which new solar energy (from PV panels) has been provided in order to increase their agricultural productivity and irrigation land, as well as to create new local businesses.

Chamkango agricultural committee

(Interviewed 8 males and 6 females)

Basic information

Before the project implementation, agriculture was the unique activity, whose products (mainly vegetables, onions and tomatoes) were consumed and sold in the nearby villages (10000 persons living nearby). Women usually walked 15 km to take water for irrigation of the fields.

Project implementation

The committee established with the project has three main tasks: irrigation of the fields, reforestation and construction and maintenance of the irrigation system. It manages also the new created businesses, whose revenues are also used for the maintenance of panels and irrigation system.

2 PV panels have been installed, both for new business and irrigation. In addition to these, the irrigation system also includes a tanks and a pump (inside the water) supplied with solar energy (Figure 5).

The available electricity is used for new businesses, among which a barber shop, tearoom, TV showroom, grocery and mobile charging, while it is not used for the households lighting.

Project impact

Thanks to the new irrigation system, the agriculture productivity has increased, allowing cultivating and irrigating 2.5 hectares more of fields and introducing a new product into the cultivation (soy beans). Moreover, 7 new farmers have found employment in these fields.

New businesses have allowed the creation of a social market close to the irrigation system, to which people come from nearby villages.

A very positive impact has been detected for women and children since they do not have to walk long distances for the water provision. For the same reason, a greater safety is felt among villagers.

Opportunities and remarks

The project has been very useful to improve livelihoods of people living nearby the irrigation system. The committee members have expressed the request to increase the power installed in order to satisfy the increased electricity demand from businesses, to better manage the irrigation system and to solve power failure. Moreover, through additional future incomes and electricity, they would like to buy a welder, a grooving machine, a hair machine for the barbershop and a refrigerator for the bottle shop. In addition, people would like to use electricity for the households lighting in future.



Figure 5 - PV panels and water tank in the Chamkango irrigation site

Chioza agricultural committee

(Interviewed 7 males and 1 females)

Basic information

Before the project implementation no other activities, except agriculture, were present. The demand of agriculture products was very high, mainly for vegetables and crops (Figure 6).

Project implementation

The committee members (5 males and 5 females) have been trained to manage the new irrigation system from technical and economical viewpoints.

The irrigation system (solar pump outside the water and a water tank) has been provided and 4 PV panels of 200 MW have been installed, two used to feed the irrigation pumps and two to provide electricity to business activities.

New created businesses are a barbershop, TV showroom, bottle shop and mobile charging. Electricity is used also to provide light to the new businesses. Business fees paid to the committee are used for the irrigation system and PV panel maintenance.

Project impact

The project has brought a positive contribution to people livelihoods in general. With the new irrigation system, an improvement in agriculture activity has been detected, more in the products selling and market (+30%) than the productivity itself (+ 1 hectare irrigated). Committee' members have expressed their difficulty to increase irrigated areas, since during cloudy days they are forced to use traditional irrigation methods. Employed farmers have increased from 63 to 86.

Opportunities and remarks



Until now, farmers had some failure problems on panels and batteries.

Since the demand is very high, committee members have expressed their desire to increase the installed capacity, in order to improve agricultural productivity. Moreover, they would like to have had more technical trainings about irrigation system, not only on basics issues.



Figure 6 - Chioza irrigation fields

2.3. Energy Saving Stoves (ESS) makers

ESSs makers are selected villagers groups that have been trained on the stoves production and they currently produce new stoves within new local businesses for the stoves selling.

Demela EES makers

(Interviewed 1 male and 2 females)

Basic information

Before the project implementation, agriculture (for the own consumption and for limited income) was the main activities. People of the village were not aware of the ESSs before the project start.

Project implementation

The project has provided to 5 persons, chosen in a group of 10, a technical training about the production, utilization and dissemination of the potentiality of ESSs. Subsequently, they have in turn trained other 5 persons. Currently, the stove production involves 3 persons, (1 male and 2 females in Figure 7) and, with a production of about 100-150 ESSs per month, is the main activity, with a work time of 6-7 hours per day.



Until now, this production group has sold 1540 ESSs, of which 800 sold to COOPI for its stove distribution activities and the others to privates. In the production process, they have estimated that about the 5% of stoves get broken.

Within the village a new stove has been distributed to each household, used to cook in the morning and usually placed outside the home to avoid indoor smoke.

Project impact

The stove production and selling activities have allowed group members to have more money to buy soap and fertilizers or pay school fees and uniforms for children.

The stoves distribution and utilization have had a great impact on the way people live and cook in the village. Indoor air pollution has been reduced, as well as firewood consumption to cook: while before 1 bundle of firewood was sufficient for two days, now the same quantity allows to cook for 1 month. Cooking time and firewood collection time are also reduced, so that both women and children can use this saved time for other activities such as studying or working in the fields (Figure 8).

Opportunities and remarks

This new activity has raised a big interest in the village itself and in villages nearby, since many people would like to participate to the production group or to get into the businesses. Kids are also curious and help adults in the stove production.

Group members have recommended to include in the training contents also modalities and foods with the new stoves. Moreover, despite they have highlighted that the stove production is an expensive business (particularly for the clay provision and transport) and some problems arise regarding the night production, they would like to expand the production.



Figure 7 - Demela group members engaged in the stoves production



Figure 8 - Cooking activity in Demela village

Chamkango EES makers

(Interviewed 4 females)

Basic information

The group members had a previous experience with stoves (the fixed type stoves), since many women of the village had already worked with clay. Agriculture was the main activity in this village.

Project implementation

Ten people (7 females and 3 males) have been trained for the ESS production (the mobile type stoves), utilization and dissemination of good practices about stoves. However, currently only 4 women are in charge of the stove production, with a result of about 300 ESSs per month (Figure 9). They usually work from 7 am to 4 pm, or they finish at 12am and go to the field.

From the beginning of the project about 2000 ESSs have been sold, of which 1600 to COOPI for its stove distribution activities and the others to privates. In the production process, they have estimated that about the 5% of stoves are broken. About 2% of the ESSs are damaged during the production (the main reasons are over heating/baking or stoves that are not dried enough due to wet weather).

Concerning the stove utilization, stoves have been distributed to each household of the village.

Project impact

The incomes from the stove selling activities have allowed group members to buy soap, to pay school fees or to buy books for pupils.

The utilization of the stoves has entailed a cleaner indoor air. Moreover, a reduction in the firewood consumption has been detected, since the quantity of wood needed for 2 days is now sufficient for 7 days.

Women and children have saved time for the firewood collection: while before the project they walked up to 5 km per day, now they have to spend much less time. In general women have shown a positive response to the stoves, also thanks to the reduction in the cooking time.

Opportunities and remarks

The main challenge for the group members when the project will end concerns the stoves marketing and selling, without the further support of COOPI. Moreover, they would like to find a place in which sell the stoves.

Concerning the ESSs production, group members have highlighted that the main expenditures are related to the clay transport, materials and firewood for baking the stoves.



Figure 9 - Chamkango stove production groups



2.4. Primary schools

The project aims to provide an adequate electricity service to primary schools thanks to new PV panels, as well as supporting IT teaching and laboratory activities.

Demela primary school

(Interviewed 3 teachers)

Basic information:

In the school 734 pupils are present (400 males and 334 females), divided into 8 classes. Pupils come from maximum 5 km; adult classes are also present. 10 teachers work in this school and 13 computers are available.

Project implementation

The project has trained 4 teachers for the PC uses, which are used in IT lessons for 3 days per week.

The installation of PV panels has provided electricity for lighting, PCs and mobile charging within the school (Figure 10). The PV systems also provide electricity to 5 close houses. Concerning the maintenance, teachers have cleaned PV panels and are in charge of controlling the system; COOPI has substituted batteries.

Moreover, 5000 new trees have been planted and other additional activities have been performed in the school garden, such as the cultivation of soya beans and other products to sell, and a video show.

Project impact

Since the project has begun, the school performances of pupils are improved, from 52% to 72% of passed exams. Moreover, students are attracted by PC learning and they have increased studying time.

Through the new activities and the mobile charging, the school has currently an additional income to the one that comes from the government.

Opportunities and remarks

The teachers have expressed the request to have more batteries to storage electricity since they have had some problems related to blackouts. They also would like to have a specific room for computers and internet connection. Moreover, other teachers would like to be trained for the PC uses (Figure 11).

In the future, they are willing to plant 600 new trees at least.



Figure 10 - Demela primary school and PV panels on the roof



Figure 11 - Meeting with the teachers in the computer room of the Demela primary school

3. Logical Framework Matrix – update

Based on the baseline and mid-term missions, the original logical framework matrix has been revised, highlighting the results reached so far, listing data assessed during the last visit and verifying which activities have been completed according to the proposal planning.

The definitive and complete evaluation will be available with the ongoing collection of data and the implementation of the M&E model.



Expected result 1

Intervention logic	Objectively verifiable indicators of achievement
9000 people will reduce by at least 40% wood consumption through the use of efficient energy saving stoves for cooking and will produce less smoke, in Kasungu and Likoma Island.	number of new and increased proportion households using improved cooking facilities (efficient energy saving / less smoke emission stoves).

Baseline evaluation (from previous report)

ESSs are quite known at local level due to previous GoM and NGOs projects, but currently a small percentage (<5%) of HHs have and use ESSs.

Mid-term evaluation

Private local groups are continuing the production activity, despite the members' number has slightly decreased since the beginning of the activity. The diffusion and selling of the ESSs has proceeded, due to an increased interest and acknowledge of the population on this cooking technology.

Assessed data:

- Demela – 1540 sold stoves;
- Chamkango – 2000 sold stoves.

Activity	Years				Note
	1	2	3	4	
Activity 1.1 Community sensitization about renewable energy sources and energy saving stoves.					Activity carried out with visits, orientation and monthly meetings
Activity 1.2 Training of at least 3-4 private local groups on energy saving stove making and provision of starting up inputs					Training initially provided to 3 groups and then to other 3 groups
Activity 1.3 Competition for the best construction of energy saving stoves at community level					Activity done at the beginning of the project
Activity 1.4 Distribution of the energy saving stoves					Stoves have been distributed in Kasungu District and Likoma Island



Expected result 2

Intervention logic	Objectively verifiable indicators of achievement
Six communities in Kasungu District will use solar energy (non grid electricity) to increase by at least 60% productivity, income and work efficiency to irrigate at least 24 new hectares around six existing dams.	1) number of beneficiaries (between 700 -900 HH) accessing to non- grid electricity for irrigation activities (baseline= none) 2) number of installed capacity/ies installed (6+3 water towers with solar panels operated pumps + pipes) by the project (baseline=0). 3) number of new acres of land irrigated - >baseline=12, target=36

Baseline evaluation (from previous report)

- 1) No farmers have currently access to power supply systems for irrigation activities
- 2) No water towers are currently installed in the target areas

Mid-term evaluation

6 communities have had access to distributed generation of electricity for agriculture activities: 6 water towers have been installed, leading to new area of cultivated land (although 24 acres have not been reached yet) and an improvement in the livelihoods.

Assessed data:

- Chamkango – increase of 10 acres
- Chioza – increase of 4 acres

Activity	Years				Note
	1	2	3	4	
Activity 2.1 Training of 6 irrigation committees on basic financial accountancy					Training provided in August 2013, after the installation of the systems
Activity 2.2 Signing of an MOU with between the 6 irrigation committees, the bank and a private company for the installation and maintenance of the water tower with solar panels operated pumps					MoU have been signed between irrigation committees and COOPI
Activity 2.3 Establishment of 6 water towers with solar panels operated pumps + pipes					After some delays caused by one contractor, the 6 systems are currently installed and operating



<p>Activity 2.4 Monitoring the generated income increase of the 6 committees to be used for maintenance and purchase of other units.</p>					<p>Bank accounts have been opened and a continuous monitoring is being carried out by COOPI and MALEZA</p>
<p>Activity 2.5 Establishment of 3 more water towers with solar panels operated pumps + pipes, purchased with the revolved funds from the first 6 area</p>					<p>Activity not performed yet</p>

Expected result 3

Intervention logic	Objectively verifiable indicators of achievement
<p>1000 households (approximately 5500 people) living around the buffer zone of the protected area of Kasungu National Park, will generate sustainable and renewable energy at local level integrating solar, bio mass and bio fuel energy to grant the management of at least 5 motorized mills, 20 new small local businesses; reading lights for 1000 households.</p>	<p>1) Number of motorized mills in rural community center (hybrid engines: solar + locally made bio-fuel and or diesel) (from current 0 to min. 5) 2) Creation of at least 20 new small enterprises / businesses using in the source of energy (solar) provided by the project to target groups. 3) Number of HH with access to reading light in at least one room for >4 hours per day (max 75kWh/year/HH) - (currently less than 30- target 1000).</p>

Baseline evaluation (from previous report)

- 1) Motorized mills are not available in community centers;
- 2) No solar power is available for any income activities in the target areas and none VNRC has connections to power supply systems;
- 3) Light appliances (candles, paraffin lamps and electric portable torches) are available and quite common at rural HHs level. Only electric portable torches can be considered as reading lights. Nevertheless direct and indirect costs and reliability surely do not allow to have >4 hours light per day.

Mid-term evaluation

The installation of the mills has not taken place and the related activities have been cancelled, since they were not addressing properly the needs and interest of the beneficiaries.

The visited villages have shown a positive response of the target groups, which have created different types of business by the use of the electric energy.

Solar torches have been distributed and are currently running, allowing the people to use them in the night, mainly to studying.

Assessed data:

- Mphampha – 3 new business established (barber shop, TV showroom, phone charging)
- Malanda – 3 new business established (barber shop, small bottle store, TV showroom)
- Kamzati – 4 new business established (barber shop, TV, grocery with radio, phone charging, bottle store)



- Phoka – 3 new business established (barber shop, phone charging, TV showroom)

Activity	Years				Note
	1	2	3	4	
Activity 3.1 Capacity building for 10 DNPW staff and 20 NRCS for the development of a clear "forest co-management scheme"					Capacity building activity was carried out, sensitizing communities on environmental practices
Activity 3.2 Identification of 20 small business entrepreneurs					Entrepreneurs have been identified by the Natural Resource Committees
Activity 3.3 Provision of 20 large solar panels (up to 300 kWh/year) to 20 villages and 5 engines (1500 Wh) for maize and other crop products mills and 2 manual presses.					All 20 panel system have been installed and are running, while the installation of the mills has not taken place and the related activities have been cancelled
Activity 3.4 Capacity building to 20 village Natural Resource Committees (NRC) and at least 20 local entrepreneurs about use and maintenance of the 20 solar panels					Trainings provided on the operation and maintenance of the systems
Activity 3.5 Opening specific community (NRC) owned bank accounts and establishment of the energy services.					Bank accounts have been opened
Activity 3.6 Provision of 1000 solar panels as incentive for trees planting activities (reforestation of the buffer zone and surrounding areas)					2600 solar kits have been distributed
Activity 3.7 Monitoring the generated income increase of the NRCs to be used for maintenance.					Monitoring is being carried out
Activity 3.8 Pilot project <i>Jatropha curcas</i> in Kasungu: provision of inputs and training in one village about planting and use of <i>Jatropha curcas</i>					Activity not performed



Expected result 4

Intervention logic	Objectively verifiable indicators of achievement
808 households, 5 new small businesses and 1 electric water pump in a remote rural area of Likoma Island will access to electricity, generated mainly by solar panels and wind power and partially (pilot) locally produced bio fuel, as part of eco system management in a tourist area.	1) number of HH with access to reading light in at least one room for >4 hours per day (max 75kWh/year/HH) - (currently 0- target 300) 2) one existing tourism cooperative (15 small enterprises) + 5 new small businesses enterprises created, are using the source of energy (wind/solar/ bio fuel locally made) provided by the project to target groups (currently no power) 3) one electric water pump (hybrid solar + wind mill) in a community center (current 0). 4) At least extra 10347 kWh/year locally generated by solar / wind (complementing the current unique diesel engine generator of ESCOM on the island) and increased number of hours of light per person per year (to the 508 HH connected to local grid).

Baseline evaluation (from previous report)

1. When within target beneficiaries are not considered those who have access to Likoma electric grid (which supplied electricity till 10pm), it occurs that light appliances (candles, paraffin lamps and electric portable torches) are available and quite common at rural HHs level. Only electric portable torches can be considered as reading lights. Nevertheless direct and indirect costs and reliability surely do not allow to have >4 hours light per day;
2. Currently no solar power is available for any income activities on the island. LITA and VNRCs have not connections to the Likoma grid;
3. Water is provided by the island water board or by isolated hand powered boreholes.

Mid-term evaluation

The mission was not performed in the area of Likoma. Data will be collected in the final step.

Expected result 5

Intervention logic	Objectively verifiable indicators of achievement
3000 students, attending six schools in rural areas, will have adequate electricity provision (up to 2000 kWh per year) through solar energy to support lightening, IT and internet teaching and laboratory activities.	1) Schools with adequate annual electricity consumption level (6 x 2000=12000 kWh/year - baseline: none) 2) Number of people and social activities benefiting the electricity generated in the school centers.



Baseline evaluation (from previous report)

Except Likoma secondary school which is already connected to the Likoma electric grid with probably more than 2.000 kWh/year consumption (but high unreliability of the supply) all the other targeted schools (i.e. Kasungu district) do not have access to electricity.

Mid-term evaluation

The visited school has shown a positive response of the teachers with respect to the project activities. PV panels and computers have been installed and they are currently running. Electricity is then provided to light rooms or feed electronic devices. Teachers have been trained for the computers uses and currently all the classes have a PC lesson during the week.

Assessed data:

- school performances improved from 52% to 72%;

Activity	Years				Note
	1	2	3	4	
Activity 5.1 Provision to 6 schools of 6 large energy solar units (up to 2000 kWh) provided by the action and basic IT facilities (the IT facilities will be donated for free by private Italian companies)					Solar systems have been installed and are functional; IT facilities have been distributed among the schools
Activity 5.2 Orient and follow up the 6 school administrations in --> a) raising funds for maintenance services and allow communities to use IT facilities for social activities					Initiatives to raise funds have been activated
Activity 5.3 Orient and follow up the 6 school administrations in --> b) sensitization to 3000 students about renewable energy by organizing a art / graphic school competition about energy and environment					Sensitization has been given, while no competition has been carried out
Activity 5.4 Orient and follow up the 6 school administrations in --> c) plant at least 1000 x6 trees around the schools in return to the solar panels and sensitize about the energy saving stoves.					Activity is being done in 4 schools
Activity 5.5 Monitoring of the program activities					Continuous monitoring is being carried out
Activity 5.6 Baseline, mid-term and final evaluation					Baseline and mid-term evaluation missions have been done
Activity 5.7 Studies and publication					



4. Revision of the M&E methodology and indicators

In order to evaluate the impact of the implemented activities, a proper Monitoring and Evaluation (M&E) approach should assess the achievement of expected project objectives, but also monitor recipients' roles into project activities and development strategies.

In this perspective, as already started in the baseline evaluation, we now propose an Integrated M&E approach which, relying on already recognized and used frameworks, allows also to monitor people-oriented components relevant for the project success. In particular, this updated Integrated M&E (IM&E) approach aims to assess the project success as (i) *changes in state*, entailed by direct activities' results (i.e. improved access to energy) and (ii) *people's changes in behaviours* (such as effect on people assets, strategies and objectives), thus giving great importance to the recipients' roles in the project. In order to match these two viewpoints, the IM&E approach couples the Logical Framework Approach (LFA) with the Sustainable Livelihoods Framework (SLF). While the first represents a management tool to regulate the project steps (permitting to detect the *changes in state*), the latter focuses on community's livelihoods' improvements (*changes in behaviours*) the key for project success.

The LFA provides logical links between the four levels of the project *results chain* (i.e. Activities, Results, Specific Goal, Overall Objective), which help the development of the M&E indicators, and it places the project within a broader development context through the distinction between Specific Goal and Overall Objective (closer to the long-term *Impact* concept). Instead, the SLF gives special attention to the community's assets and strategies and places people at the centre of changes. Through livelihoods' changes recipients can be the key players undertaking proper strategies to reach projects objectives.

Starting from these frameworks, the proposed integrated framework delivers a tool to deeply understand the dynamics of changes, in two main ways:

- Introducing three *people-oriented Assumptions* (i.e. *Participation, Ownership and Empowerment*), which allow to highlight activities, strategies and objectives adopted by recipients in response to project activities, as shown in Figure 12;
- Introducing two main modifications to the standard Logical Framework Matrix (LFM) in order to better visualize the *people-oriented components* and to add more *people-oriented indicators* at the level of Results, Specific Goal and Overall Objective.

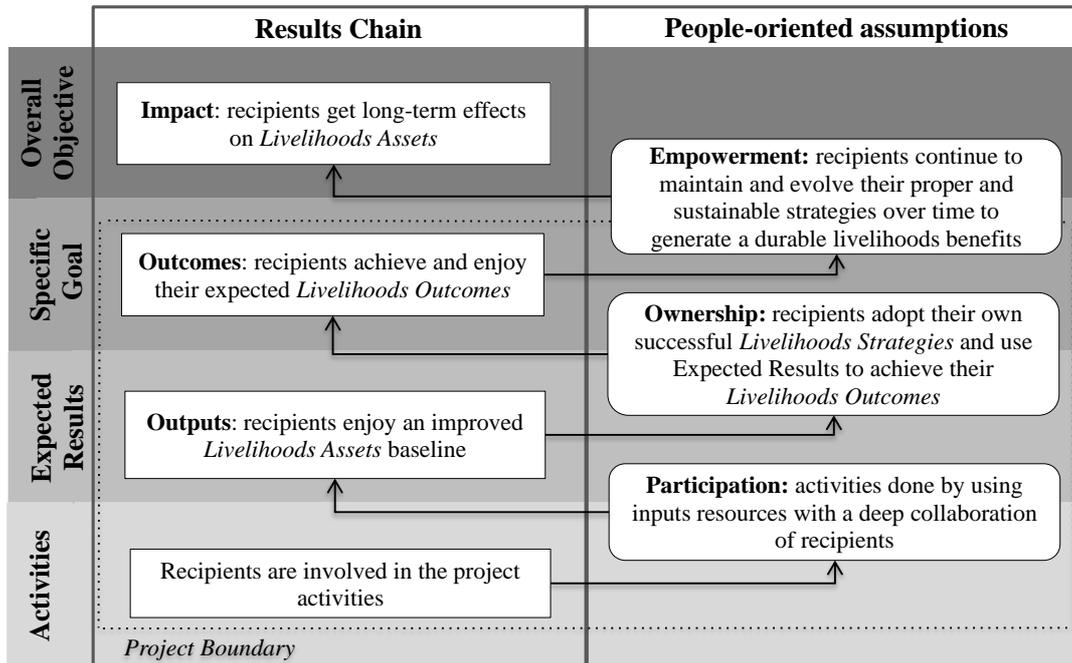


Figure 12 – The Integrated M&E framework

In line with the second point, two main modifications to the standard LFM are added:

1. Project Expected Results are restructured to better visualize the *people-oriented* components (in addition to the *project-oriented* components);
2. People-oriented indicators are therefore added at the level of Results, Specific Goal and Overall Objective.

In this way, the IM&E may provide a more explicit framework to monitor the contribution of *people-oriented* components all along the *results chain*, thus improving the LFA framework with the SLF perspective. Based on these considerations, the LFM of the project has been revised and is partly shown in the Table 2.

Table 2 - IM&E Framework - Energy Facility Malawi

Project Description	Indicators
Overall Objective To contribute to improve access to sustainable energy services in order to reduce climate change and improve the livelihood of rural communities in Malawi	Impact indicators R1_C1 - Monthly income of SMEs worker [MWK/month] Impact indicators R1_C2 - Time spent for cooking and firewood gathering per week [hh/week] Impact indicators R2_C1 - Profit per farmer per year [MWK/famer year] - N. of seasonal workers employed - Total farmer committee profits [MWK] Impact indicators R3_C1 - Quality of education is improved [annual mean score] - Skilled professors applied for positions at the school [n of qualified employees] Impact indicators R3_C1 - Infrastructure in the school are improved [N. of facilities available]
Specific Goals	



	<p>To increase access to modern, affordable and sustainable energy services for rural poor using four kinds of locally sources of renewable energy and promote efficient energy production, transformation and productive use.</p>	<p>Outcome indicators R1_C1 - Total SMEs profits (bank account monitoring) [MWK]</p> <p>Outcome indicators R1_C2 - Firewood consumption per week [bundle/week] - Expenditure for firewood per week [MWK/week] - Average exposure time to smoke per person of the household per week [hours/weep person]</p> <p>Outcome indicators R2_C1 - Cultivated area per farmer [m2 /farmer] - Production per farmer per type of cultivation [kg/year] - N. of new committee members</p> <p>Outcome indicators R2_C2 - Reduced committee member expenditure (mobile charging) [MWK/month farmer] - N. and typology of new micro businesses</p> <p>Outcome indicators R3_C1 - Hours of IT lessons per pupils [h/week pupil] - Time of lessons end [hh] - Time of free studying end [hh]</p> <p>Outcome indicators R3_C1 - School income due to micro businesses [MWK/month]</p>
Expected Results		
<p>R1</p>	<p>Component 1 (C1): 3 SMEs (20 persons involved) are available at local level and are able to provide ICSs to local Households</p> <p>Component 2 (C2): 1600 households have a ICSs and are able to use it</p>	<p>Output indicators R1_C1 - N. of privately purchased ICSs [N]; - N. of delivered ICSs by COOPI [N]</p> <p>Output indicators R1_C2 - N. of ICSs damaged/not in use [N] - N. of ICSs currently used [N]</p>
<p>R2</p>	<p>Component 1 (C1): - 6 farmer committees have technical capability to irrigate a total of 24 new ha with PV plant - 6 farmer committees have capability for economic and technical management of the irrigation system</p> <p>Component 2 (C2): - 6 farmer committees have technical capability to provide power supply for micro businesses with PV plant - 6 farmer committees have capability for economic and technical management of the power plant</p>	<p>Output indicators R2_C1 - N. of irrigation systems (pump, water tower, irrigation pipes/channels) damaged/not in use - Irrigated ha - Annual expenditure for O&M per plant [MWK/year plant]</p> <p>Output indicators R2_C2 - N. of power systems (batteries, sockets) damaged/not in use - N. of sockets in use (micro businesses) - Annual expenditure for O&M per plant [MWK/year plant]</p>
<p>R3</p>	<p>Component 1 (C1): - 6 schools have technical capability to provide power to the provided IT facilities, lights with PV plants - 6 schools are able to use IT facilities (class, social activities)</p> <p>Component 2 (C2): - 6 schools have technical capability to provide power supply for micro businesses with PV plants - 6 schools have capability for economic and technical management of the power plant</p>	<p>Output indicators R3_C1 - N. of power systems (batteries, sockets) damaged/not in use - N. of IT facilities damaged/not in use</p> <p>Output indicators R3_C2 - N. of socket in use (micro businesses) - Annual expenditure for O&M per plant [MWK/year plant]</p>

Based on the revised framework, the mid-term has been used to adjust and better define indicators and assess the right processes and dynamics to measure. Indeed, collection of data has been revised and can now proceed with an updated scheme until the end of the project.

