Malawi Renewable Energy Acceleration Programme (MREAP)

MREAP is led by the University of Strathclyde and funded by the Scottish Government. It has operated over 2012 - 2015.

Biomass Management:
Strategic Energy Project in Balaka District, Malawi
Case Study

MREAP Strand: Community Energy Development Programme (CEDP)
Produced By: Concern Universal Malawi
Received: June 2015
Abstract: This report documents the impact of the Strategic Energy Project in three result areas, namely: Promotion of energy efficient stoves to 100 new areas, enhanced biomass availability in 8 villages, and promotion of access to solar power in 5 rural primary schools.
Biomass Management Strategic Energy Project in Balaka District, Malawi

Concern Universal Malawi

Over its lifetime, this project had three result areas including: Promotion of energy efficient stoves to 100 new areas, Enhanced biomass availability in 8 villages, and Promotion of access to solar power in 5 rural primary schools. This report documents the main achievements for each result areas.

Energy Efficient Stoves

Under MREAP, the project rolled out energy efficient stoves in the Balaka District and conducted awareness meetings to promote their adoption.

The project produced and sold *Chitetezo mbaula* stove (literally meaning protective stove) through the 15 stove production groups and 33 stove promoters respectively. 550 promotional stoves were distributed to chiefs and promoters, awareness meetings were conducted in 100 new villages to promote their adoption in TA Kalembo, STA Amidu and STA Kachenga. Previous studies showed that the Chitetezo Mbaula reduces firewood consumption by 39% compared with the traditional three-stone cooking fire.

Once established, stove production and marketing to the villages under this project were able to trade without any project intervention in the stove value chain but instead driven by commercial demand and supply forces. Some promoters continued getting demand for the stoves, be it new adopters or former adopters needing additional or replacement stoves.

Adoption of the stove represents a significant reduction in women’s work burden, conflict within households, need for child labour in collecting firewood, conflict over limited resources, savings in time shifted into productive work (or leisure), and increase in community harmony. As a result it is estimated to reduce emissions by 3 tonnes of CO₂ equivalent per household using the stoves per year.

By December 2013, 8,209 stoves adopted by households in the villages of TA Kalembo, STA Amidu and STA Kachenga, against an initial overall target of 5,000.
Solar installations in rural primary schools

Under this output, the project initially aimed to use MREAP financing to install solar in Mtsimuke, Chawanda, Mthumba, Makanjila and Sawali Primary Schools. The first phase targeted the student and the teachers through classrooms and Teachers Houses.

However, the second stage of this project targeted the Community through creation of Community Power Centres (CPCs) in 5 schools. A government of Malawi approved contractor for solar installations was engaged to carry out the installations on behalf of Concern Universal (CU). The approach taken in installing the CPC was agreed with the contractor to be a phased “learning” approach where one CPC is installed and operated for a while (1 week) before the next is delivered.

CPCs of this nature were a new to Balaka and indeed have had little experience in Malawi as a whole. Hence, the intent was to observe not only user behaviour, but also system performance and end user satisfaction. These observations helped to tweak the next CPC installation accordingly, including change of next School where a CPC was to be installed. The final target schools for the 5 Community Power Centres, (CPCs) are Mtsimuke, Chawanda, Mchima, Makanjila and Mgomwa Schools. The CPCs comprise a power house which provide accessory charging, such as mobile phones, and larger battery charging, such as 12V batteries.

The project also built capacity of the Schools Management Committees (SMCs), Parent Teacher Associations (PTAs), Chiefs, and local leaders on management, security, and sustainability of solar PV systems in order to sustain the systems. Also, three local artisans were trained on the basic maintenance procedures so that they can carry out periodic preventive maintenance and minor corrective maintenance. The pool of the repairers was from local artisans that were already familiar with such repairs as radios and other small household gadgets. Most of them had already been trained on basic electronics for radio repairing, courtesy of UNICEF under some initiative involving teaching through school radio programs.
The project procured 96 solar N250 light lamps from NOKERO, which are the most economical way to replace kerosene lamps. They are clean, safe solar lights that are good for the environment and can save lives. They provide adequate light during cooking, working, reading and emergency backup, which is most relevant to rural communities where there is no electricity, as well as urban and peri-urban areas where blackouts are frequent.

The Community Power Centres (CPC) are estimated to be utilised by over 59 villages that are in the school catchment and send their pupils to the targeted schools. Those accessing them save time and money which previously was used to access power from trading centres that are grid connected. In all the catchments served by the CPCs, a snap survey indicated that there are almost 655 car batteries which were being charged twice a week at an average price of MK100.00 per charge. By bringing the power closer to the people, it was envisaged that the CPCs would attract their patronage such that income realised from accessing the CPCs will help schools to have a maintenance fund not only for the CPCs but also existing PV infrastructure installed at the schools and teacher households.

There has also been a recorded increase in learners’ enrolment in the 5 schools which rose up to 5,142 during the 2012/2013 academic year from 3,700 in the last 2011/2012 academic year and passing rate plus subsequent selection to secondary schools from these schools. There has been a total of 63 learners (39 boys and 24 girls) getting selected to various secondary schools. Although there are many factors for increases in enrolment and secondary school admissions, school staff members thought addition of Solar PV lighting was an important factor. Some community members have been encouraged to take on the reading culture due to the power at the schools.

Solar power has enabled communities to charge their phones locally, improving communication among them. Teachers are now able to use electric appliances like television and radios on top of lighting hence improving their living standards. Most rural areas in Malawi have no access to electricity, thus providing alternative renewable energy such as solar PV systems which have significantly improved delivery of education services, motivate teachers to remain in rural schools and contribute to better performance of students in these schools. The systems also assisted in income generation for the maintenance funds as the schools were getting income from charging such items.

Figure 3: A Community Power Center (Left) beside a classroom block with solar panels on the roof

MREAP - Malawi Renewable Acceleration Programme
CEDP2 SEP: MREAP Biomass Management Strategic Energy Project in Balaka District, Malawi
Biomass availability in rural communities

As part of MREAP Concern Universal formed and trained communities to manage local forestry resources. The national Forestry Policy (1996) codifies the need to establish Village Forestry Areas (VFAs) as a way to prevent further deforestation in Malawi. Given the extremely high use of wood-fuel in Malawi, there is a need both to replace traditional biomass use with modern sources (i.e. liquid fuels) and to ensure that local forests are nurtured by informed and responsible groups.

To date, 8 communities with registered forest management plans now have the legal mandate to protect, conserve, and ensure sustainable use of forest and natural resources. The activities of the established VFAs include collecting local tree seed for the tree nursery, and erection of grass fences for their nurseries. The project supported the VFAs with 112,000 polythene tubes which were pot-filled with soil.

Supervision on the tree nursery establishment was being done with the assistance from the Forest Department and Wildlife and Environmental Society of Malawi (WESM) who have assisted with the technical-know-how of tree nursery establishment in both VFAs and schools.

The project also supported school debates on energy and environment to promote awareness on renewable energy and energy efficient technologies such as stoves, encouraging environmental conservation and management and inculcating this culture among the youth. The debates were coordinated by WESM. The competition was concluded and the winning school and runners up went away with prizes such as watering canes, footballs and netballs, notebooks and writing materials.

The project has had high reaching impact. At the end of the project, communities with registered forest management plans have the legal mandate to protect, conserve, and ensure sustainable use of forest and natural resources, and are empowered to take ownership of their VFAs, as enshrined in the Forest Act of 1996. Communities are now realizing that regeneration of forests is far more effective than planting trees hence individuals have also started leaving their marginal pieces of land idle for regeneration in anticipation to own an individual forest.

Biodiversity such as snakes, including pythons, all sorts of birds including guinea fowls, small antelopes has been enhanced in the forests. There are also wild fruits such as bwemba (Tamarindus Indica) especially in Nailuwa VFA where the community members estimate that they would harvest about 250kg of the fruit and set up a community social fund with the money realized.
The VFAs have also been assisted by the project with 400 bee-hives. The bee-hives have been hung in the forests and communities have been trained in how to process the honey up to packaging in bottles, and, then producing other products from it like wine and candles from bee wax.

Conservation efforts are complemented by afforestation activities in 60 primary schools which have established school woodlots, safeguarding the school structures against strong winds and providing for future energy needs for the schools.