

Payments for Environmental Services (PES): Lichenya River Catchment Environmental Restoration Action

Project K: RedLAC-CAFÉ Knowledge for Action Project

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Trust (MMCT)

Country:

Malawi

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Case Study

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1. Executive summary

With financial support from Project K, Mulanje Mountain Conservation Trust (MMCT) is facilitating yet to be the first Payment for Ecosystem Services (PES) action within the watershed catchment of Lichenya River on Mt Mulanje in the Southern Malawi. The commitment was made available to Mulanje Electricity Generation Agency (MEGA) – a social enterprise, to finance repair of one hydropower generation scheme in exchange for a long-term financial obligation to support upstream catchment landscape management. MEGA is generating and distributing electricity through a mini-grid to local village communities with its power schemes installed on the Lichenya River. The action focuses on renovation work to repair the flood damaged and improve the climate resilience of the Bondo 2 scheme by MEGA and environmental restoration of the catchment through tree and perennial grass planting, improved land resources management of the adjacent farm fields implemented by farming families. Currently, MEGA is providing finance based on 8% monthly electricity sales with an additional 100% co-financing from MMCT in this early stage of the scheme.

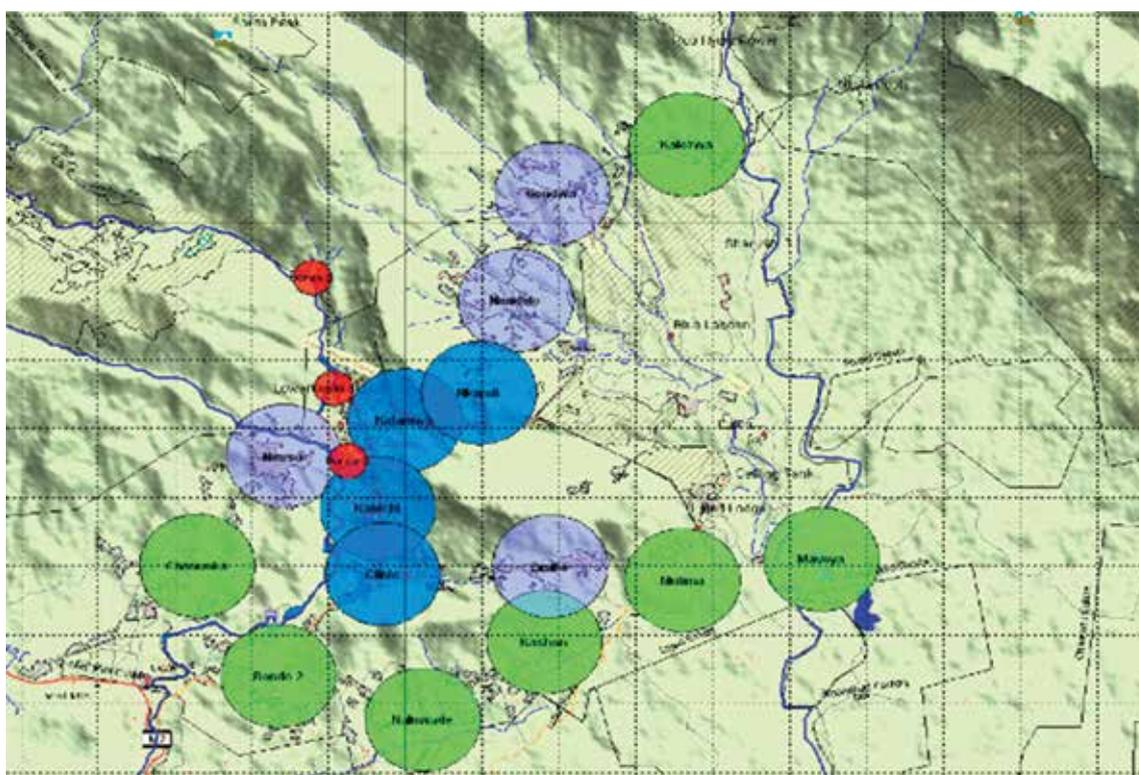
The past forest degradation status of the Lichenya River catchment renders the micro-hydro scheme unsustainable due to possible incidences of reduced water flow and infrastructure damage. For instance, in January, 2015, the flush floods damaged the scheme structure that was almost close to function and the work started all over again. Again, the reduced water levels in the dry months of October and November affects power generation. The damage of the scheme in 2015, and reduced power generation in dry periods were the driving factors for the need to ecologically manage the catchment to sustain desirable water flow and protect infrastructure from the impacts of any future flush floods. The strategy used to do this is environmental restoration and management through a Payment for Ecosystem Services approach.

Being a new approach in the locality, PES action needs adequate time for stakeholder awareness, consultations, discussions and feedbacking in order to create a common level of understanding. Demonstrating practicality and benefits of this action to stakeholders needs patience and two-way learning. Catchment restoration actions that are coupled with immediate livelihoods solu-

tions incentivise community stakeholders. For instance, cash payment in bridging the livelihood gaps, fruit tree distribution, distribution of fodder grass etc. As such, PES action needs adequate initial financing to meet desirable inputs, stakeholder capacity building needs and supervisory action in the early stages.

Given the adequate stakeholder knowledge and understanding of the action, the action can stimulate participation of actors in many sites because of its multiple benefits. Ranging from individual to social benefits, the action improves the economic status, restores the land scale, brings cohesion among stakeholders, reduces conflicts (land and forest resource use) and generally increases resilience that come with climate shocks (floods) and sustenance of infrastructure. This case study is compiled by the principal facilitators to document the progress to-date to share experiences, lessons learnt and challenges encountered within this pilot phase.

FIGURE 01: Carte de la distribution/ Auteur: Daniel Kloser



This map is showing the original distribution centres in blue, the current extensions in purple and the forecast new distribution to be implemented in 2019 with the availability of the Project K financed power. The three red circles are the current power schemes with Bondo 3 being the development that was assisted by Project K.

2. Background

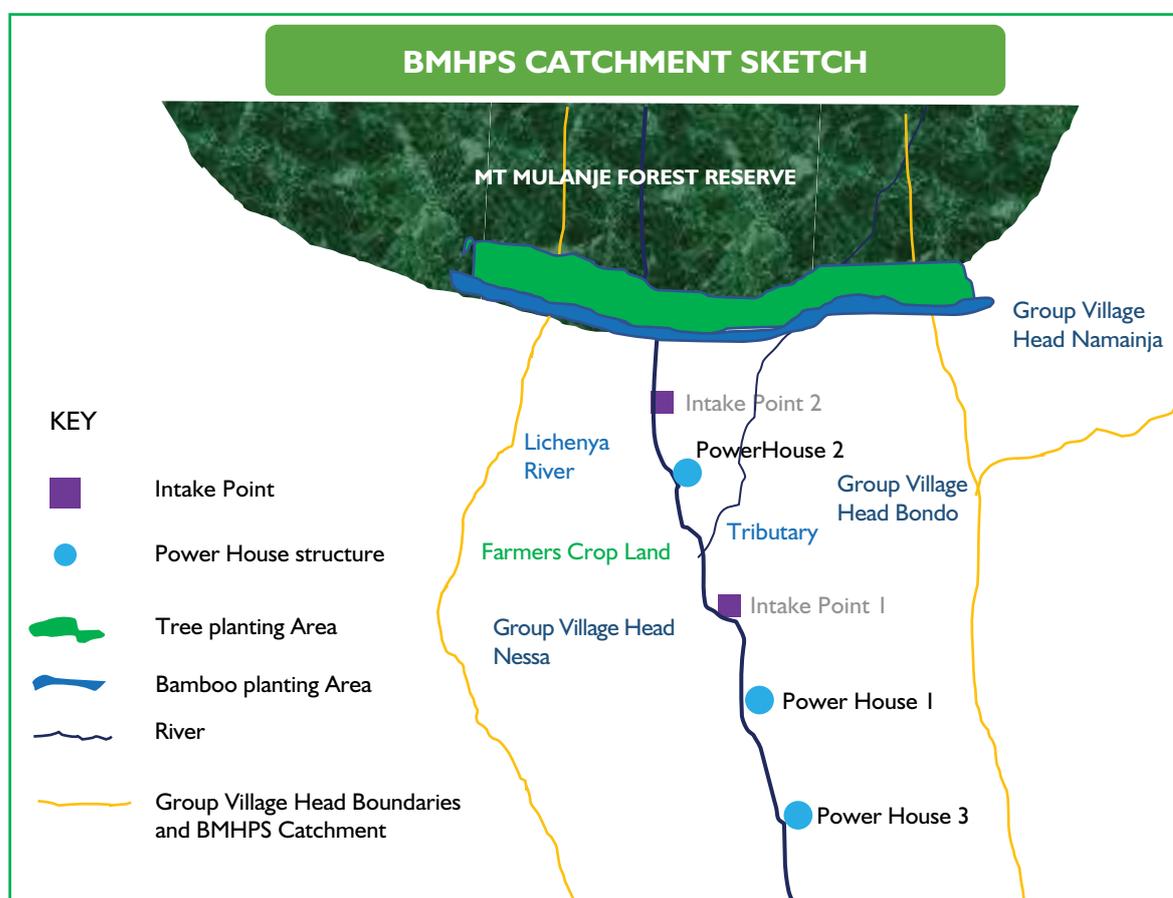
The Mt Mulanje Payment for Environmental Services scheme is the first such pilot action in Malawi that has been implemented within the Lichenya River watershed catchment area above the Bondo hydropower generation schemes. Mulanje Mountain Conservation Trust (MMCT) is facilitating the action and implementation is spearheaded by the communities of Bondo, Nessa and Namainja villages. The environmental restoration action is initially and currently financed partly by partial proceeds from Mulanje Energy Generation Agency (MEGA) and from MMCT.

Mt Mulanje is endowed with diverse resources providing diverse opportunities to boundary communities. One of such resources is water. The Mt Mulanje is a source of nine big rivers and one such river is Lichenya River. Communities in the catchment use the water for both domestic and commercial functions (crop irrigation). Tea estates also use the water for irrigating tea plantations. In 2010, an 88Kw Micro-Hydro Power Scheme was installed on Lichenya River to generate and supply electricity to the three communities. These communities lie in a remote area of Mt

Mulanje mountainous region where Electricity Supply Corporation of Malawi (ESCOM) - the sole national electricity provider- was unlikely to extend its electricity services to in the near future. More two schemes are under construction on the same river to extend power to more communities in the region. The coming of electricity in the region is already changing lives of people socially and economically. Mt Mulanje's significant water resources can be utilized for a variety of purposes for local community benefit and to sustain this use, this requires planned watershed catchment management activities.

The past forest degradation status of the Lichenya River and MHPS catchment renders the scheme unsustainable due to possible incidences of reduced water flow and infrastructure damage. For instance, in 2014 the infrastructure of the second scheme was almost completed ready for turbine installation. However, in January, 2015, the flush floods damaged the structure and the work was to begin all over again. Again, during the dry months of October and November, the water levels reduces and affects power generation. The damage of the scheme in 2015 and reduced power generation in dry periods strengthened the idea of the need to ecologically manage the catchment to sustain desirable water flow and protect infrastructure from the impacts of any flush floods. The strategy used to sustain water flow and protect infrastructure is environmental restoration and management through a Payment for Ecosystem Services approach.

FIGURE 02: Bondo Micro-Hydro Power Scheme (BMHPS) catchment Sketch/Author: Carl Bruessow



The catchment area covers the source of Lichenya River that is within the Lichenya plateau on the mountain, its tributaries as it flows down and out of the Forest Reserve into the community area, the river banks and the adjacent community agricultural areas.

3. Stakeholders

a) Boundary Communities

The communities in the three Group Village Heads are the primary stakeholders. By policy, 10-15m from the riverbank is reserved for vegetative conservation. Oftentimes by tradition, this 10-15m buffer is considered to be owned by a particular individual and use this land for crop production. Again, people are not expected to farm

or reside in the protected forest reserve but this is increasing occurrence. This is the case due to land scarcity for farming. Statistically, southern part of Malawi has the highest human population. The national population density is 139 while that of Southern Malawi is 184 and Mulanje district where the action is implemented has a high population density of 254 (NSO, 2008 population Census). Land scarcity forces farming families to cultivate marginal areas like riverbanks and encroach forest reserve thus increasing deforestation and rendering the catchment prone to natural disasters.

b) Mulanje Energy Generation Agency (MEGA).

MEGA is considered to be the financing primer of this pilot PES scheme. MMCT signed MoU with MEGA to disburse 8% of its electricity sales to MMCT to finance PES action in the Lichenya catchment. Currently, the disbursed amounts from MEGA are in the range of US\$40.54(MK 30,000) to US\$67.57 (MK 50,000) per month. This percentage is expected to decrease to around 6% as more schemes and more income is generated from electricity sales.

c) Mulanje Mountain Conservation Trust (MMCT).

MMCT is an endowment trust funded by the World Bank and the Global Environment Facility. Its objective is to assist the conservation of the Mulanje Mountain Forest Reserve biodiversity, and the empowerment of local communities who depend on the sustainable use of its natural resources. MMCT facilitates management of this pilot PES action in the Lichenya River catchment and complements the MEGA financing of the action.

d) Other Potential Partners.

There are other potential stakeholders who are likely to participate in the financing of this PES action. Discussions are underway with them. These potential stakeholders are Tea Estates who are using the Lichenya River water for irrigation in the downstream, smallholder tea growers' organizations (Sukambizi and Thuchila Trusts) and Government Water Users Association (WUAs) who uses Lichenya River water for portable water and the intakes are in the middle course of the river. The tea estates have made several donations of fruit trees, vetiver and Guatemala grass for planting.

4. Pilot Goals

In reality, this pilot scheme should be termed an environmental restoration action rather than an environmental services scheme as the principal activities are to: a) protect the riverine area from excessive run-off water and siltation due to poor farming practices on the

adjacent smallholder farming land; b) rehabilitate the river water catchment area with tree and grass vegetation and other useful plants to constrain future flash-flooding threat. The intention is to: a) sustain the flow of water along the Lichenya River in order to provide a reliable stream-flow for the turbine operation and electricity generation and; b) protect downstream infrastructure from damage in future from possible flash floods.

5. The Process and Approach

The desire to continually resolve the rural energy challenge inspired the need to repair the damaged scheme by 2015 floods hence the request from Innovation Fund. The granting of the fund was a motivation to begin repair works on the hydro scheme. Competent contractors were contracted with desirable climate smart designs to counter future climate shock. The grant was basically used for renovation works of the damaged Bondo 2 scheme as:

- The construction of a new road through a steep sided valley all hand-made over a distance of 3.1km from grid connection to fore-bay tank, to allow for quick access for future maintenance and repairs.
- The construction of a 92m under rock concrete tunnel through the riverbed to the fore-bay tank, then 500m underground PVC pipe to the penstock of 70m steel piping dropping down to the powerhouse. The entire system now underground giving much better protection from external interference.
- Assembly of the high-quality steel penstock piping over a 44m head engaged to the turbine situated in the powerhouse.
- Construction of structurally reinforced powerhouse, installation of turbine, generator, transformer and associated electrical engineering for production output of 60kVA.
- Erection of a 1.6km 11kVA overhead power-line to feed the additional power into the local mini-grid sufficient to provide electrical power to an additional 600 households.

Again, the damage of Bondo 2 scheme, due to floods, was a revelation and a demonstration enough to begin to seriously consider ecological restoration action for the Lichenya River watershed catchment. In this action, the following activities were done:

- Stakeholder analysis was conducted to identify potential players. Apart from MMCT and MEGA, other players like communities, Water Users Associations (WUAs), Smallholder Tea Farmers Associations and Tea Estates were identified;

- These potential players were consulted for possible participation in the PES action though there was no full indication of commitment to participation especially the tea estates, WUAs and smallholder tea associations;
- A general awareness creation action (meetings) with different stakeholders on the need for restoration action on the Lichenya River watershed catchment and the need to restrain occurrences of natural disasters and sustain infrastructure;
- 122 farming families whose fields are adjacent to Lichenya River were identified. A diverse farming practices were observed and possible technical advice from Land Husbandry Officer (agriculture) was sought for action;
- Restoration action for vegetative cover started with planting of 200,756 indigenous trees in the immediate Forest Reserve, 3,000 pine plantation trees, 9,300 bamboos along Lichenya River and the forest reserve boundary
- 12,320 improved fruit trees were procured and distributed to 200 farmers who planted in their home yard. Fruit trees add forest resource on the land, they are a household source of income and compliment to household nutrition.
- While MMCT facilitates the management of PES and MEGA partially finances the action, efforts were made to link up with local decentralized institutions of Area Development Committees (ADCs) and Forest Block Committees (FBCs) at Group Village level. These local institutions guide implementation of PES activities.

5. The Challenges

The principle issues that require attention in this pilot PES action include:

- With limited finances, it is not easy to consistently work with government technical advisors. Every time a request is communicated to help farming families, money in form of allowances for the work performed is demanded. Without this money, extension workers are very reluctant to provide their services. However, their service is paramount;
- There are currently lots of misconception especially among the farming families regarding river bank restoration. Due to inadequate farm land challenges, some farming families feel that the restoration action is meant to claim land from them. As a result, some farming families are not ready to participate until they see the outcome from their friends. This is a total misconception and this is happening amidst explanation of the whole PES action..

FIGURE 03: Farm land cultivation up to the river bank/ Author:Carl Bruessow



FIGURE 04: Trees and Grass planted along Lichenya River for conservation purposes/ Author: Carl Bruessow



“ With limited finances, it is not easy to consistently work with government technical advisors. Every time a request is communicated to help farming families, money in form of allowances for the work performed is demanded. ”

FIGURES 05 AND 06: Bamboos Planted along the Forest Reserve Boundary and Riverbank/ Author: CarlBruessow



FIGURES 07, 08 AND 09: Fruit trees distributed to households participating in restoration actions: Carl Bruessow



6. Remaining Challenges

The critical challenge remains working on diversifying PES financiers especially in this pilot phase. Sceptic participation of potential stakeholders' limit financing and speed of action for PES. However, there is need to demonstrate practicality to motivate these potential financiers. Adequate finances enable wide awareness and capacity building of farming families to quickly understand the PES action and increase their participation and motivate agricultural extension workers.

7. Results

Following awareness raising activities, it was expected that all stakeholders would fully support the action right on the onset. However, some stakeholders expressed resentment especially on financing participation. The action has received material support from the tea estates (grass and some fruit trees). While other farming families are willing to participate yet others are hesitant for fear of losing their land.

8. Benefits Observed

Normally ecological restoration action of this nature does not show benefits in the immediate effect. The benefits begin to show when the tree canopy covers the catchment. Depending on the type of trees planted, this can take five years above. However, the planted trees are taking good shape and it very optimistic that in time to come the benefits will be huge. Some farming families who benefited from Guatemala and fruits are beginning to yield benefits of rehabilitated areas (controlled soil erosion). Though limited, the financial benefits have helped participating communities bridge the livelihood gap. However, this is not frequent due to limited flow of financing.

9. Lessons Learned

The following are the few lessons learnt so far:

- PES action requires adequate initial financing pool to enable initial actions. The current flow of finances from MEGA alone are not adequate to quickly take off for the actions. However, the funds are enough to initiate the action. For this reason, much of the finances are directed towards enhancing community livelihoods. Supplementary funds from MMCT complements MEGA finances for the works;
- In the pilot phase, taking on board different stakeholders to participate in PES action is a challenge. The main reason is that some stakeholders are sceptical of the outcome of their participation especially financing the actions.

“The critical challenge remains working on diversifying PES financiers especially in this pilot phase. Sceptic participation of potential stakeholders' limit financing and speed of action for PES.”

They choose to wait and see. It is more challenging if other potential financiers feel they can benefit from environmental services even in the absence of their participation in management. It is therefore important to demonstrate the practicality of the actions with initial finances to convince other possible financiers;

- Although livelihood improvement benefits associated with PES action are liked by many farming families for their participation, others still feel direct cash benefits are paramount for their participation. This limits the number of faming families to participate in PES action;

