

Practical Action Southern Africa

Experiences of setting up of Micro Hydro Power stations for off-grid energy supply to rural communities in Malawi, Zimbabwe and Mozambique.

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Presentation Outline

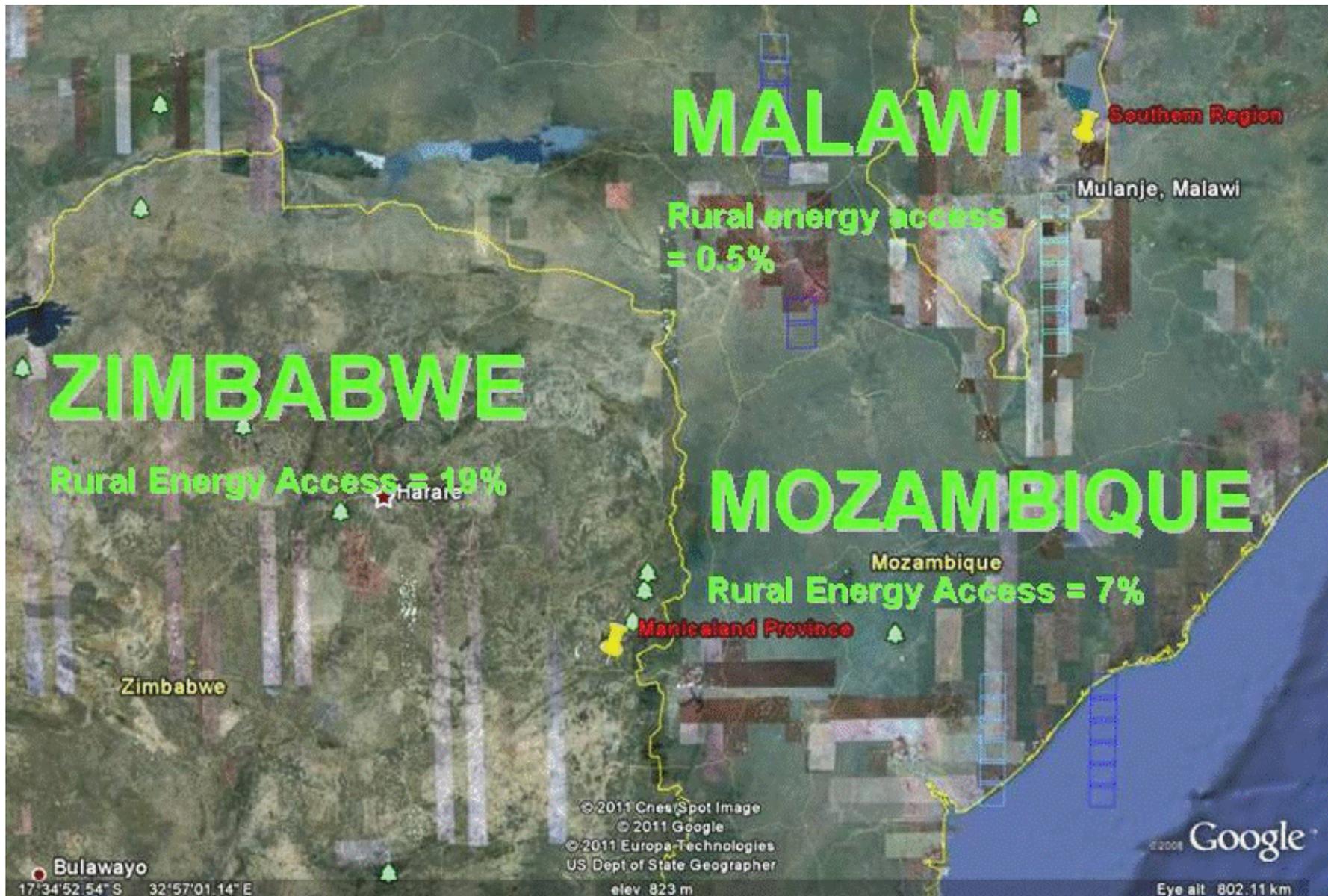
- Project Summary: the context, the objectives, the thematic area covered, the regional dimension of the project
- Methodology
- Project Impacts – Capacity Building
- Project Impacts - Socio-Economic
- Lessons learned and Scaling Up:
- Conclusion

Project Brief:

Catalysing Modern Energy Services Delivery to Marginal Communities in Southern Africa (the Regional Hydro project)

- ACP EU Energy Facility Funded Project (January 2007 – December 2012)
- Low energy access: Malawi (0.5%) Mozambique (7%) and Zimbabwe (19%)
- Total Population = 45m (est.): 28m without access
- Objective: To adopt, adapt and apply community based management models in the establishment and running of microhydro power systems (MHS) in Malawi, Mozambique and Zimbabwe
- Project Budget Euro2,2m Co-Financed by Practical Action (25%)
- In Partnership with Local NGO's:
 - Mulanje Mountain Conservation Trust of Malawi
 - Kwayedza Simukai Manica of Mozambique

Project Map



Project Objectives

- **Increased access to energy services**
- **Contributes to**
 - **supporting small-scale initiatives for integrated energy activities (small scale, community-based operations, decentralised energy systems, modern and traditional biomass etc.) in poor rural areas.**
 - **Strong focus on poverty reduction and on sustained improvement of the livelihoods of the poor**

Cost Analysis

Scheme	Generating Capacity kVA	Status	Estimated cost US\$	Estimated Cost Euro	Actual cost US	Actual Cost Euro	Average C Euro/kVA
Bondo	88	Partial Complete	220000.00	167478.68	228288.19	173788.21	1974.866
Nyafaru	20	Completed	55100.00	41945.80	39296.38	29915.03	1495.751
Chipendeke	25	Completed	73350.00	55838.92	167573.89	127568.43	5102.737
Dazi	20	Completed	50000.00	38063.34	102557.84	78073.87	3903.694
Ndiriri	27	Completed	61000.00	46437.27	53883.55	41019.75	1519.25
Nyamwanga	30	Partial Complete	132000.00	100487.21	8508.50	6477.24	215.9079
Nerufundo	24	Partial Complete	17000.00	12941.53	2691.48	2048.93	85.37226
Chitunga	33	Partial Complete	132000.00	100487.21	1675.00	1275.12	38.64005
Hlabiso	25	Partial Complete	88000.00	66991.47	0.00	0.00	0
Site A	15	To be identified					
Site B	15	To be identified					
Total	322		828450.00	630671.44	604474.83	460166.59	3005.36
Exchange Rate	Euro to US\$		1.3136				

The impacts of the project

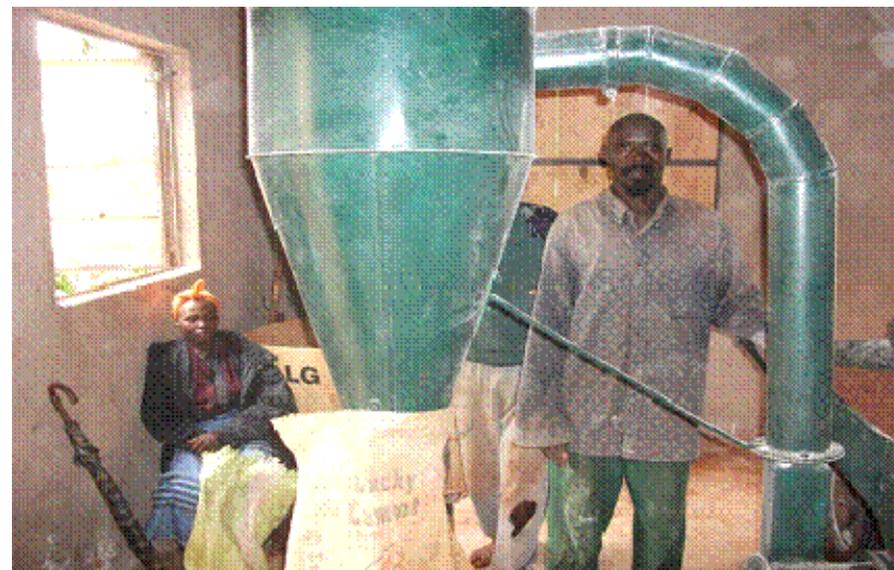
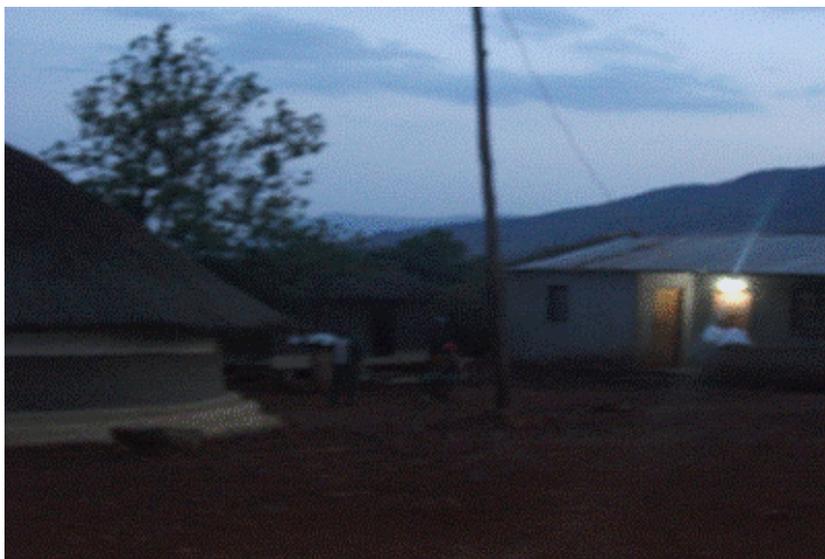
Capacity Building (At all levels)



- Critical mass of people with skills and knowledge on design, development, operation and maintenance of the schemes
- Local communities involvement enhancing their knowledge and system sustainability and lowering system cost
- Establishment of community energy service companies (with business and technical skills)
- Local manufacture of components such as turbine (lowering costs and enhancing sustainability)

The impacts of the project

Improved Access to Energy & Socio-Economic Empowerment



- **Improved access to energy (5 decentralised systems in place average of 30kW @ Euro 4,000/kW (electricity unit sold at average of Euro 10 cents)**
- **More than 200 households directly connected, schools, clinics, grinding mills, shops**
- **Direct positive health benefits, education and poverty links to estimated 45,000 people**
- **Estimated Payback 10-15 years**

Good Practices & Lessons

- Business and Finance Models involving rural communities (help in improving sustainability and attracting investors)
- Systems of billing and revenue collection needs improving a good case with the introduction of Prepayment Metering Facility
- Involvement of all stakeholders to raise awareness and knowledge:
 - MoU's with the GIZ – AMES programme in Mozambique on Rural Electrification and Rural Energy Fund
 - MoU's and joint collaboration with the Rural Electrification Agency of Zimbabwe (Learning from Best practice – community based approaches)
 - Malawi, officially recognised as the government's renewable energy strategy programmes
 - **Attracted Multi-Lateral Funds: UNIDO, Millennium Challenge Fund, BLF**
 - **Private Sector Participation: CONLOG Electrical & Prepayment Platform, Tea Estates in Malawi**
 - **Finance Institutions: Barclays Bank, Banco Terra**
- Community Based Approaches in leveraging local resources

Conclusion

- Small decentralised schemes have a niche in the energy supply matrix of the developing countries (electrification rates are still low)
- 10,000 Systems will be needed (Over **600 years** at current rate):
 - **Requiring an accelerated grid expansion + Renewable Systems**
 - **More actors beyond donors, government & NGO's**
 - **Spelling the urgency to have this on development agenda**
- Estimated Investment of Euro1.2bn (42 Euro per person) for universal energy access to be attained.
- Community Based Approaches have the potential to leverage the investment with local non monetary resources contribution
- Benefits immense - Kick-starts economies of isolated poor rural areas (access to information, knowledge etc)
- Policy and regulatory barriers on RE technologies still exist
 - **Need for a new generation of renewable energy policies and strategies at national, regional and international level**
 - **Calls for research into low cost energy options**