

Case Study: Community Owned Off-Grid Micro-Hydro Scheme, Yaye, Ethiopia

Background

A rural town in Southern Ethiopia with a 4,555-strong population, Yaye is a trading community mostly dealing in agricultural products. About 34% of the population are middle income earners, while 8% of are high income earners. Yaye got a 170 KW micro-hydro power plant in 2002, after two previous failed attempts to electrify the town using diesel gensets in 1987 and 1994, at a total cost of USD 697,674.

Table 1: Statistical details of Yaye town

Number of Households in Yaye town	940
Electrified Households in Yaye town	320
Total population of the town	4,555
Number of males	2,207
Number of females	2,348
Monthly income for most households (58%)	500Birr (\$58)
Electricity tariff	USD 0.0494 per KWh

The community played a pivotal role in the construction of the micro-hydro plant, including clearing and preparing the plant site, building an access road, diverting the river flow, digging the canal, and provision of poles for the mini-grid.

The local council members were directly in charge of the project. They co-ordinated and mobilised the community for the various tasks, while the Sidama Development Corporation (SDC) and the Sidama Development Program (SDP) provided technical assistance. They have helped access information and equipment, facilitated machinery procurement, prepared the tender for selecting a local company to do the installations, and are generally managing the scheme.

Financing

Yaye is situated hundreds of miles from the nearest national electricity grid location, and connecting it would require at least USD1.4 million. This was too high a cost for the national utility company, Ethiopian Electric Power Corporation (EETPCO), meaning that grid extension would be an unfeasible option for the Yaye community.

Therefore, the community teamed up with the local council leaders and collected funds for the purchase of a turbine and a generator which were unfortunately stolen during transit in 1998. It took the community another two

years to replace them, and this was only made possible with a grant from Irish Aid through SDP. The micro-hydro power plant now provides consumers with electricity 24 hours a day.

Public-Private Partnerships

The eventual successful electrification of Yaye town would clearly never have happened had it not been for the strong working relationship between the public and private sectors.

SDP, a local non-governmental organisation whose formation was initiated by government helped the community to secure a loan for purchasing and installing a turbine and a generator. These were installed by a local private company called Sigma, the first such job they had ever done. The project is currently administered and managed by SDC through seven staff; an administrator, a finance head, technicians, guards, a cashier, and a meter reader.

The local council also played a major role in mobilizing the community to participate in bringing electricity to Yaye. Though the community's contribution was not considered when costing the project, it was central to the successful completion of the project. Building roads, providing poles, clearing the site, diverting the river flow, they did everything.



Micro-hydro site in Yaye.

Access to Electricity

Some of the factors that determined access to electricity in Yaye town include affordability and proximity to the power source. At least 30 customers get disconnected each month due to non-payment of their electricity bills, although most of them get reconnected in no time at all.

Table 2: Yaye MHPP service charges

Category	Consumption (kWh)	Rate (USD/month)
Households	1-25	0.29
	26-50	0.47
	51-100	0.76
	101-200	1.05
	Above 200	1.28
Commercial	Petty trade	0.99
	Big trade	1.45
Industrial	Constant	4.83

At present 320 households, 62 commercial establishments and 5 industries are using the electricity. The total monthly revenue from electricity consumption should be at least USD 1,047 but only USD 814 is collected. This is because some consumers sometimes just can't pay. Defaulters are often disconnected to force them to pay their arrears, although some trusted ones are sometimes treated more leniently.

Meter sharing among households and commercial establishments is quite common probably because it is expensive to purchase one and this could be the reason peak hour demand is only 50% of the system capacity. Perhaps because the community was involved in setting the tariff, there are no complaints from consumers in that direction.

Livelihood benefits – Direct Consumers

For the 320 households with electricity, life has certainly improved. Apart from doing away with the dreaded blackness of the night, electricity has opened up new sources of information (for those who are able to buy a radio and a television).

Domestic Benefits: After connecting to the new electricity supply scheme, an overwhelming majority of the households studied have noticed significant reduction of costs related to expenditure on lighting.

Available statistics show that 10% of the households with electricity use it for cooking, 5% for refrigeration, 40% for entertainment, and 100% for lighting. Some households also use electricity for baking bread and making stands for electric stoves.

Commercial and institutional users

Commercial users have benefited immensely from the 24-hour availability of electricity, far more than the domestic users. All types of businesses have been established including metal workshops, grain milling services, automotive garages and photo-shops.

Electricity has brought the town to life, and now professionals especially teachers and doctors are seeking employment in the town. The headmaster of the town's major secondary school said it was always

Commercial Benefits: New, improved and extended services have been improved by businesses and commercial establishments resulting in increased incomes and creating new job opportunities.

impossible to attract well qualified and experienced school teachers. But at the time of the interview, four experienced teachers with very high qualifications had applied to his school for jobs. The situation is the same at the local health clinic, where the quality and quantity of staff have significantly improved.



Productive uses of electricity in Yaye – a wood workshop and one of its products.

Livelihood benefits – Indirect Consumers

Even households without access to electricity admitted to a major improvement in their lives. Although they have no power at home, they enjoy better services at the clinics, schools and restaurants. The school library now stays open until 10.00pm, while the clinic now operates 24 hours a day. Service delivery by government departments has also improved after they computerised their operations.

Conclusions

While the micro-hydropower plant in Yaye town has had a profound effect on the community, the following points must be taken into account:

- Efforts should be made to ensure the project remains profitable after SDC hands it over to the community.
- Close cooperation between the managers and the consumers has been crucial to the project's success, especially in setting tariffs.
- 24-hour electricity means that electricity can be used for much more than lighting and entertainment, including productive uses that help to boost the local economy.
- Because electricity is being used for a wide range of uses in the community, households that do not have a private connection are still benefiting from improved local services in a significant way.



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