

## DESCRIPTION OF BEST PRACTICE: COMMUNITY MICRO HYDRO PROJECT (ENERGY) - KENYA

### **Introduction**

The Department of Renewable Energy, Ministry of Energy and Intermediate Technology Development Group – East Africa (ITDG-EA) with funding from the United Nations Development Programme (UNDP) GEF Small Grants Programme implemented the Tungu Kabiri Micro Hydro Power Scheme. This project is located in Mbuiru Village, Meru South District, about 185 km north of Nairobi. ITDG East Africa partnered with the Ministry of Energy in developing the technology and training the villagers in the development of the micro hydro.

### **Characteristics that make the initiative a best practice**

The project generates 18 kW of electricity from a river which covers a radius of 3 km with 200 households (about 1000 people), a community otherwise not accessible through the national grid. The community contributed free labour for building the weir, digging the canal, and building the power house, among others. The participation of the community in the construction enables them to both own the project and maintain it thus ensuring its continuity.

### **Mainstreaming/sustainability of the best practice**

#### *(a) Positive results brought about by the initiative*

- 📌 Provision of power to remote locations away from the national grid.
- 📌 About 200 households to benefit.
- 📌 Enough power for small micro enterprises which will enable families to generate income
- 📌 Lighting which will improve education standards
- 📌 No impact on the environment compared to the fossil fuel driven power stations caused by emissions.
- 📌 Minimal impact compared to conventional hydroelectric power stations due to the need to create large dams.

#### *(b) Linkages with national developmental policies*

The Sessional Paper No. 4 of 2004 on Energy states that there exists hydroelectric potential in the category of small, micro to pico-hydro projects of the magnitude of about 3,000 MW. The Government intends to encourage development of such projects by communities and investors alike through mobilization of resources for undertaking pre-feasibility studies, especially for

those commanding high economic merit order ranking. It states that the Government will undertake reconnaissance, pre-feasibility and feasibility studies on the resource potential in all river drainage basins. Therefore it fully supports the development of such projects.

(c) *Financial viability*

The cost of the project is approximately £ 800 per kilowatt of power generated. Therefore in order to power a mill and provide electricity to about 20 families, a system of capacity 6 kilowatts is required which would cost £ 6,000. The turbine can last about 20 years after which it can be replaced.

Unlike the usual supply of rural areas using the national grid which is loss making due to the transmission losses, and low consumption in rural areas, this is able to supply the small communities without being a burden on the national economy. The power generated will be owned by the local community and sold to its members for lighting, curing tobacco, pumping water, battery charging among others.

(d) *Lessons learned:*

Lessons on the practical problems associated with the energy policy in relation to decentralized energy schemes. The need for training of turbine component manufacturers has also been identified. There is need to sensitize the community about the need to protect the water catchments areas to ensure sustainability of the project.

**Replication**

The micro hydro requires water from the river to be channeled through a basin where sediment which may damage the turbine is removed. The water is then passed to a Fore bay tank before flowing downhill through a pipe called a penstock. A turbine is located at the bottom of the penstock and is driven by the force of the falling water to produce electricity. The communities should be made to participate fully from the beginning in order to own the project and maintain it through its lifetime.

Once the system is in operation, the local people pay a small charge to use the electricity, which is used to cover maintenance and the eventual cost of replacement. The locals are also involved in the construction which will enable them to maintain the facility.

