THE REPUBLIC OF UGANDA

Water-Pumping Windmills in Karamoja: A wasted Opportunity

OVERVIEW

The Government of Uganda's (GoU's) second National Development Plan (NDP II) promotes the development of wind energy as an alternative power source. The Renewable Energy Policy 2007 indicates that Uganda, like other neighboring countries is endowed with sufficient wind for power generation.

Numerous efforts have been made by the government in collaboration with agencies such as OXFAM, and the United Nations Development Programme (UNDP) to solve the water crisis in Karamoja region considering its arid climatic nature. A total of 43 water pumping windmills have been installed in the region.

This policy brief investigates the state of the windmills in Karamoja region and highlights key issues for policy consideration.

KEY ISSUES

1. Only 18% of the windmills are functional with the biggest proportion either not working, removed, abandoned or vandalised
2. There is continued lack of maintenance by recipient local governments and beneficiary communities.
3. There are no security measures at the sites to prevent vandalism and looting of metal components.
4. Numerous units have become redundant due to community migration.

Introduction

The Renewable Energy Policy 2007 indicates that wind energy is available and sufficient for power generation especially in South Western Uganda, around Mt. Elgon and in the Karamoja region. Wind energy potential can therefore be harnessed as an alternative source of power in Uganda

Rationale for Wind Energy in Uganda

The Karamoja region is one of those areas with serious water shortages. Availability of functional windmills for water production could address the water crisis. The water pumping windmill is an appropriate technology for developing countries with a large rural population due to their ease of repair and maintenance through use of low technology artisanal skills. In addition, the various component spare parts are manufactured locally thus minimizing operational costs. Water pumping windmills also enjoy a long service life at minimal cost and environmental impact.

On a broader perspective, the neighboring countries are rapidly adopting wind power. Kenya is soon to commission the largest wind farm in Africa with 300MW installed capacity located in Turkana, the very same potential enjoyed in Karamoja sub-region. Ethiopia has already commissioned its first 175MW wind farm whilst Tanzania is building two such installations. Uganda would also benefit greatly through exploitation of this resource.

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State of Windmills in Karamoja Region

Numerous efforts have been made by development agencies to install windmills in Karamoja region to improve the water condition. A total of 43 windmills have been installed. Table 1 shows the location of the windmills and their condition.

Table 1: Karamoja Windmill Coverage/ Condition as at October 2016

No	Location	Condition
1	Kidepo Rupa Comboni Dispensary	Working
2	Moroto Hotel/KDA Compound	Removed
3	Moroto Hospital	Not working
4	Moroto Hospital	Removed
5	Nadunget School	Removed
6	Moroto Matheniko	Removed
7	Kalotom High School, Kangole	Not working
8	Lodoi Kangole	Working
9	Lotome	Not working
10	Lotome	Working
11	Lorengedwat	Not working
12	Lorengedwat- Nadunget road	Working
13	Lorengachora	Removed
14	Lorengachora	Abandoned
15	Iriri stock-water bore	Not working
16	Nakapiripirit Mission	Not working
17	Namalu Cattle Market	Removed
18	Nabilatuk Church of Uganda	Removed/ replaced
19	Apeitolim	Not working
20	Lokopo	Not working
21	Abim ADRA Forestry	Not working
22	Matany Hospital	Removed
23	Matany Hospital	Removed
24	Panyangara Catholic Mission	Working
25	Panyangara ADRA Forestry	Working
26	Napumpum Community Bore	Not Working
27	Kotido Church of Uganda	Not working
28	Kotido Church of Uganda	Removed
29	Loketalaebu	Not working
30	Nakaperimoru Community Bore	Not working
31	Kaabong Town Bridge	Not working
32	Komukuny Boys, Kaabong	Not working
33	Kalapata Community Bore	Working
34	KPIU Moroto	3 mills/tanks disappeared
35	Nadunget Community Bore	Blown down
36	Loro Valley Dam, Pokot	Vandalized
37	Amudat Hospital Church of Uganda	Motor destroyed
38	Kaboong Water Office	New uninstalled windmill
39	Tokora Community Bore	Not working
40	Tokora Private Farm	New uninstalled windmill
41	Moroto Water Officer	Removed, serviceable mill
42	Moroto Water Officer	Removed, serviceable mill
43	Nakawat Health Centre	Working

Source: Innovation Africa, Windrain (2016)

As highlighted in Table 1; only 18% of the windmills are functional; 37% are not working; 27% have been removed majorly by the district and with the Kaboong water office, and 9% have either been abandoned, blown down, or vandalized.

Discussions with the Windrain windmill expert indicated that the reasons for the perilous state of so many mills are; continued lack of scheduled maintenance and serious lack of security measures at site to prevent vandalism, and looting of metal components. Vandalism has reached very soaring proportions as functional mills are wantonly sabotaged by metal thieves to induce premature failure or even total collapse in storms to allow the damaged parts to be taken away as scrap metal. Likewise, there are numerous units which have

become redundant due to community migration which could be of far greater benefit if relocated to alternative high density community sites together with their entire associated infrastructure such as; tanks, pipes, taps, and stock troughs.

L-R: Non-functional windmill for pumping water and a tap stand at Rengen in Rengen sub-county

Consequences of the current state of Karamoja Water Pumping Mills

Apart from the obvious financial loss evidenced by the functional windmills lying idle as a result of failed repairs and maintenance, other immediate consequences are; increased school absenteeism as students seek water during school hours, a sharp rise in child labour and women preoccupied in search for water thus keeping them from performing other productive duties; and heightened stress on other manual pumping mediums as water point conflicts rise competing for the diminished resource at such locations. Manual water pumping lacks the ability to segregate stock from human watering thus bringing the two into confrontation. Health problems occur especially among children when the mill breaks down as they drink unclean water.

Today, interventions to maintain this water supply medium by government and other agencies have been restricted to short term repair and installation initiatives. In FY 2015/16, the Ministry of Energy and Mineral Development (MEMD) planned to restore two water pumping windmills in Karamoja region. Only one windmill at Lokitalebeu sub-county in Kotido district was partially rehabilitated while one in Rengen sub-county was not repaired (picture above). Repairs in Lokitelabeu were partially done due to inadequate funding. Majority of the Karamajongs in Rengen consume dirty water from the swamps for lack of alternatives.

Leaking pipes at the partially restored windmill for pumping water in Lokitalebeu sub-county, Kotido district

Conclusion

Huge investments have been made in windmills as an alternative source of energy to pump water. Majority of water pumping windmills in place are either not working, been removed or vandalized. This ultimately leads to loss of investment, increased school absenteeism, child labour and loss of time for productive work.

A mechanism to ensure an ongoing programme of scheduled maintenance and repair of all mills across Karamoja, is lacking. This has limited the continued reliable water supply to the people, and productivity of the women and children.

The diversity of mills also needs to be expanded further by more innovative installations for instance women's groups can utilize a mill to irrigate vegetable gardens year round thus enhancing food security and nutritional status.

The need for a sustainable, funded maintenance programme for mills throughout Karamoja cannot be overemphasized. Continuous training of Karamojong residents to undertake such a programme is still lacking. The Renewable Energy Department of MEMD has not organized relevant courses such as windmill erection, repair and maintenance at the various mission technical training centers in Karamoja. This intervention could provide ongoing jobs and the community's water supply would be better safeguarded particularly in the long dry seasons.

One major impediment to the above is the negative attitude of the Water Departments in the Karamoja region towards maintenance of the technology. The districts have never initiated a wind-mill maintenance training programme but instead repeatedly import foreign technicians to undertake these tasks to the detriment of local Ugandan workers.

Recommendations

To ensure functionality of windmills, there is need for; correct installation, scheduled reliable maintenance, use of large water storage tanks for reliability of supply, diversification of the mill site for varied community needs and security against vandalism and theft. In addition a training programme for repair and maintenance skills should be instituted in the region.

There is therefore need for the MEMD to mobilize funds to repair the existing mills, and in the medium term to re-install those destroyed desirably in densely populated community centers to ensure safety of the equipment.

References

- Renewable Energy Policy (2007)
- Ministry of Finance, Planning and Economic Development-Budget Monitoring Reports (FY 2014/15- 2015/16)
- Government of Uganda-National Development Plan II (2015/16-2019/20)

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