



Summary of Learnings

Brief: Solar Pumping in Kenya

OVERVIEW The Kenya RAPID program is a 5-year development program, convened by the Millennium Water Alliance, bringing together public, private and NGO institutions to increase access to Water and Sanitation for people, Water for Livestock and to build a healthy rangeland-management ecosystem. One method of providing water access in arid and semi-arid lands, is the use of solar powered borehole pumps. The information in this brief was collected from the Lodwar Water and Sanitation Company of Turkana County and the Kenya RAPID program staff.

Borehole Pumps

The standard practice for deep boreholes in low-resource settings is to utilize a diesel motor to pump water. These motors frequently break down and require regular servicing to ensure proper operation. In the event of a breakdown, a skilled technician is needed to fix the motor, often taking days, if not weeks, especially if the borehole is in a remote location. Diesel fuel can be expensive to purchase and difficult to transport. Borehole pumps powered by solar panels remove the need for diesel, and reduce the need for frequent repairs. Solar power pumps have been installed in both urban and rural areas of Kenya.

Solar Pumping in an Urban Setting

In Turkana county, the Lodwar Water and Sanitation Company (LOWASCO) has been converting their diesel pumps to solar pumps. Within the city of Lodwar, all new boreholes run on solar power. One such solar pump is 31 meters deep,

constructed in 2014. With a yield of 23m³ water per hour, the 11 kilowatt pump is powered by ninety 195 watt solar panels. Although the initial cost was 46,000USD (nearly four times the 11,785USD initial cost of a diesel motor), life-cycle cost analysis shows that the company will recover costs 4 years and 8 months from installation. This takes into account the human capital costs, daily running costs, and repair and maintenance. Thus far, LOWASCO is on track to recover costs in this time period. The pump is a hybrid, running from 9am–5:30pm on solar power, (during daylight hours) and then from 5:30pm–4am on the electric grid.

Solar Pumping in a Rural Setting

In the rural village of Napeikar, Turkana County, the Kenya RAPID program, with the local government, is supporting the construction of a solar pump to provide water to 22,000 people (the Singot project). For this project, local villagers are constructing a 250m³ water storage tank. The tank is essential to providing water access during non-daylight hours. The solar pump runs continuously during daylight hours and excess water is stored in the tank.

Lessons Learned

Solar powered pumps are a more sustainable solution than diesel motors due to the 25-40 yrs lifespan for solar panels (diesel motors last 5-7 yrs). Solar panels require limited maintenance compared to a diesel motor. All pumps can be converted from diesel motors to solar power, or can be a hybrid of the two. Due to the high initial costs of solar powered pumps communities or utilities likely need to engage a development partner (such as Kenya RAPID), or receive a loan from a bank.