Solar Pump

EWB-BU

Project Leads	Email	Phone
Maddie	mzzhang@bu.edu	617-308-2436
Ashray	amohan@bu.edu	732-332-8048

Project Summary:

This project will focus on an existing well (implemented before EWBBU started in Naluja) that serves a large population, including the expanding health clinic. The electrical system driving the solar-powered well supplying water broke down sometime between 2012-2013. The solar powered well was used to pump water to a tap near and into the Naluja Health Clinic, about a 1 km distance, for easier access to clean water for patients, mothers, and newborns. However, due to the insensitivity of feedback from electrical controllers, the system was unable to pump water to a nearby storage tank which was used as a reservoir during the dry season. Therefore, the automatic system was replaced with a hand pump, no longer supplying water directly to the clinic or storage tank. This has led to more people traveling to the well to manually pump water for the medical purposes of the health clinic as well as the expecting mothers.

The specific reasons for failure of the solar power pump were initially investigated during the assessment trip in 2012 and more assessment was conducted during the past two trips. The failure is suspected to be caused by a burn out of the battery and lack of a dry run sensor (which temporarily stops the pump if yield is less than pumping rate). Another concern expressed by the community during EWBBU's January 2016 Assessment trip was that the existing hand pump system was insufficient to provide for the community's needs and that another pump might relieve some of the stress from the existing pump. This information will allow for us to design the most practical system so that users have the freedom to use whichever modality they prefer, while connecting the

system back to the water tank for storage during the dry season to help reduce strain on the clinic and expecting mothers.

Project Goals:

1.) Comparative analysis (based on following metrics) of pump designs and building knowledge base with the team members
    a.) Ease of operation and maintenance
    b.) Construction time
    c.) Cost for community
    d.) Cost for EWB-BU
    e.) Sustainability
    f.) Efficiency of the system
2.) Maintenance Plan
    a.) Work with Pumps Committee to ensure a scheduled and effective maintenance routine.
    b.) ensure that users know basic maintenance.
    c.) Having users of the pump contribute financially towards the maintenance of the pump
3.) Pumps Plan in Naluja
    a.) What should be done with the original pump?
    b.) What is the most optimal plan for the community?
    c.) Figuring out the best contractor for installing the system based on how much they charge/quality of their work.
4.) Grant Writing
    a.) Coming up with a grant proposal in cooperation with the community that will make it possible for them to obtain a government grant for digging boreholes.

Metrics

1.) Cost
    a.) Direct cost to EWB-BU
    b.) Cost to community
    c.) Cost of maintenance
    d.) Cost of hiring contractors.
    e.) Cost of different systems.
2.) Lifespan
    a.) How long will the structure last with regular maintenance

b.) How often/how much upkeep is required

3.) Community integration

a.) How accessible is the system to users, specifically the clinic and the school.

Prospectus:

Phase 1: Research
Phase 2: Design
Phase (3): Trip prep

Project Deliverables:

Final pump design proposal with estimated cost.
Information on which contractor can best implement the design.
Maintenance plan for community.

Timeline:

1/31/16 - Have updated project framework complete
2/14/16 - Determine most appropriate pump system (hand vs solar vs dual or combination of two different systems)
3/01/16 - **(Tollgate 1)** Have design proposal for pumps system.
3/21/16 - **(Tollgate 2)** Choose best-suited contractor.
4/10/16 - Begin internal review process.
4/25/16 - All materials submitted.

IM 1 (Maddie):

1. communication between e-board and technical leads
    a. widespread understanding of what's happening
2. tech team/lead awareness big picture logistics
3. high member turnout thus far; member retention
4.