

Quarterly Report (Q1 2014)

The Earth Institute at Columbia University

**Micro-Solar Utilities for Small-Scale Irrigation in Senegal
(Cooperative Agreement No. AID-OAA-A-13-00063)**

January 15, 2014



Main Activities and Accomplishments:

This quarter marked the beginning of our award and much of our time has been dedicated towards site selection in Senegal, the identification of existing AC pump controller technologies in India for our application and the initial setup of our procurement systems for the purchasing of the required technical equipment and consulting expertise. The following is a list of the most important activities from Q1 2014:

- **Site visit to Potou, Senegal (October 2013):** Brett Gleitsmann spent one week in Senegal, both in Dakar and at the project site in Potou, Senegal. The following was accomplished:
 - Identified the initial pilot sites and control sites in Gabar ([google map link](#)), including the beneficiary farmers;
 - Identified and hired the Field Technician (Mahécor Diouf) who is based at the Millennium Villages Project office in Louga;
 - Discussed the technical approach with the MDG Centre staff (Amadou Niang, Omar Diouf, Meissa Diop) and agreed upon the way forward;
 - Met with Kirloskar pump representative, Shrinivas Amarapurkar, and received pump specifications and quotations
- **Baseline data collection (December 2013):** The next onion season at the project site began in earnest during the month of December. And so beginning December 1st, we worked with the beneficiary and control farmers to start data collection on the number of minutes per day that the farmers are irrigating and the amount of money that they are spending on fuel.
- **AC pump controller (October - December 2013):** We hired an energy expert, Pravesh Kumar, on a short-term basis to provide us with expertise in AC power control electronics. Mr. Kumar is based in India and has 15 years of experience with large solar installations and various power electronics applications. He helped us to carry out a review of two primary technological solutions, AC pump controllers and standard inverters with micro-controllers, and to identify potential vendors. As part of this process, Professor Vijay Modi visited with a few different AC drive suppliers at the Intersolar annual conference in Mumbai (<http://www.intersolar.in/en/intersolar-india.html>) and after a couple of months of vetting and due diligence, we have finally identified what we believe to be a feasible technical solution. Sakthi Electrical Controls has an AC pump controller that can control multiple pumps, do soft starts and provide usage data for each pump separately. We are now in the process of establishing them as a vendor in the Columbia University procurement system and will be procuring our first unit in January 2014.
- **Solar PV panel supplier in Dakar (October – December 2013):** We have established a good working relationship with a major PV and solar pump supplier, Soleil-Eau-Vie Senegal, in Dakar. They have invited us to participate in a regional training of solar technicians in January 2014 and Brett Gleitsmann and Mahécor Diouf will both



participate. We are also in the process of procuring 10kW of solar panels from them and hope to have them installed by February 2014.

- **Programmer identified (December 2013):** Denis Papathanasiou was identified as our power electronics programmer who will help us to communicate with the AC pump controller once it arrives. He has not started actively working for the project, but will begin working once the controller arrives in February.
- **Planning for January site visit (December 2013):** Brett Gleitsmann will travel to Senegal in January 2014 to attend the solar technician training and to revisit the site. The solar technician training will be a good chance to understand the existing network of technical solar experts in Senegal. The site visit will be focused on improving baseline data collection and the introduction of the technological solution to the beneficiary farmers.

Challenges:

The main obstacle encountered during this quarter was our inability to pay local MVP field staff and hire local consultants through our Columbia procurement system. We have initiated a budget modification with USAID in order to enter into a sub-award with Millennium Promise, a local NGO in Senegal, to handle these procurement issues for us. As of December 2013, USAID was reviewing the proposed modification and it is expected that the sub-award will be finalized in January 2014. This will improve our ability to function on the ground in Senegal.



Figure 1. Overview of pilot site area during dry season (October 2013)



Figure 2. Field technician, Mahécor Diouf, conducts the preliminary site assessment (October 2013)