Technical Investigation of the Slow Sand Filter in Jaitique, Honduras

Jessica Buckley[1], Dr. Daniel Baker[2]

Abstract:

Life in rural Honduras is challenging, especially when polluted surface water is the only source of drinking water. The slow sand filter (SSF) treatment technology in Jaitique, Honduras, is capable of removing up to 98% of harmful bacteria from the community's drinking water. However, this level of filtration has not been achieved since its initial use in 2005. This research assesses slow sand filters as an appropriate technology to use in the process of purifying drinking water for rural Honduran communities. A case study was performed on the operations and maintenance of the Jaitique filter to understand what factors contribute to the success of SSF technology in this context. The condition of the filter was characterized by physical observations, gravel sludge retention analysis, sand media sieve analysis and flow rate measurements. Additionally, the community received training on how to correctly operate the system and were evaluated prior to and after the training. The analysis identified filter defects including sediment clogging the roughing (pre) filter and a hydraulic high point in the filter exit pipe, causing the system to back up. The community and project partners worked together to reconstruction the exit plumbing and conduct a thorough cleaning of the gravel in the roughing filter. Currently, the filter is capable of draining and the roughing filter is reducing the sediment into the SSF. It continues to be a challenge working in Jaitique where social and human capital is diminished by high levels of youth emigration. Successful operation of the filter is dependent upon this capital, especially the role of the *Fontanero*, or water system head operator. The outcomes of this research project include a higher level of training for the *Fontanero* and Water Board, informed design for similar SSF projects, and the development of plans for future improvements to the Jaitique filter in May 2011.

[1] Undergraduate in the College of Engineering and Mathematical Sciences
[2] Professor in the department of Community Development and Applied Economics