

Coffee Wastewater Treatment: Project Collaboration With the University of Central America - Managua

CENTER FOR ENVIRONMENTAL JUSTICE AND SUSTAINABILITY (CEJS)

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1. Project Background and Description

Smallholder coffee farms in Nicaragua produce industrial strength wastewater but have little to no regulatory oversight, resulting in discharge of the wastewater to surface waters. This deteriorates water quality and can prohibit productive use of the surface waters by downstream users. A team of Seattle University faculty and students collaborated with University of Central America (UCA) – Managua faculty and students to design a wastewater treatment system for one smallholder farm in San Antonio, Nicaragua. The purpose of the CEJS project was to disseminate the results of the project via journal publication and to other smallholder farms in the region.

2. Project Scope

The CEJS specific aspects of this project include assessment of collaborative performance with our UCA partners via questionnaires completed at various points in the project, dissemination of the final design via a one-page flyer written in Spanish, and dissemination of the assessment data and overall project design via journal publication.

3. Project Update

The project has progressed well. To date we have accomplished:

- Assessment of the student exchange experience with our University of Central America partners.
- Final design of the coffee wastewater treatment system.
 - The final design was amended to improve feasibility for other coffee farmers in the region, in line with the goals of our CEJS grant. We have prescribed the design to use off-the-shelf tanks and fittings rather than concrete, decreasing costs and easing implementation, and have simplified the overall treatment process compared to the initial plan.
- A video documenting the project and student exchange was produced and disseminated.
 - http://youtu.be/02x_aCETglw

Ongoing work includes:

- We are currently preparing a journal publication to the *International Journal for Service Learning in Engineering*.
 - This article will discuss the final design, the project organization, lessons learned from the collaboration with UCA – Managua, and assessment data. Intended submission date January, 2015.
- Production of a treatment system design worksheet in Spanish.
 - The original goal was to produce a one-page flyer for dissemination to other farms. However, after completing the design we decided a more useful tool would be a one-page worksheet that shows the overall treatment system and specifies the required tank sizes as a function of coffee production capacity (quintales of coffee/day). We hope to disseminate this worksheet to local coffee cooperatives (who manage the small farms), rather than the farms themselves, because the cooperatives are typically the driving force behind updating the farms for wastewater treatment.

Future work includes:

- We are currently planning an implementation trip to San Antonio, Nicaragua for March, 2015. We will build the designed system and visit other potential implementation sites in the region.