SUSTA

Problem Statement

Comunidad Planes in the Intibuca region of Honduras currently does not have treated drinking water. Their water comes from a river influenced spring catchment, and due to seasonal fluctuations in rain, the turbidity of the water greatly increases July-December, making the water unsafe.

The community is rural and spread out, with 1235 members. The water is chlorinated but not treated, and people do not feel safe drinking it.



Specifications

- To design a water treatment system including coagulation, flocculation, sedimentation, and filtration with an output of 50 GPM.
- System will reduce the turbidity of water down to less than 1 NTU 95% of the time, and to below 5 NTU 100% of the time before disinfection.
- The system needs to have limited dependence on electrical power, using a solar panel to power a pump.



Goals

• A system that is easy to maintain and requires minimal maintenance.

• Since the system will be located in a small village in Honduras, it needs to use materials that are locally available in Honduras, as well as a simple design that requires minimal training for workers to fix or work on.

• To provide detailed designs and directions to Water Mission and the community that successfully show the system in way that is easy to understand and be can replicated, if needed, in the future.

• The system needs to be flexible it its ability to effectively clean the water despite varying flowrates and with varying water quality (depending on the season).

• Target capital cost of less than \$50 per person.



<u>Curi</u>

4 Stage

- Open channel at an incline
- V-notch Weir across inserted in the
- the weir creating the needed turbulence
- Insert alum (coagulant) after the weir
- Horizontal baffled flocculator, dimensions: 4.47 meters by .89 meters, by 1 meter
- 99 baffles spaced 4.5 cm apart
- Rectangular sedimentation basin
- Inlet: baffle to force the water to go underneath
- Settling tubes to force particles to settle
- Particles settle and clear water exits at the top of the basin through a weir

- and constant rate
- Filtration rate: 10 m/hour





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	Daniel Sidell	
rent Design tages of water treatment	Open Channel Inlet (with V-notch weir)	Flocculatio

*Side view

1. Coagulation

open channel that forces the water to fall a specific height from the bottom of

2. Flocculation

3. Sedimentation

4. Filtration

- · Single media rapid sand filter with constant head
- Backwash water flow rate: 45 m/hour



4.4700

Our Mission

The Sustainable Water Treatment System team believes that ALL people should have reliable access to clean and safe water. The mission of the Sustainable Water Treatment System project is to provide a cost-efficient water treatment system that can handle higher outputs of water with minimal electricity use, and will be both physically and financially sustainable.













4.4700



Methodology



- 1. The team researched water treatment processes, focusing on hydraulic designs that would be independent from electrical power.
- 2. Then using the research, the team created basic preliminary designs for the possible designs for each component of the system, and compared the options.
- 3. Using these designs, the team chose specific design components to propose a preliminary process train.
- 4. The team received specific about the site and adapted and further developed the design for the target community.

Conclusions

The project is currently is the design stage of adapting the proposed process train for the specific community in the Intibuca region of Honduras.

Next steps are to get professional feedback on and continue developing the current design. Throughout this process, the team will prepare for some small scale tests and prototyping.

Acknowledgements

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