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Water Purification in Paraguay

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Abstract

Many rural communities in Paraguay are disadvantaged by their inability to access safe drinking water. The drinking water is often purified by inefficient means. Therefore, a new method of cheaply and efficiently filtering water is vital to the long-term health of the communities. We were able to focus our research into a few key areas. First was the removal of bacteria and coliforms from the water. The communities are able to sanitize the water; however, a new system based on less harsh methods is a major objective of the project. Another main concern is the suspected presence of iron in the water. The community water boards believe that iron is causing health problems. Unfortunately, we were unable to confirm the presence of iron, making it difficult to make any final recommendation. However, it is possible to provide the relevant research and request a series of tests be done.

Methods

- Researched under the pretenses that the system had to be both cheap and effective and that it needed to remove coliform bacteria and iron from the water
- Research databases included ScienceDirect and Google Scholar
- We obtained information via our sponsor contact, Paula Burt through email communication
- Professor Plummer provided expert insight into water purification systems

Objectives

- Reduce the quantity of contaminants in the Paraguay water
- Coliform bacteria
- Iron content
- Keep cost low and materials available
- Make need for electricity minimal
- Simplify system to match skill of local community

Results

- The presence of iron was not confirmed, making it difficult to make any final recommendation
- Aeration was found to be a simple and effective method for removing bacteria and coliforms
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Conclusions

- Based on the information that we were provided with by the water board and our contact at the AVINA Foundation we cannot provide a concrete purification system
- We offer recommendations based on testing that will hopefully be done in the future
- For high iron content an aeration filter is recommended
- To remove coliform bacteria an active carbon filter is recommended
- Chlorine should then be added to keep the water free of bacterial contaminants

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- Paula Burt
- Dorothy Wolf

References

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Image 1: Water tower in rural Paraguay that is used by the water boards to store water for use by the community.

Image 2: A diagram of a water purification system.

Image 3: A diagram showing the different stages of water purification.

Image 4: A diagram illustrating the components of a water purification system.

Image 5: A diagram showing the steps involved in the purification process.