EnPRO 355: KlarAqua - Water Purification for Developing Countries

A Catalyst for Sustainable Health and Economic Development

Objectives & Accomplishments

Numerous reports by the United Nations and the World Health Organization have underscored the significance of the global water pollution problem. In conjunction with worldwide efforts to address these problems, IPRO 355 has developed a water purification system for household use that is economically and socially practical. KlarAqua, the proposed solution, is a low-cost, clay-based system requiring no electricity or advanced technology. Using a combination of clay, sawdust, and colloidal silver, the system eliminates bacteria through a series of three filters. The versatility of the three filtration layers allows the system to adapt to environmental pollutants present in different target communities such as nitrates from fertilizers. It is simultaneously sustainable and environmentally friendly. KlarAqua can be used by people of all ages and can be easily produced by local artisans using available materials without complicated industrial technology or significant capital investment. Clay can be obtained from the ground ensuring production far into the future. Sawdust is a common waste material found at any local saw mill. 5-gallon buckets already in use for related tasks will provide the container to store and distribute purified water. By using these materials, the KlarAqua product promotes sustainability, increases accessibility, and maintains cultural relevancy.

The design and composition teams have conducted tests evaluating the flow rate of the system, its areas for potential leakage, and its bacteria removal capability and efficiency. The business team has focused on market analysis and the creation of a sustainable health improvement program that simultaneously empowers individuals and generates income without foreign involvement. The proposed business plan will allow local artisans and potters to produce the filters and assemble the system while representatives of KlarAqua educate the community about the health issues related to water purity. All profits associated with the sale of the water purification system will go directly to the artisan and potter who produced the system stimulating local economic growth.

Future Tasks & Recommendations

Funding acquired through grants and other partnerships will be invested in product refinement as well as culturally appropriate and highly customized education and training programs for target markets. The design and composition of the system must be optimized so future team members can be confident in promoting the product in the final market. A full-scale working prototype needs to be produced so testing can be executed to validate effectiveness of bacterial removal. A site visit to Mexico is currently being planned for this summer that will provide key insights into potential market barriers that must be addressed before product implementation. Pilot studies should be conducted in the fall to gather user experience data to improve future design and business planning prior to implementation on a larger scale.

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