Leadership Experience Project Scope Statement Spring 2013
Ghana Project – Ceramic Water Filters Feasibility Study

This project will focus on exploring the feasibility of manufacturing and distributing affordable filters to Ghanaian communities whose main access to water is through rivers, ponds, lakes, open wells and rainwater.

Background:
Ghana is one of the most densely populated countries in West Africa. Since the adoption of a new constitution in 1993, Ghana is more politically stable, yet a history of coups, food shortages and corruption means the country remains poor and indebted.

The three northern regions are particularly deprived, with one in ten children dying before their fifth birthday. 80% of all diseases in Ghana are caused by unsafe water and poor sanitation. More than nine million people don’t have access to safe drinking water. Only 13% of the population has access to adequate sanitation facilities (Wateraid.org, 2012).

Ceramic water filters provide access to safe affordable drinking water for communities who are otherwise without access. Field trials of the effectiveness of ceramic water filters in Cambodia over time showed a 46% reduction in diarrheal disease between filter users and non-users, a 95.1% average (and up to 99.99%) reduction of E.coli in drinking water (Brown and Sobsey, 2006). Laboratory testing shows a 90-99% reduction in viruses (Brown, 2007). These results support other trials of ceramic water filters (Lantagne, 2001) as a highly successful means of empowering households to manage their own safe water supply.

Proworld Ghana, a non-profit extension of Intrax, Inc., in consultation with their community partners, determined there is an opportunity to produce ceramic filters in the rural areas of Ghana’s Volta Region. The intent is to develop a water filtration production site, sell the filter and monitor community health related to water borne diseases (e.g. trachoma and guinea worm).

Challenges:
Ceramic water filters cost an average of $30 per unit, with each filter lasting nearly 2 years. The average Ghanaian household income is the equivalent of $670 USD per year, meaning the purchase of one water filter would account for nearly 2.5% of the household income for one year (www.stats.ghana.gov). By U.S. standards, with an average income of $40,000 USD, this is the equivalent of electing to spend $1000 on a water filter. In addition to this thinking, we must
also consider the average family size in Ghana is 4.1 children per household versus 2.3 in the U.S., meaning there is less “disposable” income. Therefore, affordability must be taken into account along with means of mass production.

Despite the availability of naturally available resources needed to produce the filters (e.g. red clay, wood, sawdust), one element – collegium silver, which is necessary to kill bacteria, remains quite rare and therefore expensive. It takes 14 grams of colloidal silver to produce 1,000 filters. Because this compound is expensive, it immediately raises the cost of production.

Another barrier to mass adoption of the ceramic filters is the lack of education on health, hygiene, and water safety, lack of production and manufacturing processes, business acumen (marketing, supply chain, etc.), training and process knowledge transfer, etc. A successful business plan would address each of these elements, among others.

Research Question(s):
Is it feasible to produce and distribute ceramic water filters in the country of Ghana while creating a sustainable business model? Major sub-questions include:
- What is the lowest cost of production possible and what are barriers to lower costs?
- Who are the key stakeholders?
- How will knowledge be transferred and how will training play a role in production?
- How does health education play a role in the success of this venture?
- What are other issues and considerations?

The Ghana Project Team will work together in Spring Semester 2013 to answer the preceding questions, formalize recommendations, and produce a report. The report will be presented to key stakeholders, including the Ghana Ministry of Health as a means of potentially securing a large government contract, which would drive successful fundraising and implementation of the forthcoming social business plan.