

PROJECT WABERI

Proposal Overview

PROBLEM

Contaminated water has plagued Mogadishu, Somalia for decades causing disease, suffering and death. In 1991 the government of Somalia collapsed. For the next 21 years the nation remained without a functioning government and as a result descended into anarchy and destruction as civil war ravaged the land. In 2012 an internationally supported government was formed and a president was elected. With the help of the African Union this newly established government has begun to restore stability to Mogadishu and other parts of Somalia. Yet the devastating effects of war, anarchy and extreme poverty continues to cause extreme suffering for millions of Somalis. Prior to the war, the capital city of Somalia, Mogadishu, obtained their fresh water through a system of pipes that transported water into the city from a main river located in the Afgoye region, 16 miles north of the city. The war caused this water distribution infrastructure to collapse. As a means for the people of Mogadishu to obtain water they began to dig wells and boreholes all throughout the city. A destroyed waste management infrastructure and a complete lack of enforced well construction guidelines and policies soon caused the wells and boreholes to become dangerous and deadly because of cross contamination with human and animal waste and other pollutants. This has caused an extreme environmental health disaster for the general population. It is estimated that as much as 80% of the Mogadishu population do not have access to safe drinking water. The result is an endemic spread of waterborne diseases such as cholera and dysentery that claim the lives of many

children and cause much suffering for millions of people.

SOLUTION

Arc Solutions is committed to providing safe, clean drinking water for the people of Mogadishu. The people's need is not for more water or more wells. The need is for the water they already have to be purified and made safe for human consumption.

The project in which this proposal addresses will be located at Waberi School. A total of 1200 students attend this school on a daily basis. There is a well on the school property that supplies water to all who attend the school. This water has been known by those who drink it to be dangerous because of the high levels of bacteriological contamination. A water analysis has been taken from the sole drinking tap located on school grounds and has verified that the water these students and staff are drinking contains harmful contaminants that cause waterborne diseases. As a result of this project, 1200 of some of the most marginalized people in the world will be provided sustainable clean water every day. Access to clean water coupled with water, sanitation and hygiene education will dramatically reduce the contraction of water-borne diseases, greatly improve living conditions and give all those at the school greater hope for their future.

Project Waberi is comprised of three primary aspects:

1. WATER PURIFICATION SOLUTION

We will be installing a water purification system that will produce clean, safe drinking water for all the students and staff at Waberi School.

Throughout the installation process we will be teaching the operators

we have selected from the school staff basic principles of clean water, we will be training them in the operation and maintenance of the system and empowering them to make positive change in their community

2. WaSH EDUCATION PROGRAM

We will be educating students and staff on life saving health practices through providing WaSH (Water, Sanitation, Hygiene) training through certified Somali WaSH trainers

3. FINANCIAL SUSTAINABILITY

The costs associated with the operation, maintenance and repair of the system will be incorporated into the schools operational expenses in order to cover all ongoing costs and ensure the project is financially self sustained

FUNDING REQUIREMENTS

The estimated total cost is \$14,500.

This estimate was obtained through combining the cost estimates for each of the following elements:

- Water Purification System
- System Installation
- Construction Costs
- Clean Water Tank
- WaSH Education Program Materials

Organization Qualifications

Although Somalia has been experiencing a growing stability and peace continues to expand, it is still considered one of the most dangerous countries in the world. The combination of Islamic extremists, militant radicals, land and sea pirates, desperation caused by extreme poverty among the general population as well as other factors results in Somalia being a high risk environment to work in. The high level of risk associated with working in this environment prevents many organizations from doing sustainable development work. Arc Solutions specializes in working in this type of environment. Our experience working in this environment, the partnerships and relationships that we have developed in Somalia, and our willingness to assume the risks involved makes us specifically tailored for this project.

Statement of Need

The world is in the midst of a water crisis. 11% of the global population, or 783 million people, are still without access improved sources of drinking water (Source: JMP 2012). According to the World Health Organization (WHO), 3.41 million people die each year from water-related disease making it the leading cause of disease and death around the world (World Health Organization, 2008). Every day 3,000 children die due to unsafe water and lack of basic sanitation facilities

(<http://www.unicefusa.org/work/water/>). Among the nations with the most desperate water conditions is the nation of Somalia.

In 1991 the government of Somalia collapsed. Civil war ensued. For 21 years the war has desolated the country. At the heart of the devastation is the capital city of Mogadishu. As a result of the war nearly all of the city's infrastructure and public services were destroyed. Among those

destroyed was the city's water distribution infrastructure. Prior to the outbreak of the war, the population of Mogadishu received their water via a piping system that pumped water into the city from an area called the Afgoye region located 16 miles north of Mogadishu. When this water piping system was destroyed the population, in desperation for water, started digging wells and boreholes all throughout the city. The majority of these were shallow hand dug wells. Over the course of the following years, hundreds of these wells were dug. It is estimated that there are anywhere from 300 to 1000 wells and boreholes in Mogadishu. The reason for such a broad estimate is a total lack of the city's ability to gather accurate statistics for over 20 years. These 300-1000 wells and boreholes have been constructed without regulations, policies or guidelines because the country has been without a government to enforce them. As a result most of them are very poorly constructed. The poor construction of the wells cause them to be vulnerable to contamination. Government leaders of Mogadishu estimate that 90% of the wells are contaminated with harmful bacteria and microorganisms that cause frequent outbreaks of water-borne diseases such as Cholera, Dysentery, Typhoid and Acute Watery Diarrhea. Often these diseases lead to death especially among children under the age of 5 years old whose bodies aren't strong enough to fight off the disease.

The issue of waste management within the city is directly related to the issue of water contamination. For over two decades the residents of Mogadishu have been without a sanitary waste management system. The latrines and septic tanks leak human waste into the ground and because of the close proximity of latrines and septic tanks to wells, the wells become contaminated. The type of soil in Mogadishu compounds the problem as the soil is sandy and allows the contaminants to rapidly flow into the poorly constructed wells. The waste of an estimated city population of 3 million people plus the waste from the animal population produces an extreme sanitation hazard. The resulting water contamination is a foremost perpetrator of deadly disease among the population. The immediate water

need in Mogadishu, Somalia is not for more wells or water sources to be established. The need is for the water that is already available to be purified and made safe for human consumption.

The population of Mogadishu can be divided into 3 categories- Upper class, Middle class, Lowest class. Each category acquires water in a different way. The lowest class are the poorest of the poor. This category is comprised of Internally Displaced People or IDPs. An estimated 15% of the population falls into this category. These are people who have been displaced from their homes by violence and/or drought. They have fled into the city seeking refuge. Most of them own nothing and have no money at all. They have 3 means of acquiring water: 1. Through institutions giving them water from their own wells. 2. Finding polluted water sources i.e. puddles. 3. NGOs giving them aid through a method called 'water-trucking'. In this method large containers of water are trucked to IDP camps and distributed to the people. Both methods 1 and 2 fail to provide safe, drinking water for the people. The water that is acquired through these means is contaminated and causes water-borne disease, suffering and death. Method 3 is not a sustainable means for the people to acquire water. They are completely dependent on aid. When the aid stops, their access to clean water stops. The middle class represents an estimated 80% of the total population. This sector acquires water via the wells and boreholes located throughout the city. Local businessmen privately own the majority of these wells and boreholes. The upper class consists of 3-5% of the total population. This sector purchases purified bottled water from local businesses. This is safe drinking water, but it is only available to the small percentage of the population that can afford it.

This problem is being addressed by other organizations in primarily two ways. The first is through providing aid through methods like water trucking. The second is through using chlorine in the water sources to eliminate some of the harmful bacteria. These methods are helpful, but

they are not solutions. They require ongoing provision from the organizations for water and chlorine. Although these methods are helpful in the short term, in the long term they perpetuate the people's dependence on the foreign aid. When the aid stops the problem persists.

Our solution is superior to these methods. Through the use of a water purification system, training, educating and empowering the people, and ensuring financial sustainability, the people will be able to acquire purified water long term without the ongoing dependence on outside aid. This project is designed to be replicated and serve as a model for future projects. This model is to be replicated in schools, orphanages, medical clinics and other institutions throughout the city.

Mogadishu, Somalia is in desperate need for purified drinking water. The amount of suffering, death and overall low quality of life that results from drinking contaminated water is enormous. Although the challenges we face in bringing sustainable clean water to these people are massive, we will accomplish the task! Thousands of Somali children, men and women are waiting to receive the life giving benefits of this project.

Project Description:

PROJECT LOCATION: WABERI

We have identified 5 requirements that an institution must have in place for the project to be sustainable. These 5 requirements are a major part of Arc Solutions determination of a potential project locations eligibility.

1. Need for water purification

The most basic requirement is that there must be a need for water purification. The water that the people are drinking must be

contaminated and cause sickness among the community.

2. Water source on property

The project location must have their own water source on property from which will come the water that is to be treated.

3. Willingness among the community to take ownership of project

The community must be willing to be educated in Water, Sanitation and Hygiene practices and recognize the importance of clean water.

4. Capable leadership to operate and maintain system

The leadership of the community must have integrity. They must be honest and honor the terms of the partnership agreement.

5. Secure Location

The location must be secure from theft and vandalism.

Waberi School meets the above 5 requirements.

Strategic Partners:

Project Partner:

WABERI SCHOOL

We have developed a partnership with Waberi School, the institution where the project addressed in this proposal will be located. Waberi provides water, at no cost, to 1,200 children and 50 staff who attend the school every day. Water is first pumped from a well to an elevated storage tank then from the tank to a single, small water tap where all those at the

school retrieve their water. Through interacting and dialoguing with the school leadership, staff and students we have developed a working partnership. This partnership includes a document which describes the terms of our agreement and lays out a clear understanding between both parties of what is expected to ensure the sustainability of the water treatment system.

The presence of high levels of dangerous and disease-causing bacteria has been recognized by the staff and students at Waberi School and has been confirmed by a water analysis. Dysentery and Acute Watery Diarrhea are common diseases that result from the drinking of this water. Cholera outbreaks occur and generally happen during the months with the hottest weather. Typhoid Fever and Hepatitis A are also prevalent.

Implementation Partner:

SOMALIA FOUNDATION FOR RELIEF AND DEVELOPMENT
(SOFORD)

This project will be implemented in partnership with SOFORD. SOFORD was founded in 1997 by Abdirashid Salah, the Head Director of Projects for the Benadir Administration (the governing authority over the city of Mogadishu). SOFORD is aimed at sustainable development work in Somalia in the areas of Water, Sanitation, Hygiene, Food and Agriculture, Education, Peace making, and Emergency Aid.

SOFORD approaches emergency relief and long-term development holistically, ensuring that all people, especially the poorest and most vulnerable, are able to participate in the fullness of life â€” to have access to basic necessities such as water, food, health care and education.

Solution Partner:

HEALING WATERS INTERNATIONAL

Our strategic partner, Healing Waters, was founded by Tom and Dana Larson in February 2002. By the end of 2004, Healing Waters had 24 self-sustaining water projects in the Dominican Republic, and had launched its first three projects in Chiapas, Mexico. In 2005, Healing Waters began operations in Guatemala. Today, they have more than 100 water projects in Latin America and are expanding to serve new countries and regions of the world.

Their engineers engage in ongoing research, development and field testing to ensure that they continue to deliver scalable, cost-effective water treatment solutions that can be easily transported and installed anywhere in the world. With proper care of the equipment, a community can look forward to having safe water for at least 10 years.

To fully equip a community with a water treatment solution, Healing Waters provides not only the technology but also the training to use it via Site Management and Health & Hygiene Education.

By design, a system can be up and running very quickly, and anyone with basic mechanical skills can be trained to install and maintain it. Installation and Maintenance Manuals contain intuitive, photo-based instructions with minimal text, for clear understanding even at basic literacy levels.

Project Objective:

To eliminate the contraction of water-borne disease among all of

the children and staff at Rage Ugas School

The following is the plan of action to obtain this objective:

1. WATER PURIFICATION SOLUTION

To provide sustainable purified drinking water to all of the children and staff at Waberi School

LOCATION: WABERI SCHOOL

Water Test: A water sample has been taken from the single drinking tap at the school. The results of the test show that biological contaminants exist in the water. This information determined the appropriate water purification system to use.

Water Purification System: We will be implementing the GravityPure Ultra Filtration system manufactured by Healing Waters International. This is a gravity-powered, electricity-free water treatment system that's all about simplicity.

Some of the benefits of this system are:

Safe water

Removes 99.99% of all bacteria, viruses, and parasites regardless of source water quality or operator error.

No electricity required

Filtration is driven by gravity, with water flowing from 5 feet or more above the unit.

Modular Design

Each system is sized to fit community needs, with 1 to 4 membranes producing 250 to 3,500 gallons per day.

Rapid Assembly

Assembly and installation takes only a few hours, providing safe water from day one.

Sustainable Solution

Designed for 10-year life when properly maintained. No replacement filters are needed.

Transportation: The entire system will be transported via checked airline baggage. The system will be transported disassembled in 4-6 duffle bags. Arc Solutions installation team will take it with them when they travel to Mogadishu, Somalia.

Installation: The Arc Solutions installation team will be partnering with locally contracted engineers to install the system. A local construction team will be contracted to build a housing structure that will protect the system from theft, vandalism and the elements.

Operation: Two system operators will be selected from among the staff. The system operators will be responsible to oversee the water purification

system. They will be trained in the on-going operations and maintenance of the system.

System Operation Training Overview:

1. A thorough explanation of how the system works
 - a. The purpose of each of the parts that comprise the system
 - b. The function of each of the parts that comprise the system
2. The designated system operators will assemble the system with oversight and direction from the Arc Solutions Installation Team
3. An interactive explanation of how to operate the system
4. Training on the ongoing maintenance of the system
5. Troubleshooting

2. WATER, SANITATION, HYGIENE EDUCATION

To provide basic water, sanitation and hygiene education to all of the children and staff at Waberi School and empower them to educate others in the surrounding communities

A key to causing long-term positive change is through educating and empowering the local people. Arc Solutions is committed to educating the local people on the need for clean water, on how to reduce the risk of contracting diseases through improved sanitation and hygiene practices,

and by empowering all to bring transformation to their communities. This will happen at Waberi School by implementing our Trainer of Trainers (ToT) WaSH (Water, Sanitation, Hygiene) program. In this program 20 leaders in the school are selected to be trained by our certified WaSH Instructors. Upon completion of the this initial training, the 20 newly trained trainers hold classes throughout the school to educate all of the children and staff on Water, Sanitation and Hygiene.

3. FINANCIAL SUSTAINABILITY

To ensure the clean water is sustainable through incorporating all operation and maintenance costs into the school's current financial plan

The water purification system is designed for durability and low-cost maintenance. Yet there are still costs to properly operate and maintain the system. In addition to these costs there is also the possibility of the occasional need to repair or replace a part of the system that had been damaged. There is a very small cost of admission for a student to attend Waberi School. The costs for the system have been incorporated into the current budget of the school to ensure the financial sustainability of the system.

Staffing and Administration:

- Benjamin Church - Cofounder, Chief Operations Officer (paid by Arc Solutions)
- Abdirashid Salah - SOFORD Founder & Director, local partner (paid by SOFORD)
- Ahmed Osman - Project Coordination (paid by Arc Solutions)
- 1 Engineer (paid by Arc Solutions)
- 1 Construction Team (paid by Arc Solutions)

- 1 System Operator (paid by school)
- 1 System Back-Up Operator (paid by school)

Evaluation:

Immediately following the installation of the Water Purification System, Arc Solutions will begin our evaluation process. This process is aimed at ensuring the sustainability of the solution and measuring the impact on the community. Local Arc Solutions Staff performs regular evaluation visits to the project location.

There are 2 aspects that comprise the evaluation process:

1. Monitoring
2. Metrics

Monitoring:

This strategy is for the purpose of ensuring the sustainability of the project. It consists of periodic visits by Arc Staff to the Project Site. The purpose of these visits is to closely monitor the project site to help ensure the solution that has been implemented will be sustainable.

With each visit our local Arc Staff will accomplish the following:

1. Complete Project Evaluation
- The Project Evaluation includes a questionnaire that is designed to
 - a.) ensure that the project is operating sustainably, b.) to provide picture proof that the project is operating properly, c.) to provide valuable feedback on how future projects may be improved upon.

Month 1

-For the first month (4 weeks) following the implementation of a project Arc Staff will visit the project location once per week. At the end of this 4 week period the project site can move on to the next phase of Project

Monitoring, as long as there are no concerns. If there are concerns with the Project Site then more frequent visits are required until the concerns can be resolved.

Month 2 - Month 6

-For the second month through the sixth month following the implementation of a project Arc Staff will visit the project location once per month. At the end of this 5 month period the project site can move on to the next phase of Project Monitoring, as long as there are no concerns. If there are concerns with the Project Site then more frequent visits are required until the concerns can be resolved.

Month 7 and Onward

-For the seventh month and onward following the implementation of a project Arc Staff will visit the project location quarterly (once every 3 months). With each quarterly visit the Project Site may continue in this phase of Project Monitoring, as long as there are no concerns. If there are concerns with the Project Site then more frequent visits are required until the concerns can be resolved.

Metrics:

This strategy is for the purpose of gathering reliable data from potential project locations and completed project locations in order to measure the impact of the project. The purpose of this data is to measure baseline conditions at the proposed location and the impact that our projects are having on the location's community.

There are two Metric Forms:

1. Pre-Project WaSH Metrics

The Pre-Project WaSH Metrics Form is to be filled out prior to the implementation of the project. This is for the purpose of establishing baseline metrics that post-project implementation metrics will be

measured against.

2. WaSH Impact Metrics

The WaSH Impact Metric Form is to be filled out during Project Monitoring Evaluations. The first WaSH Impact Metric Form is to be filled out within one week of project completion. All following WaSH Impact Metric Forms are to be filled out once per quarter (every three months) during the ‘Weekly, Monthly and Quarterly Project Monitoring’ Phases. All Impact Metric Forms are to be filled out during Project Evaluations.

Budget:

- Water Purification System - \$9,500
- System Installation - \$500
- Construction - \$1,500
- Clean Water Tank - \$700
- WaSH Education Program - \$500
- Contingency Costs - \$1800

Total: \$14,500 (The numbers presented are estimates and may fluctuate.)

Conclusion:

Everyday people in Mogadishu, Somalia are drinking dangerously contaminated water. They have no other option than to drink this water. Many of these are children who contract water-borne diseases that lead to suffering and sometimes death. This is preventable! Through the solution described in this proposal we seek to bring an end to suffering and death caused by water-borne diseases for the students and staff that receive their water from the

well at Waberi School.