

**The Sandtown JETS  
Hydraulic Hand Pump Project**



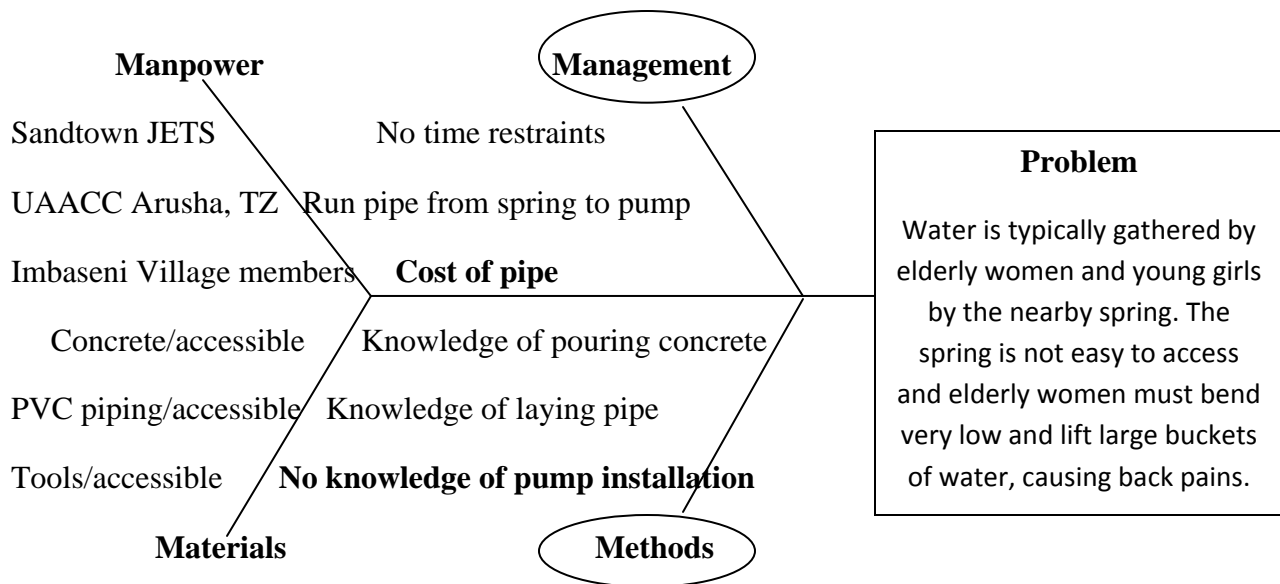
**For the United African Alliance Community Center in  
Arusha, Tanzania**

# SANDTOWN MIDDLE SCHOOL -JETS

## Hydraulic Hand Pump Project

**Introduction** Sandtown J.E.T.S. has set out to purchase and possibly modify a “Rife” hand pump for the Imbaseni Village of Arusha in Tanzania, Africa. While we will be taking the pump to only one village, we will assist in the installation of the pump and leave detailed instruction on maintenance, and trouble shooting so that the pump will benefit all within the Imbaseni Village and possibly the rest of Tanzania and Africa.

**Problem** Imbaseni Village does have a pipe system that brings water to the villagers, but most can not afford to have a pipe connected to their home. Therefore, many young girls and elderly women go to a nearby spring to get water. Due to the depth of the spring, they are forced to bend very low to get water. This, of course, puts significant strain on their backs. Sandtown JETS would like to fix this problem by installing a hydraulic hand pump that would make the nearby spring more accessible and collecting water efficient and easy.



**Sandtown JETS Fish Bone Diagram**

We used the Fishbone (Cause and Effect) Diagram to analyze the project. We started off with our “effect” or problem. We then listed four major categories to find the root “causes” of the problem. We found that there was adequate manpower and all of the materials needed are accessible in Tanzania. Under management we found that the cost of a hand pump presented a problem for the villagers. Under methods we found that the villagers also lack the knowledge of pump installation. This allowed us to address the causes to bring about a positive effect.

## **Design Requirements**

**Size:** The dimension of the spring is 5ft x 5ft with a depth of 5ft. or more.

**Flow:** The spring is still with little to no water flow.

**Installation:** Installation will take place with the combined efforts of Sandtown JETS, UAACC members and members of the Imbeseni Village.

**Maintenance:** This pump requires little maintenance however trouble shooting and maintenance will be maintained by a designee of the UAACC Arusha , Tanzania.

**Cost:** The cost of this pump and related materials will be paid for through the fund-raising endeavors of Sandtown JETS.

**Pump:** An existing design that fulfills the above requirements is the Rife hand pump. The Rife Hydraulic Engine MFG. Co., Inc. has a history manufacturing pumps that do not require electricity or fuel. The Rife Hand Pump is designed to pump water from an existing spring to another designated location. In addition, this pump is fitted for the use of a pump jack or windmill for wind powered pumping.

To address the problem of elderly women straining their backs while bending down in the spring to get water, the pump will be stand at 4 ft. in order to pump the water with ease, relieving pressure to the back.

The Rife Hand Pump that we plan to purchase has a .31 gallon per stroke ratio. This means that it will take 16-17 strokes to fill the 5-gallon buckets normally carried by the elderly women and young female children.

**Location:** The pump will be placed on a dirt road that comes from the village located near the spring. (See attached picture)

**Installation:** A concrete platform will be constructed on the side of the dirt road. The pump will then bolted down there. 30-40ft. of PVC piping will be installed 12 in. below the earth, stretching from the spring to the pump near the edge of the road. Both the concrete and PVC piping are readily accessible to the citizens of Tanzania.

**Accessories:** Two accessories will be added to the pump. 1. Hand Pump Spout to Hose Adapter which will allow the water to be delivered from spring to pump (30-40 ft.) and 2. Hand Pump Screen Kit which will filter water debris.

**Considerations:** The Sandtown JETS would like to test the water source for fluoride levels and overall water quality for the design of an additional filtration system.

The Sandtown JETS consulted with the UAACC-Atlanta Chapter, Inc to gain addition insight and guidance on this pump. Baba Noel Warner, Director of the Atlanta Chapter explained that the farm animals do not graze near this particular spring. This was important to know in order to prevent reoccurring water contamination from animals using the same spring. Currently, the village functions with the elderly women and young girls cutting through “the bush” to access the current water supply. Baba Noel Warner explained that this pump will provide a safe, accessible means to gather water that is easy to understand and takes little maintenance.

The Sandtown JETS students would like to thank you for your time and consideration.

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