Proposal for the Improvement of WaterAid's Education Efforts in the United Republic of Tanzania

How HAWILI Can Improve Water Access in Tanzania

4/24/2008

Help Access to Water Improve through Learning Initiatives

Lisa Boyd, Nora Diehl, & Jason Kramer

Dear WaterAid,

Attached is a proposal plan for improving the sustainability of your efforts in Tanzania. In researching water efforts within the Third World, it is obvious that you are making great strides in the realm of non-governmental organizations. This is why we have chosen to propose our plan to your organization in particular. We greatly appreciate and admire your efforts; however, we have noted your struggle to keep all wells functioning over an extended period of time. We hope that the creation of our NGO in partnership with your efforts will allow for a better rate of success within Tanzania.

We understand that you usually only partner with existing, local organizations. Our NGO will be run by American citizens, yet half of the staff will be Tanzanians and it will be located in the Dodoma region of Tanzania alone. Our partnership will be at little cost or effort on your part and will help improve the outcome of well building in Tanzania significantly. Your stated goals compliment perfectly our philosophy and plan, and we believe that a partnership of our efforts would enhance your current projects.

Water is the basis of all life, as you well know, and our passionate efforts will only support your causes. We ask you to keep an open mind about partnering with an internationally based organization, because we understand that it is unlike other organizations you have worked with before. This collaboration will not only help to spread your name and gain support for your work within esteemed universities, but will more importantly make a substantial difference in the lives of many struggling and impoverished Tanzanian citizens.

Sincerely,

Lisa Boyd	**Nora Diehl**	**Jason Kramer**
Founder and Creative Director	Founder and Chief of Staff	Founder and Financial Executive

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Introduction

This paper formulates a development proposal for the United Republic of Tanzania based on our determination of the most crucial factor of development. Through the analysis of basic needs fulfillment, quality of life, and other living standards, we prove that Tanzania has the potential to most improve the quality of life of its inhabitants through improving water access in rural areas. While Tanzania has progressed, grown, and developed, it still fails to provide a decent quality of life for all of its citizens. The people of Tanzania are disadvantaged as a result of poor education systems, health problems, and a failure to meet basic needs. Each of these insufficiencies can be best attributed to limited access to safe, clean drinking water. In the words of former Tanzanian Prime Minister Dr. Salim Ahmed Salim, "The issue of water is life."

Definition of Development

Every person on this earth should have the opportunity to lead a healthy and stable life. The people of Tanzania, like many other developing countries, do not have access to the resources that developed countries possess. Therefore, those who have the resources necessary for aiding development, whether they be financial or other, are obliged to help those who are in need. There is a sense of obligation because the underdevelopment of the Global South was created in part by developed nations themselves. An unhealthy society can create instability and has the potential to spread such instability elsewhere. Development, therefore, must create a foundation focused on decent quality of life, which is the basis for any healthy society.

Measuring a person's quality of life consists of determining if a person has access to clean water, adequate amounts of food, healthcare capable of fighting and preventing diseases, shelter, and an education. Without such basic needs, a human is deprived of his or her capability to live a full and healthy life.

Though a growing economy can facilitate the progress, improving basic needs is paramount to development. Economic growth can not be the main focus of developmental policy because the increase in overall GDP of a country does not necessarily benefit all members of society. Modernization theory stipulates that less developed countries strive to emulate developed countries by adopting similar policies. It measures economic improvement utilizing increases in GDP per capita and levels of industrialization as the basis for development. This theoretical approach fails to explain why increasing GDP per capita is ideal or how it improves the living standards of the average person. In many cases, a rise in GDP results from growth in capital for the wealthiest citizens of a country and creates little to no change for the majority of the population. Real development must instead be rooted in constructing a healthier society through the provision of basic needs. Tanzanian development depends on creating a foundation that can provide a basis upon which further development can bloom. Basic needs must be met in order to increase standard of living in a sustainable manner.

Throughout this paper Tanzania is consistently compared to Kenya, South Africa, and Sub-Saharan Africa. We chose Kenya due to its similar geography and close proximity to Tanzania, South Africa, which acts as a model of what is possible with a strong economy in Africa, and Sub-Saharan Africa to compare Tanzania to the aggregate of its neighbors.

Education in Tanzania

Benefits

Acquiring an education increases the potential of young Tanzanians, consequently removing an impediment towards progressing and developing the country. The human capital gained from acquiring an education can improve both an individual's life as well as the society as a

whole. Education is an integral aspect of development because well-educated masses are better equipped to make large scale social improvements by means of business or government action.

Progress in Attendance, Problems with Completion

Tanzania has a higher rate of primary school attendance rate than most of the rest of Africa. As of 2004, approximately 85% of the population was enrolled in primary school for five years with about 57% continuing through all seven years[1]; however, only 6% of students continue their education upon graduating to secondary school.[2] In Sub-Saharan Africa, the graduation rate from primary school is 61%, implying that Tanzania lags behind its regional average. The education rate, however, has improved significantly over the past decade in Tanzania. In 1961 primary school was provided for only 50% of the population and of those students, only 12.5% of which continued to secondary school.[3]

Table 1: Primary School Enrollment (%net)[4]:

	Tanzania	Kenya	South Africa	Sub-Saharan Africa
2000	51.36	66.77	90.38	58.00
2001	56.26	..	89.98	59.80
2002	71.46	63.49	89.02	62.00
2003	80.62	76.69	88.78	64.19
2004	85.92	76.43	87.07	66.34
2005	91.38	78.57	..	69.15
2006	97.99	..	..	..

[1] World Bank Education Profile, statistics from 2005

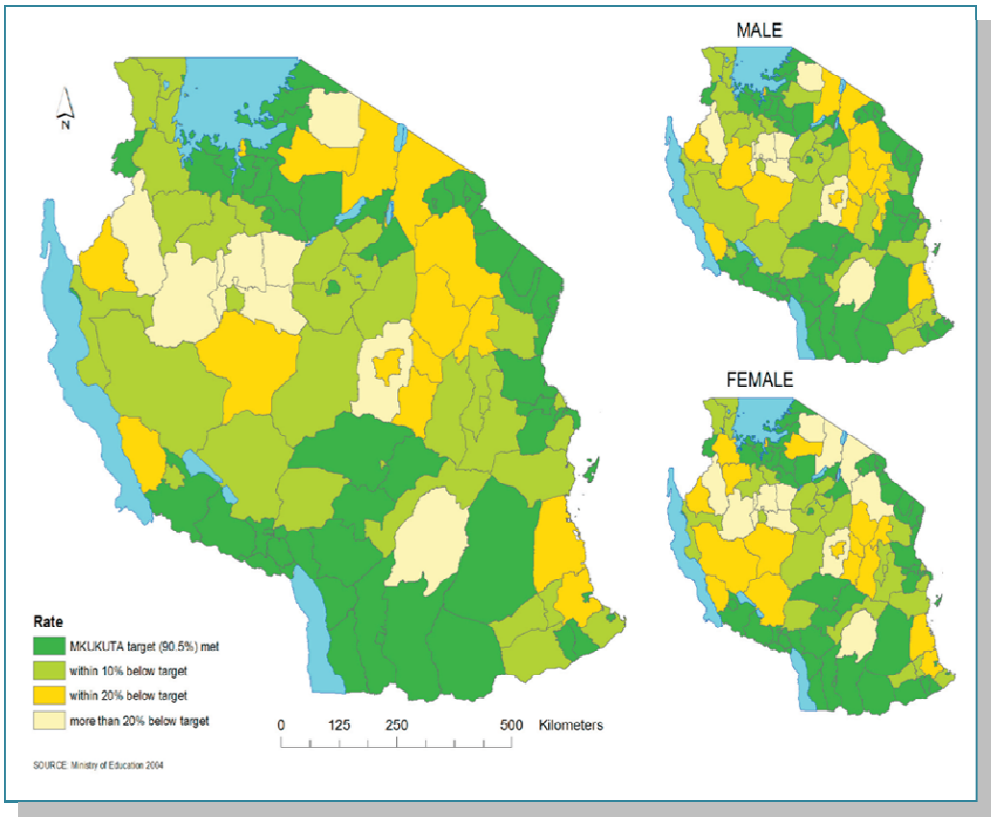
[2] World Bank Education Profile, statistics from 2000

[3] Hatch, John. Tanzania, a Profile. New York, NY: Praeger Publishers, Inc., 1972.

[4] World Bank – World Development Indicators – https://publications.worldbank.org/subscriptions/WDI/old-default.htm

In Tanzania, enrollment in primary education has increased significantly in recent years as seen in Table 1. This progress is attributable to the government's efforts to address the Millennium Development Goal for education, which aims to achieve universal primary education.[5] The Tanzanian government has implemented MUKUKUTA, a Kiswahili acronym for the National Strategy for Growth and Reduction of Poverty, and is a reform program which is currently in its second 5 year phase (2005-2010).[6] One aim of the program is improved quality of life and social well-being, part of which can be achieved through setting primary education enrollment targets.

Figure 1: Attendance Rate in Primary Schools (by province):



[5] UN – Millennium Development Goals - http://www.un.org/millenniumgoals

[6] The United Republic of Tanzania Poverty Monitoring - http://www.povertymonitoring.go.tz/mkukuta.asp

The issue of attendance can be addressed by providing incentives for children to attend school. The map provided above, Figure 1, illustrates both that males are more likely to be educated in primary school than females, and that there is still an overall inability for areas of the country to meet the 90.5% enrollment standard by MKUKUTA.[7]

Poor enrollment is the result of problems associated with the education system, often from a lack of teachers. There still exists a dearth of teachers throughout much of Tanzania. In some areas there may be more than 50 students per classroom, providing an environment that is challenging to learn in.[3] This may result in a decrease in quality and effectiveness of the time a child spends in school. Class sizes are too large to be productive and are a factor in Tanzania's low primary completion rate. Although the graduation rates in Tanzania have also substantially improved, the percentage of students who graduate primary school continues to be significantly lower than that of Kenya and South Africa. This comparison can be seen in Table 2 below. Although Tanzania has recently surpassed the regional average rate, it is clear that schools are having difficulties keeping their students enrolled throughout all of primary school, with over 28% dropping out.

Table 2: Primary Completion Rate (% of relevant age group)[1]:

	Tanzania	Kenya	South Africa	Sub-Saharan Africa
2000	..	..	89.04	50.67
2001	52.53	..	..	53.08
2002	56.75	..	93.38	56.20
2003	..	..	95.64	56.65
2004	56.54	91.76	98.66	57.98
2005	54.17	95.98	..	60.84
2006	71.61	..	..	..

The problem of high student to teacher ratios could be solved through providing more incentives for adults to become professors. An alternative would be to provide clean, drinkable water within close proximity to children and their families. By reducing the time and effort women and children must spend collecting water each day, children would be less likely to drop out due to a reduced amount of duties and time commitment within the family. In addition, clean water to drink reduces the amount of time a child would otherwise miss while healing from infectious health problems.

While the progress in primary attendance and completion rates for primary school is encouraging, primary school provides only the basic educational tools that people can use to create new ideas and improve their society. This is further compounded because Tanzania, like in most underdeveloped nations, has education quality issues as we have briefly touched upon. For Tanzania to truly reach a higher standard of education the overall quality of the schooling must be improved and increasing the number of teachers per student would be beneficial and a smart solution.

Despite this concern, about 70% of those 15 and older can read and write in Kiswahili (Swahili), English, or Arabic.[7] Considerably low enrollment and completion rates dating from Tanzania's independence until recent history, however, have left many Tanzanians without proper education. Because the improvements in these measures have only happened recently, a majority of the population still remains uneducated. This lack of general education leads to the idea that vocational training would be a beneficial addition to Tanzania's education system in order to better prepare people for employment.

[7] CIA World Factbook - https://www.cia.gov/library/publications/the-world-factbook/geos/tz.html

Health

Infant Mortality Rates

The high infant mortality rate in Tanzania results from the many health issues that plague the country. The country's infant mortality rate of 72 infant deaths per one thousand is extremely high.[2] Neighboring Kenya's infant mortality rate is under 58 deaths per one thousand, and illustrates the potential for countries in East Africa.[2] South Africa's infant mortality rate is also lower at 60 deaths per one thousand. Although Tanzania's infant mortality rate is lower than some other neighboring African nations, such as Malawi (about 92/1000) and Mozambique (about 109/1000), it is still at an unacceptably high rate. That Tanzania has the twenty-eighth highest infant mortality rate in the world as well as the evident potential to decrease that rate, as evidenced by several countries in the region, illustrates the necessity for further development by Tanzania.[8]

[8] CIA World Factbook - https://www.cia.gov/library/publications/the-world-factbook/rankorder/2091rank.html

Figure 2: Under-five Morality Rates by Province:

Figure 3: Amount of Health Facilities per Province:

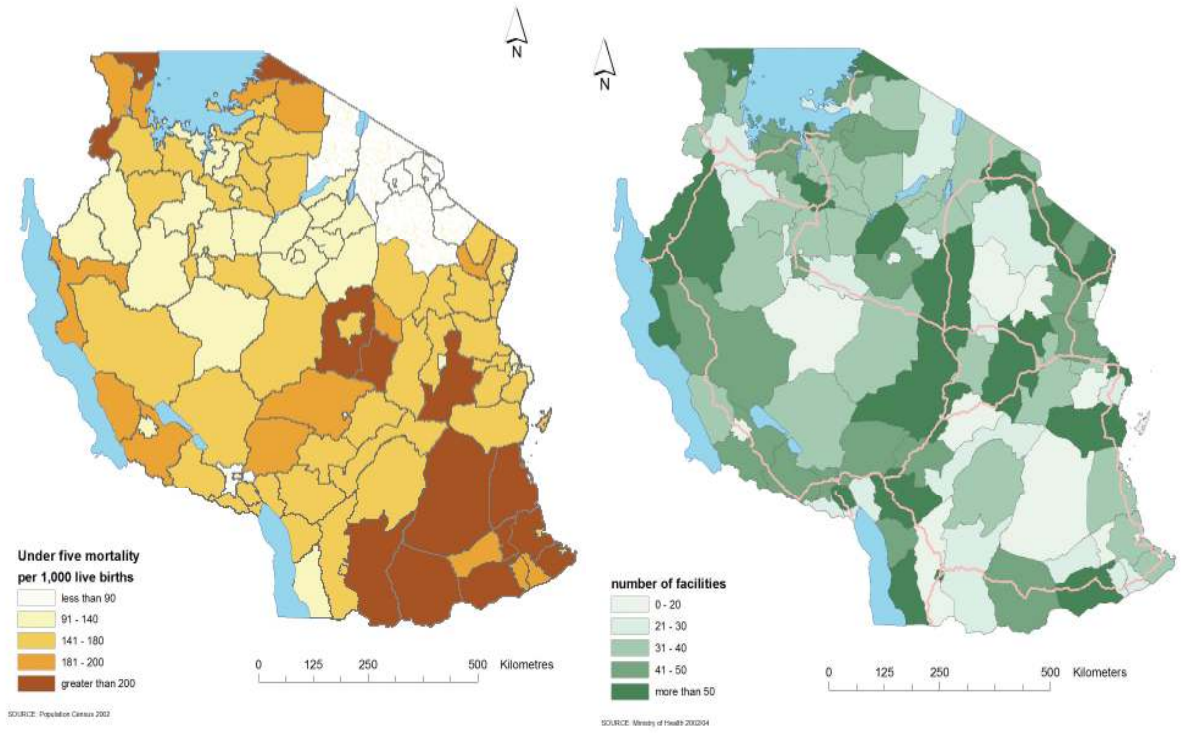


Figure 2 displays the under-five infant mortality rate by province.[7] It is important to recognize the apparent correlation between this map and Figure 3, showing that infant mortality rates decrease as the number of health facilities per district increase.[7] Infant mortality rates are generally worst in the southeast provinces of Tanzania, which have very poor access to health facilities, road infrastructure, and clean water supplies.[9] Medical facilities in Tanzania face major problems when attempting to provide health care because there is one doctor for every 30,000 to 50,000 people throughout the country.[10] South Africa has about 1 doctor per every 1,450 people, significantly more than in Tanzania.[1] While Tanzania has 846 doctors working in the country,

[9] HDR – UNDP http://hdr.undp.org/en/reports/nationalreports/africa/tanzania/tanzania_2005_en.pdf

[10] http://www.who.int/countries/tza/tza/en/

South Africa has over 12,000.[11] Increasing the amount of doctors available could solve the high infant mortality rates.

High infant mortality rates can devastate communities because, in Tanzanian society, a large portion of a woman's identity is dependent on her offspring. Men generally earn their respect because they are head of the household, while women earn their respect through their children. In many communities a girl is not considered a woman until she gives birth to a healthy child. Some women even take the name of their first born child and are called "Mama Abasi," for example.[12] A woman's pride and identity that she gets through her children is very significant to her life. High infant and child mortality rates, therefore, could be destructive to women and weaken community stability. Increasing the amount of qualified, practicing physicians, and increasing the number of health facilities can help alleviate both this problem and others caused by high infant mortality rates.

Life Expectancy

Often seen as an important indicator to a society's quality of life, life expectancy is another health-related issue. The average life expectancy in Tanzania is roughly 51 years old, ranking 197th out of 222 countries.[13] It has remained at this level since 2000.[14] While Kenya's life expectancy is only 55, a modestly higher figure, it should serve as a role model because it represents a life span about 10 percent longer. Through improving health through fighting diseases, lowering high infant mortality rates, and providing proper nutrition, Tanzania should help itself attain increases in life

[11] http://www.dartmouth.edu/~mss/data%20analysis/Volume%20I%20pdf%20/122%20On%20the%20Average%20I%20P%20per%20.pdf

[12] Everyculture.com – http://www.everyculture.com/Sa-Th/tanzania.html

[13] CIA World Factbook - https://www.cia.gov/library/publications/the-world-factbook/rankorder/2102rank.html

[14] Tanzania National Bureau of Statistics - http://www.nbs.go.tz/stmainland.htm

expectancy. Although South Africa has a stronger economy than both Tanzania and Kenya, the average life expectancy for a South African is only 42 years old. This figure illustrates that possessing a higher GDP does not guarantee higher standards of living, and emphasizes why GDP and economic growth alone cannot be sufficient in judging development on the whole. When compared to the 77 year life expectancy of the average American, all of these statistics are unacceptably low.[15] Causes of shorter life expectancies in Tanzania include rampant diseases such as cholera, malaria, and HIV/AIDS and water-related diseases. Improvement in fighting and warding off diseases would lengthen life spans and improve quality of life.

Disease

Over 75 percent of deaths under the age of five in Tanzania result from pneumonia, diarrhea, measles, and malnutrition. Tanzania is a place with a very high degree of risk for major infectious diseases.[16] The most common, and often preventable, diseases include food or waterborne diseases such as bacterial diarrhea, hepatitis A, and typhoid fever; vectorborne diseases such as malaria and plague; as well as water contact diseases such as schistosomiasis.[17] There is also the constant threat of communicable diseases such as HIV/AIDS, which is preventable through education alone, however, in 2005, 6.5 percent of the population still died of AIDS.[18] Despite the high number of mortalities resulting from AIDS, the rate in Tanzania was significantly lower than that of South Africa, which stands at 18.8 percent.[6]

[15] Index Mundi (2003) http://www.indexmundi.com/g/correlation.aspx?v1=30&v2=67&y=2003&l=en

[16] CIA World Factbook - https://www.cia.gov/library/publications/the-world-factbook/docs/notesanddefs.html#2193

[17] CIA World Factbook - https://www.cia.gov/library/publications/the-world-factbook/fields/2193.html

[18] http://hivinsite.ucsf.edu/global?page=cr09-sf-00

Malaria is another easily preventable disease. Unfortunately, it kills approximately 100,000 Tanzanians per year.[19] In neighboring Kenya, malaria is the cause of about 34,000 deaths each year.[20] South Africa suffers many fewer deaths due to malaria; in 2004 there were only 423 deaths.[21] Prevention of Malaria is as simple as using a mosquito net or insecticide while sleeping. The average Tanzanian, however, does not access or utilize these prevention methods.

There are over 20 different waterborne diseases that could be prevented through clean, drinkable water and hygiene education, ranging from diarrhea to cholera.[22] In addition to those, malaria and dengue fever are helped spread through water. Both of these diseases are spread through infected mosquitoes which breed in fresh or brackish water.

Another water-related disease is malnutrition. Malnutrition is a major health problem, especially in developing countries. Water supply, sanitation and hygiene, given their direct impact on infectious disease, especially diarrhea, are important for preventing malnutrition.[23]

Nutrition and Malnourishment

Good nutrition provides children with the energy and strength they need. About 25% of children under the age of five are underweight, and therefore lack energy which could otherwise be used toward paying attention in school or helping around the house.[24] About 44% of Tanzanians

[19] http://www.iht.com/articles/2008/02/18/africa/prexy.php

[20] http://www.irinnews.org/Report.aspx?ReportId=59587

[21] http://www.health24.com/medical/Condition_centres/777-792-818-1802,13801.asp

[22] WHO – Water and Sanitation Related Diseases
http://www.who.int/water_sanitation_health/diseases/diseasefact/en/index.html

[23] WHO – Water and Sanitation Related Diseases
http://www.who.int/water_sanitation_health/diseases/malnutrition/en/

[24] UNICEF –Progress for Children – Child Nutrition
http://www.unicef.org/progressforchildren/2006n4/index_easternsouthernafrica_table.html

under the age of five are malnourished.[25] Reducing malnourishment can therefore substantially improve the quality of life among the children of Tanzania. In Kenya about 31% of the population is undernourished.[26] In South Africa only 2.5% of the population is undernourished.[27] Both figures show what is possible to achieve in Sub-Saharan Africa and serve as a model for Tanzania.

This lack of nourishment not only causes children to be underweight, but also causes iodine deficiency and anemia. Mental development at these young ages is crucial, and dietary deficiencies deprive individuals of the capability to reach their full physical and mental potentials. Iodine deficiencies can result in serious issues such as goiters and cretinism, in turn causing mental retardation and the loss of IQ points. Anemia can result in heart palpitations and failure.

Malnourishment also results in stunting, the literal prevention of development for children because they lack access to enough nutrients and calories. Figure 4 displays stunting as a percentage of children by province.[5] "Stunting, or low height for age, is caused by long-term insufficient nutrient intake and frequent infections. Stunting generally occurs before age two, and effects are largely irreversible. These include delayed motor development, impaired cognitive function and poor school performance."[28] Tanzanian children cannot physically or mentally develop with the prevalence of malnourishment limiting their capabilities. Such a problem will prevent future generations and societies if the conditions do not improve. A healthy society is one whose citizens are able to reach their full potential.

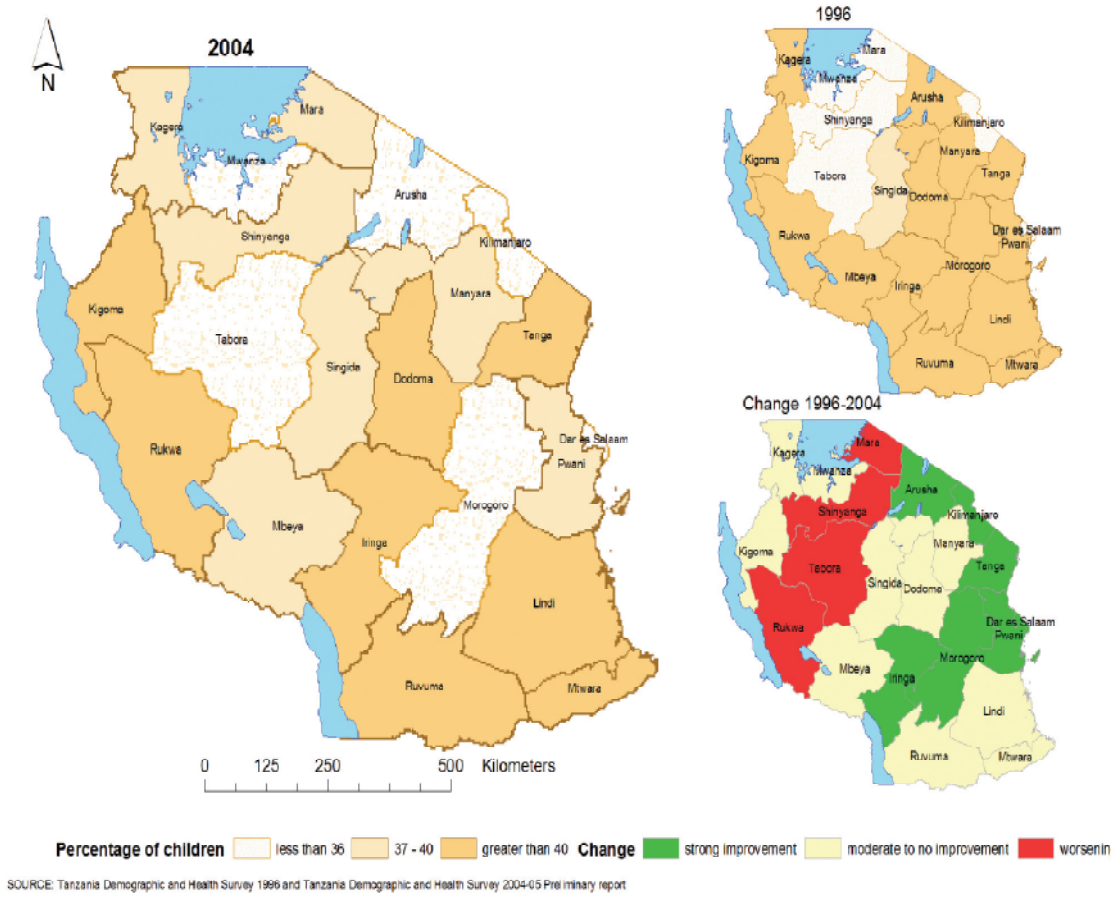
[25] World Bank – WDI - http://ddp-ext.worldbank.org/ext/DDPQQ/report.do?method=showReport

[26] World Bank – WDI - http://ddp-ext.worldbank.org/ext/DDPQQ/report.do?method=showReport

[27] World Bank – WDI - http://ddp-ext.worldbank.org/ext/DDPQQ/report.do?method=showReport

[28] http://www.unicef.org/progressforchildren/2007n6/index_41505.htm

Figure 4: Stunting as a Percentage of Children by Province:



Basic Needs

Shelter

Shelter is a basic human need that directly affects both health and quality of life. Shelter provides sanitary living conditions and protection from disease spreading mosquitoes. Homelessness plagues both Tanzania's flood plains and its rural areas. In 2006, a major flood left

19,000 Tanzanians homeless in the northern portion of the country.[29] Although this flood is a singular example, there are many flood-prone areas of Tanzania where this remains a constant threat. Urban areas are also home to large numbers of homeless people. Additionally, there are many unplanned settlements constructed as extensions to cities such as Dar Es Salaam, where slums have become the primary source of housing. Slums provide neither sanitary health conditions nor sanitary water access, and are breeding grounds for diseases and are areas where diseases spread quickly.

Table 3: Urban Population in Slums

Country/Area	% of Urban Population Living in Slums
Tanzania	92.1
Kenya	70.7
South Africa	33.2
Sub-Saharan Africa	72.5
Developing Countries	43.4
Developed Countries	7.5

As table 3 shows, the percentage of Tanzania's urban population living in slums is much higher than other countries and the average of Sub-Saharan Africa.[30] Because almost one quarter of

[29] IRIN News - http://www.irinnews.org/report.aspx?reportid=59017

[30] EarthTrends - Population, Health and Human Well-being -- http://earthtrends.wri.org/text/population-health/variable-1311.html

Tanzania's population lives in slums, these poor housing conditions require intervention by either the government or an NGO to provide more suitable shelter to those who lack it.[31] Without such action, people will not be capable of meeting their basic personal needs, and consequently will not be able to focus on reaching their potential, eventually obstructing the entire development process.

General Water Access

Along with food and shelter, access to water is essential to the fulfillment of basic human needs. Due to its location adjacent to the Great Lakes region which includes Lake Victoria, the second largest fresh water lake in the world, Tanzania should have enough water to serve its population from domestic sources.

Figure 5: Tanzania's Main Waterways and Lakes: [32]

[31] Tanzania 2002 Population and Housing Census -- http://www.tanzania.go.tz/census/tanzaniatotal.htm

[32] http://www.penfamtours.com/images/tanzania%20map.gif

A map of Tanzania and its waterways can be seen in Figure 5. Lake Victoria sits in the Northwest corner of the country and separates the two great rift valleys of Africa. The center of the country is home to a giant plateau of more than 2000 meters in elevation. Since the plateau's altitude is so much higher than that of the Rift Valley, this prevents easy access to water from the Great Lakes, through the Valley and into the majority of the country's landmass. There is a lack of infrastructure necessary to provide water to these higher elevations. This plateau, where the climate is extremely dry, is home to a sizable amount of the population which lives on plains and has no access to these vast natural resources. Tanzania has many issues connected with water distribution, irrigation, and agriculture because of this inability to supply potable water to the plateau area.

The northeastern part of the country is dotted by the Eastern Arc mountain range which includes Mt. Kilimanjaro, the tallest mountain on the African continent at 5,895 meters tall.[33] In most areas the climate is tropical with unreliable amounts of rainfall. The dry season brings drought and rainy season brings flooding, creating difficulties for farmers and significant issues in areas of Tanzania where people grow agriculture for domestic consumption or export for cash. In the northern areas there is a cycle of two rainy and two dry seasons per year, while in the south there is only one of each per year.[34] All of these physical and climate related challenges make domestic farming and access to clean water difficult for the average Tanzanian citizen.

Of the approximately 1 million square kilometers of Tanzania's land area, only between four to six percent of the land is arable.[35] Only four percent of this arable land is actually irrigated.[35]

[33] http://www.tanzaniaparks.com/kili.htm

[34] International Commission on Irrigation and Drainage. www.icid.org/index_e.html

[35] Food and Agricultural Organization (FAO) Statistical Yearbook; Country Profiles - Tanzania. http://www.fao.org/es/ess/yearbook/vol_1_2/site_en.asp?page=cp

That 89% of the country's total water usage is put toward agriculture, it is surprising that very little land is irrigated.[36]

A serious problem, and one of the main reasons for lack of irrigation, is the lack of water utilization despite Tanzania's proximity to large water supplies. The government has only recently made an effort to encourage and support both large scale irrigation reforms as well as attempts to improve small scale irrigation systems.[15] As described by the International Commission on Irrigation and Drainage, traditional irrigation schemes that are still used in Tanzania have been proven inadequate in today's society because of "(i) sharp increases in population, (ii) fair wear and tear, and (iii) catchment degradation and other environmental problems such as water logging and salinity."[37] Below, Table 4 shows the amount of land used each by small landowners, government land, and large companies. Table 5 then presents the amount of land that is irrigated and the type of irrigation that is used. [16]

Table 4: Types of Irrigation in Tanzania

Farm Type	Area (number of hectares[38])
Estates, outgrowers, medium to large commercial farms	2400
Parastatal/government farms	19,700

[36] International Commission on Irrigation and Drainage. www.icid.org/index_e.html

[37] Food and Agricultural Organization (FAO) Statistical Yearbook; Country Profiles - Tanzania. http://www.fao.org/es/ess/yearbook/vol_1_2/site_en.asp?page=cp

[38] Note that 1 hectare is equal to 10,000 square meters

Smallholder, small commercial	359,000
Total area under Irrigation	381,000
Potential total arable land	40,000,000

Table 5: Methods of Irrigation in Tanzania

Method of Irrigation Used	**Area (number of hectares)**
Formal Irrigation	26,000
Traditional Irrigation	85,000
Natural flooding/water harvesting	270,000
Total Present Irrigated Area	381,000

The data in these tables illustrates that although very little land is irrigated most irrigation is natural flooding/water harvesting which can be largely inefficient. One of the largest problems with irrigation in Tanzania today is the lack of organization between the government, outside NGOs, and both small and large scale landowners.[39] Using different irrigation methods can affect the yield of the land significantly, and therefore the reforms being implemented should improve agricultural output.[17]

[39] International Commission on Irrigation and Drainage. www.icid.org/index_e.html

Drinking Water

Although access to water presents an agricultural issue, an even larger problem results from the lack of clean, drinkable water. Not only does clean drinking water, a basic necessity like food or shelter, help keep people alive, but easy access to it solves many related problems as well. For example, providing access to sanitary drinking water can decrease under-five child mortality rates because it reduces diarrhea and water borne illnesses that are contracted through drinking unsafe water.[40]

Lack of nearby sources leaves the average woman and child in Tanzania spending more than two hours per day collecting water. It is not uncommon for Tanzanians to venture as long as six hours to the nearest water source.[41] Making water more accessible would ease the burden of everyday life, improve the constant fight against diseases, and provide better irrigation to farms. It would also allow more time for those who once traveled to collect water to perform other tasks, such as going to school, raising children, and farming food for consumption. In Tanzania, children were 12 percent more likely to attend school when safe water was available within 15 minutes rather than one hour from their home.[42] Creating convenient sanitary water access will give Tanzanians the time to get an education or use elsewhere.

WaterAid in Tanzania

The government and outside organizations have attempted to improve water access because it is an issue that plagues the lives of Tanzanians on a daily basis. WaterAid, an NGO, was established in 1981 at the Thirsty Third World conference in the UK. It was organized by the

[40] HDR – UNDP http://hdr.undp.org/en/reports/nationalreports/africa/tanzania/tanzania_2005_en.pdf

[41] WaterAid America – http://www.wateraid.org/usa/what_we_work/tanzania/

[42] http://www.wateraid.org/documents/getting_to_boiling_point.pdf

government's National Water Council in response to the UN 1981-1991 Decade of Drinking Water and Sanitation Initiative. Currently WaterAid has programs in 17 countries from Bangladesh to Zambia. Since 1983, WaterAid has been involved in efforts to make water more accessible to the average person in Tanzania. WaterAid's original efforts were concentrated in the Dodoma region, but they have since expanded and include the Tabora Region, the Singida Region, the Kiteto District of Manyara Region and the Temeke Municipality in Dar Es Salaam.

To date, WaterAid has helped 1.1 million Tanzanians gain access to safe water. WaterAid has provided sanitary water to 180,000 people in Dar Es Salaam alone since the year 2000. WaterAid's 2003/04 annual report notes that success levels are often reflected by government support for the projects. In Tanzania, government funding has continuously increased over the past

few decades. While there is no doubt that WaterAid's efforts are appreciated, there is still a great amount of work to be done and improvements that can be made to the WaterAid system.

WAMMA

In 1990, WaterAid began its partnership with local engineers as well as hygiene and education staff in the Dodoma region known as WAMMA. The name WAMMA stands for the four participatory parties; WA – WaterAid and the three Tanzanian government agencies, M - Maji (the Water Department), M - Maendeleo ya Jamil (the Community Development Department), and A - Afya (the Heath Department).[43] The focus of WAMMA initiatives has been empowerment of the people. WAMMA initiatives have been working to transform the formerly passive relationship between communities and their local governments into more active and mutual collaborations.

WaterAid also partners with local organizations such as churches and municipal governments in order to stay organized on the ground. Through the success of these localized partnerships, WaterAid has been able to set-up sustainable development projects in many communities in these areas of Tanzania. The hygiene education WaterAid provides with its projects focuses on hand washing, using of latrines, and restricting access of farm animals to areas around the home that need to be kept sanitary.

WAMMA Structure

The WAMMA program is centered on four teams of four to six people each. Each team is located within and responsible for one of the four districts of the Dodoma region. The role of the teams is to enthuse and empower communities while providing both technical guidance and basic hygiene education. With the guidance of the WAMMA teams, the villagers ultimately decide which type of well and sanitation system should be built in their village. Team members play an

[43] http://www.wateraid.org/international/what_we_do/where_we_work/tanzania/2614.asp

important role as they are the liaisons between the government and the community. Extra time spent motivating and training the team members produces more effective and efficient projects.

Each WAMMA team holds monthly meetings to make and review their plans. A regional WAMMA steering committee meets four times a year, focusing on water provision and donor inputs while setting up regional policies and budgets. The purpose of this steering committee is to coordinate initiatives and facilitate communication between the teams to improve collaboration for the Dodoma region.

Village Projects

WaterAid's projects are typically initiated by individual villages which approach the national water department and request assistance. Usually the village already has already started accumulating the funds required to build the pump and requests guidance from WAMMA for consultation about construction techniques. Of the communities who approach them, WaterAid chooses areas most in need of their assistance based on a criteria including levels of relative poverty and incidences of water-related diseases. WAMMA first meets with the local government for a preliminary consultation and then with the village, where it explains its role in the developing process. The village sets up health and water committees, which then become the WAMMA team's main liaison to the project. For the first week, the WAMMA team researches the community and assesses its needs and preferences regarding the type of pump. Next, the local committees design the project with help from the WAMMA team and a contract is signed between the village and the local government. The implementation phase can be broken down in to five sequential steps. These include: (1) constructing the water supply system, (2) training village maintenance technicians, (3) improving the latrines, (4) providing hygiene education, and (5) possibly training of voluntary village health workers. After construction of the pump is complete, the WAMMA team checks back with the village monthly to sort out any issues and continue hygiene education. The

team visits less often as time passes and after about two years, they only return upon specific requests from the village.

There are three other regions in Tanzania where WaterAid works, including the Tabora Region, the Singida Region, and the Kiteto District of the Manyara Region. Dodoma, which has a population of roughly 1.7 million people, was the first region WaterAid entered and is therefore the best documented. WAMMA is the local partnership that exists in the Dodoma region and similar partnerships exist on the local level in the other regions in which WaterAid operates.

Future Plans for Tanzania

By 2010 WaterAid hopes to directly help 80,000 more people gain access to water in Tanzania.[43] Tanzania's government is also committed to increasing water availability and has stated its intentions to halve the percentage of people without access to sanitation and clean water in compliance with the UN's Millennium Development Goals. WaterAid is working in conjunction with local governments in order to help meet those goals by 2015. WaterAid is also currently creating a map of water access density, which will help both the government and WaterAid illustrate the proportion and proximity of populations to sources of clean water. Presently, Tanzania must build 3,000 wells per year to meet the Millennium Development Goals.[43] Unfortunately, only a few hundred wells are actually built every year. Although WaterAid has been largely successful, its ambitious goals may add to some current problems the program faces, namely sustainability.

What WaterAid Must Improve

An efficient and viable solution to improve the sustainability of WaterAid's projects is to introduce more extensive educational initiatives. The root cause of failed or broken pumps concerns pump maintenance. It is estimated that 35% of all rural water supplies in Tanzania are no longer functioning. Water pump failures are attributed to various issues; some communities do not

want outside intervention, while others find that capital or recurrent costs are too high. Certain other failures result from lack of local ownership of the water pumps as well as from insufficient education programs.

A 2006 case study by Alexia Haysom, funded by WaterAid, researched the most common causes for the breakdown of water pumps in Tanzania. The case study noted the majority of installed water systems that had not broken down were either gravity or shallow hand pumps. This was most likely due to their simplicity. All of the water systems that broke down and had never been repaired had one thing in common: none of the communities in which they were located had a central bank account used for saving money collected by water attendants. A small fee is collected from the well users by the community in which the well is located. This can be in the form of a small usage charge collected by attendants or a larger monthly tax. Regardless of the collection process, this money is meant to be saved in order to repair the pump in case of a breakdown. Of the villages in Haysom's study, those that were capable of repairing their water-pumps could do so primarily because they were able to fund it. Most of these communities had bank accounts from which the funding was used.[44] Without a common bank account, the funds are often held by a single person, the well attendant, who cannot always be trusted to save the money over long periods of time due to a lack of financial knowledge.

Revenue collection substantially impacts the community's ability to sustain a water pump. The more efficient the revenue collection is, the more likely a village will be able to fix its pump.[44] Faulty revenue collection can result from a number of factors. For example, the Village Water Commission will, at times, use the steady income from a water pump for other local government expenditures. Social pressures also result in a lack of efficiency, like when a pump attendant may

[44]Haysom, Alexia. "A Study of the Factors Affecting Sustainability of Rural Water Supplies in Tanzania." 2006. Cranfield University. - <http://www.wateraid.org/documents/plugin_documents/functionality_and_sustainability_study_by_alexia_haysom.pdf>

give free water to family members. All of these problems occur not only because there is a lack of regulation among pump attendants and pump-related financial management, but also because of lack of true understanding of financial actions on the part of many well attendants. If well attendants had a basic education on the importance of revenue collection and simple business principles it would greatly increase a community's water-source sustainability.

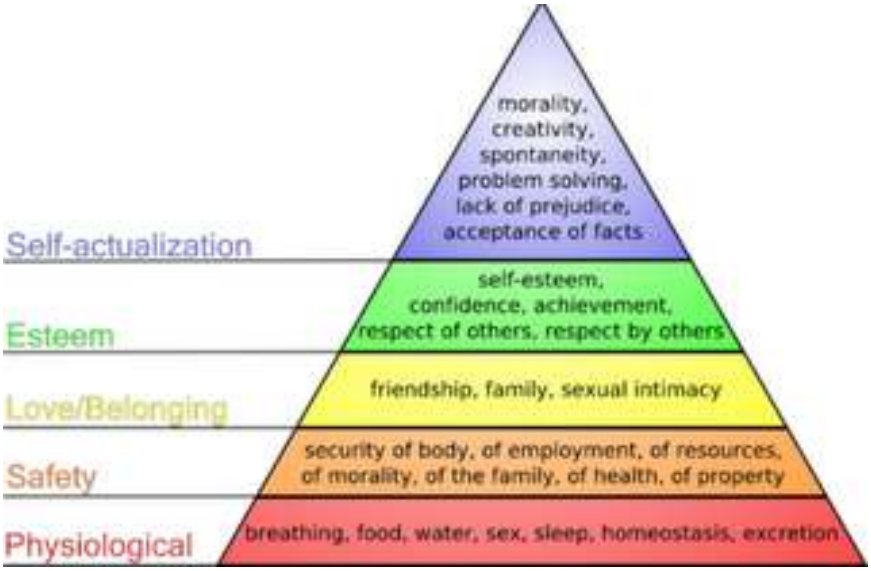
A more extensive education program will greatly increase WaterAid's sustainability in Tanzania. If pump attendants have a better understanding of their specific pump, maintenance and repairs will become immensely easier. Educating village members in greater depth will shift the programs from a top-down structure to a bottom-up method run by the average person. WaterAid already works to empower communities by including them in the pump construction phases, and we feel that more education will only add to this empowerment initiative.

Reasons for our Proposal

Improving quality of life crosses multiple social sectors, including health, basic needs, education, and infrastructure. Because clean water is the basis of a healthy life we feel that providing access to it can most improve the quality of life in Tanzania and will facilitate the improvement of the other social sectors listed above. Figure 6 illustrates water as a physiological need, the foundation of Maslow's Theory of Hierarchical Needs.[45]

[45] http://greatergoodscience.blogspot.com/2007_02_01_archive.html

Figure 6: Maslow's Theory of Hierarchical Needs



As shown in Figure 6, without water, fulfilling higher level needs is not possible. This means one without water is unable to gain a complete sense of safety, belonging, esteem, or self-actualization. An inability to attain these feelings means a person is unable to live to his or her full potential and give back to society in a manner that will aid development. Because drinking unclean water results in many preventable diseases, the improvement of access to clean water will improve health, and therefore, quality of life.

We feel that acquiring an education gives a person the ability to fulfill his or her potential; however, enrollment and completion rates in Tanzania are very low. As a result, we think the best alternative to improving the system without dealing directly with elementary level schooling is through vocational training. The literacy rate in Tanzania is surprisingly high, at about 70 percent, considering the lack of appropriate levels of schooling. This rate will remove a major challenge to acquiring vocational training, allowing the use of books and directions. Many children cannot attend school because they are too busy contributing to the family workload or walking to fetch

water buckets, much of which is a result of living a long distance from a clean water source. Should this problem be alleviated, there would be greater opportunity for children to attend school and acquire an education, improving enrollment and completion rates.

In general, we feel that improving water access is truly the foundation for overall development in Tanzania. As a result, we would like to work with WaterAid's already existing system in order to improve it and make wells more sustainable over time.

Starting HAWILI

Our development plan revolves around the creation of a school in the Dodoma region of Tanzania that will teach pump attendants about well building, pump repairing, and the business principles necessary for well maintenance. The school would be named HAWILI, an acronym for 'Help Access to Water Improve through Learning Initiatives.' Hawili is a Kiswahili word that means "to change or transform." We chose this term because through the creation of our school we hope to not only change the lives of many Tanzanians who are currently lacking access to clean water, but also to improve the issue of sustainability within the WaterAid program.

The HAWILI School would be located in the Dodoma region to be in close proximity to WaterAid's current presence. When WaterAid and WAMMA enter a village, they hire workers responsible for maintaining the pump. These well attendants, or supervisors, are sent to our school to learn about pump construction and maintenance as well as basic water safety and hygiene principles. After learning more about the water pump it will be easier for the well attendants to do their jobs and keep the wells running. In addition to the possible post-graduation roles of well attendants and well builders, the education we provide them regarding water safety and proper hygiene prepares these students to spread this knowledge to their communities and other surrounding communities.

We offer programs in partnership with American universities which serve as bases for both human and financial capital. American students and professors will be able to come to our school in order to learn about the problems associated with providing water access to local villages. Volunteers may even serve as teachers and teaching assistants in the education programs at our school. These foreign students gain field experience and understanding of the workings of wells, as well as experience working abroad with an NGO as well-established as WaterAid. Their field experience and partnership with WaterAid to repair and install wells are unique opportunities provided through our program. Students gain an international education and bond with local Tanzanians while working alongside their classmates. This hands-on approach can be very rewarding for university students and engineering students in particular.

School Curriculum

During its initial stages, our school will be taking mainly students who previously worked at wells for the WaterAid organization in Tanzania. This ensures that all students have some experience and prior knowledge regarding wells, which will better prepare them to learn the material. Additionally, their experience provides inputs to learning, further enhancing the program and guaranteeing its effectiveness and its worth. After several sessions have passed, the program will be expanded from admitting only workers with experience to admitting those who from villages Tanzania will be working with in the near future. The school does not require that prospective students apply because they will be chosen by WaterAid and sent to us; however, we will have certain requirements of the people chosen. These requirements will ensure that our students are capable, literate, and dedicated to providing education and water. Currently, about 70 percent of those 15 and older can read and write in Kiswahili (Swahili), English, or Arabic, so illiteracy should not be a major concern.[46]

[46] CIA World Factbook - https://www.cia.gov/library/publications/the-world-factbook/geos/tz.html

The school splits the curriculum in the classroom into four parts: (1) well building, (2) well maintenance, (3) basic hygiene, and (4) the financial/business interactions. In addition to this teaching curriculum, our school provides an option for students to become teachers a few years after graduation, and consequently expands the reach of our school and the reach of the knowledge we provide. Students at our school do not spend all of their time in the classroom. We believe hands-on experience is beneficial for students and is needed to test abilities learned in the classroom. This combination of academic and hands-on learning provides a well-rounded education that is enduring, practical, and effective. The hands-on activities bridge all segments of our curriculum. Students will travel to villages to build and repair wells, speak with well workers about their different experiences, and visit failed wells to explore the reasons behind the failure.

Our students experience what it is like to partner with both a non-governmental organization, WaterAid, and with local communities. Some communities require well maintenance, while others require the construction of new wells. Through collaborating with communities our school focuses student perspectives on what villages need and want.

Hygiene education is something that is already addressed briefly by WaterAid; however, we feel that its ability to reduce the spread of disease is so important that our school should teach it more in depth. We believe that WaterAid's current efforts are very important and can help many people; our focus will be to complement this education with abilities to provide the water required to combat these diseases. Not only will our school discuss the fecal-oral transmission route, its effects, and ways to block it, but also on benefits available through using proper hygiene. Many people in the communities in which wells are built have not had convenient access to clean water before and need to be educated on the benefits of proper hygiene. Because our students that build, maintain, and repair wells are also educated about hygiene, they are required to give a series of small community education sessions that spread knowledge of the benefits of proper hygiene and

how to properly access and use the water from the wells. In most rural villages like those WaterAid works in, receiving any type of outside schooling, especially internationally run, is a very significant honor. As a result, we feel that well attendants who are respected and honored because of their education will be the best people to spread information to others in their village and will be fully trusted. Their education will prepare them for all the financial transactions including collections and savings.

The academic segment of well repair discusses case-studies of previous well failures. In-depth analysis of different types of well systems gives students comprehension of average life spans, running costs, capital costs, and the necessity to acquire a form of compensation for well usage. It is often the case that money is not properly collected or community members avoid payments. Acquiring financial knowledge such as this will help our students prevent these common financial issues that result in an inability to finance the reparation of wells.

If the community has a well and it is in need of repair, students work together to investigate the well, diagnose the problem(s), and formulate a desired response to the problem. The step-by-step process for well repair will facilitate the understanding of why the wells fail and why they need to be well-maintained to help prevent failure. Inspecting why and how wells fail is important for students who go on to maintain wells and educate others about them because for most areas, these wells are brand new technology that people don't fully understand upon its creation. For example, people may attempt to get water at a pump if it has rained recently, only to be surprised that they can't retrieve the water because the pump has broken. After completing this preliminary diagnosis, students will collectively carry out the necessary actions to complete the well. Hands-on experience is invaluable for providing a well-rounded understanding of the causes and effects of well failure.

Our graduates that go on to maintain and supervise wells are more likely to act in accordance with the expectations that WaterAid and other organizations have because they understand the necessity of compensation for well usage. Some Tanzanian well supervisors do not collect money as required nor do they save the collected money and hold it for eventual well maintenance and repair. This is because some of the supervisors do not understand how frequently the wells break or how expensive repairs are. Teaching both the life spans and expenses regarding well maintenance and repair will prevent these workers from acting out of a lack of knowledge. Because close supervision of fund collection and savings is very difficult, we believe that the best alternative to reduce the risks of moral hazard, when money is lost, is to educate and emphasize their significances.

Well building provides a unique opportunity to expand the operations of WaterAid in conjunction with local communities. The school's program requires all graduates to construct one well, chosen after consulting both WaterAid and local communities. Although the type of well will be chosen by the community and WaterAid, the well building segment of our curriculum covers all of the different types of wells that might be required to build post-graduation in Tanzania. These include rainwater catchment, spring protection, gravity supply, hand-dug wells, tubwells or boreholes, and river/lake abstraction. Covering all types ensures students have the knowledge required to know every well they may encounter in the field. The students will be connected to both WaterAid and local communities so all parties can work together to expand access to water in areas that are in need.

Budget

When starting an NGO, budgeting and financing are obviously some of the most challenging issues. We have a created a tentative budget that will encompass the items that we think will be absolute necessities. We have, however, attempted to cut costs in practical and efficient ways.

The first section of our budget addresses staffing. Although a more extensive staff would be preferable, we feel that we will be able to manage with three full time staff members on top of the three founders. We founders will work as volunteers for the time being and will take on many different tasks. We will manage the program, teach classes in English, cook for the staff and students, and deal with finances. The other three workers will include a translator, a secretary, and an engineer/well specialist. A translator is necessary for many aspects, especially in the beginning to put our written resources into Swahili and therefore make them accessible to more people. This translator would also need to teach some of the classes in Swahili so that students of the school are not always required to speak perfect English. The secretary would do little to no teaching, but would deal specifically with finances, coordinating with WaterAid, keeping track of students and applicants, and general organization. The last position of well expert is necessary so as to have a point of reference should we run into any technical problems with the wells. Because most teachers will not be well specialists, an expert will be a valuable asset in sharing knowledge with the other teachers.

The average household income in Tanzania is US $564. This equates to less than two dollars per day. The average salary of a villager in Tanzania, most likely in very rural areas, is less that US $100 per year, well under the one dollar a day poverty line. Although we do not have unlimited resources, we would like to be able to pay each of our full time workers approximately US $800-$1000 per year. This would mean spending $2,400-$3,000 per year on the salaries of our workers.

The next expense in our budget is for school supplies. We plan to use simple binders and print-outs in lieu of actual textbooks because it is more cost-effective and allows us complete freedom as to how we conduct and edit our curriculum. Through calculations of binders, paper, pens, chalkboards for teaching (use chalk paint rather than purchasing an actual board), we have

approximated about US $400 to begin with. This may need to be added to in order to get through a whole year, but should be a significant amount of supplies to start with.

Next is the issue of location for our school. We feel that a hands-on education and the ability to travel to one or more wells during the learning session will be extremely important and cannot be compromised. To facilitate this movement while teaching, we must purchase tents for the teachers and students to live in. We have found that high quality tents to fit between six and eight people cost approximately US $100. We feel that we should buy five of these tents to allow for growth in our program and make sure that we can accommodate all students. This adds up to US $500, which is a fairly high expense on top of creating a main building for the school. In order to cut costs, therefore, we feel that we must start off without a central building that can be used for teaching. It would be best if our secretary and possibly one other staff member could be accommodated within WaterAid's Dodoma office; however, if this is not possible we would consider paying for a single apartment that could double as an office or we could do without a home base. Although we do not know exactly how much building a small school building or renting a floor of an existing building would cost, while working in Tanzania specifically, Habitat for Humanity can build a house with US $3,070. This is probably equivalent to the type of building we would be expecting to build, so allotting US $4,000 to our budget would give us leeway. Because we have many initial expenses, building is not necessary immediately; however, this type of funding should be possible to receive within the first five years of HAWILI's existence.

The last and most significant section of our budget is transportation costs. In order to transport students from the central location of meeting to and from a certain village to receive their hands-on experience, we need to own or rent a large SUV or van. Although vans in the United States are upward of US $30,000, we feel that we should be able to find some sort of used vehicle at between US $7,000 and $10,000. Although this is still a significant price, we would only be asking

for one vehicle to start with. After several years when our funding has grown, we should be able to purchase a second vehicle and expand our program. With multiple vehicles, we can have different groups travelling to different well sites and taught by separate teachers simultaneously. Table 4 shows the projected prices and how they amount to our first year's budget.

Table 4: HAWILI Anticipated First Year Budget:

Expense	Price Per Year (in US $)
Staff	$2,600
School Supplies	$400
Tents/Housing	$500
Transportation	$10,000
Miscellaneous Extra	$500
Total	**$14,000**

When discussing the budget, it is also necessary to note the long term annual budget. If we were to not buy a vehicle, the yearly budget would only be about US $4,000, which is significantly lower and much easier to finance. We plan to purchase a vehicle the first year, buy nothing extra the second year, purchase a second vehicle the third year, and finally purchase or build a home base for the school in the fourth or fifth year. Our six year projected annual budget can be seen in Table 5.

Table 5: Six Year Projected Annual Budget:

Year	Budget (in US $)
Year 1	$14,000
Year 2	$4,000
Year 3	$14,000
Year 4	$8,000
Year 5	$4,000
Year 6	$4,000

As you can see, the budget diminishes over time even while facilitating growth. The program will be expanding because we will be purchasing a second vehicle and building a center for our school, yet the price over time will continue to fall.

Although this is a fairly detailed budget, it is possible that prices will change over time as we realize what works and what does not. Within the first few years we feel that it is likely some of our techniques and methods will be revised, so the budget may change accordingly. One such possibility is that, after working with the system for a few years, we may decide having a central building is not actually necessary, in which case we would save a significant amount of money. Such circumstances, however, cannot be determined until we are on the ground and in practice.

One of the ways we hope to gain most of our funding is through setting up a system of "sister schools" and partnerships with universities. Many lower level schools and high schools take part in sister school programs in which an American school will stay in contact with a specific school in a Third World country and sponsor it. We hope to set up a similar system, but with American and/or European universities. In order to expand the partnership beyond simply that of

a funding university that stays in distant contact with our NGO, we would like the universities to make it a possible volunteer or study abroad program for their students. This would allow HAWILI to not only gain continuous funding on a larger scale than individual donors, but it would also lead to a fairly consistent stream of volunteers that could be easily set up with our NGO's program. In today's society, where universities are concerned with their global image and being internationally aware, we feel that asking this partnership of a few universities is by no means unfeasible. In order to facilitate growth and be able to fully fund our project, we hope to partner with between three and five universities, each of which would be asked to donate a few thousand dollars per year. Given current tuition costs and certain private university endowments, partnering with our program should not be much of a financial constraint for universities. We understand that you do not currently partner or associate with any universities or international organizations. Although this is your stance we feel that this opportunity will enhance your fundraising efforts and increase your presence in academic communities. You have previously worked with university clubs that fundraise for you, but instating a sister school will substantially increase your access to both financial and intellectual resources.

What WaterAid Can Do For Us

In order to best facilitate the growth and success of our newly created non-governmental organization, we require some action on the part of WaterAid. We feel that the majority of your organization's actions are right on target and well thought out; however, there are obviously still some areas that together we can improve.

The first thing that we ask of you is to create a central organization or group that will deal with pump-related finances of villages in Tanzania. The majority of the pumps that are broken and unrepaired throughout Tanzania, whether they were built locally or by WaterAid, remain broken due to a lack of finances. As discussed before, the biggest problem with financing is that pump

managers are not saving the money collected from pump users as they should. Often a lack of financial understanding leads to attendants using the extra money that they are expected to be saving. If WaterAid could create a central financing organization that regulates the required usage fees, however, this issue could be stopped.

This central banking organization would need to first make an estimate for each village as to how many people use the well and the approximate amount of money that should accordingly be collected by the pump attendants each month. WaterAid should then keep track of these estimates and require that each village give within a range of that amount of money every time there is a collection. This will help to stop fraud and corruption caused by pump attendants and other villagers taking money or not paying their dues. A person from this central organization must then travel around Tanzania every month or two and collect the money earned by pump attendants in each village in which a pump is located. The money should be kept track of in a central bank account and should be allocated when necessary to specific villages for the repairs that are needed. This, however, must be done in a timely fashion in order for it to be affective. To correct small problems with the wells, rather than large, expensive issues, a small amount of money should be left in each village at all times.

The next action that we ask of WaterAid is that you focus your immediate efforts in Tanzania toward repairing old wells rather than creating many new ones. Not only is it a waste of resources to let already made wells go unused, but it is an opportunity for growth and development of ideas for WaterAid. By going back to WaterAid's wells that have broken, as well as by looking at other locally-built wells that have broken down, WaterAid can better improve its system of implementation. At these sites, we ask you to both fix the wells themselves and fix the financial system that has led to a lack of funding and inability to repair water sources. By doing so, WaterAid will get a better idea of what has gone wrong in these particular villages and therefore how to

create a more functioning system to implement in future villages. Once the majority of broken wells in Tanzania have been fixed, we propose you move on to surrounding areas and allow us to aid you in the successful growth of your well-building system.

The last thing that we ask your organization to do is to contact us upon the selection of the next host village. The selection and implementation process can take up to three or four months, so during this time we would ask your organization to send whoever is chosen as the pump attendant(s) for each village to HAWILI. We will educate them in depth about the ways to deal with both the physical and financial sides of maintaining a well, as explained before. The attendants will then return to their villages in time to oversee and coordinate the building of their own community's pump. They will also provide the information and organization necessary to make the wells more effective. Sending these pump attendants to our school will be at no cost to you, yet it will help to greatly improve the sustainability of the wells and therefore the general well-being of the communities in which they are located.

Conclusion

To improve the quality of life in Tanzania, access to sanitary water must be improved through the installation of sustainable water pumps. WaterAid's current operations in Tanzania provide for the installation of many water pumps; however, sustainability continues to be a dominant issue. As noted earlier, only 67 percent of wells that WaterAid has completed in Tanzania continue to function properly. This status is well below an acceptable rate because it implies that about one third of all WaterAid's programs have ceased to provide the water access that they had promised. Without improving the current methods of pump implementation and maintenance, these well failures will continue to occur in great numbers. The best way to achieve sustainability is through providing a better education to well attendants who will in turn support their villages' efforts to effectively provide water.

HAWILI will provide the knowledge necessary for well attendants to better finance and maintain wells in their villages. Although WaterAid has made efforts to provide important aspects of education to the communities it works with, it is obvious by their high failure rates that these efforts are not adequate. HAWILI solves this problem because the extensive education we provide arms well attendants with the tools needed to keep pumps functioning over an extended period of time. This aspect of education is not something we feel WaterAid is incapable of providing; however, because of the small staff that WaterAid currently has in Tanzania, we feel that outside help and organization from HAWILI will greatly improve the effectiveness of WaterAid's programs. It is the both the uniqueness of our school as well as the hands-on experiences we pass on to our students that make HAWILI a strong asset to WaterAid and the country of Tanzania.