Yeojin Chang
West Lafayette High School
West Lafayette, IN
Kenya, Factor 9: Water & Sanitation

**Comprehensive Approach Towards Kenya's Water Problem in Urban Slums**

**Introduction**

I remember my preschool teacher telling the class, "Don't play with the water, kids! Don't waste it." Back then I did not understand what she was talking about. Water was around me all the time. I could turn on the tap or press a button to quench my thirst after a day of playing in the sandbox. I took it for granted, just as millions of other people in first world countries do. On the other side of the globe, children are thirsty and starving from malnutrition. They wish for just one more sip of water, while we complain that the backyard pool isn't deep enough. Access to clean water is an important step to reducing poverty in many developing countries. Purified water could help general health and prevent common diseases such as diarrhea and cholera, leading to a healthier society.

**Background**

Every year 3.4 million people die from lack of sanitary water, making it the leading cause of death in the world, especially in undeveloped countries in Africa and Asia (Berman, 2009). One of these third world countries is Kenya, located in western Africa. It has a population of approximately 45 million people, of which only 59% of the population has access to sanitary and safe water (Water.org, n.d.). 60% of Nairobi's urban population, about 2 million people, lives in slums.

Slum dwellers live in small one-room houses with no running electricity or water (Ekirapa, n.d.). A typical family consists of a father, mother, an average of 5 children, and grandparents. Furthermore, men in Kenya are permitted to multiple wives, but this tradition is outdated and has only been persistent in rural areas. Many poor urban families are unable to feed all of its members well. Corn, or maize, is a staple food in Kenya as well as beans, tomatoes, and vegetables, whereas meat is only eaten during celebrations because it is expensive (Stanford, n.d.).

Many urban families in Kenya work in factories manufacturing agricultural products such as tea, coffee, and fresh flowers, or EPZs, which are factories set up in developing countries to improve their economy and create workplaces. The workers work eight to twelve hours per day and earn a daily wage of only about $2, excluding deductions due to social security and health care ("Working Conditions", 2004).

For women, the working conditions are not only harsher because of a double work day, but also more dangerous, because they are frequently subjected to rape. Though children under 16 are not allowed to work, this law is often ignored because of high poverty rates. This causes lack of education in general leading to an uneducated workforce. Because the daily earnings are not enough, many children in Kenya go hungry and thirsty, which causes them to suffer from malnutrition, and they are often exposed to disease (Stanford, n.d.).

**Summary of Problems**

The education system in Kenya is a major component to its poverty. It is not universal; only half of the population attends primary school, which is for children ages 7 through 14. Afterwards, only a seventh of the children from primary school attend secondary school, where they are educated until 18. Children

often terminate schooling at such a young age because they cannot pay the tuition for higher levels of education (Stanford, n.d.). Because many are not educated, they are unaware of waterborne diseases and are therefore more vulnerable to them. In the long run, children are not knowledgeable enough to solve its country's problems, so the poverty is not improving much. Instead of learning is schools, children work in factories that pay them a low income. The children and their families are forced to live in slums because they cannot afford anything better.

Unhygienic water contributes to poor living conditions in Kenya. The slums are unorganized, consisting of shacks made from scrap material that often lack running water or electricity. Residents find water in a nearby contaminated river or pond, as buying water from water venders is an expensive alternative; the price of water for slum dwellers is eight times as much as water bills for those who can afford plumbing in their homes (Ekirapa, n.d.). Because there is no plumbing, unhygienic communal latrines are used, spreading viruses such as cholera and hepatitis A. Cholera, caused by the bacterium *Vibrio cholera*, is found in dirty water. The bacteria develop an infection inside the intestines, which generates symptoms such as diarrhea, vomiting, and severe dehydration. Hepatitis A results in inflammation of the liver. People with hepatitis suffer from frequent fever and a weak body. Most infected recover over time, but cholera can be fatal if not treated properly (WHO, n.d.).

The viral state of deadly diseases is worsened due to the inefficient medical system that is not accessible to the slum dwellers. Because the healthcare system is not universal and children are uneducated about waterborne diseases, the child mortality rate is high. 71 children out of 1,000 children die from water related diseases.("Poor Sanitation", 2010; The World Bank, n.d.). To prevent waterborne diseases, the Kenyan government needs to make healthcare available for everyone. The government should look for affordable and effective ways to cure the diseases and implement them as needed. In addition, foreign organizations should help to educate the slum dwellers about everyday hygiene and how to prevent water related diseases.

Kenya's weak and unstable government is also a factor that contributes to the water problem. Though there are several laws in Kenya regarding access to water, they are not sustainable and water is mismanaged. Some are not put to action because the government lacks money to carry out the necessary projects. The recent terrorisms of al-Shabaab, a Muslim extremist group, are one of the reasons why Kenya is running short on money. The terrorist group is based in Somalia, but has recently been attacking Eastern Kenya. Their most notable attack took place in the Westgate Mall in Nairobi on September 21, 2013. The terrorists took siege of the mall for four days, and killed at least 67 people (Howden, 2013). Money is being used to protect the citizens instead of improving their living conditions; this is necessary, but the police are not very efficient and have lost much credibility from the civilians (Higgins, 2015)

Corruption in the government, police force, and political sponsors are also reasons why Kenya cannot solve its water crisis. The government is dishonest honest with its expenses; politicians use money for unnecessary purposes, such as building the support group of a political party through bribery (Michela, 2014). This strains wealthier countries and organizations to donate money to Kenya. A strong government that cares for the wellbeing of its people is ideal, but Kenya's corruption is disrupting its citizens from fulfilling their basic needs in life. It is crucial for the government to be more transparent with its money, and the citizens to help their government realize how severe the water issue is.

Other sanitation problems stem from social issues, such as those that women face day-to-day. Every day, women living in the urban slums walk an average of six miles to retrieve water. Because women spend enormous amounts of time walking for water, they are often uneducated and unemployed, leaving them

vulnerable to discrimination. During these long walks, they are often put in violent situations and face abuse. This also happens when they go to the public latrine, which women avoid using because they are afraid of being raped. Instead, they relieve themselves in a bag and throw it out their door, causing sanitation problems that affect everyone in the area (Barton, n.d.). The Kenyan government needs to make stronger laws that protect women, such as those punishing for rape and abuse. Also, it needs to provide women with better education so that more women are employed, making them independent and empowering them in general. Women also need to learn to stand up for themselves by learning about women rights and gender equality.

**Potential Solutions: Water Purifying Products And Inventions**

A potential solution for Kenya's water crisis is the LifeStraw created by Vestergaard. When someone drinks water through the LifeStraw, the water goes through a filter as the person sucks up the water. In the end, someone can drink clean water without the presence of an advanced water purification system. It is very small and portable, only weighing about two ounces, and it does not use chemicals or electricity. The filter is made of hollow fibers that trap bacteria and contaminants, which are backwashed into the water source while the clean water permeates the fibers through tiny pores and reaches the top of the straw (LifeStraw, n.d.). This product is only about $20, and the user is able to filter up to 1,000 liters. The invention was made in 2005 and has already been used in natural disasters such as the Haiti earthquakes and the Pakistan floods. There are several forms of the LifeStraw such as Family 1.0, Family 2.0, Community, Go, and Guinea Worm (Lifestraw, n.d.). For the urban poor in Kenya, Family 1.0 or Family 2.0 is the most suitable because the slums are already crowded, and the gathering of too many people in one place can spread disease.

The Aqauduct Mobile Water Filtration Vehicle is a likely solution for a water-safe Kenya. It is a bicycle that purifies water when the pedals move. It was made by IDEO, a global design company, for the contest Innovate or Die. Though it was not created for practical use in developing countries, this idea could be an instant solution for women who labor many hours a day to retrieve water from dirty lakes and rivers. Instead of struggling to carry a lot of water and wasting time, they could arrive home with two gallons of clean, disease-free water for their families (Conger, 2008). The holding tank in the back of the bicycle is filled with 20 gallons of contaminated water. Then as someone pedals, the rotational motion serves as an energy source for the dirty water to push through a filter and enter the water tank in the front of the bicycle through a clear tube. The water tank is detachable and closed which makes it easy to use and prevents further contamination. When a woman arrives home, she has access to two gallons of clean water; she can later pedal while the bicycle is stationary in order to purify more water. Not only does this help women, but it can prevent deforestation because people would not have to sterilize water by boiling, which requires wood. One flaw of this innovative product is that the carbon filter is too expensive, so it is not accessible in poor communities. Also, the bicycle may be difficult to transport to and use in Central and Western Kenya due to the mountainous landscape. However, the design team of the Aquaduct is working hard to find a cheaper material for those in need of this bicycle (Conger, 2008). It is likely that the design team might find a likely solution to this problem by collaborating techniques with companies that make affordable portable water filters such as Verstergaard. Sharing technologies to improve water sanitation is necessary because that way citizens in third world countries will be provided with the most efficient products at the least cost. Some organizations that are acquainted with the invention are Google and Goodby Silverstein & Partners, because they hosted Innovate or Die. Global organizations that care for the wellbeing of third world citizens should realize the potential success in this project and support IDEO and the Aquaduct design team.

Although financially supporting developing countries is helpful, it is equally important to educate the people about methods of water filtration. Donating money and supporting projects may help now, but it will not last long enough for citizens to use in the future. A native water purification system will allow people to become independent from foreign aid and solve other problems to come. Experts and professionals in water filtration can help Kenyans build a bio water filter with natural ingredients such as gravel, sand, and some activated charcoal. The gravel and sand will take out the larger chunks such as small rocks and dirt, while the charcoal will purify the water by removing the bacteria and disease (Rich, n.d.). This method is beneficial because the components of the filter are easy to find in Kenya, and the mechanics of the filter are simple enough for anyone to fix if something goes wrong. All that is necessary is a few experts that can help install the filters and educate the people of the functions, importance, and workings of the filter.

**Potential Solutions: How Organizations Can Help**

There are many organizations that are helping in different ways. The Water Project is a campaign that is fighting for cleaner water in developing countries. This organization uses donations from people around the world for projects improving water accessibility and sanitation. For instance, they are currently installing legal pipes for clean water in the Mathare slums in Nairobi, Kenya. They will also provide sufficient plumbing for the area to improve overall sanitation for a healthier community ("Mashimoni Water and Sanitation Project", n.d.).

Global organizations like UNICEF are providing sanitation facilities in schools to attract children for education. They are also teaching the children about personal hygiene that will help prevent some diseases at home ("Water and Sanitation Bring Children Back to School", 2012). The education will help prevent severe illnesses related to water and encourage students to find sustainable methods at local levels to produce sanitary water. Such global organizations should take part in more activities to help those in need. People should donate to these organizations and encourage their projects to help communities all over the world.

Because it seems that providing everyone with clean water is too difficult of a task, Vestergaard provides a program called Follow the Liters, which provides one child in a developing country a full school year of safe water when a LifeStraw product is purchased. Vestergaard is taking small steps to eliminate water diseases, and citizens of first world countries should help by buying a LifeStraw, which is also useful for those who enjoy camping and hiking. The company's first distribution of clean water was made in Western Kenya to 301 schools with 157,975 students (LifeStraw, n.d.). People should grasp that it doesn't take a lot of money or time to help those in need, and ways to help are closer than expected.

Although Aquaduct was created by IDEO, such humanitarian projects are more supported by IDEO.org, which is a non-profit organization recently made by IDEO. The group is geared towards designing innovative devices that provide practical solutions to everyday problems in developing countries, such as the water sanitation problem in Kenya (IDEO.org, n.d.). One of their biggest donors is the Wasserman Foundation, which provides funds for "areas of education, arts & culture, health, service and global initiatives." They have been providing IDEO.org with financial support for the past four years, and have backing a project in Kenya involving sanitation in toilets to improve general hygiene (Wasserman Foundation, n.d.). Citizens can show their encouragement for these projects online at http://www.ideo.org/donate.

**Potential Solutions: How We Can Help**

Most of the products and inventions need funding in order to improve their functions and introduce them in Kenya. The organizations such as UNICEF, The Water Project, and IDEO.org also need financial support in order to help install sustainable water sources, educate the citizens about hygiene, and develop new products that will benefit the slum dwellers. It is our responsibility to back these organizations by donating and raising money for them. People can take interest in fundraisers that aid third world countries and participate in clothing drives. The problem is in our hands to solve, so we should be active in helping those in need.

Students can also take part in the fight for sanitized water around the world. Though their financial abilities are probably limited, they can take interest in such matters that cause poverty. They can participate in programs like the World Food Prize Youth Institute and suggest creative solutions for real crises that citizens of developing countries are going through. Students can create clubs that share information and potential solutions for problems around the world. They can take steps to pursue careers that help eradicate poverty, such as earning a degree to further broaden their knowledge. Various academic areas can aid third world countries, such as engineering, agriculture, human services, and interdisciplinary studies. Students can donate their abilities to design projects to enhance living standards; for instance, they can find a new way to produce food in the most polluted areas, make a blueprint for an affordable and efficient water filtration system, or discover a cheap pesticide that repels malaria mosquitos. It is important for students to realize that these world issues are not going to disappear when they are adults, and that the younger generation must prepare to face these difficult challenges.

**Conclusion**

If clean water is available to Kenya, general hygiene would be improved, helping to eradicate water-related diseases like cholera and hepatitis A. Women would be better educated and be capable of standing up for themselves. It would allow the slum-dwellers in Nairobi to have a higher quality of life because they can spend money on more nutritious food. It could help save children from dying without seeing their world. “Now, more than ever, we need to connect the dots between climate, poverty, energy, food and water. These issues cannot be addressed in isolation” said Ban Ki Moon, Secretary General of United Nations (“Resources for Speakers on Global Issues.”, n.d.). He is right; water is one of the dots that we must connect to solve the picture of problems in this world.

Works Cited

"About Us." Wasserman Foundation. Wasserman Foundation, n.d. Web. 15 July 2015.

Barton, Alexandra. "Water In Crisis - Women In Kenya." *The Water Project*. The Water Project, n.d. Web. 08 Mar. 2015.

Berman, Jessica. "WHO: Waterborne Disease Is World's Leading Killer." *VOA*. Voice of America, 9 Oct. 2009. Web. 06 Mar. 2015.

Conger, Cristen. "How the Aquaduct Mobile Water Filtration Vehicle Works." *HowStuffWorks*. HowStuffWorks.com, 9 Dec. 2008. Web. 08 Mar. 2015.

Ekirapa, Akaco. "Civil Society Organizations: Capacity to Address the Needs of the Urban Poor in Nairobi." *Journal of Public Health Policy* 33.4 (2012): 404-22. Web.

Higgins, Abigail. "Kenyans Blame Corrupt Government for Escalating Al-Shabab Violence." TIME. TIME, 4 Apr. 2015. Web. 15 July 2015.

Howden, Daniel. "Terror in Westgate Mall: The Full Story of the Attacks That Devastated Kenya." Thegaurdian.com. N.p., 4 Oct. 2013. Web. 24 July 2015.

"IDEO.org | IDEO.org." IDEO.org. IDEO.org, n.d. Web. 14 July 2015.

"KENYA: Focus on Working Conditions in EPZ Companies." *IRINnews*. IRIN, 4 Mar. 2004. Web. 08 Mar. 2015.

"KENYA: Poor Sanitation Brings Misery to Slums." *IRINnews*. IRIN, 27 Sept. 2010. Web. 06 Mar. 2015.

"Kenya." *Water.org*. Water.org, n.d. Web. 05 Mar. 2015.

"LifeStraw Personal Water Filter." Buylifestraw.com. N.p., n.d. Web. 15 July 2015.

Marshall, Samantha. "Urban Poverty and Vulnerability in Kenya." *The Water Crisis in Kenya: Causes, Effects and Solutions* (n.d.): n. pag. *America.edu*. Global Majority, June 2011. Web. 8 Mar. 2015.

"Mashimoni Water and Sanitation Project." *The Water Project: Kenya*. The Water Project, n.d. Web. 08 Mar. 2015.

"Mortality Rate, Under-5 (per 1,000 Live Births)." Data. The World Bank, n.d. Web. 24 July 2015.

"Resources for Speakers on Global Issues." *UN News Center*. UN, n.d. Web. 08 Mar. 2015.

Rich, M. "How To Build A Bio Water Filter." Off The Grid News. N.p., n.d. Web. 14 July 2015.

Stanford, Eleanor. "Countries and Their Cultures." *Culture of Kenya*. N.p., n.d. Web. 24 Feb. 2015.

"Water and Sanitation Bring Children Back to School." *UNICEF*. N.p., 6 May 2012. Web. 08 Mar. 2015.

"Water-related Diseases: Information Sheets." *WHO*. WHO, n.d. Web. 08 Mar. 2015.

Wrong, Michela. "'Everyone Is Corrupt In Kenya, Even Grandmothers." Foreignpolicy.com. FP, 6 May 2014. Web. 15 July 2015.