

Term Paper: The Causes of Clean Water Shortage and Their Effects on Kenyans

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GCH 360

4/21/14

Word Count: 2,786

Introduction:

Living in a peaceful era, in the comfort of our own bedrooms, we are all unaware that the world is about to undergo another potential apocalypse. About 65 million years ago, scientists believed that all life on Earth was destroyed by an asteroid that struck the planet. Today, the issue of water shortage that is experienced by the majority of the world is so severe that it could potentially be the next asteroid to wipe out mankind. About 1.1 billion people in the world today do not have adequate access to sanitary water (Tarrass). Kenya, a sovereign state located in the African Great Lakes region in East Africa, is one of the places experiencing this disaster. Kenya's population is about 40 million, and about 17 million have no access to clean water (Marshall). The lack of availability of clean water in poor areas of Kenya caused more people to be exposed to cholera epidemics and other fatal diseases that are life threatening (Marshall). Kenya is experiencing more of an economic scarcity rather than physical scarcity. Physical scarcity happens when there is not enough water to meet demands, while economic water scarcity occurs when there is improper management of water to meet the demand of those who are not financially well-off to utilize the existing water (The Looming Threat). In areas of Kenya, the recurrent droughts and the contamination of available water affected Kenyan citizens' businesses, thus leading to a decline in economic growth. With a decrease in economic growth, Kenyan's health declined as well. To address this issue, it is essential to examine the causes and effects of water shortage in order to educate the public about the importance of maintaining clean water sources before this crucial element runs dry.

Recurrent droughts are one of the main causes responsible for water scarcity in Kenya. Unfortunately, Kenya's empirical background of its climate puts the country even more at risk of experiencing water scarcity. The country's annual rainfall is "surprisingly low and rather

variable from year to year,” (Kenya). This is due to the “inter-tropical belt of cloud and rain passes rather quickly across Kenya in April and October,” (Kenya). In addition, its average annual rainfall is 630 millimeters,” (Marshall). Therefore, the little amount of rainfall led to the water scarcity that Kenya is experiencing. Then, to make matters worse, these droughts are prolonged due to global warming. Below is a depiction of Africa, conveying the countries in which global warming had impacted (Kenya Imagine):

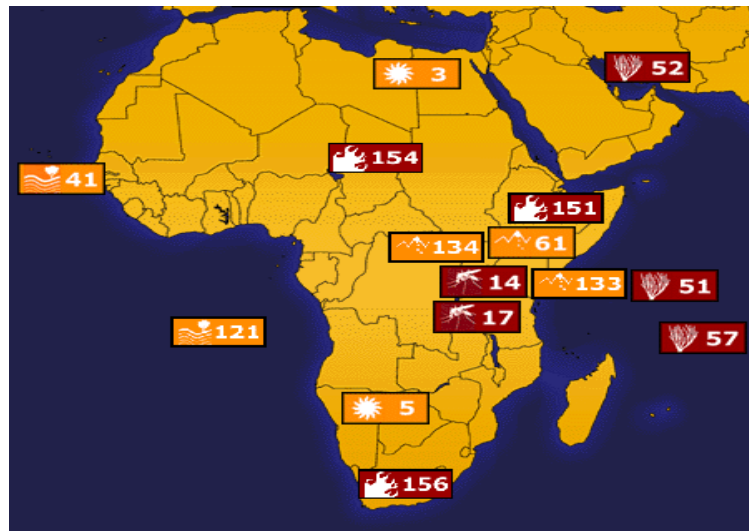


Figure 1:

The red icons of the numbers “symbolize the types of impacts likely to become more frequent and widespread if global warming continues,” (Marshall). The drought that hit Kenya in 2001 is represented by the number 151. This drought was recognized and labeled as the “worst drought in 60 years,” (Marshall).

The droughts that constantly re-visit Kenya in turn negatively impacted the country’s agricultural growth and businesses, which led to a decrease in economic growth. Figure 3 below is obtained from The Pacific Institute which shows a representation of the amount of water required to produce certain crops:

Table 2. Water Required To Produce Selected Foods	
Crops	Water Needed (liters per kilogram)
Potato	500–1,500
Wheat	900–2,000
Alfafa	900–2,000
Corn/Maize	1,000–1,800
Sorghum	1,100–1,800
Soybeans	1,100–2,000
Rice	1,900–5,000
Animal Products	(liters per kilogram of meat)
Eggs	3,300
Chicken	3,500–5,700
Goat	4,000
Sheep	6,100
Beef	15,000–70,000

Source: Pacific Institute (2009)

Figure 3:

The addition of these values will exceed the average annual rainfall in Kenya, which is “630 millimeters,” (Marshall, Samantha). Therefore, this little amount of rainfall cannot sustain all the lives of crops and animals in the farms. Below is an image showing Kenya’s dependency and value placed in agriculture compared to the world’s (Agriculture):

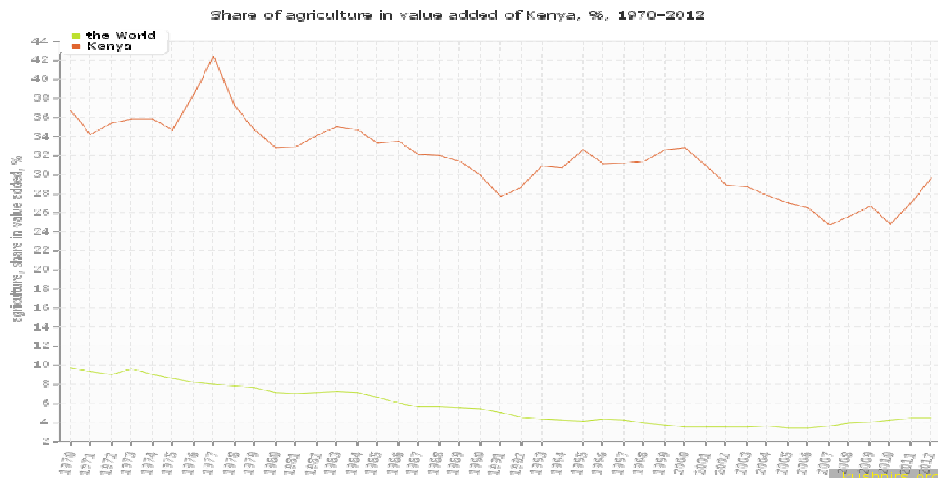
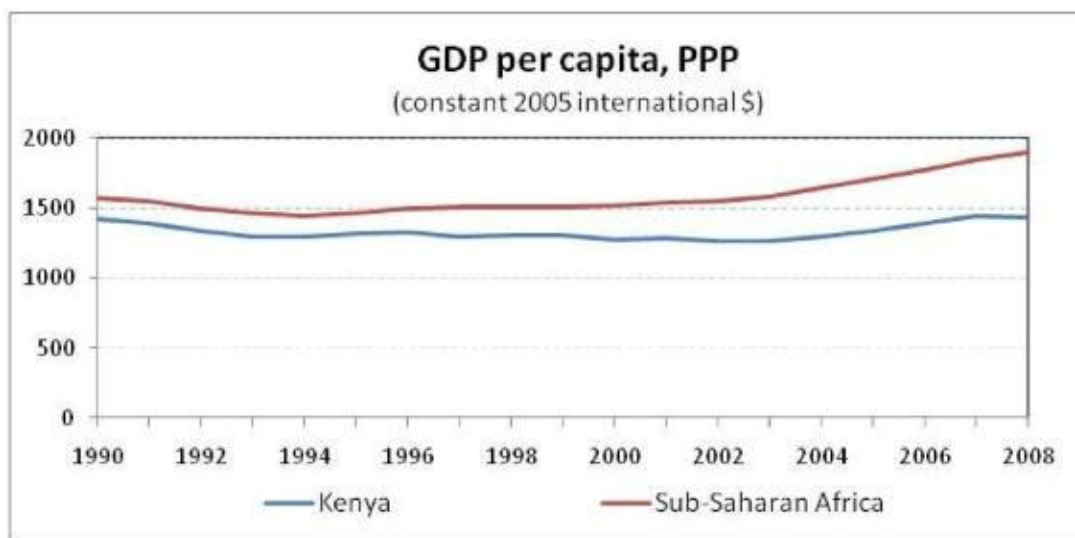


Figure 4:

The top line represents Kenya’s dependency placed in agriculture comparing to the world’s dependency, which is represented by the bottom trend-line. Here, agriculture provides about one third of Kenya’s income (Marshall). The rest of the world’s share of agriculture lies around the 10th percentile while Kenya’s share of agriculture quadruples this number, going up to the 37th

percentile. Therefore, when the drought hit, one third of Kenya's income deriving from agriculture declined. It was estimated that "100,000 cattle" and crops died due to "lack of water," (Kenya: Severe drought). When agriculture failed, Kenya's economy declined as well. Figure 5 shows that Kenya, which is represented by the bottom line, has not raised its GDP per capita during the last 20 years. Kenya is even doing worse than Sub-Saharan Africa, which is the top line, its "GDP per capita was slightly below US\$1,500 (expressed in purchasing power parity and in constant 2005 dollars) in 1990 and still was below US \$1,500 in 2008" (Marshall).



Source: World Bank (2010) *World Development Indicators*
(as posted on the World Bank website; downloaded on October 5, 2010).

Figure 5:

In addition, aside from agricultural failures, many factories in Kenya closed down due to water shortage as well. In Nakuru, three factories: Flamingo Bottlers, Coil Product Kenya and Kapi Limited "had to close down for lack of water to sustain their operations" (Kenya Suffers). Therefore, the inability to sell crops and failure of factories and companies to function would in turn result in an incapability to obtain profits to provide for their families. Thus, with a decrease in agricultural growth, Kenyans' economic income in turn began to decline as well.

Example I: The effects of water shortage on a Kenyan family living in the Rift Valley:

In addition, the lack of rainfall caused animals to grow desperate and destroyed Kenyans' homes, ravishing for food. Below is an image of how the drought had affected wildlife in Kenya:



Figure 2:

This image was captured by Rohlt Kachroo from NBC News when he visited one of the worst hit areas in Kenya, Nairobi, and said, "I counted the carcasses of 27 cattle by the roadside, and one giraffe-apparently killed because the land could not sustain them," (Kachroo).

Thus, without water to sustain plants and crops to feed wild animals, they began to disturb Kenyans. One documentary from the Gorta TV called, "One Drought in Kenya-One Family's Perseverance" interviewed a family in the Rift Valley, one of Kenya's 8 provinces, whose home was destroyed by a starving elephant for food. The family said, "We grew maize and after harvesting, had stored it in our home. This stored maize had attracted an elephant, who tore through and destroyed the store room," (Kenya: Severe drought). Hence, with animals destroying their homes to search for food adding to the inability of crops to grow due to water shortage, most Kenyan families were left without crops to harvest and sell. This in turn led to Kenyans experiencing a decline in income as a result of water shortage.

Example II & Example III: The effects of water shortage on families in Kakuma (the case of a girl named Nzangu, and the case of a toddler named Lokol, who are both underweight):

Due to a sudden declination in economic stability from water shortage, Kenyans are unable to afford food and in turn left to face with many negative health factors. A recent assessment by Kenyan authorities and the United Nations showed that “nearly 3.8 million Kenyans currently lack sufficient food, due in large part to an especially harsh drought” (World Vision). Figure 5 shows an image captured by the World Vision staff of a five-month-old girl named Nzangu (World Vision). She is only half the weight of her age:



Figure 6:

According to the Huffington Post, the U.N Children’s agency stated that in Kakuma, the northwestern region of Kenya, “A little more than half of the population here consumes just one meal a day,” and “20 liters of water costs a third of John Ekidor’s (a Kenyan citizen) daily wage” (Gordts). Since Kenyans are unable to afford water being sold at preposterously high prices, some are left to face with negative health effects. Another example of how water shortage from prolonged drought had brought negative health effects due to hunger is the story of when a 28 – year-old mother brought her 3-year-old daughter, Lokol, for clinical checkup. It was determined that the toddler “is only about a third the weight she should be and can barely stand. She weighs

only 12.35 pounds” (Gordts). Loree, the nurse, says that, “The number of children being treated for acute malnutrition tripled from 21 to 68,” and will continue to rise (Gordts). Being underweight due to not getting enough nourishment can lead to serious critical health effects. According to Health Line, it can lead to a weaker immune system due to in taking insufficient amount of nutrients. Therefore, one will be more prone to infections and diseases. It can also lead to: low muscle mass, hair loss, irregular hormone functioning and regulation, osteoporosis, anemia, pregnancy complications and menstrual irregularities (Gidus). Extreme hunger can even lead to death. According to the World Bank in 2010, there was an increase in mortality rates of adult males and females, children under five, and infants from 1990 to 2008 (Marshall).

Despite how recurrent droughts are problematic for Kenyan citizens, people still have a difficult time conserving the only sources of clean water that are left. The contamination of available water is another cause for the water shortage dilemma in Kenya. Many Kenyans rely on wells to obtain domestic water. However, their wells are often built in very close distances to the pit latrines, a pit dug in the ground that collects human excrement. These are widely used in rural, developing world and wilderness areas. It is advised that the wells “should be placed in elevated areas, at least 2 meters above the water table and at least 15 meters from the pit latrines,” (Marshall). However, urban slums in Kenya do not abide this rule. About 39 percent of the wells out of 175 wells were less than 15 meters away from the latrine, and 59 percent were built within 15 and 30 meters away (Marshall). A study performed by Elizabeth Wambui Kimani-Murage and Augustine M. Ngindu in 2007 showed that the reason for the severe contamination of drinking water in Kenya is related to the pit latrines being close to the wells (Marshall). The study consisted of 192 respondents from Langas slum in Kenya. Forty samples were collected from the water sources used by these respondents, 31 samples obtained from

shallow wells, four from deep wells, and five samples from taps. After closely examining these samples, the -tube fermentation technique was used to count coliform bacteria in water (Marshall). The study found that all of the samples derived from the shallow wells tested positive for fecal contamination, and three out of four samples obtained from the deep wells were contaminated as well. None of the tap water was contaminated (Marshall). Therefore, this proved that by being close to the wells, microorganisms can easily travel from pit latrines to the wells and contaminate the clean source of water used for cooking, farming, drinking and bathing.

In addition, pit latrines are not the only sources of contamination in Kenya. Kenyans reported that “contamination can be a result of children dipping dirty objects into water sources (34 percent), drawing water from the source with dirty containers (27 percent), domestic animals excreting around water sources (19 percent) and people washing their clothes at the water source (5 percent)” (Marshall). This study shows that people in Langas urban slum and other areas of Kenya do not preserve their sources of clean water very well, which in turn caused water to become contaminated and unsafe to drink.

Despite knowing that the water is unsafe to drink, the declination in economic stability resulting from recurrent droughts led Kenyans to no choice but continue utilizing the contaminated available water, which in turn affected their health. The documentary, *Flow*, by Steven Starr, shows that there were private companies taking advantage of the water shortage dilemma and visited poor countries to sell clean water at a price impossible to afford. Therefore, due to not being able to afford water, they are forced to “go to the river” to obtain water. Since the rivers and the wells in Kenya are contaminated with feces and deadly microorganisms, in taking this water would cause one to be vulnerable to many diseases. Schistosomiasis is a water based infection that is caused by *Biomphalaria* snails and *Bulinus* worms. This is contracted

through major water bodies in Kenya and “affects especially people between the ages of 10 to 20 due to increased contact with infected water bodies and also through defecation” (Marshall). Cholera is another illness associated with unsanitary drinking of water. It is a bacterial of the intestinal tract, which can cause diarrhea and lead to dehydration and death if not treated correctly (Pure). Thus, having no monetary funds, people are unable to afford medical treatment and left to deal with the illnesses themselves.

Example IV: The effects of water shortage on a family in Kakamega, Kenya:

Even if the families could afford medical treatment, the water sources at most hospitals in Kenya are also contaminated. Therefore, patients in Kenya hospitals become more ill when they are admitted to the hospital for treatment. One example is the story of a twenty-year-old named Hellen Wasiliwa who developed typhoid fever, a fatal waterborne disease, after giving birth to her newborn (Mapondera). This was due to her being exposed to un-treated and unsanitary water in the Kakamega hospital. Hellen reported that, “After giving birth we had to share (the same) bathing water between seven women.” She said, “I developed a skin rash and got typhoid. I was then re-hospitalized and my bills came very high, despite the poor services. E-coli parasites then began to eat up my internal organs. I almost died” (Mapondera).

All of these diseases originated because of the recurrent droughts which resulted in a limited amount of water for plants and crops to grow, and factories in turn shut down. This therefore affected the income of agriculture-based and factory-based businesses. Having no financial stability, Kenyans cannot access clean water because the filtration system and clean water are being offered to them at preposterously high prices. In addition, while dealing with the water shortage caused by recurrent droughts; people still continue to contaminate the only sources of water available, thus killing more crops and livestock. This in turn resulted in

Kenyans obtaining no profits due to continued businesses failures. This on-going cycle thus causes Kenya's health to decline because with no money, they continue to settle for drinking and using unsafe water.

Solutions:

To put an end to this cycle, it is essential that Kenyans manage their clean water sources more efficiently. One of the proposed solutions includes, "The Poverty Reduction Strategy Paper (PRSP) of the Government of Kenya (2008)" (Marshall). This plan provides "a short-term recovery strategy that includes rehabilitation of Kenya's water infrastructure and the provision of water to Kenya's people" (Marshall). This is a plan that includes many projects which aim to fix the different factors that are worsening the condition of water in Kenya. The plan aims to restore and attain a new hydro-metric, and to develop two multi-purpose dams (Marshall). These dams will have a storage capacity of 2.4 billion cubic meters along the Nzoia and Nyando rivers in order to supply water for domestic, agriculture and irrigation use" (Marshall). Furthermore, since wells are one of the main reasons for the contamination of water in Kenya, it is recommended that Kenyans rebuild the pit latrines to be farther from the wells to inhibit the transportation of micro-organisms. Kenyan parents should be more attentive in educating their children to not dip their dirty hands in the wells and the newly built dams. It is essential that we educate the people of Kenya about the causes and effects of water contamination to preserve the scarce available clean water that is left.

Conclusion:

The reoccurring droughts are inevitable causes of Mother Nature on the water shortage dilemma in Kenya. However, the contamination of water is majorly caused by human's

carelessness and unawareness. Therefore, to conserve the available clean water after the recurrent droughts, Kenya should build multi-purpose dams, educate their citizens about the dangers of water contamination, and build wells further away from pit latrines. By addressing these issues, Kenya can reduce its mortality rates and thus improve its agriculture growth and other businesses that depend on water. By continuing to generate profits, Kenyans would be able to afford water filtration and be more financially well-off to build more dams and wells to preserve water in case the droughts are further prolonged. It is also important for the world to note that water scarcity does not only concern Kenyans, but this epidemic will slowly expand to the rest of the world if we continued to be wasteful of water. Therefore, everyone, not just Kenyans, should be educated about the causes and effects of water scarcity for the sake of the future generation. Next time, when you leave your sink or shower run lavishly, remember that you are contributing to the water apocalypse that could potentially hit our planet. Therefore, use water wisely.

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Images and videos:

Figure one photo: "Kenya Imagine: Economic effects of global warming in Africa." *Kenya Imagine: Economic effects of global warming in Africa*. N.p., n.d. Web. 21 Apr. 2014. <<http://kenyaimagine.blogspot.com/2007/03/economic-effects-of-global-warming-in.html>>.

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