A Clean 5 Gallons a Day Keeps the Doctor Away: The Water Crisis in Kenya and Rwanda

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Abstract

This article analyzes the impact of the water crisis in Kenya and Rwanda, as the lack of water availability and safe water sources increases mortality rates from exposure to water-borne diseases. The five major causes of the water crisis will be evaluated, consisting of poor management of water resources, population growth and urbanization, droughts and floods that will become increasingly detrimental with future climate change, water contamination, and a lack of education about safe water consumption. The impact of these major contributors will be discussed in detail after the presentation of a brief literature review and the empirical background of both countries. Subsequent solutions are proposed to reduce the short-term and long-term impacts, and the multi-faceted nature of the water crisis is discussed in relation to its impact on the health and economy of the population.

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I. Introduction

The lack of access to clean water is one of the main perpetuators of poverty and inequality in many developing countries due to the harmful, and often fatal, implications for health, as well as the highly restrictive effects on economic growth. Kenya is a drought-stricken country of about 43 million people in which an estimated 16 million lack access to safe water and about 10,000 children die each year from diarrhea as a result of water sanitation issues. Not only is the scarcity of water an issue in Kenya, but unequal distribution of water sources primarily to planned urban areas and wealthy rural communities has left urban slums and poor communities in a state of constant deprivation. Recent discoveries of large bodies of underground water have given Kenyan communities hope for revival, but minimal policy framework exists for government legislation to manage distribution of this vital resource.

Although Rwanda has a smaller population of 11.5 million, it faces similar problems as 31 percent of their population, or 3.4 million, lacks access to clean water and about 3,000 children die each year from diarrhea caused by inadequate water sanitation. Rain is not uncommon in Rwanda, so the main problem is not water supply, but the collection, storage, and catchment systems to capitalize on Rwanda’s natural sources of water. Decentralization is currently a main focus of the Government of Rwanda to delegate responsibilities to communities in an attempt to increase self-sufficiency. It has also been found that an increase in water rates can be afforded by urban payers and thus steps can be taken to alleviate the burden of clean water access for poor communities via altered water arrangements.

This article discusses the main studies, causes, and solutions to the water crisis in Kenya and Rwanda, beginning with a brief literature review in section II. Empirical background information on both countries is then discussed in section III, followed by an analysis of the five major causes of the water crisis and possible solutions in section IV. Finally, closing statements are made in section V in regards to the impact of the water crisis and what areas of focus should be emphasized in long-term and short-term solutions.

II. Brief Literature Review

A field action report analyzes the impact of the Safe Water System (SWS) that was implemented in 2001 as a part of the Water, Sanitation, and Education for Health (WASEH) Project that began in Kenya in 1998 (Makutsa et al., 2001). This consisted of water treatment with sodium hypochlorite (chemical water treatment), safe storage of household water in improved clay pots, and behavioral change techniques, of which 33.5% of communities adopted chemical water treatment and 18.5% adopted the use of the newly innovated clay pots for safer water storage. The chemical treatment solutions were sold at a US price of 33 cents and the modified clay pots
were sold at the US price of $2.53 (the equivalent to about 3 to 4 days wage for most individuals), most likely resulting in a higher percentage of the communities opting for the cheaper chemical treatment. A significant finding was the importance of marketing and promotional activities in encouraging the adoption of these new techniques. Social marketing tools were crucial such as posters, brochures, T-shirts, skits, dancing and visual art performances, athletic tournaments, health promoters, educational quizzes with prizes, and various other incentives to attract attention to the new implementations and their overall importance. Sustainability would require continual monitoring of the safe water and storage practices as well as active promotion of the new innovations, community mobilization, and constant access to the products. The results of successful implementation techniques in this project can be applied to other areas of safe water access and implementation in the future.

An SWS intervention program to reduce the occurrence of diarrhea and increase knowledge about safe water and hygiene practices in Nyanza Province in Western Kenya was conducted in 2006 (O’Reilly et al., 2007). Initial and final evaluations of almost 400 students and their parents were collected and utilized as the basis for determining the effectiveness of school-based health and awareness programs on home practices. Improvements were observed as there was an increase from 21 to 65 percent of students who became more knowledgeable of correct water treatment procedures and knowing when to wash their hands, an increase from 6 to 14 percent of parents who claimed to be treating their water, and a reduction of absenteeism in schools by 35 percent. The data gathered from the intervention program supports the conclusion that school-based safe water and hygiene programs are effective in improving school and home environments, increasing awareness and knowledge of safe practices, changing behavior in the home through knowledge transfer from teachers to students to parents, and reducing absenteeism. Such programs could therefore improve safe water access and practices in schools with few latrines, insufficient water supplies, poor quality of water sources, water storage containers that are susceptible to contamination, and a lack of hand washing stations. The reduction of diarrheal diseases can increase school attendance and physical wellbeing, ultimately leading to cleaner, more educated, and more prosperous communities.

In the Natural Resources Forum of 2003, the development and application of the Water Poverty Index (WPI) is discussed in relation to the implications for local and national policymaking, interventions, prioritization of aid to countries, and an overall transparency in providing information about the level of water stress in every country (Sullivan et al., 2003). Target 10 of Millennium Development Goal (MDG) 7 is to “halve by 2015 the proportion of people without sustainable access to safe drinking water,” and the WPI is a means of providing governments and agencies with accurate and transparent information regarding the progress and problems of countries’ water needs. The WPI for each country takes into consideration resources (availability and amount of water), access (distance to safe sources), capacity (effectiveness of water management), use (domestic, agricultural, and industrial uses), and environment (integrity and
ecosystem goods), all of which can be compared individually as subcomponents or together as a whole as given by the overall WPI value. In contrast to other indices, the WPI is locally rather than nationally-oriented, allowing decision-makers to make impartial choices based on a specific and transparent framework and allowing communities to lobby for action. Reliance on the WPI can help to monitor progress towards accomplishing some of the MDGs and external donor assistance can be targeted towards countries and communities in which their contribution will have the greatest impact.

The rapid population growth of poor countries has a major impact on the water crisis in those regions of the world, as Falkenmark and Widstrand explain in the Population Bulletin (1992). The climate, geography, soil type, latitude, and vegetation of different African populations affect water availability and distribution, as well as human activities such as deforestation, agricultural practices, air pollution, irrigation, and population growth. Poor countries remain in a constant state of deprivation due to inadequate water resource management, poor sanitation and hygiene, and a lack of family planning that serve to perpetuate their condition. To improve access to safe water, there must be an implementation of better management to increase water accessibility and efficient use in the long-term, the establishment of cooperation between local and international governments and industries, and policies aimed towards reducing fertility rates to reduce the demographic forces fueling the water crisis.

The changes in water supplies from 1967 to 1997 in various East African urban communities were examined in an Environment and Urbanization publication (Thompson et al., 2000). Both low and high-income communities (receiving both piped and un-piped sources of water) were examined and the water supplies in most locations had deteriorated from 1967 to 1997 because they received less water per day, spent more time collecting water, and paid higher prices, as shown in Tables 1A and 1B of the article. Families without piping receive their water from unprotected sources such as springs, seeps, streams, rivers, and lakes and are prone to water shortages in dry seasons as well as higher rates of contamination. The average cost of water is highest for low-income urban households that receive un-piped water due to their reliance on vendors and kiosks, which comes at a significant financial cost. Unequal distribution of piped water services leaves some areas with only 5 hours of service and other more affluent areas with 24 hours of service, along with various other inequalities that result from poor water management and a lack of effective policies.

### III. Empirical Background

Kenya became independent in 1963 through the works of the founding president, Jomo Kenyatta, and has undergone political struggles from being ruled as a one-party state (by KANU) to constitutional reforms in 2010 that allocated power and resources to 47 newly created counties. Kenya is located in Eastern Africa and has an area of 569,140 square kilometers (sq km).
According to data gathered in 2003, 1,032 cubic km of that land is irrigated and about 72.96 cubic meters of freshwater per person per year are withdrawn from Kenya’s water sources (CIA, 2014a). Agriculture has been a major factor for sustainability in Kenya, as 48 percent of the total land area in 2009 was agricultural, making up 27 percent of the nation’s GDP; but water pollution from urban and industrial wastes, pesticides and fertilizers, and soil erosion are constant environmental issues that continue to affect Kenya today (World Bank, 2013). Rainfall also affects water availability because in the two rainy seasons, from April to June and October to December, the average annual rainfall varies from 5 inches in the dry regions to 76 inches near Lake Victoria (Encyclopedia of the Nations, 2014a).

Rwanda gained their independence from Belgium in 1962 with a Hutu as acting president, later followed by the Hutu genocide of Tutsis in 1994 and the gain of power by the Tutsi RPF the following year. The first post-genocide elections were held in 1999 and the country joined the Commonwealth in 2009. Rwanda is located in Central Africa and has an area of 24,670 sq km, of which 96.25 is irrigated, and as of 2005 about 17.25 cubic meters of freshwater per person per year were withdrawn from Rwandan water sources (CIA, 2014b). Agriculture has also been a major factor in sustainability as it made up 32 percent of the total GDP in 2001, and agricultural land constituted 81 percent of the total land in 2009 (World Bank, 2013). However, periodic droughts continue to impact the agricultural industry despite the two rainy seasons, from February to May and November to December, in which the average annual rainfall may vary from 31 inches to 63 inches (Encyclopedia of the Nations, 2014b).

Both Kenya and Rwanda have increased in GDP per capita (expressed in purchasing power parity in constant 2005 international dollars) as shown in Figure 1, although Rwanda has made more net progress than Kenya. In 1980, the GDP per capita was US$1375 in Kenya and US$805 in Rwanda, whereas in 2010 those values rose to US$1509 in Kenya and US$1132 in Rwanda; showing an increase of US$134 in GDP per capita in Kenya and almost double that at an increase of US$327 in Rwanda. Although increasing at a lower and more constant rate, Kenya has maintained a higher level of GDP per capita than the average low income country (LIC), whereas Rwanda started off slightly better in 1980 than the average LIC but dropped slightly below the average LIC in GDP per capita by 2010.
Figure 1: GDP per capita, PPP (constant 2005 international $) in Kenya, Rwanda, and LICs, 1980-2010

Source: created by author based on World Bank (2013).

Figure 2: Life Expectancy at Birth Total in Kenya and Rwanda, 1970-2010

Source: created by author based on World Bank (2013).
As Figure 2 shows, the life expectancy at birth has been relatively constant in Kenya but more fluctuating in Rwanda in the past 40 years. The life expectancy at birth in 1970 was 52 years for Kenya and 44 years for Rwanda, but both increased to 56 and 55 years, respectively, by 2010. Just as shown in GDP per capita, Rwanda demonstrated a greater net increase, but Kenya started off at a greater life expectancy to begin with. The similarity in life expectancy at birth by 2010 (the difference of which was only 1 year) could suggest that conditions in both countries were similar enough to induce a similar outcome.

Data on the literacy rate for the total percentage of the population ages 15 and above in both Kenya and Rwanda has been sporadic, as shown in Figure 3 by the lack of data in ranges of years for each country. However, an overall trend from 1978 (in Rwanda) and 2000 (in Kenya) to 2010 can be deduced because Rwanda increased from 38 to 71 percent and Kenya increased from 82 to 87 percent. As was the case in both GDP per capita and life expectancy, Rwanda displayed a greater net increase despite Kenya starting off at a greater literacy rate percentage.

Figure 3: Literacy Rate, Adult Total (% of people ages 15 and above) in Kenya and Rwanda

![Figure 3: Literacy Rate, Adult Total (% of people ages 15 and above) in Kenya and Rwanda](image)

Source: created by author based on World Bank (2013).
IV. Discussion: Causes of the Water Crisis

In order to implement effective solutions to the water crisis in Kenya and Rwanda, the major causes must first be understood. This section analyzes the five major causes: management of water resources, population growth and urbanization, climate change (droughts, floods, and increases in temperature and rainfall), water contamination (particularly in urban slums), and education about water treatment and safety. Areas of focus in implementing solutions are also outlined when applicable.

IV.1. Management of Water Resources

The availability of freshwater sources have been declining in many Sub-Saharan Africa countries, such as Kenya and Rwanda, and a study in 1999 on the National Water Master plan demonstrated that in comparison to global standards, these countries lag far behind. It was found that freshwater availability per capita was 647 m$^3$ in Kenya and 843 m$^3$ in Rwanda, as compared to the global standard of 1000 m$^3$, and projections indicated that those levels would drop to 235 m$^3$ per capita by 2025 if no corrective measures are taken. The lack of clear policies on water resource management has served to perpetuate the poor water availability conditions despite the 1970s government development goal in Kenya and the Rwanda’s Vision 2020 goal to supply water to the entire population by 2000 and 2020, respectively (Rwanda’s Management Information System, 2012). The water policy of 1999 and Water Act of 2002 brought about reforms with a renewed focus on the fundamental principles of Integrated Water Resources Management (IWRM), and these principles identified key factors to ensure effective and sustainable water resource management. The key factors were stakeholder participation, recognition of the vulnerability of water resources, and the consideration of water as a social and economic good; and the Water Resource Management Authority (WRMA) incorporated these internationally recognized goals into operational use in 2005 (WRMA, 2009).

Despite attempts by organizations to improve water availability, Figure 4 shows that Kenya has experienced a reduction from 66 to 65 percent of the population with access to an improved water source. However, unlike Kenya, Rwanda has experienced an increase from 44 to 59 percent of the population with access to an improved water source. The overall access to an improved water source combines the data reflecting differences in improvement between rural and urban populations from 1990 to 2010. The percentage of the rural population with improved access increased in Kenya from 33 to 52 percent and decreased in Rwanda from 64 to 63 percent. In comparison, the percentage of the urban population with improved access decreased from 92 to 82 percent in Kenya and also decreased from 95 to 76 percent in Rwanda, most likely a result of increasing concentrations of people in urban slums (World Bank, 2013).
To correct failed policy reforms and water management, other challenges must also be addressed in management approaches in order to take steps toward long-term improvement (Rwanda Management Information System, 2012). Such challenges are as follows:

I. Insufficient funding and decreasing allocations of the government development budget for water and sanitation.
II. Funding agreements with development partners that will end in the near future.
III. Disparities in access to water in both rural and urban areas.
IV. Low sustainability of water supply services in rural areas in conjunction with high infrastructure rehabilitation costs.
V. High water tariffs in rural areas and water tariffs in urban areas that do not reflect operation and maintenance costs.
VI. Unplanned settlements in both urban and rural areas resulting in difficulty in reaching the entire population.
VII. Rapid increase of urbanization and population growth that leads to unplanned housing with high costs for water treatment.

An evident factor in many of the aforementioned challenges is population growth and urbanization, as it affects the population proportions in rural and urban areas.
IV.2. Population Growth and Urbanization

Both Kenya and Rwanda have experienced large levels of population growth in the past 40 years which has negatively impacted the water crisis. From 1970 to 2011, the population of Kenya increased from about 11 million to 41.5 million, and the population of Rwanda increased from about 4 million to 11 million, as shown in Figure 5 (World Bank, 2013).

![Figure 5: Population Total in Kenya and Rwanda, 1970-2011](source: created by author based on World Bank (2013).

Not only have the populations grown, but each country has demonstrated active urbanization in which a proportion of the rural population has migrated into urban cities. For instance, from 1970 to 2011 the percentage of the population that lived in rural areas decreased from 90 to 76 percent in Kenya and also decreased from 97 to 81 percent in Rwanda. The increased concentration of people in urban areas has resulted in unplanned housing in cities, raising the cost of water treatment. Population growth in general has had major implications in both rural and urban settlements because not only are there more individuals who need access to water, but unplanned settlements that account for the increasing population also leads to a greater number of areas that lack access to established water systems (African Development Bank Group, 2012).

IV.3. Climate Change: Droughts and Floods, Increases in Temperature and Rainfall

Kenya is a drought-stricken country that experiences contrasting impacts, from extreme water shortages in the dry season to floods in the rainy seasons (from April to June and October to
December). Since 1960, the temperature has increased by 1°C and is expected to increase by 2.8°C by 2060. However, precipitation may have an even greater impact as it is expected that the annual rainfall will increase by up to 48 percent in some areas. Figure 6 shows the observed and future projected trends in temperature and rainfall, indicating the large-scale impact of global warming and more extreme temperatures on future generations (McSweeney et al., 2010).

Figure 6: Projected Changes in Temperature and Rainfall in Kenya, 2030s-2090s

<table>
<thead>
<tr>
<th>Observed Mean (°C)</th>
<th>Observed Trend 1970-99</th>
<th>Projected Changes by the 2030s</th>
<th>Projected Changes by the 2060s</th>
<th>Projected Changes by the 2090s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(°C)</td>
<td>(°C)</td>
<td>(°C)</td>
</tr>
<tr>
<td>Annual</td>
<td>23.9</td>
<td>0.21°C per decade</td>
<td>1.2°C</td>
<td>2.4°C</td>
</tr>
<tr>
<td>JF</td>
<td>25.1</td>
<td>0.22°C per decade</td>
<td>1.6°C</td>
<td>2.3°C</td>
</tr>
<tr>
<td>MAM</td>
<td>24.6</td>
<td>0.29°C per decade</td>
<td>1.8°C</td>
<td>2.6°C</td>
</tr>
<tr>
<td>JJAS</td>
<td>22.7</td>
<td>0.17°C per decade</td>
<td>1.2°C</td>
<td>2.0°C</td>
</tr>
<tr>
<td>OND</td>
<td>23.9</td>
<td>0.19°C per decade</td>
<td>1.1°C</td>
<td>1.9°C</td>
</tr>
</tbody>
</table>

Source: McSweeney et al., 2010

Rwanda is dependent on rain-fed agriculture for rural sustainability and certain exports (such as tea and coffee), and half of its electricity is hydro powered. There has been a 1.4°C increase in temperature since 1970 – which is higher than the global average – and it is expected that the temperature will increase up to 2.5°C by 2050. During the rainy seasons from February to May and November to December, it is predicted that rainfall could increase by 20 percent by 2050, thus causing landslides, loss of crops, health risks, and damage to infrastructure (Republic of Rwanda, 2011). Figure 7 shows the current precipitation rates in Rwanda, but larger areas surrounding regions of high precipitation could become more affected in future years by increases in flooding during the rainy season.
The striking dichotomy between droughts and floods leads to severe impacts on the Kenyan and Rwandan communities because the dry season brings more extreme water shortages while the rainy season can cause floods that lead to damage and contamination of water sources. Simultaneous increases in temperature can also lead to vector-borne and water-borne diseases, leading to increased health risks for humans and animals, decreases in crop yields, and negative impacts in the export sector of the economy (Republic of Rwanda, 2011). Some specific impacts of climate variability have been catchment degradation (which increases erosion and run-off), the drying up of rivers, receding lake levels, significant siltation of dams meant for hydropower and water supplies, and the deterioration of water quality (UNESCO, 2006). In order to become more resilient to climate changes, certain issues must be focused on in Kenya and Rwanda as outlined below:

I. Irrigation Infrastructure: Such infrastructure allocates more control of water resources to farmers, therefore reducing susceptibility to changes in rainfall. It also allows for crop diversification, efficient land and water use, and provides water to dry areas that otherwise would not receive it.

II. Stronger road networks: Poor quality roads, such as dirt tracks, contribute to loss of products while in transit and an increased vulnerability of transportation routes in extreme weather. Constructing and maintaining stronger roads that are more resilient to extreme weather and future climate changes will promote economic development.

III. Center for Climate Knowledge and Development: Insufficient data about projected climate changes (especially in Rwanda) prevents the ability to plan for the future,
therefore hindering adaptation to future increases in temperature and rainfall. By providing more predictions and information, a wider array of policy options will be available for decision-makers to plan for future adaptation.

IV.4. Water Contamination, Particularly in Urban Slums

Although the water crisis is heavily focused on the lack of a sufficient amount of water and water resources, another key aspect is water quality. Water contamination is a major issue in many urban slums due to the close proximity of wells (from which water for household use is drawn) and pit latrines (holes dug into the ground into which excrement falls). Due to population growth and urbanization as discussed in section IV.2., increases in the percentage of the population living in urban cities results in overpopulation, unplanned housing, and ultimately the expansion of slums. Overcrowding results in the limitation of available land, and therefore wells and pit latrines are placed at distances that are too close for safety. The short distances between the wells and latrines allow bacteria and other micro-organisms to invade the water sources from the nearby latrines, resulting in contamination of communal water sources (Murage and Ngindu, 2007).

Urban slums are informal settlements that do not receive governmental drainage, water, sewerage, and waste services, and the mortality rates are therefore higher than in rural populations because rural areas have enough land to safely separate water sources from waste disposal. Human excreta can cause diseases such as cholera, typhoid, hepatitis, polio, cryptosporidiosis, ascariasis, and schistosomiasis; diseases of which contribute to the one-third of deaths in developing countries that are caused by drinking contaminated water.

Until governmental services and proper infrastructure are available to all residents regardless of their location of residency, certain guidelines should be followed in well and latrine placement. When coexisting, wells should be located no less than 2 m above the water table and no less than 15 m from pit latrines, as studies have shown that the greater the distance of separation, the lower the risk of contamination.

In one study done in Langa, Kenya, as conducted by Murage and Ngindu (2007), 192 households were selected and 31 shallow wells were tested, along with 4 deep wells and 5 taps (kiosks nearby). The World Health Organization (WHO) defines acceptable standards for drinking water as water in which there are no traces of *E.coli* or coliform bacteria. In this experiment, all of the shallow wells contained traces of these micro-organisms, indicating that the coliforms invaded the water sources via transport from the closely located pit latrines through the soil and into the wells. Similar studies have been conducted in Rwanda as well, showing contamination of water sources as a result of run-off of industrial and domestic waste (Namuwaya, 2012). As Table 1 shows, the contamination of the wells in Kenya was most likely due to their placement in relation to the pit latrines.
Table 1: Distance between Pit Latrine and Wells for all Wells in Study in Langas Slum, Kenya

<table>
<thead>
<tr>
<th>Distance</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–15 m</td>
<td>67</td>
<td>38.3</td>
</tr>
<tr>
<td>15–30 m</td>
<td>103</td>
<td>58.9</td>
</tr>
<tr>
<td>30 m and above</td>
<td>5</td>
<td>2.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>175*</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Murage and Ngindu (2007)

However, about one-third of the children were accustomed to excreting openly on the ground and many of the wells did not have adequate coverage for protection, resulting in the contamination of the wells from run-off of the excrement in the presence of rain. There could have been additional sources of contamination, such as contact between the children’s dirty possessions and the water, withdrawing water with unsanitary containers, deposits of animal excrement near the wells, and the use of wells to wash clothes. Also, only 42 percent of well-users admitted to boiling their drinking water, leading to the next issue of the importance of education about water safety.

IV.5. Education

One of the root causes of the contraction of water-borne diseases is the lack of education about clean water and water treatment. Many individuals in developing countries use whatever water sources that are available, due to the lack of adequate resources as well as the lack of knowledge about the implications of drinking unsafe water. The SWS intervention program as discussed in the Brief Literature Review in section II is a good example of how school-based education about water treatment and safe practices can lead to increased levels of safe practices in schools as well as in home environments. O’Reilly (2007) described the result of the intervention as an increase in knowledge of correct water treatment from 21 to 65 percent of students, in conjunction with an increase in the percentage of parents who claimed to be treating their water. By emphasizing the importance of water safety interventions in developing countries, rates of water-borne disease contraction can be lowered and death tolls can be reduced until permanent infrastructure and government provided services can be provided to the entirety of every population.

V. Conclusion

Kenya and Rwanda are significantly impacted by the water crisis due to factors such as poor management of water resources, population growth and urbanization, climate change (that involves droughts, floods, and increases in temperature and rainfall), water contamination, and education about water treatment and safety. Changes in policy implementation and construction of more widespread and strengthened infrastructure can help to reduce the impacts of low water
availability and poor management, but future conditions may further jeopardize the populations of these countries due to global warming. Changes in climate conditions are projected to increase temperature and precipitation levels, which will produce more extreme weather conditions that increase the severity of droughts and floods. Steps must therefore be taken to create effective catchment, storage, and irrigation systems that will provide better adaptation to unexpected weather conditions.

Population growth will also continue to plague Kenya and Rwanda, as both countries have shown consistent percentage increases in population growth in the past decades. A renewed focus on the importance of education for girls is essential to reduce fertility rates and stabilize the population growth, as positive implications have been observed between the length of female education and fertility rate. Services to assist in family planning will also contribute to reducing population growth, and thus heightened emphasis must be placed on the future educational and informational services for female children.

Finally, until long-term management, policy, and infrastructure changes can be made, short-term solutions must be employed. Such short-term solutions consist of educational awareness about safe water drinking and treatment habits, increased availability of chemical water treatments, and an increased provision of clay pots for safer water storage along with filtration systems with which to cleanse drinking water. These relatively simple solutions will not only serve to reduce naivety to the water crisis, but they will also minimize the incidences of water contamination and contraction of harmful and fatal diseases.
References


