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Egypt: Water Scarcity and its Impact on the Urban Poor

“The cure for anything is salt water -- sweat, tears, or the sea” –Isak Dinesen. Water means life: survival requires- food, water, and shelter.

The water situation in Egypt is severe with farmers being forced to use untreated sewage to irrigate their crops immensely affecting the Egyptian diet (Amin). Fruits and vegetables are the core of a family diet in Egypt. Low crop production because of water shortage and high salinity affects all Egyptian families' ideals for a healthy diet including sanitary fruits and vegetables and pure drinking water. CNN stated that this high salinity of the water is seriously affecting soil fertility and causing the loss of agricultural land altogether. A deprived urban family is forced reduce a healthy diet even more. Poorer harvests result in a short supply of both produce and livestock which provide the protein in a healthy diet. The people are significantly affected by this high salinity in the water, particularly the poor. Produce would be in short supply because of poor harvests, and furthermore, livestock which provides protein in a healthy diet would also be in short supply. Farmers cannot raise cattle, goats, or sheep if they have no water supply to provide their stock or no grain to feed them.

For thousands of years, Egypt's economic status relied on agriculture. The stability of the Egyptian economy was constantly uprooted by the seasonal flooding in the Nile River. The situation was significantly improved by the creation of the lower and upper Aswan dams in 1899 and 1960 respectively (The Aswan Dams). These dams helped to create a stable water supply for both rural and urban people. Improved water availability allowed Egypt to make economic progress and develop into one of the most prosperous societies in northern Africa (The Aswan Dams).

The Nile River has been, and continues to remain, important to the economic and social success of Egypt. The Egyptian people derive economic success from the Nile River through these uses, drinking water, irrigation, transportation, fishing, and Nile cruises (Mayton).

The Nile and its fertile delta have served the Egyptians well, and the harnessing of it as a crucial resource has always been a vital element in Egypt's development, especially as the country's population has grown. Currently, the river Nile supplies 95 percent of Egypt's total water needs for irrigation, industrial, and economic activities. Additionally, approximately 96 percent of Egypt's population lives in an area representing only 4 percent of the space in the country; The Nile Valley (Gaafar).

Agricultural success in Egypt has reaching effects in the country, influencing not only its wealth as a country, but political development and relations with other countries as well. Irrigation from the Nile River is the leading way the Egyptian people acquire their water because of the small amount of rain fall they receive each year. Egypt receives fewer than eighty millimeters of precipitation annually (Gaafar). Water from the Nile supports the principal crops that are grown in Egypt, which would include cereal grains like sorghum, wheat for bread, barley, and flax. Egyptian flax is used for rope as well as fine linen cloth to be exported (Baines). These agriculture products are not only important for food security in Egypt, but also sustain the economy by creating valuable exports to other countries. This economic growth comes at a cost resulting from the direct correlation between increased population growth and increased water usage.

Egypt's agricultural success is threatened by the rapid population growth that has occurred over the past two centuries (Postel). Egypt has been growing at a rate of 1.7% annually (Population growth). The Nile supports not only the growing population of Egypt, but also the growing population of Egypt's neighboring countries. These countries are dependent upon the Nile for their water resource as well, but unfortunately there is not enough water to support everyone's needs. The Information and Decision Support Center reported that the country of just Egypt would need around 86.2 billion cubic meters of water in 2017 to satisfy the needs of the people, but resources are only expected to be at 71.4 billion cubic meters (Mayton). Agriculture, fisheries, and water consuming industries are affected by environment as it relates to water supply because aquatic ecosystems are disturbed, and environmental balances are disrupted. Water scarcity and pollution of the existing water supply are threatening the lives of millions of people not only in Egypt, but across the Middle East because world food, health, and people's livelihoods depend on a diverse and healthy ecological system.

Decreasing abundance or quality of agricultural output has a higher effect on the poorer people in Egypt by causing them to pay a higher percentage of their income on food and basic necessities. Therefore, even a small increase in the cost of food may most harm the families that can least afford it. In addition to higher food prices, the availability of work may also decrease because a lack of water may cause many factories to not run at full production (CITE). Furthermore, core employment in other areas, such as agriculture, agricultural transportation, and food vendors may also be affected because of poor crop production, because agricultural production is central to a countries economy.

The poorer segments of society are also more profoundly affected by the lack of access to a clean and healthy water supply in Egypt. Whereas the wealthy can afford to pay higher prices for premium services, food, schooling, and healthcare, the poor are often forced to settle for second best. They may have to buy vegetables that were perhaps grown in contaminated soil or watered with polluted water sources. The meat they buy may be from unhealthy animals that drank polluted water. Adults that become sick may miss work, which further impacts their financial security.

The water shortage in Egypt adds further problems to an already challenged educational system for many urban dwellers. It is affecting the ability of families to lift out of poverty because sick children may miss school, which can further leave them disadvantaged in society. A lack of access to clean water and poor water sanitation wreaks havoc among families. For instance gastrointestinal diseases are common among children of the urban poor due to unsanitary water and diet, and of course, overcrowding in the schools causes these diseases to spread rapidly increasing absenteeism and even mortality among children. Malaria infections and parasitic infections are also spreading in schools due to inadequate and often unsanitary water, too, and with most poor urban families lacking access to health care these children are left to suffer.

If a large segment of society is unable to achieve success in education, this may have a wider societal impact. In regard to education in Egypt, the system faces many challenges. Twenty-seven percent of the young people in Egypt ages 18 to 29 have not completed basic education. Seventeen percent of them have dropped out of school, and the other 10 percent have not attended school at all. (Mayton). Public schools are extremely over crowded, and there is a large shortage of qualified teachers. In contrast to the poor urban families, wealthy families have the option of sending their children to more privileged private schools.

Many of the water issues in Egypt not only have to do with increasing strains on the water supply, but a disparate water infrastructure among the social classes. Currently, most running water in urban homes is cut to satisfy the needs of the rich (Mayton), subsequently many poor families have to trudge for a quarter of an hour or more to find a tap or well in the city. In most households in Egypt it is the woman who is solely responsibility for housework and the man who is responsible for the chores outside of the house, therefore finding water would be generally the man's job. With the average household size being roughly

four people, the man must need to make additional trips to satisfy the family's need of water (EGYPT: Scientists uncertain about climate change impact on Nile).

Lack of water in Egypt is not improving. According to Hammou Laamrani of the International Development Research Center in Cairo, "Egypt is looking at a dark future where large numbers of people will be without water." People are angry at the situation and the government's apparent lack of response. The water scarcity in Egypt causes political upheaval such as seen in 2010. In July of that year 600 people protested at the Irrigation Ministry in Cairo. Little improvement in crop production has been seen, and with the population increasing and more and more demands made for water, the future appears quite bleak indeed. Urban family life is getting more difficult. More and more people are struggling just to obtain their basic needs and every aspect of daily living is affected (EGYPT: Scientists uncertain about climate change impact on Nile).

Many experts say agriculture is accountable for 70 percent of the consumption of water in Egypt and blame traditional irrigation methods for the loss of 8-17 billion cubic meters of water a year. If Egypt improved their irrigation methods to conserve water, this problem would be lessened, the experts contend. (EGYPT: Growing protests over water shortages). If the water scarcity is ever resolved in Egypt, many would benefit. Jobs would increase with amplified factory production, which would help decrease poverty. Agricultural output would improve greatly and the food supply would be healthier as the farmers would not be forced to use sewage water to grow their crops. Livestock would thrive with good drinking water. First and foremost, the citizens of Egypt would enjoy better health with a plentiful and sanitized water supply.

Fixing the water scarcity in Egypt is not simple. Other issues could easily occur causing an even greater water problem. If Egypt, or Africa for that matter, experience another rapid population growth, more demands will again be placed upon the Nile. A population growth could also seriously affect urban families. With a larger population, less food would be available and there would also be a greater energy demand. A climate change could also seriously impact Egypt. In 2004 a report by the Organization for Economic Co-operation and Development (OECD) stated that a rise in temperature of just one degree centigrade could lead to large evaporation losses and could also significantly reduce the Nile rivers flow (EGYPT: Scientists uncertain about climate change impact on Nile). This would greatly impact agricultural productivity, which would lower the country's food supply.

Thus, in order to insure enough water and food supply for the future people of Egypt, the government of Egypt must try work with its neighboring countries. Egypt can no longer rely on just the Nile River for irrigation and drinking water; new water sources, will require the cooperation from other countries. Instituting population control and pollution control will also help with the water scarcity in Egypt; this too requires the cooperation from neighboring countries. Egypt must update and/or expand their water treaty with countries along the Nile (Nile water agreement of 1929) to address their growing populations, increasing pollution, and climate change.

Improved agricultural irrigation techniques such as irrigating when evaporation is minimal, and using effective methods to apply water can reduce water use significantly. Drip irrigation is the most effective method to apply water for crop use. It works by applying water slowly and directly to the soil. It is the most efficient method of irrigating and wastes the least amount of water (Stryker). Another option for Egypt is to grow crops that require less water and/or are salt-tolerant.

The people of Egypt must learn how to conserve their water. Because most of the systems used to carry in Egypt water are outdated and leak (some systems even lose up to 60% of the water). Egypt's government must update their methods of carrying the water from source to user since it is currently inefficient, and much water is wasted (Middle East Water Shortage). Water is wasted and ends up on the ground, and of

the water that does make it to the people, much of it is unusable due to pollution and pesticides (Middle East Water Shortage).

The people of Egypt must learn how to conserve their water. There are many ways to do so. One way of conserving water is home improvement. With heated pipes and better insulation throughout a house, wasted water would no longer be a problem because hot water would immediately pour from the faucet as opposed to letting the cold water pour out while you are waiting for the hot water to come. I feel the government should be willing to support this financially if it meant saving water (Water Scarcity: Tomorrow's Problem).

Recycling wastewater is another way in conserving the limited water supply. Many options for treatment are available. The systems can range from inexpensive sand filters to expensive water treatment facilities that run reverse osmosis and ion exchange practices (Middle East Water Shortage).

An additional solution to the Egyptian water problem is desalination, which is the removal of salts from seawater. Desalinated water could offer Egypt a secure source of potable water (Detrie). The people of Africa have established desalination as the technique for the future. Saudi Arabia and Israel have already invested in building plants however, the technology is extremely expensive. Desalinated water could help quench thirsty Egypt. The problem with desalinated water, though, is the cost and the amount of energy needed to perform it.

A hybrid using Nano composite membranes for water desalination is a possible option. The membrane relies on reverse osmosis. Reverse osmosis is a separation process that uses pressure to force a solvent (liquid) through a semi-permeable membrane that retains solute (solid) and allows the pure solvent to pass through the other side. The difference between desalination and any other desalination is the structure of the membrane. The membrane in this desalination structure allows higher water penetration and higher salt preservation, leading to lower energy consumption per cubic meter of produced water (Desalination May Help Increase Egypt's Fresh Water Supply).

Perhaps the best governmental agency to implement this plan of the Nano composite membrane would be the Egyptian Environmental Affairs Agency (EEAA). The EEAA is an environmental agency that defines environmental policies, sets up priorities and implements initiatives within a maintainable development (About MSEA– EEAA). This governmental agency may be the best organization for overseeing a the desalination process because of the very nature of this governmental organization

Considering cooperation with other countries in regard to solving water issues in the Middle East has been difficult to obtain up to this point. Egypt may best be served by developing toward its own plan and self-sufficiency to solving its water problem.

In any country the government plays a huge role in improving the water supply. In order to implement these water saving techniques in Egypt, the government must partner with the rural farmers and provide them with the monetary aid needed for improvement. The government also has a responsibility to insure that a safe water supply can be delivered to all urban families, especially the poor. This may require significant infrastructure upgrades such as water treatment plants and better plumbing to all neighborhoods. Education of the general population is also needed. Citizens of all urban communities should be taught to conserve water when possible.

All of this can happen in an ideal political climate. However, as of July 2013 the government in Egypt has become unstable. The previously elected president of Egypt, Mohamed Morsi was over thrown by the military and now there is new leadership. It is unclear how this will affect Egypt's future stability in terms of economic health and general well-being of the country and its citizens. One would hope that any future government entity would put its citizens' well-being first. Only time will tell if this is the case.

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