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Drinking Water in Egypt: The Effects of Water on Egyptian's Health

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Abstract

The Nile River, often thought of as the backbone of Egypt, has been source of great sustenance and mobility throughout the years. Due to the failure of a multi-layered system, however, Egypt has had difficulty providing its citizens with clean drinking water. This paper examines the perceptions regarding this matter, as well as causes and solutions as provided by experts.

Introduction

The Nile River has long been a crucial component of both the identity and the vitality of Egypt. In more recent times, issues of water usage have become more prevalent as various entities, both within Egypt and outside its borders, increasingly take water from the Nile, and increasingly put waste material back in. This paper attempts to gather and present the responsibilities of citizens as well as their perceptions on how this issue affects their health. Our research is focused on the way Egyptian people's perception of the relationship between drinking water, pollution, and health in their lives and work. Also of significance is the way these differing perceptions interact, and possibly conflict, with one another.

By avoiding the scientific aspect of the issue, our research can circumvent possible areas of disagreement that a more scientifically based paper would be forced to contend with. Such insight can be part of a toolbox of research useful in crafting policy or opinions on how and why the state of Cairo's water can be improved in cooperation with the Egyptian populace, not in opposition to it. Our research, however, focuses on a number of factors that aim to provide a useful mosaic of aspects of the issue at hand – waste in drinking water. Agricultural activity accounts for a significant amount of pollution of Egypt's drinking water through fertilizer and pesticide run-off. Industry, though more popularly associated with air pollution, also shoulders a share of responsibility for contamination of the Nile River and, thus, the water people drink. It is not only what is put into the water that affects its quality, but it is also the impact of overpopulation on drinking water. Just as a discussion of drinking water in Egypt is incomplete without an examination of overpopulation, a discussion of overpopulation needs to address issues of poverty. Finally, we hope to examine and elucidate the Egyptian government's role in managing drinking water.

Materials and Methods

As with any academic endeavor that crosses linguistic or cultural boundaries, issues of language and translation present interesting nodal points of meaning. The linguistic makeup of our own team – only one of the researchers is fluent in Arabic - played a role in indicating the sources were available to us. In a more general sense, language is a concern in most, if not all, research regarding environmental issues in Egypt. Hopkins and Mehanna point out that there is not a word in Arabic that directly corresponds to the English word 'environment' as it is used in the context of this research (Hopkins and Mehanna, 1996). Presented with such a statement, any speaker of Egyptian Arabic will immediately offer the Arabic "bi'a", which does indeed translate as 'environment' but carries a very different set of connotations than in English. The Arabic word 'bi'a' includes social and moral environment so that when asked about environmental pollution, an Egyptian may well respond with comments concerning perceived moral degradation. The Egyptian Arabic word that can be translated as pollution, "tallawuth" seems to carry connotations of air pollution such as dust and smog, as opposed to water pollution. How language is used in Egypt to address environmental issues is a theme that we cannot help but constantly revisit in nearly every aspect of our paper.

Interviews were conducted with a select group of doctors and professors and an *imam*, or leader in the Muslim community. The focus of these interviews was to investigate whether they, as professionals, perceive a health risk from water pollution and how societies are at risk of being aborted. Their opinions were also sought in regards to the way they perceive water pollution in Egypt and how this perception may affect the advice they give to their patients, informants and other key advisees on any aspect related to the use of polluted water.

Of the three doctors who were interviewed, two are specialists in tropical medicine, Naglaa Hashem and Ala'a Al Essawi, and one, Mostafa Assem, is a gynecologist. Two professors who had conducted field research of their own at several sites in the country, Nicholas Hopkins and Hussein I. Abdel-Shafy were also interviewed. The former is currently a professor at the American University in Cairo (AUC) while the latter works at the National Research Center in Dokki where he teaches students methods of water purification. He also holds workshops at the center informing other professionals on the current condition of Egypt's water. Imam Dawud Salam, the Muslim leader interviewed, was a Muslim Chaplain at the California Department of Corrections and has worked at both the Mule Creek State Prison and Folsom State Prison.

Background

The amount of fresh water on the planet is constant, and yet the demand for this water is continually growing, thus leading to the inevitably increasing scarcity of clean drinking water worldwide (Barzilay, 1999 and Abdel-Shafy, 2005). Clean drinking water is important because even very small amounts of contaminants can accumulate over a lifetime and lead to serious health problems (Barzilay,

Drinking Water in Egypt

1999). Some of the diseases and conditions that have been linked to drinking water supplies include heavy metal poisoning, cancer, and bacterial and viral infections. Medical professionals interviewed also mentioned schistosomiasis as one of the most widespread water-related diseases in Egypt. The disease is transmitted through physical contact with water. Farmers are often the most affected population of Egyptian society because, as Dr. Hashem explains, they pick up the infection from irrigation water used in agriculture. Further, Dr. Hashem explains that foreigners coming from more developed countries such as those in North America and Europe usually suffer from diarrhea when they first arrive in Egypt and, as a result, are forced to drink bottled water. The fact that many Egyptians drink tap water everyday without suffering the tourist's malady indicates that the ill effects of some bacteria are mitigated by familiarity.

Also of particular concern in Egypt are lead poisoning and microbiological diseases (Hopkins and Mehanna, 2003). In their research, Hopkins and Mehanna (2003) found that "respondents seemed largely unaware of lead pollution, though it is considered by experts to pose a serious environmental threat in Cairo" (p.22). In Egypt, 98% of all drinking water comes from the Nile River (Hopkins, 1992). Relying on a single source for so much of a country's water supply can make the task of tracing the effects of various activities on the drinking water supply somewhat easier and more transparent. Nevertheless, the factors that contribute to the health of the Nile River and, by extension, to drinking water in Egypt are perhaps innumerable and could include many historical, political and scientific factors.

Agriculture

The agricultural system in Egypt has long been the primary source of Egypt's produce. According to researchers, "the major challenge facing Egypt now is that of developing and managing better the very limited natural resources of water to meet the needs of a [growing] population" (Abdel-Shafy and Raouf, 2002, p.13). However, the link between agriculture and water pollution is a two way street - not only is agricultural activity affected by polluted water, it is also a perpetrator of water pollution.

Farms in Egypt suffer greatly from the lack of water and the rapid deterioration of water quality due to pollution (Abdel-Shafy and Raouf, 2002). Agricultural engineers have addressed the double-threat of large amount of sewage water coupled with insufficient amounts of clean water by attempting to treat sewage water for agricultural purposes. Perhaps the most intriguing method for this is one that takes advantage of naturally occurring purification systems. Abdel-Shafy explains that trees, particularly citrus trees, have a system within themselves of purifying the water they absorb. Sewage water can be diverted to specially selected trees and then, as the water travels through the roots of the tree to the branches and finally to the leaves and fruit, the tree has essentially filtered the harmful components of the sewage as it has extracted the nutrients it needs to survive. The sewage used in this process always goes through a primary

treatment plant yet proponents claim that this method is an appropriate technology for preserving water. If sewage water can be treated and reused in this manner, then the admittedly small amount of freshwater cleansed can be used for other necessities.

In recent years, engineers and agronomists have had to take special precaution even after sewage water is treated. Studies have shown a high rate of post-industrial heavy metals even in treated and supposedly clean water (Abdel-Shafy, 1990). Although it is claimed that these metals can be harmlessly absorbed in soil and plants, scientists are still ultimately unsure of what effects these heavy metals may have on human and plant health.

Agricultural practices serve as perpetrators of pollution in so far as they allow harmful chemical run-off to flow directly into the Nile. Once in the river, this run-off forms bacteria that works its way into the drinking water (Hopkins, 1992). Despite the clear link between drinking water and agriculture, our research found that there appears to be little awareness or concern, either in the government or in the general population, about this aspect of water in Egypt. Even within the academic literature, there is much more focus on how issues such as industry, poverty and over-population affect water in Egypt. One reason for this trend may be that the intensive use of chemical fertilizers and insecticides is defended by our informants as essential for the exploitation of the available land (see Abdel-Shafy, 2002). The government can also be incriminated in that it has been accused of importing illegal pesticides from foreign countries, like those used for the growth of watermelons in 2005. Despite the recent success in Egypt of high priced organically grown produce, our research found that the use of chemical fertilizers and insecticides in agriculture is rarely, if ever, questioned. Instead, attention seems to focus not on how agriculture might be efficiently carried out without the use of harsh chemicals, but on how to deal with those harsh chemicals once they have contaminated the water supply. Such a perception undoubtedly colors the types of solutions considered and even the entire solution seeking process. Furthermore, a perception that chemical run-off from farms is the inevitable cost of necessary agriculture in Egypt may contribute to feelings, such as those voiced by Abdel-Shafy and others in interviews, that the burden placed on Egypt's water treatment facilities is simply far too great.

Industry

Industry, too, seems to escape widespread criticism except in specific cases. Industries in Egypt dump their toxic and untreated waste directly into the Nile (Hopkins 1992). Our informants from medical fields all cited industrial waste, both in the air and water, as being one of the main causes of the increase in cancer patients in Egypt. Abdel-Shafy (2002) claims that "about 350 industries are discharging their sewage water either directly into the Nile or through the municipal system" (p.11). The waste produced from these industries contains some of the most hazardous detergents, heavy metals, and pesticides. These toxins not only mix with the water people drink, but also with the water that

Drinking Water in Egypt

farmers use for irrigation. The worst industrial waste liquids are those laden with organic or heavy metals or with corrosive, toxic or microbial substances. Some groups of chemicals such as carcinogens, mutagens, and neurotoxins, are unaffected by the usual methods of water treatment (Abdel-Shafy, 2002). In several of his studies throughout Cairo, Abdel Shafy found many examples of factories and other industrial waste producers located near farms and villages. This proximity potentially places people's health at great risks.

One particularly potent example is that of the metal vanadium which is used in cement production and, when inhaled through dust or consumed through water, has profound health effects on humans. When ingested, vanadium can cause bronchitis and pneumonia as well as dizziness, headaches, nose bleeds, and skin rashes (Hope B.K., 1997). Abdel-Shafy has produced numerous studies concerning harmful health effects as a result of industrial processes, vanadium representing only one of many toxins that cause great harm to people and the environment. Unlike the case with agriculture, there seems to be little apathy toward addressing the problem of harmful industrial emissions. Whereas Abdel-Shafy and our other informants were generally uninterested in addressing the use of harmful chemicals in agriculture, they are all motivated to encourage laws limiting the waste factories are allowed to produce, as well as enforcing existing environmental laws.

Over Population

Factors contributing to poor health due to any type of pollution are "compounded in the Egyptian case because of the concentration and density of the population" (Hopkins and Mehanna, 2003, p.19). Overpopulation is a complex subject and of which causes and remedies lay outside of the scope of our research. In terms of drinking water, however, the issue of overpopulation is less concerned with the number of people in the country, but with the way they live. In 1996, Hopkins and Mehanna found that 20% to 25% of Cairo residents live in what are called "informal zones" (Hopkins and Mehanna, 2003). Such informal zones vary in terms of both population density and quality of services available. However the clear assumption in all of the research available to our group is that, barring a few exceptional cases, drinking water quality within any informal zone is very poor.

Egypt's high population density can affect drinking water quality in a number of ways. One of the main reasons is that infrastructure, including both sewage and drinking water systems, cannot help but lag behind the pace of growth in many areas. Hopkins cites Hafez in saying that the poor or non-existent treatment of solid waste leads directly to contamination of the drinking water supply (Hopkins, 1992). Hashem details a process whereby solid waste is often dumped untreated into the Nile River which then feeds into shallow wells. In rural areas the water from these wells is used for everything from drinking to washing. Hopkins mentioned in an interview that the effects of already polluted water are compounded by the tendency of women to reuse the household water they fetch

from the pumps or wells in order to avoid the arduous task of carrying and disposing of more water.

Poverty

The link between poverty and pollution in Egypt is clear and operates on several levels. Firstly, there is a definite association in the minds of most Egyptians, across class boundaries, of poverty with dirtiness. Dirt is in turn associated causally with pollution and what emerges is a persistent attitude that poor people are not only responsible for their own unclean state, but by being dirty, are responsible for pollution in general (Hopkins and Mehanna, 1996). This type of attitudinal association of poverty with pollution may stem partly from the above mentioned linguistic issues involved when addressing environmental problems in Egypt. If, for example, when addressing environmental degradation one might include not only aspects of the physical environment, but aspects of the moral environment as well, such as crime, joblessness, and violence, the association between the poor and environmental degradation becomes clearly manifested.

The second way in which poverty can be linked to pollution, specifically with regards to drinking water, is the tendency of the poor to be disproportionately affected by lack of easy access to clean drinking water. Hopkins and Mehanna note throughout their work that health problems caused by pollution are not only exacerbated by poverty but are more prevalent in poor areas (Hopkins, 1992, Hopkins and Mehanna, 1996, 2000 and 2003). As far as drinking water in particular are concerned, poverty exacerbates the problem in so far as it is associated with poor infrastructure for delivering clean water and evacuating waste, both of which can lead to increased health risks for individuals living in such areas.

Another aspect of the link between poverty and water related health problems are the attitudes of healthcare professionals. Dr. Hashem in particular explained that she does not give any preventative or lifestyle related advice to her patients with regards to the environmental aspect of their illness that can be seen as being related to poverty. Instead she prefers to give them a prescription. Modern medicine has previously come under criticism for its perceived failure to address root causes of poor health in preference for a reliance on treating symptoms after they arise in a patient. In Egypt, however, this common attitude among medical professionals may be compounded by the previously mentioned common association between the poor themselves and pollution. The most cynical reflection of this, and one we did not witness in any of our informants, would be an almost Calvinistic resignation that the poor are expected to suffer from lack of clean water because of their cultural practices.

Government

The role of the Egyptian government in addressing environmental issues is a complex and sometimes seemingly contradictory one. The two main governmental organizations that oversee the environmental conditions in Egypt

Drinking Water in Egypt

are the Ministry of State for Environmental Affairs and the Egyptian Environmental Affairs Agency (EEAA). Political analyst Salwa Gomma states that the Egyptian government describes itself as “adopt[ing] an environmental policy that supports sustainable development programs, taking environmental considerations in perspective, and provides a life fit for its citizens” (Hopkins and Mehanna, 2003, p.19). As far as drinking water is concerned, measurements taken at the source show that Cairo’s water is, for the most part, fairly clean. Also, the government is constantly working to expand Cairo’s sewage network and “improve the supply of drinking water in the villages” (Hopkins and Mehanna, 2003, p.19). Indeed, the maintenance of water purification systems is one of the few areas that Hopkins and Mehanna seem to feel that the Egyptian government is making an acceptable effort.

In this way, the problematic nature of the government’s involvement with environmental issues in general, and drinking water in particular, is not whether or not it is doing anything, but how it is doing it. Most people seem to feel that the government is “responsible for dealing with the environment” but remain unsure about exactly what that means (Hopkins and Mehanna, 1996, p.23). At the same time, there is little involvement of local people in attempts to manage environmental issues like the procurement of drinking water. Hopkins and Mehanna offer criticism of government attempts at solving environmental issues by saying that “there is more concern at the official level with the technology, than with the human element” (Hopkins and Mehanna, 2003, p.20). This criticism can be extended to include more than just the government but to encompass academic and popular perceptions “that ‘the people’ are an empty slate on which leaders are free to inscribe what they wish” (Hopkins and Mehanna, 2003, p.20).

Our research uncovered a distinct dissonance between written sources and personal interviews on the role of the Egyptian government with regards to pollution. All the available literature is circumspect at best when it comes to suggesting that the government ought to take a more active role in managing and maintaining the quality of drinking water in Egypt. However, when asked during face to face interviews who is to blame for polluted water, some of our informants reveal that they feel the Egyptian government itself is to blame, a position that is not taken in writing. Out of all our informants, Hopkins was the only one who positively did not blame the government, though the interviewers expressed feeling that they had been led to believe that the government was responsible for the poor state of Egypt’s drinking water. While Hopkins prudently stopped short of blaming the government, Abdel-Shafy was explicit in his criticism of it. Abdel-Shafy’s overt criticism may stem in part from his own ideas on what is needed to improve the condition of water in Egypt, while Hopkins, as a sociologist, is more likely to look at social and cultural factors, Abdel-Shafy sees solutions in more government funding for technology. In this way it can be observed that the paradigm employed for examining issues of water related health problems in Egypt not only effects the way in which research is carried out and solutions suggested, but also in locating causes and assigning blame.

Conclusion

The issues surrounding drinking water in Egypt, and the attempts to study those issues, involve a variety of factors that often cross traditional disciplinary boundaries. Technological solutions bear little fruit if not joined with political reality. Similarly, a purely political solution may well fall flat if the technology for implementing the solution is not understood. Underpinning both of the above unsuccessful scenarios is ignorance of cultural factors. Very little is accomplished, for example, if a population prefers unclean water over equally available clean water because they feel it tastes better. Making the clean water available to a population is a striking demonstration of technological and political factors coming together to produce positive results. However, it is all but meaningless without the realization that a population will no doubt have opinions, habits and cultural norms that need to be taken into consideration for a truly successful outcome.

We can observe that the cultural aspect of how issues of water pollution in Egypt are dealt with is perceived and apparent. Most people seem to prefer medical treatment over addressing the environmental issues. Doctors add to this worldview by not seeking to make their patients aware of how improving their environment could lead to a massive improvement in overall health. It would seem that for both the doctors and patients perceive their situations; on the long run diminishing the behavior related to water pollution aspects would be less expensive for them. In the mean time, the government should seek to tailor rather than import environmental policies that are specific to Egypt, in terms of its economic, political, social and cultural situation.

Discussion

Following the presentation of this research at the 2nd annual Undergraduate Research Conference at the AUC, Aneesah interviewed Imam Dawud Salam to bring light issues related to the practice of Islam within Egypt. "The physical world is symbolic of the spiritual world", began Imam Dawud Salam. Salam used the growth of a tree as an example: When we see a large tree with extensive branches we are able to deduce that the root system is equally extensive. This example is a physical explanation of how we as humans develop and attain our greatest potential. Just as simply if we get side track we can abort ourselves from such development or achievement.

This is applicable to societies as well. God provided enough resources on this earth to prevent poverty and disease. It is when leadership becomes corrupt, original objectives for citizens are changed, and perversity is injected into natural plans, that societies begin to witness suffering like that in Egypt as a result of the poor environmental conditions (Salam).

After rereading the perceptions of many victims and perpetrators of this multilayered issue of Egypt's drinking water, what appears to be a constant is the

Drinking Water in Egypt

failure of adequately fulfilling ones responsibility. Salam states that “everybody has rights and obligations and it is ones right over another that makes them responsible.” We can prevent the abortion of individuals, communities, and societies by fulfilling our obligations. If we, as believers, behave as such and take refuge in the wealth God has created for us and refuse and reject that which he has not prescribed for us like corruption and perversity we will indeed win through and develop healthy societies able to attain and benefit from their greatest potentials (inspired by Sura 23).

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