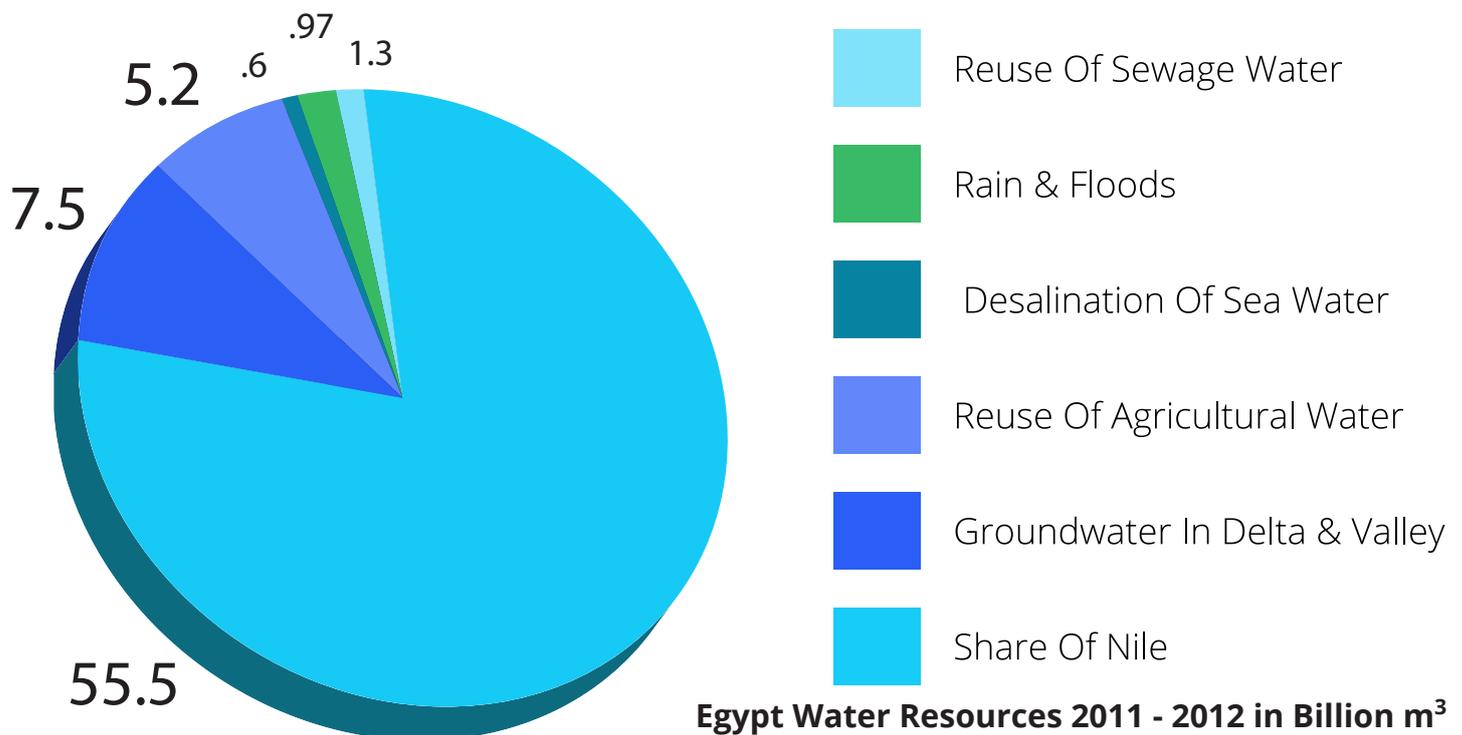


Water Pollution in Egypt

Causes and Concerns

By Isabel Bottoms

Where Does Egypt's Water Come From?



As can be seen from the chart above, Egypt's main source of fresh-water is the Nile. The second largest source being the non-renewable groundwater from the various aquifers Egypt sits on.

Egypt's main source of freshwater, the Nile, is subject to unsustainably and shockingly high levels of industrial, agricultural and domestic wastewater pollution. All of these sources of pollution are preventable with good governance, proper infrastructure, and enforcement of existing regulations for the benefit of the poorest through to the richest in Egypt - we cannot survive without clean water.

Industrial Pollution

Assessing the industrial landscape of Egypt, wastewater from various industrial processes could regularly contain pollutants such as asbestos, lead, mercury, cadmium, arsenic, sulfur, oils and petrochemicals. All of these are very hard or even impossible to separate from the water causing permanent damage once dumped in it. Furthermore, radioactive materials can also be found in wastewater from ore processing and weapons production; radioactive materials such as uranium, thorium, iodine, cesium and radon cause pollution to both surface and underground water.

To date however, industrial polluters have continued to pollute unabated, despite laws which expressly state they cannot pollute above certain levels. What we now see is uncontrolled polluted wastewater from leather tanning and dyeing processes, sugar distillation factories, chemical producing factories, building materials industry - including cement, the food canning industry, paper and wood pulp processing factories and the electrical industry (amongst many others).

Despite the argument that a level of deregulation is required to bring in investors to rebuild the economy in Egypt, if it comes at the cost of the lives of those supposedly benefitting from the economic improvement, then we cannot find that misuse of Egypt's main water source for the profit of the few at the top of the economic chain, outweighs the expense of:

- Egyptians suffering from longterm illnesses and in need of medical care owing to kidney failure [1], cancer or the Hepatitis C Virus (10-20% of the population [2]). Worryingly high and increasing rates of renal diseases and renal failure: roughly 30% of which are caused by Schistosomiasis. The highest rates of Schistosomiasis contributing to renal failure are in Lower and Upper Egypt [2.5]: the areas with least access to safe drinking water and sufficient sewage treatment infrastructure. Public Health researchers based in El Minia identified Drinking unsafe water and exposure to pesticides as the cause of renal diseases for an estimated 72% of patients [3].
- Egyptian fishermen losing their livelihoods because the fish can no longer survive in the water [3.5].
- The disproportionate amount of pressure it puts on the environmental and ecosystem services that Egypt's 40% below the poverty line (living on less than \$2/day) rely on most. Ecosystem services are the "GDP of the poor" [4]. This reliance includes:
 - Rural villages and towns along the Nile which are not connected to mains water and without sufficient means to buy bottled water, drinking the untreated and polluted river water.
 - Polluted sources of food: fish, fruit and vegetables grown using polluted water and soil.
- The added cost to farmers whose land remains permanently polluted and unusable whilst the groundwater and water sources [4.5] are also polluted.
- Loss of tourism due to lack of safe access to clean water and unsightly surroundings.

The added cost to treat the polluted water for mains water users, 98% of all drinking water in Egypt comes from the Nile, and the burden of pollution is already too heavy for the water treatment systems in place [5].
- The added costs to farmers requiring fertilizers to fertilize the land in the same way that silt from the Nile floods would have done when unpolluted [6].

In 2008, the EEAA recorded that roughly 102 industrial plants are discharging their waste water either directly into the Nile or through the municipal system. The waste produced from these industries contains some of the most hazardous detergents, heavy metals, and pesticides of all. Such industrial contaminants dumped in the Nile have reached levels of almost 4.5 tons per year. And the percentage of industrial organic pollutants thrown in the water is roughly 270 tons per day [7]. The only published inventories of industrial facilities violating the regulations are 5 years or more old, therefore there is no longer an up to date dataset of the facilities in question sufficient to operate good monitoring and enforcement activities as required.

Agricultural Wastewater & Domestic Sewage Pollution

Along the Nile valley between the Aswan High Dam and Cairo, there are 43 towns and approximately 2,500 villages, with a total population exceeding 20 million; all of them discharge their waste water and untreated sewage into the Nile [8].

As an indication of the level of infrastructure still required across Egypt, according to CAPMAS 2010/11 statistics, only 24.7% of the rural population was connected to a sewage system, as opposed to 88% in urban areas. Those “connected” to a sewage tank, will mostly empty the tank into the Nile and near freshwater sources, or onto ground where the water source is polluted through the soil.

In turn bad sanitation extends to untreated drinking water, statistics show about 95.5% of the population drink untreated water [8.5]. The World Health Organisation (WHO) 2008 report “Safer Water, Better Health” indicates that 5.1% of all deaths and 6.5% of all disabilities (disease and injury) in a year in Egypt are attributable to unsafe drinking water, inadequate sanitation, insufficient hygiene and an inadequate management of water resources.

Agriculture contributes roughly 15% of Egypt’s GDP, and employs 32% of Egypt’s workforce [9]. There are over 8.5 million feddans of available land for agriculture in the whole of Egypt, 521,000 of which is cultivated with crops along the Nile [9.5]. Agriculture was responsible for 86.38% of freshwater withdrawals across Egypt in 2000 [10] and 2.9 billion m³ of drainage water loaded with fertilizers, pesticides, and organic material is returned to the Nile annually upstream of Cairo as a result. The runoff from farm fields due to irrigation and rainfall often carries with it organic material, chemical fertilizers and pesticides directly into the drains which are routed back to the river. Phosphates, nitrates and ammonium form the main constituents of fertilizers, all of which pollute the river causing eutrophication which endangers marine life. Furthermore, illegal but unregulated pesticides like DDT which are used across Egypt, affect the nervous system and fertility of fish, birds, mammals and humans. These chemicals seep into the ground contaminating the composition of the ground water and the runoff into the river.

Clearly, agriculture is at the centre of a nexus of very important water-related issues in Egypt: significant agricultural freshwater use, pollution of the Nile from wastewater polluted with pesticides and fertilizer runoff, ability to sustain a livelihood for the large portion of the population reliant on agriculture, and the food security of Egypt as a whole.

Given this nexus, we see it is absolutely integral to Egypt's water and food security to recognise that a dramatic water crisis may be in store, and to initiate the adequate measures now.

Water Scarcity

Average per capita fresh water availability in Egypt is on a steady decline from about 1,893 cubic meters per year in 1959 to about 900 cubic meters in 2000, to 700 cubic meters in 2012 [11]. Its population, according to government projections, will likely grow from 80 million now to 98.7 million in 2025. According to the Ministry of Water Resources and Irrigation, Egypt will need 20 percent more water by 2020, yet Egypt already uses 127% of its water resources [12]; meaning Egypt imports 27% of its water used through imported food and other products; and by 2020 could be using 147%. The United Nations now says Egypt could be water scarce by 2025.

Added pressures include "the huge population density and deteriorated water pipe network causes a huge water loss in the city network that reach the values of 34-35% which is equal to around 791 million m³/year which if saved can provide fresh potable water to additional 11 million inhabitants." [13].

This combination of water scarcity yet pollution of the available water sources, could be one of the worst resource crises Egypt faces.

It is our position that of the three sets of polluters, it is industry that is the least justifiable. Not only do they possess the potential to run their industrial facility according to the law, internalising the costs within the product price; but as businesses operating in Egypt they must respect the laws laid down to effect the balance between economic gain and resource preservation, incorporating considerations of how their actions effect the people and environment outside their premises.

Once the water testing laboratory has identified a violation, the Ministry of the Interior is responsible for implementing the regulatory laws against pollution and taking legal procedures against violating establishments. Noting the extent of the pollution and the violations that have caused it, we question the interests that have allowed this lapse of enforcement over and above the prioritisation of the health of the Egyptian people and the environment they rely on.

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A Publication by the Egyptian Center for Economic & Social Rights
Environmental Justice Programme

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March 2014

ecesr.org