

## **Water Pollution in Zambia**

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### ***Abstract***

#### **Introduction**

Water in Zambia, is not equally provided to everyone. For example, out of the population of about 13 million in Zambia, about 5 million do not have access to clean water. This also applies to sanitation in Zambia; about 7 million of Zambians do not have access to sanitation facilities.

In Zambia, water pollution has been seriously affecting the life of humans, plants as well as animals. The eco-system of rivers, streams and lakes is also getting deteriorated due to the contamination of water, through various sources. This condition also leads to the outbreak of numerous diseases, majority of them being lethal and contagious. Although certain natural processes may cause some of the water pollution, however, human activity is the largest cause of our streams, rivers and lakes getting polluted. We get this water from groundwater sources, rivers, and lakes, and after using it, and often contaminating it, most of this water gets back into the rivers, lakes, and streams. The used water from agricultural and industrial practices as well as household use creates wastewater, also referred to as sewage.

#### **Zambian urban and rural water sources**

For both urban and rural areas gets their water from groundwater sources by means of boreholes or dug-up wells, also they get their water from rivers, lakes, streams and pools in plains by means of water fetching by buckets or a well-articulated water system by a utility company assigned to supply water to communities at a prescribed fee. The utility companies have introduced water kiosks where, community members can access water at an afford cost and close to their settlements. This is in view of reducing in the distances that people walk to fetch water from river banks or streams.

#### **Sources of water pollution**

There are a number of means in which water gets contaminated. The most common ones are as follows; human activity is the largest cause of our streams, rivers and lakes getting polluted. The water from underground, streams, rivers and lakes are used by humans in unsafe way. The used water from agricultural and industrial practices as well as household use creates wastewater, also referred to as sewage. The companies drain off the sewage in large quantities into rivers and other water bodies. If this is allowed to flow back into water systems without being treated, it causes pollution, which results in harming both humans as well as animal life. Water also gets polluted when there is a runoff of rainwater from industrial, agricultural, and urban areas, which flow directly through storm water drains into water systems without any treatment. Another cause of pollution is dumping litter into streams, rivers, and lakes. People living near these water bodies have a tendency of dumping such litter as cardboard, newspapers, foam, plastic packaging, aluminum, glass, and so. The rising use of synthetic organic substances that are disposed of carelessly causes water pollution, oil and fuel spills causes' water pollution and acid Rain caused by the burning of Fossil, cause water pollution.

#### **Health hazards of water pollution**

Polluted water is highly contagious to humans and causes a lot of health-related problem. Drinking untreated water nowadays causes your body immediately to react to it. You will get a stomach ache at the least. Water-borne diseases account for the deaths of 3,575,000 people a year worldwide, and the majority of these are children. Infectious diseases can be spread through contaminated water. Some of these water-borne diseases are Typhoid, Cholera, Paratyphoid Fever, Dysentery, Jaundice, and

Amoebiasis. Chemicals in the water also have negative effects on our health. Pesticides can damage the nervous system and cause cancer because of the carbonates and organophosphates that they contain. Chlorides can cause reproductive and endocrinal damage. Nitrates are especially dangerous to babies that drink formula milk. It restricts the amount of oxygen in the brain and cause the “blue baby” syndrome. Lead can accumulate in the body and damage the central nervous system. Arsenic causes liver damage, skin cancer and vascular diseases. Flourides in excessive amounts can make your teeth yellow and cause damage to the spinal cord. Petrochemicals even with very low exposure, can cause cancer. Drinking untreated water can be a source of exposure to chemicals caused by nutrient pollution. Drinking, accidentally swallowing or swimming in water affected by a harmful algal bloom can cause serious health problems including: Rashes, Stomach or liver illness, respiratory problems, and neurological effects.

### **Objective of the study**

1. To determine the types and sources of water pollution
2. To determine the health hazards of water pollution.
3. To determine the possible interventions to stop water pollutions

### **Methodology**

This observational study was carried out in urban, peri-urban and rural areas of Lusaka city of Lusaka province and Kitwe town of Copper belt province. Most of the selected areas are well planned and organized areas, while others are unplanned high-density compounds. This is so to compare the quality of life that the residents in these places have and to determine the awareness level of residents about the health hazards of water pollution and how it affects everyday life.

Locations were selected randomly for the study by making a list of all areas under the planned residential areas and the unplanned residential areas, and a total of 12 areas were picked for the study

### **Study**

This observational study was carried out in Lusaka and Kitwe cities, the most commercialized and densely populated cities in Zambia. The selected areas are close to industrial and mining areas for unplanned. The locations assessed in Lusaka for planned residential areas include

1. Woodlands
2. Kabulonga
3. Kalundu
4. Avondale.

For Kitwe

1. Nkana East
2. Nkana west.
3. Zambezi way
4. Wuzakile

Locations assessed in Lusaka and Kitwe for unplanned residential areas include

Lusaka.

1. Chawama
2. Missisi
3. Kanyama
4. Chibolya

Kitwe

1. Mulenga
2. Kawama
3. Chamboli
4. Kamitondo

In carrying out this study, before questionnaires were handed out or interviews were conducted, observations were done by mingling with the residents to observe their lifestyle using the three L (3L). The 3L implies Look, Listen and learn. The facilitators of the study have to mingle and learn how people live in the midst of water shortages, poor water supply services by utility companies, poor waste disposal habits by residents themselves, poor health services in the residential areas and insufficient and poorly maintained boreholes.

Residents at all locations were very warm and receptive since the observer came down to their level to actually interact and seemed to be comfortable with them. They were able to divulge information and answer questions without holding back. And residents were happy to answer questions because they felt it was the only water authorities will take seriously the issue of improving water supply to these areas.

## **Analysis**

The study findings show that there is a lot of difference in the quality of life between unplanned and planned residential areas. Authorities and utility companies pay much attention to planned and organized areas. Unplanned areas are highly hit with health hazards that come with water pollution, and areas lack health facilities. Those living around industrial areas and mining areas have highly polluted water and company owners are more concerned with making profit than the wellbeing of the nearby residents. The following are some of the study findings.

1. Zambia's high rate of child stunting (40 per cent) is in part a result of poor sanitation — research indicates that adequate sanitation can decrease the risk of stunting.
2. In Zambian schools, lack of access to adequate water supply, sanitation and washing facilities negatively affects students and contributes to high dropout rates, especially among girls (20%).
3. With separate toilets for girls and boys, and privacy for menstrual hygiene management, girls are more likely to remain in school, delay pregnancy and marriage, and have stronger employment opportunities than boys (26%).
4. There are highly diarrheal cases, especially among children in unplanned areas (30%).
5. After study and stakeholder consultations, the following were discovered and documented.
6. 61% of the population use basic drinking water services (86 % in urban areas, 44 % in peri urban and rural areas)
7. 31 % of the population use a basic sanitation service (49 % in urban areas, 19 % in peri urban and rural areas)
8. 15 % of the population practices open defecation (1 % in urban areas, 25 % in peri urban and rural areas)
9. 14 % of the population has access to basic hygiene services, i.e. a hand washing facility with soap and water (26 % urban, 5 % rural)
10. 21 %, 34 % and 46 % of schools do not have basic drinking water, sanitation and hygiene services (respectively)

## **Control water pollution**

Control of water pollution could seem to be difficult, but it is very possible and can be attained through collaborative efforts. The following are some interventions that can be implemented and reinforced to ensure water pollution is stopped and controlled.

1. Don't throw litter in the rivers, streams and open wells.
2. Don't dispose of chemicals, paint, in water supplies, rivers, streams and other city drains.
3. If you see anyone throwing litter into any body of water, report it to the authorities.
4. Help increase awareness by educating children, youth and women and, increasing awareness within your community.

Here's a list of water pollution solutions

## **Waste water treatment**

Waste water treatment consists of removing pollutants from waste water through a physical, chemical or biological process. The more efficient these processes are, the cleaner the water becomes.

### **Green agriculture**

Globally, agriculture accounts for 70% of water resources, so it is essential to have climate-friendly crops, efficient irrigation that reduces the need for water and energy-efficient food production. Green agriculture is also crucial to limit the chemicals that enter the soils.

### **Storm water management**

“Storm water management is the effort to reduce runoff of rainwater into streets, lawns and other sites and the improvement of water quality” It is important to avoid pollutants from contaminating the water and helps to use water more efficiently.

### **Air pollution prevention**

Air pollution has a direct impact on water contamination as 25% of human induced CO<sub>2</sub> emissions are absorbed by rivers, streams and lakes. This pollution causes a rapid acidification of our rivers and lakes, and threatens marine life and corals. Preventing air pollution is the best way to prevent this from happening.

### **Plastic waste reduction**

80% of plastic in our water sources is from land sources. In order to reduce the amount of plastic entering our water sources, we need to both reduce our use of plastic globally, and to improve plastic waste.

### **Water conservation**

Without water conservation, we won't go very far. It is central in making sure the world has better access to clean water. It means being aware that water is a scarce resource, taking care of it accordingly, and managing it responsibly.

### **Conclusion**

Different types of water use require different levels of water purity with the highest level of purity being required for drinking water. Pollutants bring about many physical and chemical changes in water, for instance, suspended particles make water turbid; dyes, chromium and iron compounds change the color of water; phenols, oils, detergents, hydrocarbons, chlorine etc. impart an un-pleasant taste to water. As it is a vital resource essential for sustaining life, contamination of water has immediate as well as far reaching effects on the health and environment of living organisms.

### **Health hazards of water pollution**

(a) Phosphorus and Nitrates from fertilizers and detergents contaminate surface waters where they act as nutrients and promote the growth of oxygen consuming algae which reduce the DO level of water, killing fish and other aquatic organisms.

(b) Industrial effluents result in the addition of poisonous chemicals such as Arsenic, Mercury, Cadmium, lead etc., which kill aquatic organisms and may reach human body through contaminated food (i.e. fishes etc.)

(c) Domestic, commercial and industrial effluents (petroleum refineries, paper mills, breweries, tanneries, slaughter houses) contaminate the water with organic pollutants. These provide nutrition for micro-organisms which decompose the organic matter and consume oxygen and reduce the DO level of the aquatic system thereby killing the aquatic organisms.

### **Recommendations**

Water pollution control should be supported at all costs to avoid water pollution effects that has detrimental effects on human health and wellbeing of the ecosystem. Authorities should put up and strengthen policies that are meant to control water pollution at all levels of developmental activities.

Surface water will remain as an alternative source of water to meet domestic water demand mostly in rural areas of the world if potable water is not supplied on a regular basis. Wastewater effluents should be treated efficiently so as not to pose a health risk to the users of surface water resources.

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