

# AN INVESTIGATION INTO THE SOURCE OF WATER SUPPLY, AND MANAGEMENT OF POLLUTION IN URBAN ENVIRONMENT

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## Abstract

The study examine water sources, supply and the management of population in the urban centre the vitality of water cannot be over emphasize and the pollution of water constitutes hazard to life and the environment. To achieve the aim of the study the article focused on the sources of water supply and how the are polluted and the ways out of the pollution for healthy living

## INTRODUCTION

If one thing is abundant on earth to the point of near ubiquity, it is water, yet today it has become scarce, something we pay for. Public water supply remained exclusive for the rich in the state (Taraba).

In this research we exposed our readers to what water is, and the uses of water, we have gone further to its sources, distribution, pollution and control of such pollution and the effects to the environment and economic impact to the economy of Taraba State.

### Introduction

For the purpose of this study, this research was specifically conducted based on the following scope.

- ❖ What is water?
- ❖ Uses of water

- ❖ Sources of water
- ❖ Distribution of water
- ❖ Water pollution
- ❖ Control of water pollution
- ❖ The effect on environment

Water is a substance or liquid which is consumed by all living organism and is composed of the following attributes: tasteless, colourless and odourless. Water is an essential resource for all life on the planet. Of the water resources on earth only 3% of it is fresh and two-third of the fresh water is locked up in ice-caps and glaciers of the remaining 1%, a fifth is in remote inaccessible areas and much seasonal rainfall in monsoonal deluges and floods cannot easily be used. At present only about 0.08% of the word fresh water is exploited by mankind is ever increasing demand for

sanitation, drinking, manufacturing, leisure and agriculture.

An assessment of water resource management in Agriculture was conducted in 2007 by the international water management institute in Sri Lanka to see if the world had sufficient water to provide food for its growing population. It's assessed the current availability of water in Agriculture on a global scale and mapped out location suffering from water scarcity. It found that a fifth of the world's people, more than 1.2 billion lives in areas of physical water scarcity where more is not enough water to meet up demands.

A further 1.6 billion people lives in areas experiencing economic water scarcity, where the lack of investment in water or insufficient human capacity make it impossible for authorities to satisfy the demand for water.

The report found that it will possible to produce the food required in future but the continuation of today's food production and environmental trends will lead to crises in many parts of the world.

Regarding food production, the World Bank target Agricultural food production and water resource management as an increasingly water issue that is fostering an important and growing debate, this research therefore intends to brings a clearer understanding of how Agricultural food production affect water management.

**Sources of water are:** stream, rainfall, lake,

rivers, ocean, seas etc.

## **USES OF WATER IN AGRICULTURE SECTOR**

Agricultural is the largest users of the world's fresh water resources consuming 20%. International water management institute in Sri Lanka estimated that as the world's population rises and consumes more food (currently exceeding 6%, it is expected to reach 9% by 2050). Industries and urban development expand and the emerging biofuel crops trend also demands a share of fresh water resources, water scarcity is becoming an important issue. The most important use of water in Agriculture is for irrigation, which is the component to produce enough food. Irrigation takes up to 90% of water withdrawn in some developing countries and significant proportions in more economically developed countries (United State, 80% of fresh water usage is for its takes around 3,000 liters of water, converted from liquid to vapour, to produce enough food to satisfy one person's daily dietary need.

This is a considerable amount, when compared to that required for drinking which is between 2.5 liters. To produce food for the 6.5 billion or so people who inhabit the planet today required the water that will fill a carnal 10 meters deep, 100 meter wide and 7.1 million kilometers long that is enough to circle the globe 180 times.

Fifty years ago, the common perception was that water was an infinite

resource. At this time, they were fewer than half the current numbers of people in the planet. People were not as healthy as today, consumed fewer calories and ate less meat, so less water was needed to produce their food. They required a third of the volume of water to presently take from rivers today, the competition for the fixed amount of water resources is much more intense, giving rise to the concept of peak water.

This is because they are now nearly seven (7) billion people and planet, their consumption of water thirsty meat and vegetables is rising, and there is increasing competition for water from industry, urbanization, and Bio-fuel crops. In future, even more water will be needed to produce food because the earth population is forecast to rise to a billion by 2050. An additional 2.5 or 3 billion people, choosing to eat fewer cereals and more meat and vegetable could add an additional 5 million kilometers to the virtual canal mentioned above.

### **INDUSTRIAL USES OF WATER**

The water industry provides drinking and waste water services (including sewage treatment) to households and industries. Water supply facilities include water wells cisterns for rain water harvesting, water supply network, water purification facilities, water tanks, water tower, water pipes including old aqueducts. Atmospheric water generators are in development. Water in use in power generation, hydro-

electricity- is electricity obtained from hydro-power. Hydro- electric power comes from water driving a water turbine connected to a generator.

Hydro-electricity is a low cost, non-polluting, renewable energy source. The energy is supplied by the motion of water. Typically a dam is constructed on a river creating an artificial lake behind it. Water flowing out of the lake is forced through turbines that turn generators.

### **RECREATIONAL USES**

Humans use water for many recreational purposes as well as for exercising and for sport. Some of these include swimming water skiing, boating, surfing and drinking. In addition some sports like ice-hockey, ice-skating is played on ice. Lake-side, beaches and water parks are popular places for people to go, relax and enjoy recreation. Many find the sound and appearance of flowing water to be calming and fountains and other water features are popular decorations.

Some keep fish and other life into aquarium or punster show, fun and companionship. Humans also use water for snow sport i.e. skiing, sledding, snow mobbing or snow boarding, which requires the water to be frozen.

### **FIRE EXTENSION**

Water has a high heat of evaporation and is relatively inert, which makes it a good fire extinguishing fluid. The evaporation of water carries heat away from the fire. It is

dangerous to use water on fire involving oils and organic solvent, because many organic materials, fluid and water and the water tend to spread the burning liquid. Use of water in fire-fighting should also take into account the hazard of a steam explosions, which may occur when water is used on very hot fires to confirm space, and of a hydrogen explosion, when substance which react to water such as certain metals or hot carbon such as coal, charcoal, coke, graphite, decompose the water, producing water gas.

#### **Transportation as another Use of Water**

The use of water transportation materials through rivers, and canals as well as the international shipping lines is an important part of the world economy.

#### **Other uses include:**

✓ Washing hands: the propensity of water to form solution and emulsions is useful in various washing processes. Many industrial processes rely on actions using chemicals dissolve in water, suspension of solids in water slurry or using water dissolve and extract substances. Washing is also an important component of several aspects of personal body hygiene.

✓ Drinking: the human body contains from 55%-78% water, depending on both side. To function properly the body required between 1 and 7 liters of water per day to avoid dehydration. The precise amount depends on level of activity, temperature, humidity, and other factors. Most of these are ingested

enough food or beverages other than drinking straight water. It is not clear how much water in-take is needed by healthy people, though most specialist appropriately 2 liters (6-7 glasses) of water daily is minimum to maintain proper hydration medical literatures favours a lower consumption typically for an average men, excluding extra requirement due to fluid loss from exercise or warm weather. For those who have healthy kidneys, it is rather difficult to drink too much water but (especially in warm humid weather and while exercising) it's dangerous to drink too little.

People can drink far more water than necessary while exercising, however putting them at the risk of water intoxication (hyper-hydration) which can be fatal.

The popular claim that a person should consume "eight (8) glasses of water per day" seems to have no real basis in science similar misconception concerning the effect of water in weight loss and constipation can also be dispelled.

#### **WATER DISTRIBUTION**

In the area of water resources development in Taraba State and Nigeria as a whole, PSE consultant Ltd as over taking well over 180 measure water schemes. This is inclusive of Dam structures confining surface flow and boreholes abstracting underground water. The firm specialized in hydrology and hydrogeology section in well

acquitted with the research for, and provision of portable water for private, industrial, commoner and government sponsor scheme, it is also well experienced in the design of supervisions of conjuncture water supply project. it major work in Taraba include Wukari, Ibi water supply project which was rehabilitation of the intake works and water treatment plant at Ibi improvement of 25km pumping mains and redesign of pumping station, 2nr service reservoir and extension of Wukari distribution network. Jalingo water supply project-it was also a rehabilitation of 14nr boreholes design of high lift, pumping stations, extension of transmission mains and distribution of network including a new service reservoir.

Lastly, Takum water project which is Donga river intake works 20,000 cumm per day treatment plant, 32km diameter DI, Pipe, 4,000 in cube reinforced concrete service reservoir and 25km of distribution network.

Per capita water supply on Taraba State is about 15.5 liters/day which contrast greatly with the 25.8% liters/day. This cannot be said to be good enough especially when one realizes much of the supply is ether from hand dug wells or from stream which quality is doubtful.

### **SAFE WATER**

Safe water is scarce like petrol, and expensive as gold. Residents of Jalingo, Taraba State capital in Northern Nigeria, are

groaning over the unending scarcity of portable water.

“Water, they say is life”, and the human body constitute of 70% of this liquid substance, as such water tops the priority list of the demand of mankind. 80% of diseases plaguing humanity are due to use or consumption of unsafe water.

It is generally believed that the accessibility of sufficient quantities of portable water and safe sanitation facilities to a household determines the quality of life of the people and potential for poverty alleviation. This leads to the welfare improvement and is generally linked to a disease in infant and maternal values and environmental hygiene.

In Jalingo, accessing portable water by residents remains a major battle forcing residents of the city to rely on local vendor popularly called Mai ruwa and few streams for water, while public water supply remained exclusive for the rich the state.

ATC, Jalingo is a one of the slum communities in Jalingo, and is inhabited mainly by students, traders and farmers. Here the source of water for domestic consumption is a local stream about 7 kilometers away. What would have served as a safer source of water supply-two hand-pump boreholes donated to the community 5 years ago, had collapsed.

In another slum community, Barade ward, there are tales of woes and anguish whenever the Lamorde River, the only

source of water in the area, dries up, typically during dry season. When this occurs, residents of the community are left with no other option than to buy from 'Mai ruwa' water vendors, whose source of water is unknown.

A resident, Mrs. Franca Osita told us that she starts her day by searching for water, "I have to wake up early and walk to the stream to get water, or else buy from the water vendors and then prepare the children for school before resuming business, and this is usually difficult for me".

She called on the government to show more concern to untold suffering water scarcity has brought upon the people, by making provision for more boreholes and making sure that the taps are running again. Several areas, shared their testimonies, such as Mayo-Gwoi village, Mile six, etc. and the research has shown that most of these residents consumed two to three trucks a day, but largely depends on the average family size and it cost N200 for each truck which contains ten (10) Jerry cans. These people are at the mercy of water vendors, who sometimes hike the price of the water at will. This shows that for an average citizen in the state who earns less than N18, 000 per month, it is expensive considering other family expenses like sending children to school.

Findings indicate that it cost N60, 000 for the installation of pipe by water board which is quiet expensive, therefore

government should subsidies this to help residents of Jalingo have available water.

### **CAUSES OF WATER POLLUTION/ IMPLICATIONS**

1. Septic tanks: in every domestic "home" toilet is connected to septic tank usually located outside the house, each time poop is flushed down the toilet, it gives into this tank, where the solid is separated from the liquid point. Biological processes are used to break down the solid and liquid is usually drained out into the arid drainage system, from this stage it can escape into the soil and nearby water bodies.
2. Ocean and marine dumping: again, think of the rubbish we all make each day, paper waste, food waste, plastic, rubber metallic and aluminum waste. In some countries they are deposited into the sea. All these waste types take time to decompose e.g, it is known that paper takes about 2 weeks; aluminum takes about 200 years and glass take even more. When these end up in the sea, they harm sea animals and cause a lot of debt.
3. Sewage and waste water: everyday, we cook, do laundry, flush the toilet, wash our cars, shower and do many things that use water. Think about how we use water in school, hospitals and public places. In some not so developed countries, the sewage is not treated but quickly dumped into seas or water bodies. This is dangerous because they contaminate the environment and water

bodies and bring so many deadly diseases to us.

4. Atmospheric condition: atmospheric decomposition is the pollution of water bodies caused by air pollution each time the air is polluted with sulphur dioxide and nitrogen-oxide; they mix with water particles in the air and form a toxic substance. This falls as acid rain to the ground, and it gets washed into the water bodies. The result is that water bodies also get contaminated and this affects animals and water organisms.
5. Oil pollution: routine shipping, run-offs and dumping of oils on the ocean surfaces happens every day. Oil spills make up of about 3% of the oil that enters the ocean. Oil spills cause major problems, and can be extremely harmful to local marine wildlife such as fish, birds, and sea-offers and other aquatic lives. Because oil does not dissolve it stays on the water surface and suffocates fish. Oil also gets caught in the feature of sea birds stopping them from flying. Some animals die as a result.

### **Prevention of Water Pollution/Possible Solutions**

Dealing with water pollution is something that everyone (including government and local) needs to get involved with. Here are few things we can do to help:

i. Never throw rubbish away anyhow: always look for the correct waste-bin. If

there is none around please take it home and put it in your trash cane. This includes places like the beach, river-side, and water bodies.

- ii. Use water wisely: do not keep the tap running when not in use. Also, you can reduce the amount of water you use in washing and bathing if we all do this, we can significantly prevent water shortages and reduces the amount of dirty water that need treatment.
- iii. Do not throw chemical paints and medicine down the sink drain, all the toilet. In many cities, your local environment office can help with the disposal of medicine and chemicals, check with your local authorities if there is a chemical disposal plan for local resident.
- iv. Buy more environmental septic cleaning liquid for the use at home and other public places. They are less dangerous to the environment
- v. If you use chemicals and pesticide and fertilizers this will reduce run-off of the materials into near-by water sources. Start looking at option of composting and using organic manure instead.
- vi. If you live close to water body try to plant lot of trees and flowers around your home, so that when it rains chemical from your home does not easily drain into the water.

## **Conclusion**

Since the Taraba water supply board has shortage of water supply and obsolete machines that need renovation and replacements, adequate funding should be provided to meet the demand of water. This can be achieved if government subsidizes the supply of this water and this deficiency in water supply will be meet.

Proper education should be given on chemical and waste disposal to avoid polluting the water which is essential for our health. As water becomes more scarce, the importance of how it is managed grows vastly. Finding a balance between what is needed by humans and what is needed in the environment is an important step in the sustainability of water resources.

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