

## ASSIGNMENT 3

### 1. Explain six major non-domestic use of water.

According to an article titled “Nigeria’s Water Use by Industry”, published on Class Blog, 10% of Nigeria’s fresh water is used by industries, 21% of fresh water is used for domestic purposes and the remaining 69% is used for agriculture (Nigeria’s Water Use by Industry, 2013). Nevertheless, the six major non-domestic use of water include:

#### I. Irrigation

According to Sojka et al. (2002), irrigation is the practice of applying additional water, beyond what is available from rainfall, to the soil to enable or enhance plant growth and yield, and, in some cases, the quantity of foliage or harvested plant parts. In other words, it is the artificial provisioning of water for the growing of crops with the aim of increasing crop yield, preventing famine and cultivating superior crops. It involves transporting water from alternative sources of water to a locations where crops are planted as against waiting for rainfall. Some of the common methods<sup>1</sup> of irrigation include:

- a) Surface irrigation
  - i. Uncontrolled (or wild or free) flooding method
  - ii. Border strip method
  - iii. Check method
  - iv. Basin method
  - v. Furrow method
- b) Sub-surface irrigation
- c) Sprinkler irrigation
- d) Trickle or drip irrigation

These irrigation methods are further classified as wasteful and non-wasteful methods. The trickle or drip irrigation is classified under the non-wasteful methods while others are classified as wasteful methods.

#### II. Industrial Usage

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<sup>1</sup> Irrigation and its Method (Gaur & Thakur, 2014)

Industrial usage of water varies depending on the type of industries but in general the uses can be categorized into two major groups namely as an ingredient or used as part of the production process. In beverage, tomato paste, cosmetics and other related industries, water is used as ingredients. Under production process, water is used for cooling, washing, diluting, boiling or cooking, transportation of raw materials (for example, moving potatoes in a food factory), and as a cleaning agent.

### III. Mining Use

According to the USGS Water Science School, 5,320 million gallons of water is utilized daily for mining operations in the United States of America in 2010. According to Prosser et al (2011), Water is used by the mining industry for operational activities that include:

- transport of ore and waste in slurries and suspension
- separation of minerals through chemical processes
- physical separation of material such as in centrifugal separation
- cooling systems around power generation
- suppression of dust, both during mineral processing and around conveyors and roads
- washing equipment
- dewatering of mines.

Some of the highest mined minerals in the world include coal at 7.4 billion tonnes, Iron at 4.6 billion tonnes, Bauxite at 289 million tonnes, Phosphate rock at 276 million tonnes, and Gypsum at 267.1 million tonnes (Casey, 2018).

### IV. Aquacultural Use

Aquaculture water use is water associated with raising organisms that live in water—such as finfish and shellfish—for food, restoration, conservation, or sport. Aquaculture production occurs under controlled feeding, sanitation, and harvesting procedures primarily in ponds, flow through raceways, and, to a lesser extent, cages, net pens, and closed-recirculation tanks (Nigeria's Water Use by Industry, 2013).

## V. Recreational Use

People love water for swimming, fishing, boating, river rafting, and other activities. Even activities such as golf, where there may not be any standing water, require plenty of water to make the grass on the course green. Many recreational water uses are non-consumptive including swimming, fishing, and boating. Golf courses are the biggest recreational water consumer since they require large amounts for irrigation, especially because many courses are located in warm, sunny, desert regions where water is scarce and evaporation is high.

## 2. Briefly describe the important roles that water plays in the human body.

The role water plays in human body include:

- Water plays an important part in keeping us and our environment clean. It is essential for good personal hygiene. We use water to wash our hands and bodies, and also to wash places in our homes that could possibly harbour harmful microorganisms (such as toilets).
- Many of our foods are prepared with water and others naturally contain large amounts of water (e.g. milk is made up of approximately 88% water; eggs 66%; fish 80%; potatoes 75%; and beef 77%)
- Inside the body, water serves as a lubricant during digestion of our food. Water in saliva facilitates chewing and swallowing, and the food goes down into the stomach with the help of water. The functions of all the body's cells and organs depend on water
- Water is involved in transporting valuable nutrients around the body in the bloodstream. Nutrients are broken down in the digestive system and transported to where they are needed in the body.
- Water is used by the body to remove harmful toxins and wastes through urination and perspiration. Water also helps to reduce constipation. Drinking enough water helps body organs such as the kidneys and the liver to get rid of waste products

- Water helps to regulate body temperature. The body controls over-heating through perspiration. When sweat evaporates from the surface of the skin, it takes heat from the body and produces a cooling effect.
3. List the types of people who are most vulnerable to waterborne diseases. Explain your answers why and how to overcome the diseases

The types of people who are most vulnerable to waterborne disease are

- Infants
- Young children
- older people and
- People suffering from diseases (such as HIV/AIDS).

Infants and Children are more vulnerable to waterborne diseases because their immune systems are not fully developed. Also because of crawling and playing on the floor, children are exposure to infections agent in the environment especially contaminated environments. Older people and people are equally more exposed waterborne diseases because they have weaken immune system or lack the strength to practice.

The major ways to overcome waterborne disease include:

- Provision of access to safe drinking water.
- Improved sanitation.
- Good personal and food hygiene.
- Health education about how infections spread.

4. **Suppose that inhabitants of a village obtain water from a spring. What advice would you give to the users about the prevention of contaminants entering the spring?**

I will advise the inhabitants of the village to take the following measure to protect the Spring:

- Animals should be excluded from the surrounding area by a stock-proof fence.
- The springs should be protected from flooding and surface water pollution by constructing a deep diversion ditch above and around the spring. The ditch should be constructed so that it collects surface water running towards the spring and carries or diverts it away. It needs to be deep enough to carry all surface water away, even in a heavy rainstorm.
- Spring box should be constructed with brick, masonry or concrete, and is built around the spring so that water flows directly out of the box into a pipe or cistern, without being exposed to outside pollution such as run-off, bird droppings and animals. It should be fitted with a watertight cover with a lock
- Prevent the siting of water contaminating activities close to the sources of the spring.

**5. The following are pollution sources. Give two specific pollutants for each source.**

a) residential area

- Open defecation
- Leakage from poorly constructed pit latrines

b) metal plating plant:

- cyanides and
- heavy metals may be present in wastewaters from electroplating

c) Agricultural activities:

- pesticides and
- fertilizers

d) An uncontrolled landfill site

- Dissolved organic matter and
- many different types of inorganic components depending on the type of waste

e) Urban surface water run-off

- emissions from vehicles which include vehicle wear and Copper Vehicle brake pads
- plumbing and guttering

## Reference

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