COURSE: POST GRADUATE DIPLOMA IN WASH

ASSIGNMENT: No 3

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ASSIGNMENT 3

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

**Answer**

The explanations of six non-domestic use of water are as follows:

1. Irrigation: About 70% of water used globally is in irrigation. Spraying irrigation, where pressurized water is sprayed over plants to feed them, is often used on large farm, but greater efficiency of water can be achieved by drip-feed irrigation system. In drip-feed irrigation, water is fed to the roots of plants through narrow pipes dripping water onto the soil surface near the base of the plant; this takes the water directly to the growing crops and reduces losses by evaporation.
2. Industrial use: In many industries water is essential. Some industries use piped water supplied from water treatment plants while others draw the water themselves from underground sources and treat it on site for use. The water may be use either as part of the production process or as an ingredient, where water is one of the components of the products, for example in a soft- drink plant. In production process, it can be used for cooling, washing, diluting, or cooking, transportation of raw materials, for example moving potatoes in a food factory and as a cleaning agent.
3. Mining use: mining activities use huge amount of water in processing ore to extra minerals. In countries like Ethiopia, mining for gold and other valuable metals is an increasingly important part of the national economy and would not be possible without the use of water.
4. Use in power generation: Hydroelectric power uses the energy from moving water and converts this to electric energy. The development of hydroelectric power has transformed energy supply in recent years and more schemes are under construction or planned. However, it is important to realise that in HEP they water is not used in the sense of being consumed, because after passing through the HEP plant the water continues on its path in a river channel. Another process under development in the Rift Valley area of Ethiopia is the use of geothermal energy, in which energy is derived from the heat of the earth. This process involves drilling down into hot layers of underground rock and using this heat to convert water into steam, which is then used to drive generators to produce electricity.
5. Aqua cultural use: water can also be in aquaculture, which is the farming of aquatic organisms such as fish, crustaceans and molluscs for food. Fish farming obviously needs water for the fish to live in water. In this case, water is used to hatch fish eggs under controlled conditions and the fish are grown to maturity in tanks or ponds before being sold for human consumption. Although not currently practised in Ethiopia, the business potential for aquaculture has been recognised and it may be introduced in the future (*Rothuis et al*, 2012).
6. Recreational uses: water plays an important role in recreational activities and here again it is not consumed in the process of it use. Boat trips are popular on many of Ethiopia lakes and several resorts have been built on their shores.

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

**Answer**

* 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 micro-organisms (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.

1. List the types of people who are most vulnerable to waterborne diseases. Explain your answers why and how to overcome the diseases.

**Answer**

Infants and children are particular vulnerable to the lack of safe water provision. Lack of accessible safe water increases vulnerability to diseases. Their immune systems are not fully developed and may not be able to respond to a water-borne related infection. They also have less body mass than adult, which means that a water-borne chemical may be dangerous for a child at a concentration that is relatively harmless for an adult. Children often share with women the responsibility for fetching water. This means they may miss school and it can affect their health and put them especially girls at risk of harassment. Other groups who may be more vulnerable to a lack of safe water include people who are ill or debilitated in some ways because their immune already be weakened. They elderly may also be at greater risk.

1. 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?

**Answer**: The users of the spring should be advised to:

* avoid open defecation around the spring
* Do not construct latrines above the spring because of the danger of contaminating the groundwater
* use latrines properly
* Keep animals away from the spring.

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

**Answer**

1. A residential area: Human excreta, wastewater containing dissolved and suspended organic matter, suspended inorganic matter, pathogenic micro-organisms.
2. A metal plating plant: Cyanides, heavy metals.
3. Agricultural activities: Nitrates, Phosphates, Pesticides.
4. An uncontrolled landfill site: leachate containing dissolved organic matter, inorganic components and heavy metals.
5. Urban surface water run-off: Sediment, metals, hydrocarbons, rubber, detergents and litter.

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