**POST GRADUATE DIPLOMA IN WATER, HYGIENE AND SANITATION – PGD002**

**MODULE 3**

**ASSIGNMENT 3**

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

Non-domestic water is water that is not used for domestic purposes. Some non-domestic use of water is explained below.

1. Power generation: Rivers can be dammed to produce hydroelectric power. Hydroelectric power uses the energy from moving water to turn turbines to generate electrical energy. Typical example is the Akosombo dam on the Volta River in Ghana which generates 1020 MW.
2. Irrigation: This is the artificial application of water to land for the purposes of agricultural production. Water for irrigation may not be of high quality depending on the crop but the quantity of water required is usually high.
3. Industrial use: Water has numerous industrial applications. Water may be used as an ingredient in the production of a product e.g. carbonated drinks or employed in the production process of a product. Example of application of the latter includes cooling towers where heat is removed from products or industrial components.
4. Mining: Water is used in the mining sector for mineral processing and dust suppression. Water used in mineral processing gets polluted and requires treatment before it is can discharged back into the environment or river.
5. Aquaculture: This is the farming of fish and other aquatic animals. Aquatic animals live in water and cannot survive outside of water.
6. Recreational use: Water plays an important role in tourism and recreational activities which creates income for countries.
7. Briefly describe the important roles that water plays in the human body.

Some key roles played by water in the human body include;

1. Transportation of valuable minerals in the bloodstream. After the digestive system has broken down food into nutrients, water, which is the main constituent of bloody aids the transportation of the nutrients to where they are needed in the body.
2. Lubrication of food inside the body. Water serves as a lubricant during digestion of our food. Saliva, which contains water facilitates chewing and swallowing, and easy movement of food from the mouth through the oesophagus into the stomach.
3. Removal of toxins from the body. Water is involved in the removal of harmful toxins and wastes through urination and perspiration. Drinking enough water helps to reduce constipation and aids body organs such as the kidneys and the liver to get rid of waste products.
4. Regulation of body temperature. Water enables the body to release heat when ambient temperature is higher than body temperature i.e., we begin to sweat, and the evaporation of water from the skin surface cools the body very efficiently.
5. List the types of people who are most vulnerable to waterborne diseases. Explain your answers why and how to overcome the diseases.
6. Children, especially those under 5 years are vulnerable to waterborne diseases because their immune systems are not fully developed. This can be overcome by providing clean water to children and keeping children in a clean environment.
7. People who depend on surface water for domestic use. Surface waters are easily polluted by animals drinking and defecating in the water as well open defecation. This can be overcome through investment in cleaner sources of water for communities by government or applying preliminary treatment such as boiling of water from surface sources before use.
8. Communities which engage in open defecation are vulnerable to waterborne diseases like cholera. Flies can settle on the faecal matter and food and spread diseases within the communities. Provision of household toilet facilities will help to prevent the spread of diseases such as cholera.
9. People who do not wash their hands after visiting the toilet facility and before eating are vulnerable to water borne diseases. Good hygiene practice such as washing hands with soap under running before eating and after visiting the toilet can help prevent waterborne diseases like cholera.
10. 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?

Spring protection is important to maintain the quality of the spring water and to prevent pollution. To prevent contaminants from entering the spring, the following measures would be recommended to the village.

1. The spring should be protected from animals. A fence should be erected around the spring to prevent animals from accessing and contaminating the spring water.
2. The spring should be protected from surface runoff and floods through the construction of diversion ditches to receive and divert surface runoff away from the spring water.
3. Construction of spring box to prevent direct exposure of the spring water.
4. Setup rules for all the members of the village such as no defecation close to the spring and no dumping of refuse close to the wall.
5. The following are pollution sources. Give two specific pollutants for each source.

**Pollution Source Pollutant**

1. A residential area: Faecal matter, grey water
2. A metal plating plant: Lead, cadmium
3. Agricultural activities: Pesticide, fertilizer
4. An uncontrolled landfill site: Leachate, greenhouse gas
5. Urban surface water run-off: Detergents, Litter

**References**

1. Lecture material Post Graduate Diploma in Water, Hygiene and Sanitation, Module 3 Water Supply.