STRATEGIA NETHERLANDS

POSTGRADUATE DIPLOMA IN WATER, SANITATION & HYGIENE (WASH)

ASSIGNMENT FOR MODULE 3 (WATER SUPPLY)

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ASSIGNMENT CONTENTS

(MY ANSWERS TO ALL QUESTIONS)

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

The non-domestic use of water refers to the usage of water done mainly in industry, agriculture, hotels, educational, recreational or sports facilities, as well as hospitals, etc.

Below are the details for each category of non-domestic use of water identified:

a) **Recreational water use:** People use water for recreational activities like swimming, surfing, water skiing, white water sports, underwater diving, sailing, boating and shellfish gathering.

b) **Industrial water use**: Probably every manufactured product uses water during some part of the production process. Industrial water use includes water used for such purposes as fabricating, processing, washing, diluting, cooling, or transporting a product; incorporating water into a product; or for sanitation needs within the manufacturing facility. Some industries that use large amounts of water produce such commodities as food, paper, chemicals, mining, refined petroleum, or primary metals.

c) **Commercial water use**: Commercial water use includes water used by commercial facilities such as hotels, motels, restaurants, office buildings, government and military facilities, hospitals, educational institutions, and retail sales stores. Commercial water use in office buildings primarily is used for sanitation, maintenance, and aesthetic appeal. Specific uses of water include toilet flushing, air-conditioning, washing floors and other surfaces, fountains and lawn watering. Since lawn watering and air-conditioning use more water than sanitation or cleaning, commercial water use will be larger for business parks in a warm, dry climate with large areas of grass than in cooler, more humid areas.

d) **Agricultural water use**: Agricultural water is water that is used to grow fresh produce and sustain livestock. The use of agricultural water makes it possible to grow fruits and vegetables and raise livestock, which is a main part of our diet. Agricultural water is used for irrigation, pesticide and fertilizer applications, crop cooling and frost control.

e) **Electricity generation water use:** Power generation involves thermoelectricity and hydroelectricity. The thermoelectric or "thermal" plants, boil water to produce steam for generating electricity. The hydroelectric power plants use dams and other approaches to capture the energy in moving water.

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

Water is one of the most important requirements for human health and life. The human body needs water to perform all the following functions: **regulating body temperature, lubricating joints, moistening tissues in the mouth, eyes, and nose, helping to dissolve nutrients and make them accessible in the bloodstream, carrying nutrients and oxygen to cells, and for flushing out waste products**. In other words, nearly everything that the human body does, requires water.

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

Waterborne diseases are caused by a variety of microorganisms, biotoxins, and toxic contaminants, which lead to devastating illnesses such as cholera, schistosomiasis and other gastrointestinal problems. Waterborne diseases can impact anyone, however dependent on this illness characteristic, it can have a much more severe impact in **young children, babies, the elderly and those living with chronic conditions like heart disease, diabetes, kidney disease** etc. because of their low body resistance and physiological weaknesses and sometime low immunity.

In order to overcome the waterborne disease which is generally caused by eating or drinking food or beverages contaminated by bacteria, parasites or viruses and mainly these organisms are passed in the feces of animals and infected people, the following precautions should be taken:

a. **Use good environmental management**. Dispose any stool in the toilet and observe hygienic practice. Practice good personal hygiene.

b. **Regular and careful hand washing practice by all age groups**. Wash hands thoroughly after using the toilet, changing a diaper or cleaning up a child who has used the toilet, before and after preparing food or eating, etc.

c. **Take food safety precautions**. Practice the fundamentals of food safety which protect family and people in your community. Therefore, wash and/or peel all raw vegetables and fruits before eating, etc.

d. **Drink properly treated and treated water**. Do not drink untreated water from lakes, rivers, ponds, streams, or shallow wells.

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?

Springs are where groundwater naturally comes to the surface. Because spring water is filtered through rock and soil and moves quickly, it can be considered safe unless it is contaminated from the surface. Therefore, my advice to users for to prevent their springs from contamination, they should:

a) Ensure the water spring and the collection area are not likely to be polluted by surface run-off.
b) Ensure that there are no use of pesticides and fertilizers, latrines within 30 meters, particularly upstream of the spring.
c) Fence the area around the spring to prevent pollution by children or livestock.

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

a) A residential area: **Detergents, oil**, automobile fluid, paint, trash and other pollutants containing the untreated wastewater from residual area flows into channels and the water boby (river, lac, ocean, etc.) where it can endanger marine life and contaminate water sources.

b) A metal plating plant: Many Industrial effluents, particularly from metal plating plant, are contaminated with **heavy metals** causing serious environmental pollution.

c) Agricultural activities: Many **fertilizers** and **pesticides** are chemical products that are used by farmers to protect their crops against attacks from insects and harmful bacterias as well as help to grow crops and improving the yield. Unfortunately, when these chemicals are mixed with rainwater they can become a problem as they flow off the land into streams, rivers, and canals. Eventually, they will make their way to the water sources and pollute.

d) An uncontrolled landfill site: The main pollutants from the uncontrolled landfill site are **toxins**, **leachate** and **greenhouse gases.**

- **For toxins:** Many materials that end up as waste contain toxic substances. Over time, these toxins leach into our soil and groundwater, and become environmental hazards for years. Electronic as example, the waste such as televisions, computers and other electronic appliances contain a long list of hazardous substances, including mercury, arsenic, cadmium, PVC, solvents, acids and lead.

- **Leachate** is the liquid formed when waste breaks down in the landfill and water filters through that waste. This liquid is highly toxic and can pollute the land, ground water and water ways.

- **Greenhouse gas**: when organic material such as food scraps and green waste is put in landfill, it is generally compacted down and covered. This removes the oxygen and causes it to break down in an anaerobic process. Eventually this releases methane, a greenhouse gas that is 25 times more potent than carbon dioxide. The implications for global warming and climate change are enormous. Methane is also a flammable gas that can become dangerous if allowed to build up in concentration.

e) Urban surface water run-off: Water running off impervious surfaces in urban area tends to pick pollutants from roadways and parking lots, as well as gasoline, motor oil, heavy metals, trash and other chemicals from lawns. Roads and parking lots are major sources of polycyclic aromatic hydrocarbons (PAHs), which are created as combustion byproducts of gasoline and other fossil fuels, as well as of the heavy metals nickel, copper, zinc, cadmium, and lead. Fertilizer and organic waste that urban runoff often carries brings eutrophication which often affects waterways.

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