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| **WASH ASSIGNMENT 3-MODULE 3-READY** |

**COURSE TITLE: POST GRADUATE DIPLOMA IN WATER, HYGIENE & SANITATION.**

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QN1. Water is used in many ways. Apart from domestic purposes, it can be used in industry, in commercial establishments (such as hotels and restaurants), in farming (for agriculture and animal-rearing) and for emergency uses such as fire-fighting. The quality and quantity of water varies for each use. Water for industry/agriculture could cope with water of a lower quality but the demand is much higher in terms of quantity. The following are some of uses of water.

1. **Irrigation**

About 70% of water used globally is in irrigation. Many different irrigation methods are used by farmers in different countries in Africa. For example in Ethiopia, spray irrigation system where pressurized water is sprayed over plants to feed them is often used on large farms. Drip-feed irrigation where water is fed to the roots of plants through narrow pipes dripping water onto the soil surface near the base of the plant.

1. **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 used either as part of the production process or as an ingredient, where water is one of the components of the product, for example in a soft-drink plant. In the production process, it can be used for cooling, washing, diluting, transportation of raw materials (for example, moving potatoes in a food factory) and as a cleaning agent.

1. **Mining use**

Mining activities use huge amounts of water in processing ore to extract minerals. In Ethiopia for example, 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.

1. **Use in power generation**

The rivers of Ethiopia have enormous potential for generating hydroelectric power (HEP). HEP uses the energy from moving water and converts this to electrical energy. The development of HEP has transformed energy supply in many African countries. However, it’s important to realize that in HEP the 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.

1. **Aquaculture use**

Water can be used 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. 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 food.

1. **Recreational uses**

Water plays an important role in recreational activities and here again it’s not consumed in the process of its use. Boat trips are popular on many of African countries such as Ethiopia, Uganda & Kenya lakes and serval resorts have been built on their shores.

QN2. **Important roles of water in the human body.**

Water is essential for the proper functioning of the body. Human beings can live several days without food but only three or four days without water. Each person needs to consume about 2-4.5 liters of water per day (depending on the climate and level of activity) for their body to function properly. In all, each of us needs 30-40 liters of water for domestic purposes, including drinking, food preparation, cooking and washing (WHO, 1997).

Water makes up a majority of body weight and is involved in many important functions, including; flushing out waste from one’s body. It regulates body temperature and helps brain to function very well. Other important roles of water in the human body include the following.

**It helps create saliva**

Water is a main component of saliva. Saliva also includes small amounts of electrolytes, mucus, and enzymes. It’s essential for breaking down solid food and keeping your mouth healthy.

Your body generally produces enough saliva with regular fluid intake. However, your saliva production may decrease as a result of age or certain medications or therapies.

**It regulates your body temperature**

Staying hydrated is crucial to maintaining your body temperature. Your body loses water through sweat during physical activity and in hot environments.

Your sweat keeps your body cool, but your body temperature will rise if you don’t replenish the water you lose. That’s because your body loses electrolytes and plasma when it’s dehydrated.

If you’re sweating more than usual, make sure you drink plenty of water to avoid dehydration.

**It protects your tissues, spinal cord, and joints**

Water consumption helps lubricate and cushion your joints, spinal cord, and tissues. This will help you enjoy physical activity and lessen discomfort caused by conditions like arthritis.

**It helps excrete waste through perspiration, urination, and defecation**

Your body uses water to sweat, urinate, and have bowel movements.

Sweat regulates body temperature when you’re exercising or in warm temperatures. You need water to replenish the lost fluid from sweat.

You also need enough water in your system to have healthy stool and avoid constipation.

Your kidneys are also important for filtering out waste through urination. Adequate water intake helps your kidneys work more efficiently and helps to prevent kidney stones.

**It helps maximize physical performance**

Drinking plenty of water during physical activity is essential. Athletes may perspire up to 6 to 10 percent trusted Source of body weight during physical activity.

Hydration also affects your strength, power, and endurance.

You may be more susceptible to the effects of dehydration if you’re participating in endurance training or high-intensity sports such as basketball.

Negative effects of exercise in the heat without enough water can include serious medical conditions, like decreased blood pressure and hyperthermia. Extreme dehydration can cause seizures and even death.

**It helps prevent constipation**

Eating fiber isn’t the only way to prevent constipation. It’s also important to maintain your water intake so your bowel movements contain enough water.

If you don’t consume enough water, magnesium, and fiber, you may be more likely to experience constipation.

If you’re already constipated, you may find that drinking carbonated water Trusted Source as well as plain water can help ease your symptoms.

**It aids in digestion**

Contrary to what some believe, experts confirm drinking water before, during, and after a meal will help your body break down the food you eat more easily. This will help you digest food more effectively and get the most out of your meals.

**It helps with nutrient absorption**

In addition to helping with food breakdown, water also helps dissolve vitamins, minerals, and other nutrients from your food. It then delivers these vitamin components to the rest of your body for use.

**It improves blood oxygen circulation**

Water carries helpful nutrients and oxygen to your entire body. Reaching your daily water intake will improve your circulation and have a positive impact on your overall health.

Water also helps you absorb important vitamins, minerals, and nutrients from your food, which will increase your chances of staying healthy.

**It helps boost energy**

Drinking water may activate your metabolism. A boost in metabolism has been associated with a positive impact on energy level.

One study found that drinking 500 milliliters of water boosted the metabolic rate by 30 percent in both men and women. These effects appeared to last over an hour.

**It helps improve mood**

Not getting enough water can also affect your mood. Dehydration may result in fatigue and confusion as well as anxiety.

**It helps keep skin bright**

Adequate water intake will help keep your skin hydrated and may promote collagen production. However, water intake alone isn’t enough to reduce the effects of aging. This process is also connected to your genes and overall sun protection.

**It prevents overall dehydration**

Dehydration is the result of your body not having enough water. And because water is imperative to so many bodily functions, dehydration can be very dangerous.

Severe dehydration can result in a number of severe complications, including: swelling in your brain, kidney failure & seizures.

(Source; [Natalie Butler, RD, LD](https://www.healthline.com/medical-team) on March 19, 2019 — Written by Natalie Silver)

QN 3. Waterborne diseases remain the major the cause of morbidity and mortality among mothers and under- 5 children in South Sudan in particular and other developing countries in Africa. The people vulnerable to waterborne diseases include; infants (under-5 children), elderly people, mothers & all adults. This is because the body immunity for children, elderly & mothers is weak. They are prone to malnutrition and waterborne diseases such as diarrhea, cholera, typhoid fever, bacterial dysentery, viral hepatitis & poliomyelitis among others.

However, waterborne diseases can be overcome through the following ways.

Open defecation practices that contaminate water sources can be stopped by constructing household pit latrine in every home so that human faeces are safely disposed. Food covering before serving it to people to avoid flies sitting on food, water source protection to prevent animals contamination/human contamination. Other good hygiene practices may include; keeping household latrine clean, having plates rack at household where utensils are washed and put to dry up. Hands washing with soap at five critical moments (before preparing food, eating food, feeding the baby and after visiting latrine and cleaning the baby’s bottom).Safe water handling practice from the source, transportation, and storage and drinking should be promoted as good hygiene behaviors.

QN4. Preventive measures against contaminants entering the spring.

**Spring source protection**

Whether the spring originates from shallow or deep rock layers, animals should be excluded from the surrounding area by a stock-proof fence. 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.

Small springs are typically protected by a ‘spring box’ , which is constructed of 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. The spring box should have a watertight cover with a lock.

The water source should be fully enclosed or capped and no surface can run directly into it. People should not step into the water while collecting it. Latrines, solid waste pits, animal excreta and other sources of pollution should be located as far away as possible from the water source and on ground lower in elevation than the water source. There should no stagnant water within 5 meters of the water source/spring. The water collection buckets and the spring (water source) are to be kept clean.

QN5. Examples of specific pollutants for the following sources.

1. A residential area: Nitrates & phosphates
2. A metal plating plant: hydrocarbons, cyanides
3. Agriculture activities: pesticides & fertilizers
4. An uncontrolled landfill site: leachate, litter
5. Urban surface water run-off; human excreta, sewage, lead, copper & hydrocarbons

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