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

**MODULE 4**

**ASSIGNMENT 4**

**KWADWO GYASI**

**FEBRUARY 2019**

1. List and briefly describe the measures by which the success or otherwise of a public–private partnership providing water supply services can be assessed.

The performance of a Public-Private Partnership (PPP) providing water supply services can be assessed through the following parameters:

1. Accessibility: This parameter seeks to assess amongst other the things the proportion of a population have accessing to water, the distance to the nearest water access point (less than 1 km or 30 minutes’ walking time). Research (Pickering and Davis,2012), has shown that the further away a water source is, the less that water is used.
2. Affordability: This parament seeks to access the cost of the water supply to population. The cost of water supply to households should be affordable and should be less than 5% of the household’s income.
3. Cost recovery: This parameter accesses whether the costs associated with the provision of water to households is being recouped.
4. Minimisation of non-revenue water: This parameter is related to cost recovery. Non-revenue water is water that is used but does not generate income. This parameter assesses whether non-revenue water is this reduced to no more than most 15%.
5. Water quality: This parameter assesses the public health implication of supplying water to households. It checks whether the quality of the water complies with national and international standards.
6. Operational efficiency: This parameter assesses the adequacy of the quantity of water supplied per capita and how long water is supplied in a day.
7. Give six possible causes of water emergencies, three due to natural causes and three due to humans.

A water emergency is an event that disrupts the normal supply of water to a location. Water emergency can occur due to natural causes or human induced causes.

Some natural causes of water emergency are:

1. Drought: This is the phenomenon where there is a deficiency in rainfall over an extended period of time, resulting in a water shortage. Prolonged draught can lead to food security crisis and cause mass migration of people and animals.
2. Floods: Flooding is an abnormal rise in the water level and may result in overflowing of streams or rivers. Apart from flood waters destroying properties and lives, flood waters can carry chemicals that contaminate wells and streams.
3. Earthquake: The Britannica encyclopaedia defines earthquake as any sudden shaking of the ground caused by the passage of seismic waves through Earth’s rocks. Earthquakes can destroy water lines and infrastructure, interrupting the supply of basic services.

Some human causes of water emergency are:

1. Accidents: Human induced accidents can cause contamination of drinking water and pollution of rivers and streams.
2. Human neglect: Failure to monitor and regulate the use of water resources and water infrastructure can lead to water emergency.
3. Sabotage: Deliberate destruction of water infrastructure can lead to water emergency.

b. What are the options for safe water supply during a water emergency.

Options for safe water supply during a water emergency include:

1. Use of water tankers for distribution of water
2. Use of plastic water bottles
3. Treating of water before consumption

3. You are about to set off to conduct a sanitary inspection of an abstraction point at a river.

1. What would you take with you?

* Note book
* Pen
* Empty bottles for taking water samples if necessary
* GPS device

1. Explain four things you will be looking for during your inspection.
2. Presence of human habitation upstream that could be pollution the source. Human habitation upstream of the source will come with human activities such as open defecation and washing along the river which can pollute the abstraction point.
3. Presence of fence around the intake facility. The presence of a fence will prevent intruders and trace animals from accessing the abstraction point.
4. Presence of industries upstream of the river. Pollution can result from release of industrial effluents that do not meet quality standards into the river.
5. Possibility of landslide or mudflow into the river. Deforestation along the river makes the soil loose and easy to be swept away during heavy rain leading to landslide and erosion into the river.
6. Explain briefly why a Water Safety Plan is necessary

Water Safety Plan is a plan to ensure the safety of drinking water through a risk assessment and management process that considers all the points in water supply from the catchment to the consumer. (Lecture notes)

Water safety plans are necessary because they help to prevent contaminants and pollutants from entering a water source. This is achieved through putting measures in place to control and prevent runoff from the catchment area from polluting a water source.

Water safety plans also ensure to prevent recontamination of water during distribution, storage and handling of drinking water. This is achieved by identifying the potential hazards at each stage of the water supply process and preparing detailed management processes to address the hazards and risks.

1. Distinguish between the two types of maintenance at a water utility and give reasons why one of them is Better.

The two types of maintenance are preventive maintenance and breakdown maintenance. Preventive maintenance involves regular, planned activities to ensure that breakdowns are avoided, and everything works properly. Examples of preventive maintenance include servicing of equipment, inspecting equipment for wear and tear, cleaning and greasing moving parts of equipment, and replacing items that have a limited lifespan.

Breakdown maintenance is carried out when components fail and stop working.

Preventive maintenance is important because it ensures that an asset fulfils its service life. It also prevents crises occurring and costly repairs (in terms of time and money) being needed. This makes preventive maintenance a better approach than breakdown maintenance.

**References**

1. Lecture material Post Graduate Diploma in Water, Hygiene and Sanitation, Module 4 Water Safety and Distribution.

2.<https://sswm.info/arctic-wash/module-3-health-risk-assessment/further-resources-risk-assessment/water-safety-plans>

3. <https://www.who.int/water_sanitation_health/water-quality/regulation/sheet5.pdf?ua=1>