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| **WASH ASSIGNMENT 7-READY** |

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

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**REGISTRATION NUMBER. Aimps/226/2019.**

**31 OCT. 2019.**

Assignment 7

1. Describe the particular challenges of providing WASH services in urban settings arising from each of the following factors.

* + - * 1. Increasing population size
        2. The diverse nature of the urban community
        3. Infrastructure required for WASH services
        4. Governance, in particular the process through which resources for improving WASH services are allocated and utilized.

1. **Challenges related to population size**

WASH service upgrade and expansion is slower than the rate of population growth, which puts pressure on the existing systems. As the services are shared by many more people, they quickly become inadequate and may break down.

Population growth and urbanization are enforcing rapid changes leading to a dramatic increase in high-quality water consumption. Frequently, this demand for water can’t be satisfied by the locally available water resources, while the discharge of insufficiently treated wastewater increases costs for downstream users and has detrimental effects on the aquatic systems.

Climate change is predicted to cause significant changes in precipitation and temperature patterns, affecting the availability of water.

A rapidly growing demand for water for multi-sectorial uses, on the one hand, and diminution of natural storage capacity and lack of development of artificial storage capacity to meet demand and to buffer against shocks.

**Wastes and pollution;** Urbanisation affects land, water, air and wildlife because of the number of people, the amount of buildings and construction, and the increased demands on resources. It has impacts on the physical environment in several ways.

**Water quality;** in developing countries such as South Sudan and Ethiopia, many rivers in urban areas are more like open sewers. The lack of sanitation and sewerage systems has a dramatic impact on urban watercourses. People use the rivers to dispose of all their wastes from homes, industries and commercial businesses. Wastewater from human settlements contains organic material and nutrients; industrial wastewater contains many different types of toxic pollutant. These make the water unsafe for humans to use for many purposes including drinking and irrigation, as well as harming the fish and other animals and plants living in the water. Any changes to the quality of surface water also affect groundwater because they are linked by the processes of the water cycle so pollutants from the surface will infiltrate down and contaminate soil and groundwater as well.

**Solid waste;** in many towns and cities solid waste management is inefficient or non-existent. Solid waste management means the proper collection, transfer, recycling and disposal of all the solid material we throw away, including plastics, paper and cardboard, food wastes, electrical waste, etc. It also includes industrial, hospital and institutional wastes which often contain pathogens as well as hazardous and toxic chemicals, which need special care. Urban waste often ends up in illegal dumps on streets, open spaces, wastelands, drains or rivers. This is frequently a problem in peri-urban areas, which are convenient for dumping wastes because of the availability of open space and ease of access from central urban areas. This can lead to the pollution of groundwater and surface waters which may be used as a source for drinking water. Sometimes the wastes are collected and taken to legalised waste disposal sites but these are not always properly managed to protect water bodies and groundwater.

**Air quality;** air quality in towns and cities is frequently very poor as a result of air pollution from many different sources. These include: vehicle exhausts, smoke from domestic fires, outputs from factory chimneys, diesel-powered generators and dust from construction works and city streets. Poor air quality has a significant impact on the health of many urban residents as well as leaving a damaging and unsightly layer of dust on plants, buildings and other surfaces.

Water supply planning in many developing cities in Africa such as South Sudan didn’t take into account of present and future water demand by people, and by industrial and commercial development. Domestic use is likely to increase as living standards improve. Planning also needs to consider the needs of schools, health facilities and other institutions.

1. **The diverse nature of the urban community**

Urban communities come from different backgrounds and have varying economic status. They are likely to be very mixed and include people from different ethnic groups and religions. Moreover, most people living in urban areas move frequently in and out of town. They may not feel they are part of a community or care very much about the place where they live. These characteristics make it difficult to raise awareness and understanding of basic service issues and pose significant challenges for mobilizing people to change their behavior and actions.

1. **Infrastructure required for WASH services**

The key challenge to meeting the increasing WASH service needs in South Sudan’s urban areas is the availability of adequate resources, including finance and human resources that can provide and maintain the necessary infrastructures. The infrastructures required are: water supply system; storm water drainage system; solid waste collection, transportation equipment and disposal sites; liquid waste (including feacal sludge from latrine) transportation and disposal sites and waste recycling or reuse equipment and facilities.

Water supply systems include developed water sources, treatment plants, storage reservoirs, and a network of distribution pipes delivering water to users. Growing population numbers and economic activity in urban areas mean that: large amounts of investment are required to expand the capacity of these systems to meet the water needs of the population adequately. Mobilizing sufficient funding is often difficult; water sources especially ground water may become depleted over time because of high extraction rates; Waste from industrial activities increases the threat of contamination of water sources.

Sanitation services include infrastructure for collection and safe disposal of liquid and solid waste. The amount of waste increases with the population size. Industrial activities also add to the type and composition of wastes generated.

(d) **Governance, in particular the process through which resources for improving WASH services are allocated and utilized.**

The term governanceis used to represent many interrelated areas in government systems and refers to such things as the ways decisions are made and strategies are developed. Here, the focus is on responsibility and accountability of local governments in decision making to improve and effectively manage WASH services. Accountability means an obligation or willingness by an organization or individual to account for their actions and accept responsibility for them.

Effective operation and management of urban WASH facilities is another challenge related to governance. In principle, WASH facilities are managed by service providers, such as water utilities and micro- and small enterprises (MSEs). These groups are expected to recover costs for operating and maintaining the facilities but their performance is often below expectations. Service providers may not listen to the needs and complaints of user communities. Where services are not provided to the expected standard, the community’s motivation and willingness to pay the tariffs is reduced. This affects the capacity of the service providers to manage the WASH facilities and is a major challenge for governance.

2. What are the major health risks from?

* + - * 1. open defecation
        2. allowing food waste and litter to accumulate in a ditch
        3. not washing hands before eating.

Briefly explain how these risks could be reduced

1. Open defecation.

Open defecation is the practice of excreting faeces in the open rather than in a latrine and is common practice in highly populated corners of urban areas, as well as in pre-urban settings where adequate latrines are not available. People practice open defecation because there is no suitable alternative. The possibility of pathogens from faeces re-infecting people is very high in this situation.

Where latrines are available, they may become overfull if not emptied regularly. As a result, faecal matter may overflow the pit and become a contamination risk in the same way as open defecation or flying toilets.

Faecal waste that accumulates in the bottom of pits and septic tanks is called faecal sludge, septic sludgeor simply sludge. Inefficiencies in sludge management systems can increase the chances of contaminating the environment during collection, transport or disposal of sludge.

Open defecation contaminates surface water sources, underground water and other unprotected sources of water in urban areas and more particularly in rural areas.

When people defecate in the open areas, it increases the risk of diarrhoea disease infection. Flies sit on the feaces in the open fields and carry such feaces to the uncovered food and water in the household.

Management and appropriate disposal of human excreta is a key environmental issue. It is important to remember the inevitable link between human excreta and disease. That is why building latrines, encouraging their proper use and promoting hand washing stand out as key strategic interventions to reduce the incidence of disease.

1. **Allowing food waste and litter to accumulate in a ditch**

In many towns and cities in Africa, solid waste management is inefficient or non-existent. Solid waste management means the proper collection, transfer, recycling and disposal of all the solid material we throw away, including plastics, paper and cardboard, food wastes, electrical waste, etc. It also includes industrial, hospital and institutional wastes which often contain pathogens as well as hazardous and toxic chemicals, which need special care.

Urban waste often ends up in illegal dumps on streets, open spaces, wastelands, drains or rivers. This is frequently a problem in pre-urban areas, which are convenient for dumping wastes because of the availability of open space and ease of access from central urban areas. This can lead to the pollution of groundwater and surface waters which may be used as a source for drinking water. Sometimes the wastes are collected and taken to legalized waste disposal sites but these are not always properly managed to protect water bodies and groundwater.

The effect of no waste management; paper, plastics and other solid waste litter the environment.

The effect of poor sanitation; liquid wastes are discharged into rivers and streams that may be used as a water source for drinking and other domestic consumption.

Surface water contamination;Waste that end up in water bodies negatively change the chemical composition of the water. Technically, this is called water pollution. This will affect all ecosystems existing in the water. It can also cause harm to animals that drink from such polluted water.  
   
Soil contamination:   
Hazardous chemicals that get into the soil (contaminants) can harm plants when they take up the contamination through their roots. If humans eat plants and animals that have been in contact with such polluted soils, there can be negative impact on their health.  
  
Pollution:   
Bad waste management practices can result in land and air pollution and can cause respiratory problems and other adverse health effects as contaminants are absorbed from the lungs into other parts of the body.   
Leachate;   
Liquid that forms as water trickles through contaminated areas is called Leachate. It forms very harmful mixture of chemicals that may result in hazardous substances entering surface water, groundwater or soil.

1. Not washing hands before eating.

**Diarrhea may become a frequent visitor**

Not washing your hands regularly can increase your chances of catching an illness that leads to diarrhea. One of these might be shigellosis, a bacterial infection with symptoms that include watery diarrhea, abdominal cramps, and fever, according to the CDC.

There is good news, though, in that simply washing your hands especially after coming in contact with germ surfaces can prevent about 30 percent of diarrhea-related sicknesses, the CDC says.

## Your snacks can get contaminated

Think of all the times you've plunged a dirty hand into a bag of chips, box of crackers, or bowl of popcorn. If you aren't washing your hands, it's so easy to contaminate these shared foods with germs, according to the New York State Department of Health.

This is also why you may not want to share food or utensils with someone who is sick, especially if they have the norvirus. According to the CDC, if you get the nor virus illness, you can shed *billions* of nor virus particles that you can’t see without a microscope, and it only takes a few of these particles to make people sick.

**It could contribute to antibiotic resistance**

According to the CDC, reducing the number of infections people get by washing your hands can help prevent the overuse of antibiotics, which is the single most important factor leading to antibiotic resistance around the world. "Antibiotics are often overused when someone has a viral infection (remember, antibiotics only fight bacterial infections, not viruses)," Dr. Elliott says. "So, the fewer viral infections (by proper hand washing and other sanitary measures), the less use of unnecessary antibiotics."

**You're infecting everyone you touch**

Sure, it's polite to cover your sneeze with your hand than it is to let it fly. And yet, how often do you really wash up after doing so? It's easy to forget, or to touch a few surfaces first and just like that the germs spread.

Again, hand washing is the best way to prevent the transfer of disease, which is why "this is one of the first things you learn in medical school or in any health profession," Dr. Trattner says.

**You could get Or Spread food poisoning**

There are many ways to come down with a case of food poisoning, including eating undercooked meats, or food that has gone bad. You can also get pretty darn sick by preparing meals with dirty hands. (See above information about fecal matter).

According to the CDC, a large percentage of food-borne disease outbreaks are spread by contaminated hands. But appropriate hand washing practices *can* reduce the risk of food-borne illness and other infections. So do yourself, and everyone else, a huge favor by washing before you handle food.

Briefly explain how these risks could be reduced.

1. The following health major risks from open defecation, allowing food waste and litter to accumulate in a ditch and not washing hands before eating will be reduced as seen below.

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.

Solid waste management systems are developing in many developing countries such as South Sudan and Ethiopian towns and cities, but there is still considerable scope for improvement. Based on a study of Addis Ababa, Desta et al. (2014) identified several ways of increasing efficiency including:

Raising awareness of the public health implications of poor waste management.

Improving planning decisions and the enforcement of regulations

Increasing the number of transfer stations at accessible sites

Increasing the number of trucks available for transportation

Promoting compost production from organic waste

Promoting the separation of waste at the source (household level)

Enhancing the collaboration and participation of the private sector and communities.

To make significant and sustainable progress in solid waste management, an integrated approach that used a combination of these methods should be adopted.

Sanitation and waste management as part of institutional framework.

Awareness campaigns in the neighborhoods. Healthcare waste management should include; healthcare workers should try to reduce the amount of waste but reducing (or reusing) waste should never be carried out if it compromises patient care or creates any other risk of infection.

Hazardous and non-hazardous waste must be separated and stored separately.

Waste should be separated immediately by the person generating it. The different wastes should be placed in containers with the appropriate colour for that particular type of waste (FMHACA, 2013). The container for each waste type is:

Black bins for all non-hazardous waste such as paper, packaging materials, office supplies, drink containers, hand towels, boxes, plastic bottles and food wastes.

Yellow bins for infectious waste, which includes any material that has been in contact with blood or body fluids such as gauze, dressings and gloves.

Red bins for highly infectious wastes such as anatomical wastes (e.g. teeth, placenta) and pathological wastes (e.g. sputum-containing materials, test tubes containing specimen fluids).

A safety box for sharps wastes that have the potential to cause injuries and spread disease, such as needles, scalpels, syringes, blades, and broken glass.

Waste disposal facilities such as an incinerator and burial pits must be available, appropriate for the type of waste and health services provided.

Water supply and hand washing facilities are very important for good personal hygiene practice among health workers and patients.

In addition, all staff that handle or come in contact with the waste should be provided with appropriate protective clothing including gloves, aprons and face masks.

(Source: Institutional sanitation and waste management study session 12, study session 10: disposal of solid wastes and study session 11: Integrated solid waste management).

3. Describe three specific challenges posed by peri-urban areas and slums for improving access and utilization of WASH services.

The following are some of the challenges of peri-urban and slums areas; they are associated with adverse environmental effects such as reduced water quality, a build-up of waste materials and poor air quality. In peri-urban areas, there is inadequate housing, water and sanitation which lead to health problems such as frequent cholera outbreaks. There is an increased poverty and inequality which leads to adverse social effects such as higher levels of crime and violence and lack of social support.

Lack of infrastructure and services, especially for water, sanitation and solid waste management. Lack of proper drainage systems lead to flooding. Increase in peri-urban areas, building insecure homes in unsafe places lead to disease outbreaks by poor sanitation. **Water quality;** in developing countries such as South Sudan and Ethiopia, many rivers in urban areas become open sewers. The lack of sanitation and sewerage systems has a dramatic impact on urban and peri-urban watercourses.

Some of the most common sanitation practices in peri-urban areas include; no system; defecation occurs in open areas within the settlement, on the perimeter of the settlement, or in drainage ditches. The lack of any planned waste disposal system is characteristic of most peri-urban areas.

Latrines; use of latrines is the second most common sanitation practice in peri-urban regions. A wide range of latrines can be found in peri-urban areas, including bucket latrines, pit latrines and ventilated improved pit (VIP) latrines. In some developing countries such as South Sudan, some systems for excreta removal from latrine pits exist, either through buckets or vacuum trucks but in other areas excreta removal is not common. Latrines in peri-urban areas are often poorly designed and maintained and may not be used by all family members.

Pour-flush toilets/septic tanks; in peri-urban settlements experiencing regular or even irregular water supplies, pour-flush toilets with soak-away or septic tanks may exist, relying either on household or community septic tanks. However, the septic tanks often are poorly maintained or undersized.

4. Explain three challenges associated with engaging stakeholders in planning and implementing urban WASH projects.

A stakeholderis any person, organization or group with an interest (stake) in something, such as a particular situation, intervention, project or programme. The stakeholders depend on the type and scale of the project, the local context, the local institutional set-up and the cultural conditions. A key stakeholderis a person or a group of people with significant influence over a programme or who will be significantly impacted by it. For the programme to be successful, their interests and influences must be recognized. Key stakeholders may include individuals, organizations and businesses in the public, private and non-profit sectors. These could be local community representatives, municipal sector offices (for example, water resources, health and education) and development partners including donors, non-governmental organizations (NGOs), community-based organizations (CBOs) and private sector groups.

**Challenges for stakeholder engagement.**

**Lack of coordination**

In the past there has tended to be a lack of coordination among the organizations and agencies responsible for WASH projects, for example between governmental and non-governmental organizations, and this has resulted in duplication of effort, contradiction or inconsistency (WUP, 2003). There has also tended to be separation between projects to improve water supply and those related to sanitation and hygiene. As a result of this fragmented approach, there have been gaps in communications with stakeholders and some have been left out of the planning and knowledge sharing in a project.

**Reaching low-income households**

The delivery of water supply and sanitation to low-income urban and peri-urban communities is complex. Poor consumers may not be adequately represented in community organizations and are often perceived as being ignorant and apathetic. However, in many instances this is clearly not the case because they have proved themselves able and willing to help bring about change that will improve their living conditions (WUP, 2003). Effective communication strategies that reach out to low-income communities will be needed to ensure they are also included within the stakeholder group of users and beneficiaries.

**Working across boundaries**

One of the particular challenges of WASH is that it means working across sector and disciplinary boundaries. Although commonly referred to as the ‘WASH sector’, WASH is a combination, as you know, of water, sanitation and hygiene sectors and is therefore cross-sectoral, meaning it involves people from different sectors working together. In particular it involves representatives from offices and bureaus of water, health, urban development and finance. It is also cross-sectoral in the sense that it involves both public and private sectors including government departments and agencies, and contractors, consultants and other private companies.

Cross-disciplinary communication is also essential because many complex WASH problems require more than one source of information to solve them. Cross-disciplinary refers to the academic disciplines and training of the people involved. These could include engineers, sociologists, hydrologists, doctors, nurses, accountants and managers to name but a few. People trained in different disciplines often have different ways of thinking and approaching an issue that can make communication between them difficult.

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