WATER, HYGIENE AND SANITATION POST GRADUATE DIPLOMA

WATER, HYGIENE AND SANITATION ASSIGNMENT 5

NAME OF STUDENT

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STRATEGIA NETHERLANDS

1. Paul, a resident in the outskirts of your town, consults you about building a latrine in the compound of his house. He is an open-minded man who is keen to improve life for his family. He has a wife and three young children, and his elderly mother also lives with them. He doesn’t have a tap in his house and gets water from a nearby well. The area has heavy soil and the rock below is impermeable.
2. Which types of latrine are possible choices for him?

**In study Session 5 on Latrine Technology Options for Urban Areas** we have several choices to be considered when choosing the most appropriate latrine technology. This is a complex technical process so we can only cover some of the main issues. For any type of pit latrine, the location of the pit relative to water sources is of more importance. That means, distance from house and the users also needs to be considered. Since he does not have a piped water supply, Paul has to install a dry latrine system that has well ventilated. The types of latrines that are possible choices for him should be a **ventilated improved pit latrine**, **an Arborloo**, **a urine-diverting** **latrine** or **biogas latrine**. I may explain each and every choice of latrine so that he can understand them well. For example **Biogas or Bio-latrine** is a latrine where waste enters an airtight tank situated underground, and undergoes anaerobic digestion, resulting in the production of biogas and digested sludge. Biogas is a clean and convenient fuel that contains about 60% methane. Anaerobic digestion is a process whereby bacteria and other micro-organisms break down (decompose) organic material in the absence of air, yielding biogas. The **urine-diverting latrine** also known as **urine –diverting dry toilet** (UDDT) is a latrine that separates urine and faeces. Bothe wastes are treated separately without damaging the environment or endangering human health, and then used in agriculture. The urine and faeces go into different containers at the source. **Arborloo** **latrine**. A simple form of ecological sanitation is the Arborloo; these are types of latrine use in the rural areas and these are found more specially especially in Ethiopia because of their space requirements. An **Arborloo** is a single, unlined shallow pit with a portable ring beam (circular support), slab and superstructure. It is used like a normal latrine, but with the regular addition of soil, wood ash and leaves. When it is full, it is covered with leaves and soil and a small tree is planted on top grow in the compost. **Ventilated improved pit latrine**, the **ventilated improved pit latrine** or **VIP** **latrine** differs from a standard improved latrine due to addition of vent pipe. This VIP latrine is developed to overcome the problems of odours and fly breeding commonly found in unvented pit latrines. Odours control is achieved by air coming in through the superstructure, entering the squat hole and pushing the hot, smelly air in the pit upward through the vent pipe.

1. Which types of latrine would you recommend, and why?

I would recommend for him, the ventilated improved pit latrine would be suitable, but since he is at the outskirts of town I can recommend a composting system, such as the Arborloo or urine-diverting latrine. This would produce useful organic compost and so that it protects the environment. In the urine-diverting latrine, a fertiliser from urine is also produced. Paul could sell these products to the farmers. The biogas latrine is not recommended because it is suitable only where there are a large number of users.

1. What other advice would you give him about the location, design and construction of the latrine?

The other advice that I should give him, is that, the pit must be at least 30 m away from his well otherwise it is going to affect his drinking water, and it must also be at a lower level according to the slope of the land. He should also consider the wind direction and place the latrine downwind and at a convenient distance from the house. For the safety of the children, he should choose a San Plat for the slab. He should seek advice about possible materials to be used for the superstructure. The materials should be available locally, so that the system is sustainable. He should install a hand washing facility next to the latrine.

2. Nancy is a laboratory technician. She is analyzing a sample of wastewater collected from a pipe that discharges effluent into a river.

(a) Name two tests Worknesh could perform to assess the physical characteristics of the effluent.

**In study session 4 on Liquid wastes**; Sources, types and Characteristics, I have found out that Nancy as a laboratory technician, could perform two tests as follows;

(1**) A suspended solid test**.

(2) **She could also test or measure the temperature** of the sample and assess the odours and she has to do this at the point of origin because the temperature could change within a short time.

(b) **As part of the analysis** she also does a BOD test on the sample and gets an unusually high result. What does the high BOD tell her about the wastewater? What effect could it have on the river?

In the same study session 4 on liquid wastes; Sources, Types and Characteristics. A high BOD test result would tell Nancy that there was a lot of organic matter in the sample. If this was discharged into the river it would remove oxygen from the water, which would harm fish and other organisms living in the river

3. What is the purpose of the report of a rapid assessment and who should receive copies of the report? Explain the contents of Rapid Assessment Report

**According to Study Session 3 on Rapid assessment**, the purpose for rapid assessment of urban sanitation and waste management is to collect information from households and institutions to get a quick overview of the situation in an urban community. The results can be used to identify the areas that need to be improved and suggestions of possible solutions. The assessment involves observations of the community, discussions and meetings with target households and other community members. The copies of the report should have to be handed to the organization that commissioned the work. In any event, the report should only be sent to other organizations with the specific permission of the funding organization. Apart from the funders, recipients include

1. the kebele administration
2. community representatives
3. the local Health Extension Workers team
4. any non-governmental organizations (NGOs) or funding organizations who might be willing to finance or support a follow- on programme
5. Any local WASH programme.

4. Explain five ways in which urbanization creates challenges for effective sanitation and solid waste management.

Sanitation and waste management in urban areas, **in Study Session 1 Introduction to Sanitation** **and waste management**, sincerely speaking, all countries are aiming to improve their standards of sanitation and waste management and have many policies and the regulations to try and achieve these improvements. Sanitation and waste management can cause problems in any community, regardless of its size. In urban areas, where people live close together can have much greater effect on people’s health and on their surroundings. For example**;**

**Challenges on** **the environment**, urbanization can have major effect on the environment in the following areas; challenges emerging form urban- rural interaction. Urban centers are usually surrounded by rural communities and the two areas depend on each other to supply many of their needs. Urban areas depend on rural areas to provide food, fuel and construction materials. In return, the rural community depends on urban areas to supply employment, commercial products, advanced healthcare provision, education and equipment, machinery, and other industrial outputs. Having said this, problems may arise when there is a large temporary influx of people from the rural to the urban areas. Examples include:

(i). the increased demand for sanitation facilities in the area around a city market.

(ii). the manure generated by animals that are brought for sale or use for transport.

(iii). the congestion caused by the number of people and animals using roads.

**Challenges to Society**

Increasing urbanization puts on society as a whole as well as on the environment. People who migrate to cities may become unemployed and then need to be provided for. The urban population requires daily supplies of food, fuel and other goods which can put pressure on the infrastructure needed to deliver and sell these goods. Once goods reach the end of their lives they become waste, increasing the pressure on the waste collection and treatment systems.

**Challenges from industrial discharges:** most industries in developing countries discharge untreated or partially treated liquid wastes to sewers, where these are available, or to rivers, streams or ditches. Industries also release waste gases that may contain harmful substances and produce solid wastes that may contain hazardous materials (such as poisons, strong acids, infectious material, etc. That can cause harm to humans because of their properties).As a result, unregulated industries can harm human health and the environment in many ways.

**Challenges from transport**

1.4 Sanitation and waste management in urban areas

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I have already mentioned problems from traffic congestion, but the use of a large number of often badly maintained petrol- and diesel-fuelled cars, Lorries and buses cause additional health problems. The exhaust gases from these vehicles contain fine particles, partly burned fuel and acidic substances that make breathing difficult and cause irritation of the lungs. While this is a problem for all people, it is much worse for the old, the very young and the ill, especially those with heart problems or who suffers from asthma

**Challenges to administration**

A growth in population creates more work for the city’s administration. If funds are not available to increase staff numbers to deal with this demand, problems will occur. In the case of sanitation and waste management, as well as services not being provided to the whole of the city, the additional workload can reduce the effectiveness of the governance of these programmes, which can result in lower standards and a poorer service for the entire city. To deal with the problems of population growth, various organizations need to work together; for example, water, sanitation and health service providers, and nongovernmental organisations (NGOs). When growth is rapid, these organisations can be overwhelmed and so coordination can break down. This may mean that in some cases, efforts are duplicated, and sometimes there will be gaps in addressing some aspects of the programme. If public administration and regulation is already weak, the entire system can fail. In the absence of good regulation, standards of sanitation and waste provision can fall, increasing pressures in other areas such as health services.

There are several possible answers to this question, but the main challenges from urbanization are caused by many people living very close together which put pressure on all urban services. The rate of increase in population is very fast and the development of infrastructure for water supply and sanitation services cannot maintain the same pace of change. People arriving in cities often live in informal settlements which are developed without planning or control and lack essential facilities for the people who live there.

5. How do good sanitation and waste management practices bring a positive effect to urban inhabitants? Give examples for effects on:

a) **Health**

In study Session 2 on the effects of poor Sanitation and Waste management, a healthy community has many economic advantages over an unhealthy one. If people are health they will spend less money on health care and the loss of working days due to diarrhea and other related infections is reduced. Illness can affect both the sick person and the family, for example when women have to take time off work to care for sick children. Therefore good sanitation and waste management help to keep people separate from potential sources of pathogens. They reduce the risk of contaminating water supplies with pathogens and discourage the transmission of the diseases.

b**) Education**

diseases linked to live in poor sanitation and hygiene have a significant impact on children’s health and education 48% of South Sudan School children are infected with parasitic worms (WHO 2015). These infections contribute to malnutrition because the parasites prevent the child’s body from absorbing nutrients from the food that they eat. Long term malnutrition retards children’s physical and intellectual development. The Young Lives survey (2014) reported that around 30% of Ethiopian children are stunted, which is a sign of long –term malnutrition. (Stunted means that a child’s height is less than expected for their age)

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Effects on education: Health children have fewer days off school through illness. When they are at school, healthy children learn better than sick children, particularly girls during their menstrual periods.

c) **Economic conditions**

Effects on economic conditions: the health benefits promoted by good sanitation and waste management make for a more productive community. Less money is spent on health care and people lose fewer days off work through caring for the sick.)

d) **The environment**

What do we mean by “the environment”? Environment is the surrounding in towns or villages where each and every one lives or works. However, it can also mean the wider natural world on a much larger, even global, scale. Poor sanitation and waste management have direct impacts on the local environment, but human practices can also broader consequences. Good sanitation and waste management means that there will be less faeces and waste deposited in public places and less pollution of the water and soil. Improving waste management improves the local environment and also benefits the national and even the global environment. Good waste management means less litter in the streets and in the neighborhood of waste disposal sites.

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