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| **WASH ASSIGNMENT 5-MODULE 5-READY** |

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

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1. The following types of latrine are the possible choices for Paul; a) ventilated improved latrine; b) Arborloo; c) urine-diverting latrine. Since he doesn’t have a piped supply of water, Paul cannot install a water carriage system; instead, he has to install a dry latrine system. The possible choices are a ventilated improved pit latrine, an Arborloo, a urine-diverting latrine or a biogas latrine.

(b) I would recommend to Paul the following latrine types; VIP latrine and Arborloo latrine.

**Reasons for recommending VIP latrine to Paul.**

(c) The ventilated improved pit latrine would be suitable, but if he has space and farms near him (since he is at the outskirts of town) a composting system is recommended, such as the Arborloo or urine-diverting latrine. This would produce useful organic compost and so protect the environment. In the urine-diverting latrine, a fertilizer 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.

Ventilated Improved latrine is one of the types of improved latrines in sanitation ladder. Taking Paul through sanitation ladder, which is a four step ladder; (open defecation, unimproved facilities, shared latrines to improved latrines such as VIP latrine, pour –flush latrine, Arborloo etc.) I would recommend to him VIP latrine as the first option.

Fly control is achieved by a screen at the top of the pipe unlike other unimproved latrines such as traditional pit latrines which don’t ensure hygienic separation of human excreta from human contact.

VIP latrine overcomes odor problem and fly breeding since hole has slab for cover. Odor 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.

VIP latrine has the following characteristics; safe to use, has a structurally sound and cleanable slab floor, no contamination of groundwater or surface water, excreta is not accessible to flies or other creatures and it’s also free from odor or unsightly conditions.

Cleaning and maintenance is easy because it’s not shared latrine but individually owned.

Cost is affordable due to availability of local materials in the country side.

The pit must be at least 30 m away from his well, 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 SanPlat 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 handwashing facility next to the latrine.

C) The following pieces of advice should be considered by Paul as per location, design and construction of the latrine.

**Location;** Paul should be advised to consider groundwater contamination. For any type of pit latrine, the location of the pit relative to water sources is of prime importance. Distance from house and the users also need to be considered. The latrine distant from house should be 6-10 m and located downwind from the home. Latrine shouldn’t be built in areas where groundwater is used as a water source due to groundwater contamination but if this has to be done, the base of the pit should be at least 2M above the water table. On sloping ground, it should be located below the level of any liquid seeping out of the pit flows away from the water source. The pit should be located at a recommended distance of 30M from water source. If the soil formation is unstable and liable to collapse, the wall of the pit should be lined for at least the top 0.5 M. The diameter of pit should be at least 1M.

**Design;** when designing the latrine, user preferences should be considered. Paul should be consulted on his preference of latrine systems. There may be cultural and social reasons why some types are preferred over others. People will only use the system if they are happy with it. They should be given details of the options possible in their locality (e.g. design features, costs, maintenance details, etc.), so that they can make an informed choice. Latrine system that is easy to build and maintain using locally available skills is preferably recommended. Other importance consideration is accessibility for elderly people and people with disabilities. It should be easily accessible to them without causing discomfort or inconvenience. Latrine systems have to be affordable to the users. The cost is made up of two components: construction cost and operating cost. The operating cost will include the cost of pit-emptying (in the case of pit latrines) and the cost of water (for water-flushed systems). The total cost should be kept low so that most people find it affordable. (Source: latrine technology options for urban areas- page 66).

**Construction of the latrine;** the type of construction materials and their availability will often dictate the type of latrine that is possible in a given area. To keep costs down, and for the latrines to be sustainable (i.e. to be able to be used for a long time), materials that are readily available locally should be used for construction. Added to this, a system that is easy to build and maintain using locally available skills is preferable. (Source: latrine technology options for urban areas- page 66).

1. Waste management is defined in the European Union’s Waste Framework Directive (European Commission, 2008) as:

The collection, transport, recovery and disposal of waste, including the supervision of such operations and the after-care of disposal sites, and including actions taken as a dealer or broker.

The two terms – sanitation and waste management – both refer to waste, but sanitation is primarily concerned with liquid waste and waste management is primarily concerned with solid waste. **Liquid wastes** are any wastes in a liquid form such as wastewater and **sewage**. Faeces and the contents of pit latrines and septic tanks are also classed as liquid wastes. **Solid wastes** are anything in solid form that is discarded as unwanted.

To assess the physical characteristics of effluent; Worknesh could perform a suspended solid test. She could also measure the temperature of the sample and assess the odour. She could also perform other physical methods of wastewater treatment such as screening, sedimentation and skimming to remove the solids.

B). A high BOD test (Biological Oxygen Demand) result would tell Worknesh that there was a lot of organic matter in the sample. If this was discharged into river it would remove oxygen from the water, which would harm fish and other organisms living in the river.

**Effect of high BOD on the river.**

When BOD levels are high, dissolved oxygen (DO) levels decrease because the oxygen that is available in the water is being consumed by the bacteria. Since less dissolved oxygen is available in the water, fish and other aquatic organisms may not survive. High biological oxygen demand level indicates that water is polluted. It can reduce dissolved oxygen in the water, whereas oxygen is needed by living things, so the life of aquatics would be disturbed. It may increase the water temperature of the river. It can increase sedimentation processes at the bottom of the river due to high run-off of the rainwater carrying sediment particles. It increases the burden of organic waste for water bodies.

1. The purpose of the report is to summarize the results from the assessment and indicate how well its aims have been achieved. After permission from the funders has been obtained, it should be sent to all those who had an interest in its findings. Apart from the funders, recipients could include:

* Community representatives
* The local Health Extension Workers team
* Any non-governmental organizations (NGOs) or funding organizations who might be willing to finance or support a follow-on program
* Any local WASH program
* Any government institutions involved in the assessment
* Any other stakeholder that participated in the assessment.

**Contents of rapid assessment report.**

The first part of any assessment is to agree on why the assessment is being carried out and to identify any specific aspects of WASH that need to be looked at. An assessment that is carried out as part of a project to determine the need for latrines, for example, would need very different information than one looking at the possibility of setting up a waste composting scheme. This first part will normally be done by the team leaders working with the organization that requested the survey or provided the funding for the work. It is important that representatives of the community being assessed should be part of this process so that they can influence the decisions and remain informed. The output from this initial stage of the process will be an overall aim, together with a series of objectives (you can think of objectives as the aims for each smaller piece of the work).

All assessments should end with the production of a report, and it is important at the start to consider who this report is for. This will determine what data needs to be collected and what sort of data analysis is done. This in turn will determine some of the skills required of the project team and may identify where specialized computer data processing software is required.

Based on the aim and objectives, the team should prepare a checklist of the information that needs to be collected. The advantages of using a checklist are that it:

* provides a standardized approach to what is reviewed during assessment
* helps supervisors to cover all issues without forgetting anything
* provides a means of documenting assessment findings in a simple manner that can be referred to in the future
* provides a record for tracking performance changes over time
* Provides a basis for identifying needs for follow-up actions.

The information gathered during the assessment will come from both primary and secondary sources. Primary sources are the information obtained by the survey team through observations, questionnaires and other methods, which are discussed in the next section. Secondary sources consist of the results of work that has already been done, such as previous surveys in the same area or in other locations that are similar to the survey area. Reviewing existing documents and reports can also provide valuable background information for the planned assessment. For example, demographic data such as the total population of the study area, the number of people of different age groups and the proportion of men and women will be useful.

Having prepared the plan and agreed the process with community representatives, at the start of the survey the team should arrive at the community as scheduled and on time. The visit should start with introductions to the community (usually done through a small group of community representatives), including descriptions of each person’s position and responsibility in the project. The team leader should explain the objective of the assessment and agree with the community representatives how the assessment will proceed. The time required for interviews, reviews, discussion and action planning should be set at this stage.

It is important to make sure that the community is aware that it is not being ‘judged’ in any way, but that the work is to find the best way of improving WASH in the community. At this point, the community should be reassured that all discussions with individuals and questionnaire responses will be treated in the strictest confidence.

**Assessment Methods**

Assessing the key sanitation and hygiene aspects of a community requires the use of a number of investigation methods. The main methods (Asefa and Tessema, 2000; Feleke et al., 2003) are listed below:

Interviews are conversations between the investigator and members of the community, usually on a one-to-one basis. Depending on the information required, different types of interviews and questions can be used. The interviewer takes notes of the interview or uses a voice recorder. When conducting interviews it is important to gain the interviewee’s consent before starting and to make it clear how the information will be used. Generally, interviewee’s comments should not be used in reports in a way that allows the person to be identified.

Observation is often combined with interviews. **Observation** simply means recording what you see or are aware of. For example, while visiting households, interviewers observe the availability and quality of the sanitation and waste facilities, such as the household latrine, solid waste storage and disposal, and handwashing provision. In addition, the interviewer will try and gain a picture of the use of these facilities through observation and discussions. At the same time, the general condition of the housing, water management and food handling can also be observed. There is a risk that the observer will assess the position against their own personal views (a **subjective** view), so it is important to have a set of standards to be used by all observers to make the assessment as **objective** (based on things that can be measured or counted and not influenced by personal opinion) as possible. General observations can be made simply by walking around the area and noting the condition of the town.

Discussions with the communitycan provide valuable information about the concerns and health situation of community members that can help to confirm the findings of the interviews and observation. For example, one would expect a high incidence of diarrhoea to be reported if an absence of latrines and handwashing facilities had been identified.

**After the assessment.**

It is important to keep proper records during the assessment process. Notes of interviews and observations should be made in a notebook and not on scraps of loose paper. These notes should be transcribed onto a computer as soon as possible after taking them. After the assessment work has been completed, the notes and data can be analysed and the results prepared and presented in a report.

**Analysing the findings.**

Using more than one method for the assessment will produce more complete information but it will also generate a lot of data that needs to be summarized. The standard method is to gather the information together and incorporate it into a set of tables. This should be done as soon as possible after the end of the survey.

**Reporting.**

The findings of the investigation and analysis need to be summarised and incorporated into a report. The report should always refer explicitly to the aims of the assessment that were agreed at the beginning and say how well these have been achieved. Depending on what the aims were, the report may identify the areas where action is necessary and make recommendations for a programme to implement the action plan. The report will often make suggestions about any additional survey work that may be needed. The report will be distributed to the organisation that commissioned the work. They may ask that the report is also sent to other interested organisations. In any event, the report should only be sent to other organisations with the specific permission of the funding organisation.

*(Source: Study Session 3: Rapid Assessment of Urban Sanitation and Waste Management pg. 31)*

**SUMMARY OF ASSESSMENT INFORMATION**

Given the constant changes that take place in an emergency context, several stages of assessment may be required. Different assessments will vary in time (for example, the 1st assessment could be conducted in the first 2 days; the 2nd during weeks 1 to 3; and the 3rd within 1 month) and also in purpose, methods, approach, etc.

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|  | **RAPID ASSESSMENTS** | | **MORE IN-DEPTH** |
| **1st Assessment** | **2nd Assessment** | **3rd Assessment** |
| **Objective** | To understand scale of disaster and whether there is a need to respond | To determine WHAT are the priority needs for our immediate response | To collect more in-depth information (for sectoral or early recovery planning) |
| **Information Needs** | * Type of damage / impact * Estimated numbers of affected families (and persons * Geographic areas (least and worst affected) * Trends in population movements, where applicable | * + - Household coping strategies. Focus on question of who, what, how, and why.     - Protection and vulnerability issues     - Level of damage within village     - Who is doing (or planning to do) what | * Pre-disaster information (e.g. sanitation practices for WASH) * Local resource availability (both labor and materials) * Trends in recovery * Gaps and remaining needs |
| **Methods** | * Observation * Open-ended interviews * Secondary sources | * + - Open-ended interviews     - RRA methods (social mapping; transect walk; focus group discussions; etc.) direct observation     - Reviews of secondary sources (local government and village-level data) | * Mix qualitative (e.g. RRA) and quantitative methods (close-ended or structured interviews; water quality tests, etc) * Observation * Consultations with key stakeholders * Coordination |
| **Key Informants** | * Media * Local government * Affected persons | * + - Village leaders     - Specific groups of affected persons (e.g. women; children; minority groups)     - Government officials     - Other responders | * Line departments * Sectoral specialists * Affected households * Community groups * Other coordination structures |
| **Use of information** | * Go / no-go decision * Situation reports | * + - Immediate response planning     - Emergency Proposals | * Long(er) term planning * Design of sectoral interventions * Proposals for external donors |

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| ***Key Message:***  Any single assessment should be **focused** and **time bound** – one tool or approach should be developed / used within a limited period of time to meet specific information needs. If gaps in information emerge, plan to reassess (typically, using a different tool or approach). |

*(Source: Emergency \_Assessment \_Guidance\_SASIA doc.) [CRS/SOUTH ASIA (revised Jan. 09].*

1. **Urbanisation** is an increase in the number of people living in towns and cities. Urbanisation occurs mainly because people move from rural areas to urban areas and it results in growth in the size of the urban population and the extent of urban areas. These changes in population lead to other changes in land use, economic activity and culture. The following are the impacts/challenges of urbanization towards effective sanitation and waste management.

**Water supply and sanitation;** the provision of water and sanitation services to growing urban settlements, peri-urban and slum areas presents critical challenges. The increased demand for water from the growing population can place added stress on already stretched resources. In and around cities, water is commonly in short supply and subject to increasing competition by different users. Urban growth leads to increasing demand for water for industrial and domestic use, which conflicts with agricultural demands. It is especially difficult to provide water and sanitation services to deprived areas and the poorest people. Many people in these areas live without access to safe drinking water and proper sanitation. Even where adequate water supplies are available, sanitation and wastewater disposal are often inadequate or missing. Pit latrines and septic tanks are the usual methods for human waste disposal but they have limited capacity and are not always adequate to cope with the quantity of waste produced by many people living close together. Overflowing latrines and septic tanks contaminate surface water and create a serious health risk.

**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.

**Bad city planning and refuse disposal scheme**; bad planning and indiscriminate erection of walls and housing structures block water flow channels to form big floods. Bad refuse disposal schemes marked by indiscriminate dumping of solid waste and thrash in drainages and stream channels results in clogging of flow path of rainwater and pollution of surface water systems.

**Inadequate infrastructure;** many local government areas lack the capacity to meet infrastructural services for waste generation in rapidly growing areas. When vehicles to evacuate waste and other infrastructure are not provided or inadequate from the local government to state government, there will be problem in handling the waste generated by the populace.

1. We can think of sanitation as the prevention of human contact with wastes, or as the provision of facilities and services for the safe disposal of human faeces and urine. More formally, the World Health Organization (WHO, n.d.) defines sanitation as: the provision of facilities and services for the safe disposal of human urine and faeces, the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal.

By ‘facilities’, we mean the structures that are used to provide sanitation. This ranges from latrines and toilets, the system for collecting the excreta from latrines, through to sewage treatment systems. By ‘services’ we mean the whole scheme for providing sanitation; providing facilities, maintaining them, treating the wastes from them and organising finance and payments.

The WHO (n.d.) goes on to state that: inadequate sanitation is a major cause of disease world-wide and improving sanitation is known to have a significant beneficial impact on health both in households and across communities. **Waste management** is the collection, treatment and disposal of solid wastes produced in the home, workplace and public buildings. **Sanitation is important** for all, helping to maintain health and increase life-spans. However, it is especially **important** for children. Around the world, over 800 children under age five die every day from preventable diarrhea-related diseases caused by lack of access to water, **sanitation** and hygiene

The following are the positive effect of good sanitation and waste management to urban inhabitants in developing countries.

**Impacts on health;** good sanitation and waste management reduce child morbidity and mortality rate. Handwashing with soap, improved water quality and excreta disposal reduce diarrhoea by about 45%, 17% and 36% respectively. Handwashing by midwives and mothers may reduce neonatal mortality by 25% and 60% respectively. Improves maternal health; Nutrition and health are improved by less diarrhoea, fewer worms and the use of surplus water for food and income from kitchen gardens and animal breeding. Combat HIV/AIDS, malaria, and other diseases; Keeping water points and drains free from stagnant water reduces breeding places for malaria-transmitting mosquitoes, especially in areas where surface water is scarce. Good hygiene and sanitation reduces the risk of chronic diarrhoea in HIV/AIDS infected persons and keeps them healthier. Conserves energy and help to save earth from pollution. Good waste management reduces pollution and give us the fresh air to breathe.

**Impacts on education;** achieve universal primary education; less diarrhoea, respiratory infections and worm infestation improve school attendance and learning performance. Girls’ school attendance is influenced positively when they can use toilets. Providing for privacy and hygiene for older girls during menstruation is very important.

Children are frequently ill as a result of parasites and other infections, which leads to poor school attendance and performance. Furthermore, if the school attended by an infected child does not have good sanitation and handwashing facilities the infections are likely to spread to healthy children.

There are also social impacts of poor sanitation provision in schools. An absence of latrines with separate facilities for girls and boys means that post-pubescent girls are more likely to stop attending schools, especially when menstruating. When healthy children attend a school with well segregated sanitation facilities, they are present more regularly and are better learners. This, in turn, makes them better able to find jobs that demand higher-level skills on finishing school; an advantage to them, their families and the community as a whole.

**Impacts on the economy;** a healthy community has many economic advantages over an unhealthy one. If people are healthy they will spend less money on health care and the loss of work days due to diarrhoea and other related infections is reduced. Illness can affect both the sick person and their family, for example when women have to take time off work to care for sick children. It creates employment opportunities for people. For example, manufacture of latrine slabs, digging latrine pits and building the superstructure, emptying latrines, operating public latrines, and composting organic wastes and latrine sludge and selling the compost.

**Impacts on environment;** improved sanitation and waste management keep the environment clean and fresh. It also reduces environmental pollution. There are obvious local environmental benefits from improved sanitation. This means that defecation only takes place in properly constructed latrines, areas of land are not contaminated with faeces and watercourses no longer act as sewers. This in turn allows plant life, fish and other aquatic organisms to flourish. 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 neighbourhood of waste disposal sites. It also reduces the smell in the streets from decomposing wastes.

(Source: Study session 2: the effect of poor sanitation and waste management. Pg. 21-29).

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