Diploma in water, hygiene and sanitation

Diploma in WASH assignment 4

Yusuf Goddard

AIPMS/291/2019

African Institute for Project Management Studies

Diploma in WASH assignment 4

Question 1: Explain what municipal solid waste (MSW) means?

Municipal solid waste (MSW) is solid waste produced in a municipal area and consists of house hold waste, commercial waste and institutional waste, more commonly called garbage. It includes none hazards waste from industry. The composition of municipal solid waste varies significantly from one municipality to another and from country to country significantly.  “Municipal Solid Waste (MSW) can be defined as solid waste which includes all domestic refuse and non-hazardous wastes such as commercial and institutional wastes, street sweepings and construction debris”(Magutu et al., 2010). Municipal solid waste generally has variable physical and chemical characteristics depending on source and generation. “Household or municipal wastes are usually generated from variable sources where different human activities are encountered. Several studies reported that the municipal solid waste that are generated from the developing countries are mainly from households (55–80%), followed by market or commercial areas (10–30%). The later consists of variable quantities generated from industries, streets, institutions and many others” (Hussein I.Abdel-Shafyand Mona S.M.Mansour). Social-cultural, economic, legal, political and environmental factors influence composition of solid waste for example socio-economical factors including and not limited to family size, monthly income and social behaviours all have a influence on the composition of municipal solid waste.

Question 2: Explain the importance of the following MSW properties in solid waste management or treatment.

Following Municipality solid waste properties is important in solid waste management because it’s important to know the physical and chemical characteristic of the waste. The physical characteristics one looks at the density of the waste expressed as mass per unit volume (kg/m3). This parameter is required for the designing a solid waste management program. One also looks at the moisture content in the waste which is defined as the ratio of weight of water content in the waste to the total weight of the wet waste. Moisture content increases the weight of the solid waste thus increasing the cost of transportation and collection. Information of chemical characteristics is important in evaluating alternative processing and recovery options. Typically waste is considered as combination of combustible and non-combustible components Solid waste is classified as follows; house hold waste which is garbage, rubbish, organic waste and ash. As well as Industrial waste, construction waste, agricultural waste and institutional waste that are waste from health centres, schools etc. Knowing the properties of the solid waste has an influence on collection mechanisms, waste handling and segregation, storage and processing as well as on the disposal method

Question 3: Outline the advantages and disadvantages of source separation of MSW

The achievements of source segregation are depended on the active involvement of households. Willingness of the community, their attitude towards recycling, their environmental awareness, and more pro-environmental attitude would lead to more consistent results. “Nevertheless, the success of any designed for solid waste segregation depends mainly on the public awareness and the active participation of such waste generators in the different communities. Source separation is a significant process in optimizing collection and treatment of MSW, and this process is proved to be cost-effective in both recyclable waste separation systems (Lavee, 2007) and organic waste separation systems” (Bonk et al., 2015).

Source separation is a significant process on optimizing collection and treatment of MSW and this process is proved to be cost effective in both recyclable waste and organic waste systems. There many advantages to source segregation of MSW. One of the first advantages of source segregation of MSW is the reduction in the volume of waste that ends up in land fill and an increase in recycled waste. Source segregation is an easier way to recycle as efficient and consistent waste segregation means less waste goes to landfills and more to recycling. The segregation of waste at source keeps the environment clean and less pollution due to waste as waste segregation reduces size of landfills, reduces hazardousmaterials in turn reducing accidents to waste collectors. It reduces environmental pollution; waste segregation done in proper manner reduces waste in landfills in turn reducing methane gases and carbon monoxides. Source segregation also has a financial advantage to both the community and the municipality. The practices of waste segregation is highly lucrative, revenue can be generated from waste segregation through recycling. In more developed countries bio fuel can be generated from organic waste which can be used for fuel in house hold heating and cooking thus reducing the cost on the house hold. Organic waste can be used for compositing and be used for farming and gardening in turn this can be used for income generation. In so municipalities where waste removal is charged on volume, segregation reduces the volume and thus saving money for the households. For the municipality the finical advantages of segregation are many. Firstly the reduction in waste volume means a reduction in size of landfill which reduces the cost for the municipality and the rate payers. Recycling of waste has to advantages for the municipality it’s a source of income and there is less of an environmental in impact reducing the cost to clean the municipality. Waste segregation at source reduces the danger to municipality workers as they do not need to spend hours separating waste and they reduce man hours and costs for the municipality. So basically source segregation of MSW makes waste management cheaper as less is dumped in landfills and more is recycled. It is quicker, cheaper and cleaner to do waste segregation at source and makes it easier to handle the waste.

There are also some disadvantages to source segregation of waste. For example the process is not always cost effective; the process needs monetary, time and resource investment for it to be effective. If the collection of waste is not segregated by the municipality then it’s a wasted effort to segregate from source. For the municipality to be able to do segregation collection a lot of investment is need to run the process. In developing countries there are not always recycling plants thus there has to be investment to build them which for many municipalities is beyond their capacity. In terms of the individual house hold there has to be investment in the materials to do waste segregation and in low income countries and communities this in not a priority. Source segregation also depends on population participation, willingness of the community to participate, usually this is only ensured if there are bylaws passed that reinforce this as not many people are in environmentally conscious. It also takes a lot of time to do waste segregation thus some people are not wiggly to invest their time in it. People have to be well educated or informed about waste segregation and its advantages to ensure participation. Environmental knowledge is assumed to be a fundamental solution to improve the effects of source separation of MSW. Separation methods may also cause confusion and a lot of work, complex separation into many subcategories of waste may not be like by people thus also been a disadvantage of source separation of MSW. The main disadvantage of source separation to summarize is the cost and time need to archive effective and efficient source segregation of municipality solid waste.

Question 4: Discuss the challenges faced in disease surveillance.

Disease surveillance is generally, epidemiological data about patients are reported by healthcare practitioners via passive surveillance systems to a central database, which is used to determine trends over time in and map the geographic distribution of burden of disease in different regions as well as the extent and efficacy of interventions. There are several challenges to the system including inadequate resources, poor infrastructure, high cost of maintaining the various systems, poor coordination, heavily centralized systems, inability to detect disease outbreak in a timely manner, over burdened health personal, rapid urbanization mainly affecting developing countries and poor data quality.

Data quality is often a big challenge in disease surveillance, especially poor data quality as it has an effect on resources and planning. Data quality is often perceived as a major barrier to using passive surveillance data to guide resource prioritisation. Data may missing, unavailable or even over reported giving unrealistic view, this is mainly when health workers are given incentive to produce data, sometimes leading to unrealistic data. Problematic reporting pattern that emerges repeatedly is an apparent increase in disease incidence that is actually caused by increased surveillance efforts and/or diagnostic capacity. Census data may be also out dated as there is also an increase in population movement due to modernization and better transport means. Due to the lack and incorrect data policy makers have little confidence in them or make wrong or late decisions.

Lack of resources is one of the biggest challenges faced is disease surveillance. This includes financial resource, trained human resources and poor infrastructure. Lack of funding or insufficient finical resources are a big challenge to disease surveillance especially in developing countries. Disease surveillance is a cost intensive exercise and usually ministry of health is insufficiently funded to run the programme thus leaving the system lacking. In most developing countries these programmes mainly depend on donor funding which in its own way is also a challenge, if funding is pulled by the donor the system collapses or data may be over exaggerated in order to receive more funding. Lack of adequate training human resources is a big challenge in disease surveillance; in order for the programmes to be run effectively human resources are needed. The available human resources are usually over burdened and over worked, sometimes not motivated because of poor remuneration. Lack of proper infrastructure is also a contributing challenge to disease surveillance.

Poor coordination and heavily centralized systems are another of the challenges faced in diseases surveillance. Mainly in developing countries the disease surveillance system is heavily centralized meaning the main decision making and data collection is done usually at a central level mainly in the capitals of most countries. This coupled by poor coordination is big challenge. Sometimes there is poor coordination between different actors in the field leading to duplication of programmes also may result in some disease been over looked. This lack of coordination also results in loss of data and information. Heavily centralized systems usually have the inability to detect disease out break in a timely manner. Rapid urbanization is also proving to be a challenge in developing countries because of the high movement of population it’s very difficult to track and this is proving to be a challenge to disease surveillance. Rapid urbanization is also cause of having a high population in a area with limited resource thus you find the population lacking basic resources like clean water, proper sanitation and lack of sufficient housing this is also adding to the challenges of disease surveillance. Due to this concentration of the population mainly in slums it’s making it difficult to detect disease outbreaks in a timely manner and also is contributing to the spread of out breaks as the population has become more mobile and the improved transport network makes movements of population rapid and difficult to track.

Question 5: Explain 5 diseases that can be prevented by observing proper sanitation.

Five diseases that can be prevented by observing proper sanitation are diarrhoea, cholera, dysentery, typhoid fever and Polio.

Diarrhoea mostly results from lack of safe drinking-water, adequate sanitation and hygiene. Primary prevention of diarrhoea through water, sanitation and hygiene interventions is based on reducing the faecal-oral transmission of pathogens. A number of interventions are effective in preventing diarrhoea that is access to clean water, access to improved sanitation facilities and hand washing with soap at critical times. Proper disposal of humane excreta to reduce direct or indirect contact with humans is a large part of preventing diarrhoea. This is mainly achieved by building latrines, sanitation seeks to prevent contamination of water sources and food that is consumed by people as this is the main source of diarrhoea. Safe excreta disposal is as essential as a safe water supply in preventing the spread of the disease. “Lack of access to safe, clean drinking-water and basic sanitation, as well as poor hygiene cause nearly 90% of all deaths from diarrhoea, mainly in children (1). While 87% of the world's population now have access to improved water sources, 39% still lack access to improved sanitation”( WHO technical staff; 2011)

Cholera is an acute epidemic infectious disease. It is characterized by watery diarrhoea, extreme loss of fluid and electrolytes, and severe dehydration. Cholera can be prevented by well developed sanitary systems as evident by Europe and America, Cholera was prevalent in the United States in the 1800s, but now it is rare because there are well-developed sanitary systems and living conditions. Cholera bacteria enter the body through the mouth, often in food or water that has been contaminated with human waste, due to poor sanitation and hygiene. In situations where sanitation is severely challenged, such as in refugee camps or communities with highly limited water resources, a single affected victim can contaminate all the water for an entire population. Measures for the prevention of cholera mostly consist of providing clean water and proper sanitation to populations who do not yet have access to basic services.

Typhoid fever is an illness caused by a bacterium called Salmonella typhi and is contracted by drinking water or eating food contaminated by Salmonella. There are about 107 different strains of the bacteria. Safe water, sanitation, and hygiene (WASH) interventions are critical to preventing the spread of typhoid. Typhoid is spread via the faecal-oral route, because the bacteria can pass into people’s mouths through food, water, hands, or objects that have been contaminated with faecal matter. Solutions such as water treatment or filtration, installation and management of toilets and sanitation systems, and education about proper hand washing and food-handling practices can save lives and protect people from typhoid infection.

Polio is a contagious viral illness that in its most severe form causes nerve injury leading to paralysis, difficulty breathing and sometimes death. Aside from taking polio vaccine, proper human waste disposal and sanitation can help prevent the spread of the polio virus, the virus is primary spread through human waste; these infect via the oral-faecal route, often through food, water or objects contaminated with faeces from an infected person

Dysentery is an infectious disease associated with severe diarrhoea and like diarrhoea can be prevent by proper sanitation and personal hygiene...

**References**

Peterson Obara Magutu and Cliff Ouko Onsongo (August 23rd 2011). Operationalising Municipal Solid Waste Management, Integrated Waste Management - Volume II, Sunil Kumar, IntechOpen, DOI: 10.5772/16457

## Hussein I.Abdel-Shafyand Mona S.M.Mansour (December 4th 2018) – Egyptian journal of petroleum Volume 27, Issue 4, December 2018, Pages 1275-1290

Bonk, F., J.R. Bastidas-Oyanedel, and J.E. Schmidt. 2015. Converting the organic fraction of solid waste from the city of Abu Dhabi to valuable products via dark fermentation—Economic and energy assessment. Waste Manage. 40:82–91. doi:10.1016/j.wasman.2015.03.008 [Crossref], [PubMed], [Web of Science ®], [Google Scholar]

Water, sanitation and hygiene interventions and the prevention of diarrhoea:Biological, behavioural and contextual rationale; WHO technical staff; October 2011