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COURSE-WATER, HYGIENE AND SANITATION

WASH ASSIGNMENT-MODULE FOUR

1. **Explain what municipal solid waste (MSW) means**

* Municipal solid waste (MSW) (also called trash) consists of everyday items such as product packaging, yard trimmings, furniture, clothing, bottles and cans, food, newspapers, appliances, electronics and batteries.
* Municipal Solid waste, also called garbage or trash, is nonhazardous disposable materials generated by households, institutions, industries, agriculture, and sewage. It is made up of Waste, organics, and [Recyclable Materials](https://www.buschsystems.com/resource-center/knowledgeBase/glossary/how-are-recyclable-materials-separated), with the municipality overseeing its disposal
* These kinds of waste encompass packaging, food waste, bottles including PET & glass, cans, papers and agricultural wastes are the wastes which are unwanted and useless for all inhabitants during their life.
* Municipal solid waste includes commercial and domestic wastes generated in municipal or notified areas in either solid or semi-solid form excluding industrial hazardous wastes but including treated bio-medical wastes.
* The composition of municipal solid waste varies greatly from [municipality](https://en.wikipedia.org/wiki/Municipality) to municipality, and it changes significantly with time

1. **Explain the importance of the following MSW properties in solid waste management or treatment**

* Solid waste management Solid waste management can be defined by all the efforts which are related to the solid waste. These tasks are involved to storage, collection, transport, treatment, processing and ultimately disposal.
* Types and Properties of Municipal Solid Waste in solid waste management
* The important thing for managing the MSW is to know the source, types, and composition of that in each local. The amount, rate of waste generation, the types and the compositions, changing the rate of generation, determining the hazardous components are quite important things which should be answered.
* [Municipal solid waste](https://www.sciencedirect.com/topics/engineering/municipal-solid-waste) (MSW) is one of the important challenges to the environment. Municipalities; generally; are responsible for the waste management.
* They have to provide an effective and efficient system to the inhabitants. Nevertheless, they are; often; facing with many problems beyond the ability of the municipal authority to handle the MSW This is essentially due to financial resources, lack of organization and complexity
* The composition of MSW varies significantly from one municipality to another and from country to country significantly. Such variation depends mainly on the life style, economic situation, waste management regulations and industrial structure.
* The quantity and the composition of the municipal solid waste are critical for the determination of the appropriate handling and management of these wastes
* For better handling in waste management, identifying the properties of the wastes is essential. A physical, chemical and biological property of the wastes helps to choose the better treatment for them.
* Physical properties of wastes such as specific weight, particle size and size distribution, compact waste porosity, moisture contents are the properties which determine how to collect, store, separate, transport and transfer the waste.
* Likewise determining the chemical substance in the waste will be useful for the chemical treatments such as combustion.
* For example by determining the chemical properties of the waste, the amount of released energy from the burning of the waste can be estimated. The usual chemical compositions of the waste are carbon, hydrogen, oxygen, nitrogen, sulfur, ash and trace elements.
* The other properties of the waste are biological properties. In biological treatment the organic parts of MSW are using as a feedstock due to produce biogas or composting in the specific process.
* So determining the nutrients and the other elements which are contributed in the process is very important.
* In order to design the waste management system, one of the important factors is waste generation. Determining the total amount of MSW helps to design the collection routs, material recovery and disposal facilities

1. **Outline the advantages and disadvantages of source separation of MSW**

* Source separation is the segregation of different types of solid waste at the location where they are generated (a household or business).
* Source separation, also called curbside separation, is done by individual citizens who collect newspapers, bottles, cans, and garbage separately and place them at the curb for collection.
* The most common reason for separating wastes at the source is for recycling . Recyclables that are segregated from other trash are usually cleaner and easier to process
* Before any material can be recycled, it must be separated from the raw waste and sorted.
* Separation can be accomplished at the source of the waste or at a central processing facility.
* Before transportation, source separation of municipal solid waste the papers, is very important in reducing the cost of facilities and equipments in recycling centers.
* For this purpose there are several methods for source separating of municipal solid waste in different sources. for example:
* In residential sources, based on the type of the buildings, local population and the collection method, the waste handling is varied.
* In the low dense areas usually each inhabitant collects his wastes at home and puts in the containers near that local, but in high apartments, using the chute opening which can collect the waste of one apartment or more, is typical.
* On the other hand for the commercial and industrial sources according to the wastes’ types and their volume, usually some containers are used near the waste generation place
* However, it is important to note that choosing the type and volume of the container is quite important for the waste handling. In this part the source of waste generation, the amount of waste generation, the period of waste transporting and the odor problems should be considered.
* In some cases there are some solutions to use the recovery facilities at the source; for examples there some composting methods for the residential sources which can produce compost from the compostable part of their part.
* In the commercial and industrial sources due to reduce the volume of the wastes and the cost of transport, using the shredders and compactors are the other samples of the tasks which can be occurred before collection
* Source separation of municipal waste may occur during the manufacturing and processing by changing the design and packaging or may occur in the consumers’ sides in the households by changing their consumption pattern
* Many [communities](https://www.merriam-webster.com/dictionary/communities) allow “commingling” of non paper recyclables (glass, metal, and plastic). In either case, municipal collection of source-separated refuse is more expensive than ordinary refuse collection.
* MSW is often-managed with little-technical-capacity and inadequate- resources

Rapid-urbanization, and increasing-global-consumerism, is driving unprecedented levels of waste-generation, increasing environmental, social, and economic-burden, for the-society.

* In-many-parts of the-world, waste-collection is still limited-to more-affluent-areas and communities, disposal via open-dumping is still-widespread, and many of the world's poorest-people depend on informal- 'recycling' activities to-survive ( Lerpiniere et al., 2014).
* Another-study, conducted in-Kenya found, that much of the-municipal-budget, for waste-management, is directed to-pay, for an-over-staffed and under-qualified workforce (Henry et al., 2006), and not allocated, to-make improvements, within their-own-infrastructure;
* The-data from yet-another- study suggests that the-inadequacies of vehicles, supervisors, and solid-waste collection-crews, were the-major- obstacles to the-management of solid-waste, in the-country.
* When the area is very populated and the materials are densely, usually some problems are inevitable in these centers as far as source separation is concern.

1. **Discuss the challenges faced in disease surveillance**

* Surveillance: systematic monitoring for a case (or cases) of an unusual disease and/or an unusual cluster of diseases—the stimuli for the initial disease outbreak report;
* Disease surveillance is an [epidemiological](https://en.wikipedia.org/wiki/Epidemiology) practice by which the spread of [disease](https://en.wikipedia.org/wiki/Disease) is monitored in order to establish patterns of progression.
* The main role of disease surveillance is to predict, observe, and minimize the harm caused by [outbreak](https://en.wikipedia.org/wiki/Outbreak), [epidemic](https://en.wikipedia.org/wiki/Epidemic), and [pandemic](https://en.wikipedia.org/wiki/Pandemic) situations, as well as increase knowledge about which factors contribute to such circumstances.
* A key part of modern disease surveillance is the practice of disease case reporting

**CHALLENGES**

* The global communication networks necessary to support disease surveillance systems are inadequate. Countrywide deficiencies in the phone and internet systems weaken surveillance, reporting, outbreak investigation, and response. Even where electronic reporting systems are available, they are often not used regularly for disease surveillance, in part because information technology personnel are inadequately trained and funded.
* The absence of health infrastructure in resource-limited countries creates gaps in coverage in regional surveillance systems. The result is a porous patchwork of surveillance systems that is exacerbated by differences in focus, approach, intended audience, and resource base and by inadequate integration and poor coordination between surveillance systems.
* The accuracy of electronic surveillance systems that use media sources is constrained by both the quality of news reports and the completeness of news coverage. In addition, analytical methods and the number of subject-matter analysts available to assess the credibility of the reports vary across the systems.
* There is no strategic plan to raise the financial resources required for implementing at the country level. Without identified financial resources to acquire needed technical and human resources, the plans for implementing at the country level are unlikely to be realistic.
* If disease outbreaks of potential international public health importance cannot be detected and contained in all places, it is likely that they will have an impact on global health security and on global economic stability. The most compelling example of this is the global spread of HIV/AIDS in the past three decades. Containment of global disease outbreaks will require all nations to work in partnership and to pool resources.
* Policy: Perceived economic consequences due to disruption of trade and travel caused by disease outbreaks deter reporting and delay verification.
* The designated human and financial resources of WHO are inadequate to fulfill the expanded responsibilities. The dependence of WHO on volunteer donations and temporary staff weakens the potential.
* Inadequate sharing of surveillance data and information; inadequate supervision and mentorship; weak laboratory capacities; and reduced availability of communication and transport systems particularly at the peripheral level.

1. **Explain 5 diseases that can be prevented by observing proper sanitation**

* Sanitation refers to all aspects of excreta disposal (human and animal, faeces and urine). It

includes sanitary structures (e.g. latrines); material needed for the proper operation and use of

the structures (e.g. water, soap); and the human behavior and attitudes relating to excreta and

its disposal.

* Disease is a broad term normally used for any malfunction of the body resulting from a cause other than injury. An infection is only a communicable or infectious disease if it results in illness.

Although, strictly speaking, it is not correct to use disease and infection synonymously (most infections covered in this manual can result in infection without symptoms), we have done so here to improve readability.

* Diarrheal diseases are the most common problem caused by poor sanitation and contaminated water. Long-term health issues caused from contaminated water include skin lesions that can cause skin, bladder, and lung cancer. Millions of people are at risk for developing arsenic poisoning because they depend on water supplies that may be contaminated and do not have a water supply that is safe. One of the most important factors in eliminating diarrheal deaths, next to proper sanitation facilities, is handwashing. Something so simple can save lives and stop the cycle of diarrhea
* Cholera is a bacterial infection throughout the intestinal tract. It causes diarrhea and if left untreated, can cause severe dehydration and death. Cholera can be stopped by having access to drinking water that is safe. Developing good sanitation and hygiene can also prevent this infection. It is unknown precisely how many deaths are directly the result of this waterborne disease, but WHO estimates that [cholera kills](https://www.afro.who.int/health-topics/cholera) from 21,000 to 143, 000 on a yearly basis. Contact with waste from an infected individual either directly or through food and water perpetuates the cycle of infection at an alarming rate. Proper sanitation is currently the first line of defense needed to curb this disease
* Acute respiratory infections can also be caused by poor sanitation. Respiratory infections are one of the biggest causes of death in the world. There are about 4 million cases of death annually reported in the world. Half of these individuals are children. Studies show that better hygiene practice prevents the increased infections. Combining the cases of diarrheal diseases and acute respiratory infections, uncontrolled sanitation and hygiene is the leading cause of death in children.
* Dysentery can be caused by either bacteria or an amoeba and presents an [infection of the intestines](https://www.nhs.uk/conditions/dysentery/). Fortunately, dysentery is usually cleared up on its own without treatment. However, this disease can be easily spread throughout communities without a system to separate waste from food and water.
* From 11 to 20 million people are infected with typhoid fever every year, causing up to 161,000 deaths on yearly basis. Typhoid fever is a [life-threatening infection](https://www.who.int/mediacentre/factsheets/typhoid/en/) caused by bacteria Salmonella Typhoid through contaminated food or water and sometimes from direct contact with someone who is infected. Unlike many waterborne diseases, antibiotics and new vaccines can provide treatment and limited immunity. Yet, without proper water, sanitation and hygiene typhoid infection will persist and antibiotic-immune typhoid will spread which will make treatment of the disease more complicated.
* Polio transmission has significantly decreased over the past 30 years thanks to aggressive, worldwide immunization. Still, the threat of infection continues to spread as a direct result of poor sanitation. Poliovirus is spread when humans come into contact with the virus from human excreta or [poliovirus that survives](http://polioeradication.org/polio-today/polio-prevention/the-virus/) in the wild. Polio is close to being eradicated and providing sanitation to the areas where the disease persists is imperative if the world hopes to one-day be polio-free.

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