ASSIGNMENTS

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

There are different kinds of solid waste: a. compostable waste (from plants and slaughter material) b. non-compostable waste. This comes from households and industry: paper, plastic, industrial waste, bottles etc. With the proper infrastructure this can all be re-or up-cycled. The non-compostable waste can de divided in durable goods (furniture), nondurable goods (newspapers) and packaging.[[1]](#footnote-1)

Municipal Solid Waste (MSW), commonly called “trash” or “garbage,” includes wastes such as durable goods (e.g., tires, furniture), nondurable goods (e.g., newspapers, plastic plates/cups), containers and packaging (e.g., milk cartons, plastic wrap), and other wastes (e.g., yard waste, food). This category of waste generally refers to common household waste, as well as office and retail wastes, but excludes industrial, hazardous, and construction wastes. The handling and disposal of MSW is a growing concern as the volume of waste generated in the U.S. continues to increase.1

* 1. Explain the importance of the following MSW properties in solid waste management or treatment. Question not clear: the following MSW properties (which ones)?

This is important because the toxic waste should be separated from the non-toxic and also needs another treatment.

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

Advantages:

The starting point for separate collection is that there are valuable materials in the waste that can be reused. As a result, fewer new raw materials, energy and money are needed to make new materials. This is not only good for the environment, but also for your wallet: the municipality's waste collection fee can be reduced.

Waste recycling has 4 major advantages over incineration:[[2]](#footnote-2)

It saves resources: for example, trees for paper, petroleum for plastic, (rare) metals for appliances and tin.

Agricultural land can then be used to grow food.

Recycling usually costs (much) less energy than raw materials and making new materials. For example, 20 times more energy is required for new aluminum than for the remelting of old aluminum. The quality of recycled materials is usually just as good.

Recycling creates less greenhouse gases.

In the Netherlands most of the waste that can not be recycled goes to the incinerator (waste-to-energy plant). The combustion provides energy for electricity or district heating. The remains after incineration can be used for the construction of roads. Less than half a percent of household waste (eg non-recyclable construction and demolition waste) is deposited; that happens in a responsible way.

Disadvantages:

Source separation is costly. People need separate containers at home and the municipality must collect the garbage in a separate way. Because households not always separate in a proper way, it has to be done again in the plant.

Especially plastic is a difficult product since plastic packaging usually consists of different types of plastic. This can not be recycled.

It is also about human behaviour. If people have the idea that by separating their garbage that garbage will be reused/recycled, they are not eager to reduce their garbage production. It is better to introduce a well-functioning deposit system so 1. The packages will be used more than once and 2. The industry becomes co-responsible for the garbage.

Some studies show that post-separation (at the plant) is more cost-effective. Subsequent separation also results in an average of 8 kg more per household and that there is more CO2 reduction for one euro. [[3]](#footnote-3)

But the situation in the Netherlands is different from the situation in developing countries. In most countries urban waste recollection is not very well organized and recycling industry is not very well developed. Municipalities normally dump the collected garbage in landfills and/or burn it. Of course, this causes a lot of contamination since the garbage contains household waste but can also contain waste from hospitals and industry. Poor people make a living of garbage and live near or on a garbage dump. They separate paper, plastic, bottles, tin, metal and other materials that can be sold to the industry. They also eat the leftovers from households or restaurants. This is not a healthy business at all but a survival strategy.

In rural areas the introduction of plastic packaging, electronics, batteries etc. can cause a huge problem since garbage collection is non-existing. So, the garbage is scattered in the landscape or burned.

* 1. Discuss the challenges faced in disease surveillance.

According to the WHO *surveillance* can be defined as 'ongoing systematic collection, collation, analysis and interpretation of data and the dissemination of information to those who need to know in order that action may be taken' [[4]](#footnote-4) Public health surveillance is ‘the on-going, systematic collection, analysis, interpretation and dissemination of health data (disease occurrence and disease potential) to help guide efficient and effective public health decision making and action’ (Buehler et al. 2004). [[5]](#footnote-5)

It is the responsibility of local, regional and national healthcare providers to report on prevailing diseases and take the adequate measures. Governments should also make available enough funds and that is not always the case. All countries have a disease surveillance system, but it is not always working properly. The data are collected in the field and transmitted to a central level and not much coordination between the actors (data collectors, analysts, decisionmakers). This makes the process a rather passive one. During the Ebola outbreak in Guinea in 2013/2014 the reaction of government was rather slow (and that of WHO also). Data during this early phase of the outbreak were irregularly collected and it took long before government declared the emergency.

Another challenge concerns the fact that in developing countries surveillance is generally limited to humans and there is lesser attention to zoonotic pathogens. Over 60% of the emerging diseases are caused by those pathogens. [[6]](#footnote-6)

To improve the disease surveillance in developing countries WHO developed the Integrated disease surveillance and response approach[[7]](#footnote-7) This approach is using a single infrastructure for data gathering of multiple diseases. The focus is on local capacity building at each level of the health system and on more community involvement. Resources are used more efficient and the same for the data gathered. Data will also be shared and improved. Laboratories are strengthened, and participation of local clinics stimulated. Exchange of knowledge and expertise between the partners involved. Available resources will not only be used more efficient but efforts to get more funds is also an objective of this approach. [[8]](#footnote-8)

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

There are quite a lot of diseases that can be prevented by proper sanitation.

1. Vector born diseases like malaria, dengue, chaga, Zika etc.
2. Intestinal worm infections
3. Hepatitis A
4. Typhoid and Shigella Dysentery
5. Trachoma

1. Retrieved from http://css.umich.edu/sites/default/files/Municipal\_Solid\_Waste\_Factsheet\_CSS04-15\_e2017.pdf [↑](#footnote-ref-1)
2. Retrieved from https://www.milieucentraal.nl/minder-afval/ [↑](#footnote-ref-2)
3. Retrieved from https://www.binnenlandsbestuur.nl/ruimte-en-milieu/nieuws/vooraf-scheiden-plastic-afval-relatief-duur.9555916.lynkx [↑](#footnote-ref-3)
4. Retrieved from http://www.who.int/countries/eth/areas/surveillance/en/ [↑](#footnote-ref-4)
5. Retrieved from https://academic.oup.com/heapol/article/30/1/131/564023 [↑](#footnote-ref-5)
6. idem [↑](#footnote-ref-6)
7. Retrieved from http://www.who.int/countries/eth/areas/surveillance/en/ [↑](#footnote-ref-7)
8. https://academic.oup.com/heapol/article/30/1/131/564023 [↑](#footnote-ref-8)