ENV 103

Waste Management

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Inspiring Excellence

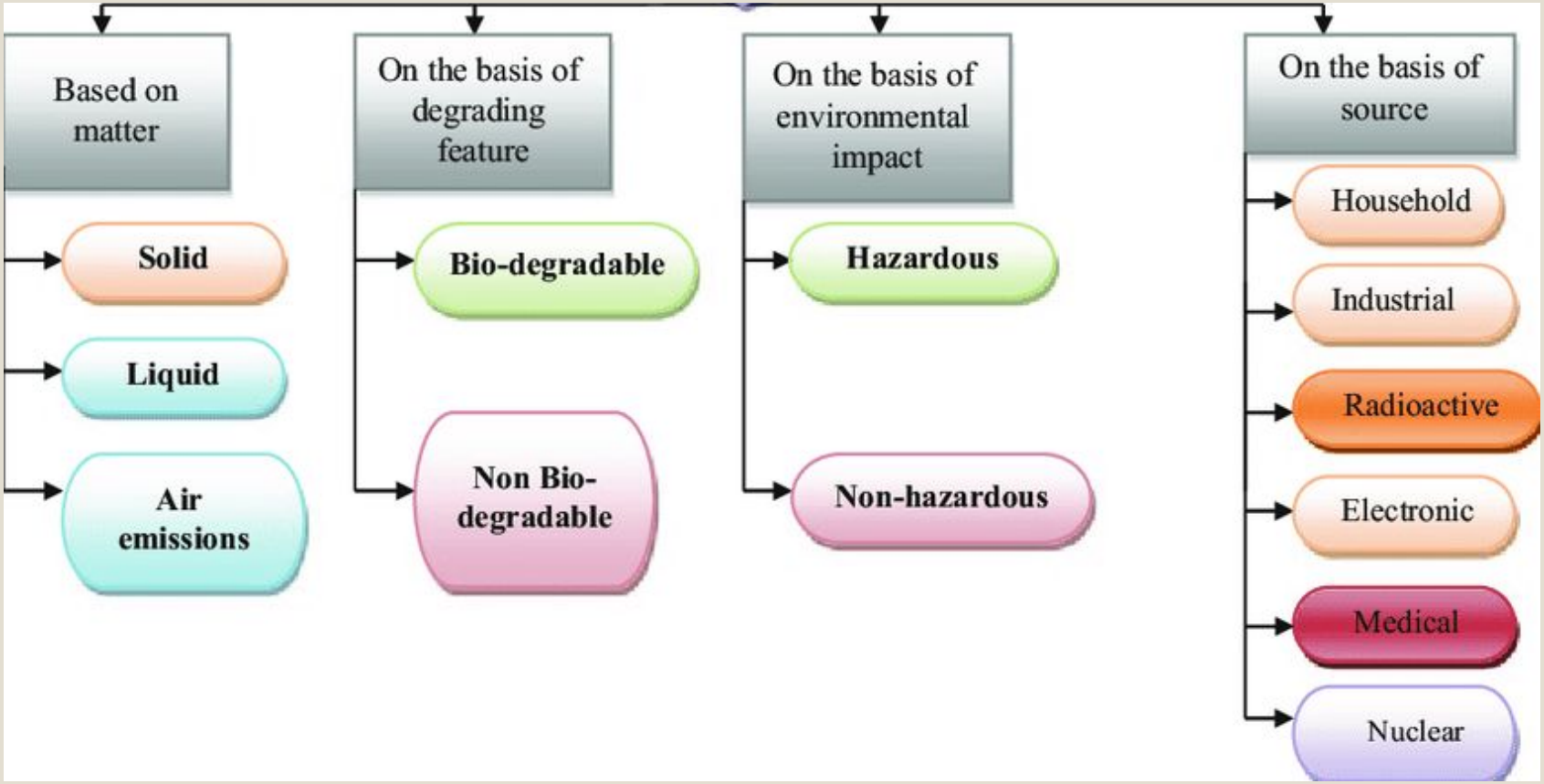
- **Waste management** is the **collection, transport, processing**, **recycling or disposal**, and **monitoring** of waste materials. The term usually relates to materials produced by human activity that cause health hazards or environmental pollution.
- **<u>Purpose of waste management</u>**:

- to reduce the effect of waste on health, the environment or aesthetics.

- to recover resources from waste.

Waste management can involve solid, liquid, gaseous or radioactive substances, with different methods and fields of expertise for each.

Types of Waste



Waste management practices are different for developed and developing nation, for urban and rural areas, and for residential and industrial producers. Management for non-hazardous residential and institutional waste in metropolitan areas is usually the responsibility of local government authorities, while management for non-hazardous commercial and industrial waste is usually the responsibility of the generator.

Waste Management concepts

Integrated Waste Management

- The dominant concept today in managing waste is known as integrated waste management (IWM).
- The 3R's of IWM are reduce, reuse and recycle
- Reduce consumption, reuse material again and again and recycle it.

Waste Hierarchy

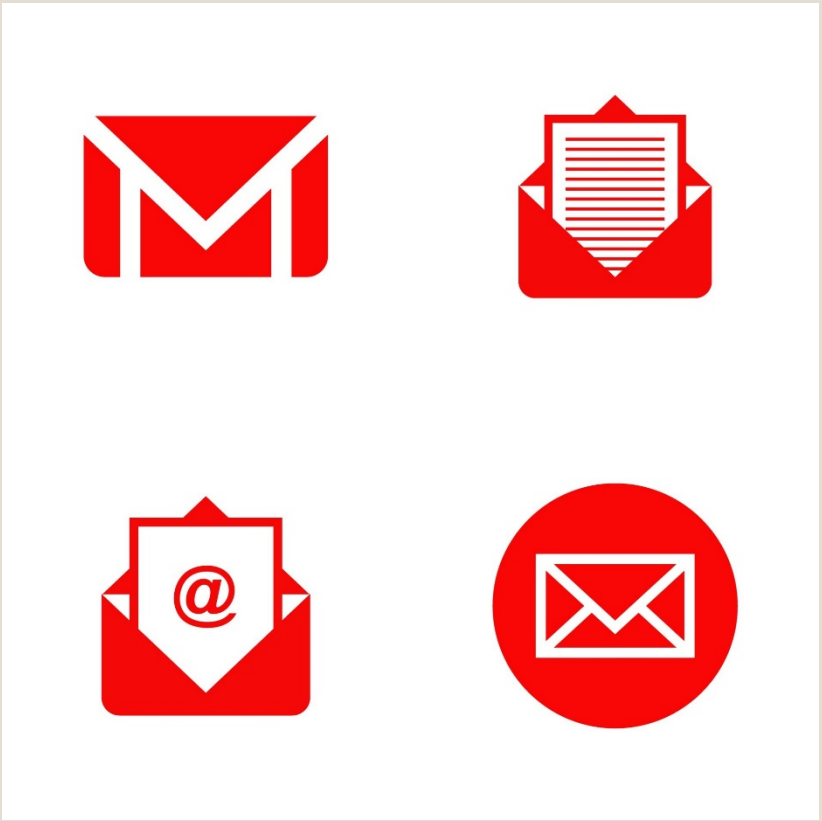
The waste hierarchy refers to the "3 Rs" reduce, reuse and recycle, which classify waste management strategies according to their desirability in terms of waste minimization. The aim of the waste hierarchy is to extract the maximum practical benefits from products and to generate the minimum amount of waste.

Reuse

- Reusing bottles for storing liquids
- Rechargeable batteries
- Reusing items again and again
- Donating old items to the poor

Reduce

- Use good quality products
- Use durable products
- Avoid papers, instead use electronic mediums



Recycle

- Make glass, bottles, showpieces from broken/thrown glass bottles/cups/items
- Paper Recycling
- Plastic Recycling

Industrial Waste Minimization

Classification:

Hazardous and Non-hazardous

Treatment plants- the processes used for treating wastewater produced by industries. After treatment, the treated wastewater may be reused or released to a sanitary sewer or to a surface water in the environment.

Advantages of waste minimization are:

- minimum use of resources;
- minimum waste production;
- improvement in production process

- At least 50% reduction by weight of **urban waste** is possible by:
  - Better design of packaging to reduce waste, an element of source reduction (10% reduction)
  - Establishment of recycling programs (30% reduction)
  - Large-scale composting programs (10% reduction)

Common methods of managing waste

- Composting
- Incineration
- Landfill
- Open dumping

Composting

-is a biochemical process in which organic materials such as kitchen scraps decompose to a rich, soil like material. Composts can be used as fertilizers as a source of nutrients.

- Benefits of composting:
  - Enriches soil
  - Reduces need of chemical fertilizers

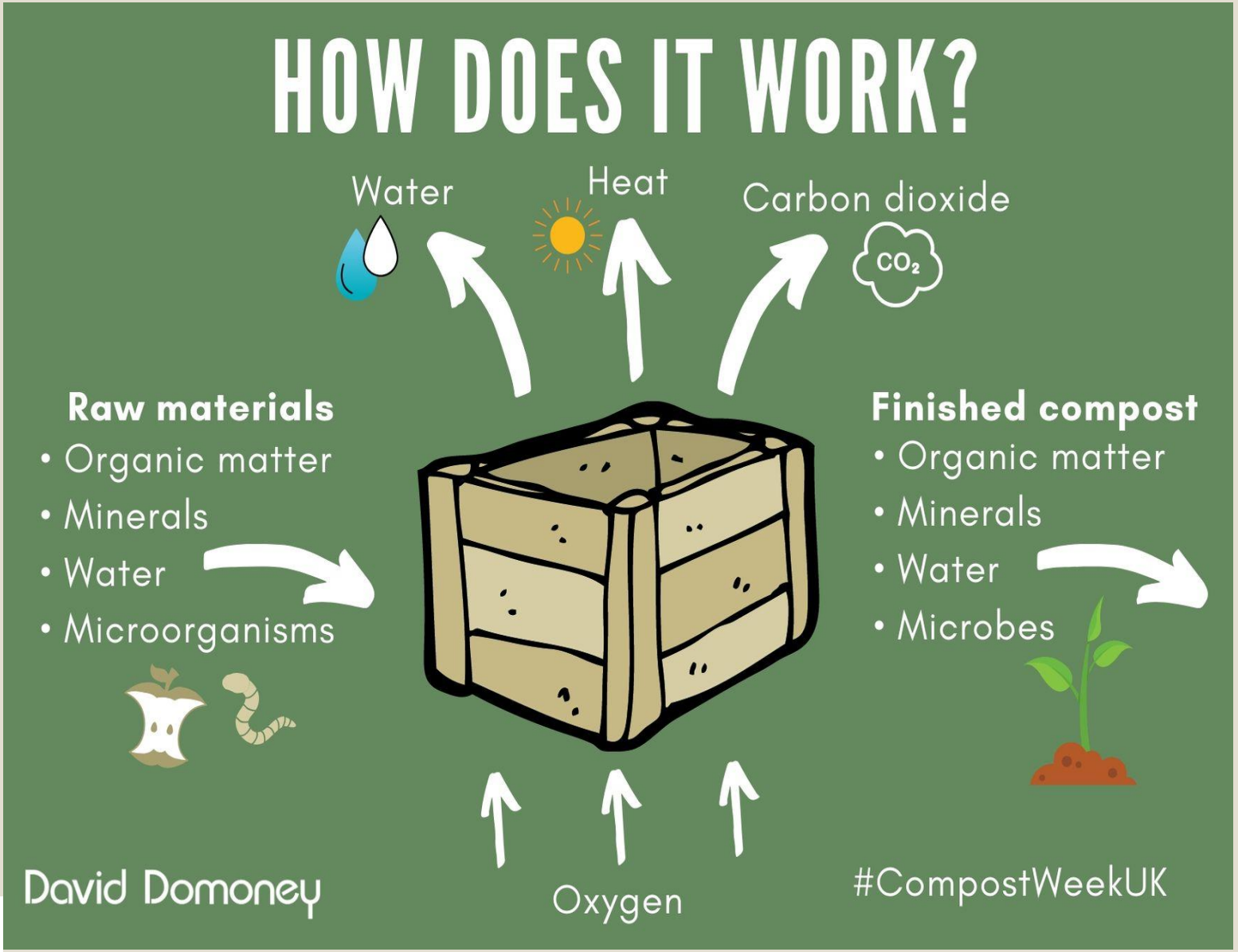

HOW DOES IT WORK?
Water
Heat
Carbon dioxide
CO_2
Raw materials
• Organic matter
• Minerals
• Water
• Microorganisms
Finished compost
• Organic matter
• Minerals
• Water
• Microbes
Oxygen
David Domoney
#CompostWeekUK

Fig. Woman from a rural area preparing compost

Incineration

Combustible waste is burned at temperature high enough (900-1000^{0}C) or (1650-1830^{0}F) to consume all combustible material, leaving only ash and non-combustible to dispose of in a landfill.

- This process reduces the volume of solid wastes to 20-30% of original volume.

Fig. Incineration plant

Open dumping

- In many places of our country, solid waste is accumulated in open dumps where refuse was piled up without being covered or otherwise protected.
- Open dumps creates health hazard, polluting air and sometimes polluting groundwater and surface water.

Landfill

Disposing of waste involves burying the waste and remains and is a common practice in most countries.

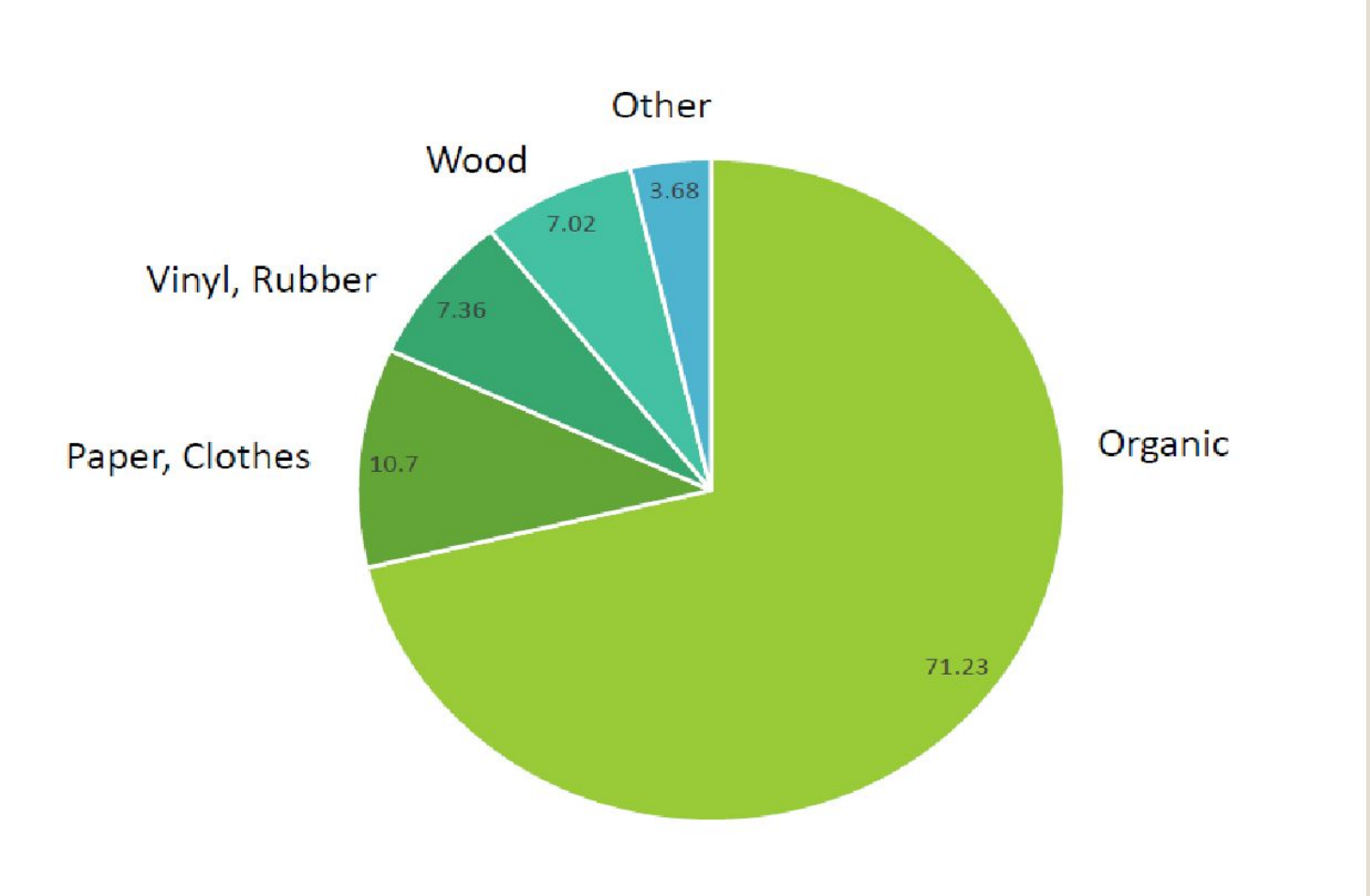
- Properly designed and well managed landfill can be a hygienic and relatively inexpensive method of disposing of waste materials.
- May cause leaching leading to ground water contamination.
- May cause air pollution.
- Plastics take 1000 years to decompose and releases harmful toxins in the soil.

Waste generation in Dhaka City

- Dhaka City Corporation (DCC) responsible for waste collection
- Following landfill method to manage waste
- Dhaka City Consists of 2 city corporations
- Dhaka North City Corporation (DNCC)
- Dhaka South City Corporation (DSCC)
- Waste Generation of DNCC : 4220 tons/day (approx.)
- Aminbazar landfill site: manage 2774 tons/day
- Waste Generation of DSCC : 3319 tons/day (approx.)
- Matuail landfill site: manage 2605 tons/day
- Per capita waste generation: 0.56 kg/day/per person (approx.)

Locations of landfill site (DNCC and DSCC)

Composition of waste at Dhaka City



Current Situation in Dhaka City

- NGOs, community and working on door to door collection, motivation and cleaning of roads & drains.
- DCC collects wastes from secondary transfer points
- DCC also responsible to change waste containers on specific locations
- DCC encourages all the CBOs and NGOs to go for Solid Waste recycling and composting with own initiatives.
- DCC has floated tender for Solid Waste Management through Private Sector Participation in two zones in the city.
- Prepared first master plan with the cooperation of JICA in 2005 known as ‘Green Dhaka Clean Dhaka Plan’’

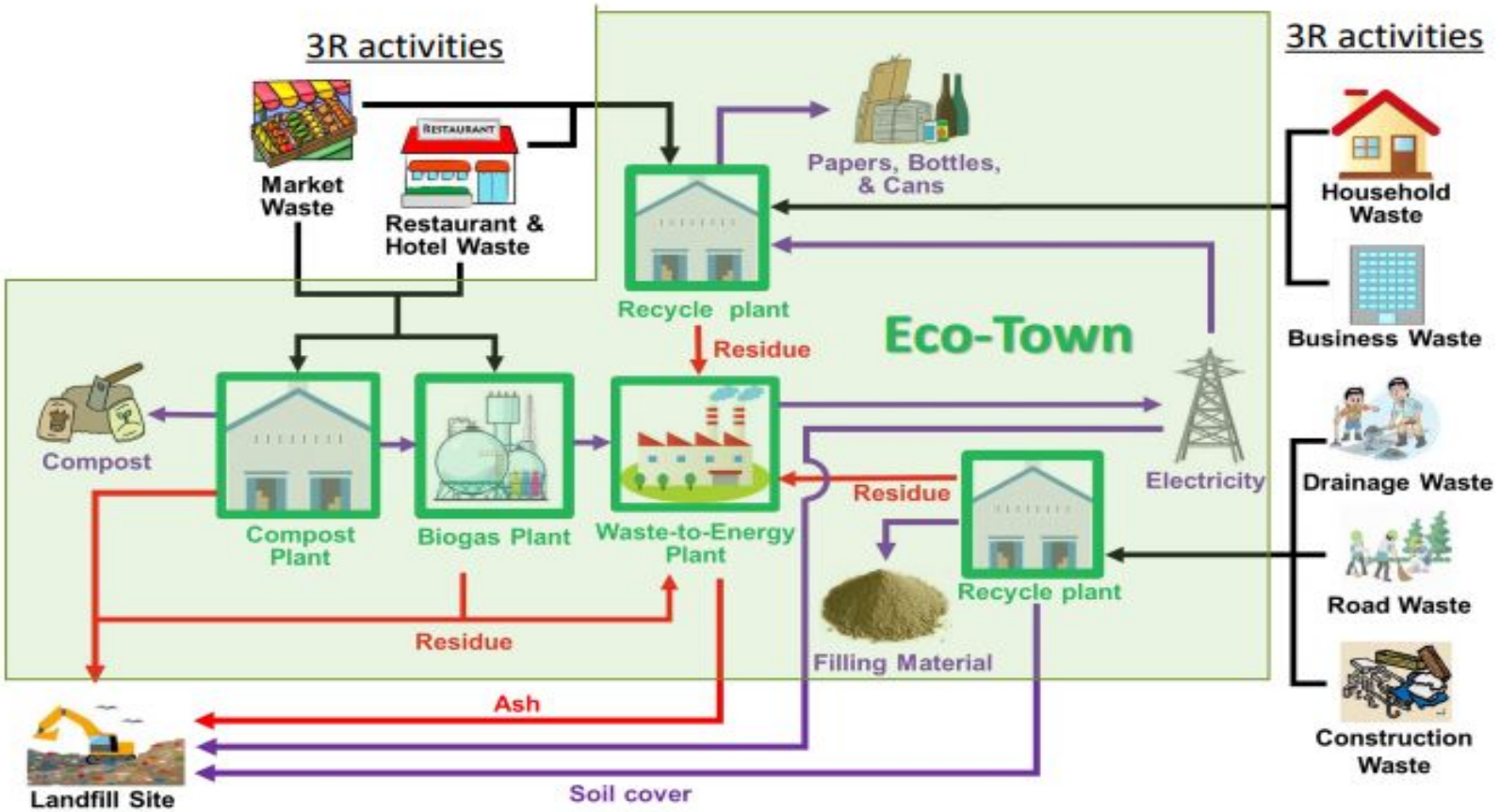
CHALLENGES

- Large number of population and a large quantity of waste generation
- Lack of Public Awareness
- Inefficient Primary Collection System
- Shortage of Secondary Transfer Station
- No formal Segregation of Waste
- No Intermediate Treatment facilities
- Shortage of manpower Landfill Management

Future Plans

- Approval and execution of second waste management master plan for Dhaka City
- Increase of public awareness
- Proper segregation of waste
- Setting up hubs for secondary waste collection throughout the city
- The induction of incineration plant at Aminbazar Landfill.
- Eco-Town for Nasirabad Landfill

WASTE TREATMENT FLOW IN ECO-TOWN with 3R



THANK YOU