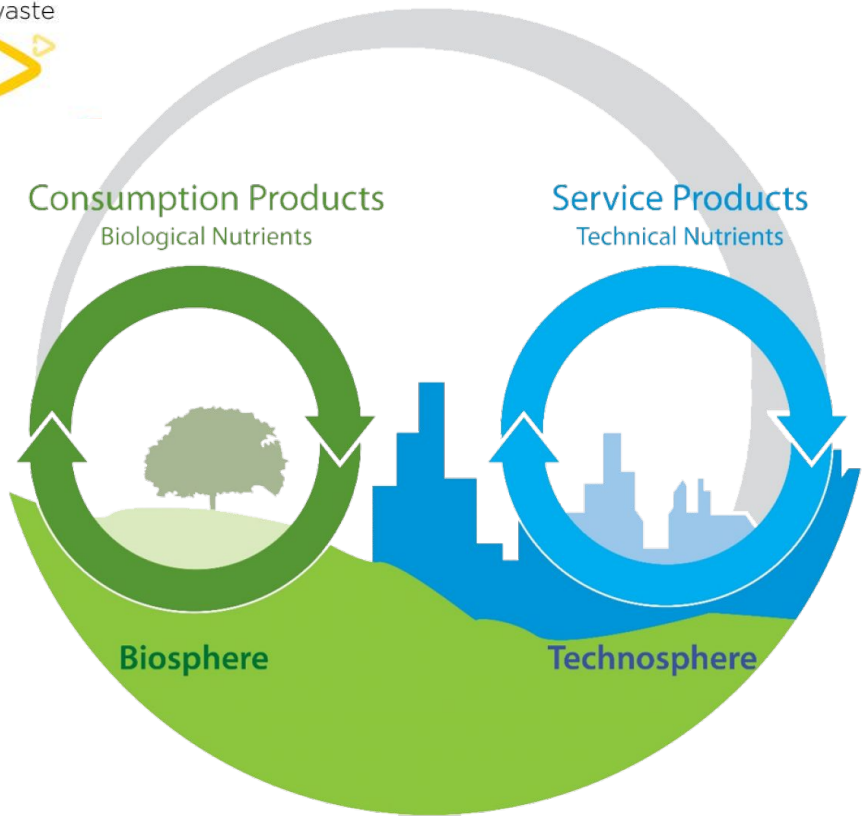
nothing
is
waste



Circular Economy Municipal Solid Waste

Policies, Challenges and Opportunities

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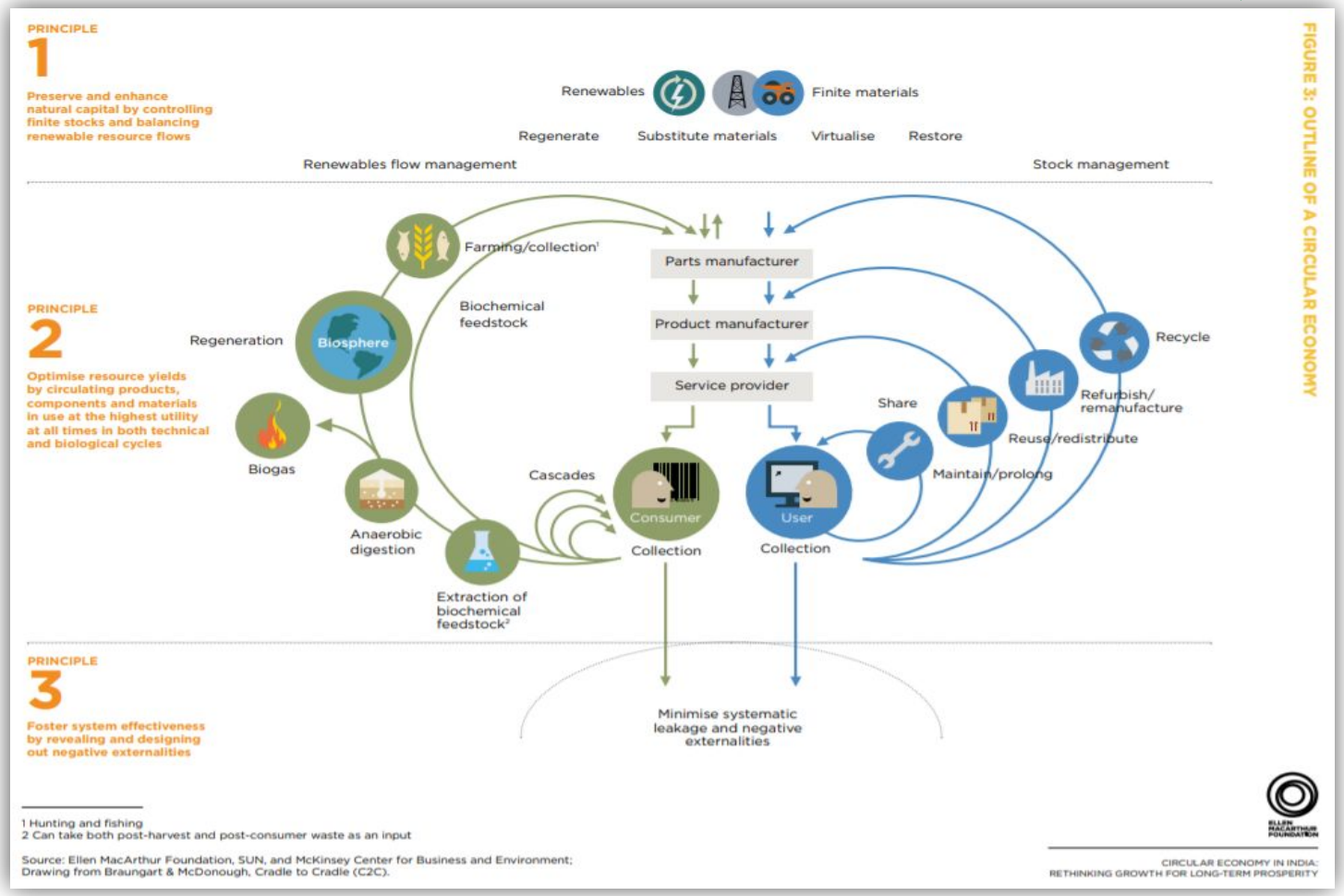

FIGURE 3: OUTLINE OF A CIRCULAR ECONOMY

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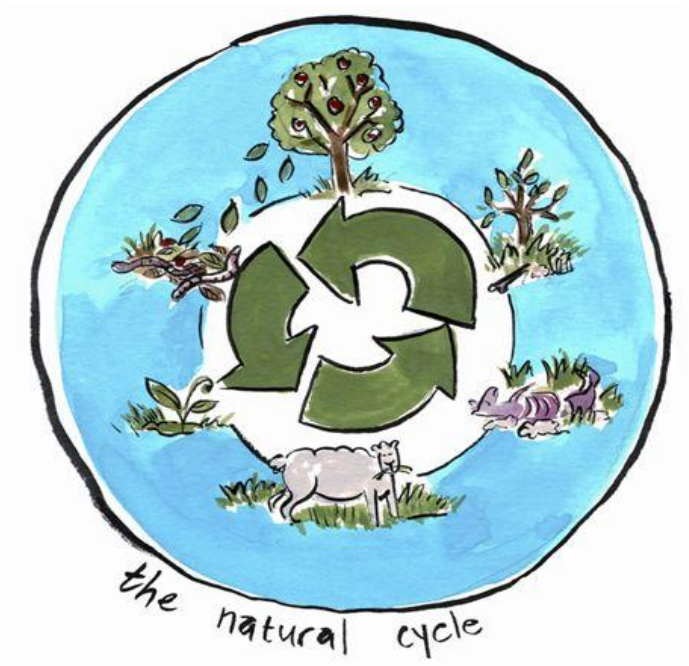
Nature knows no waste



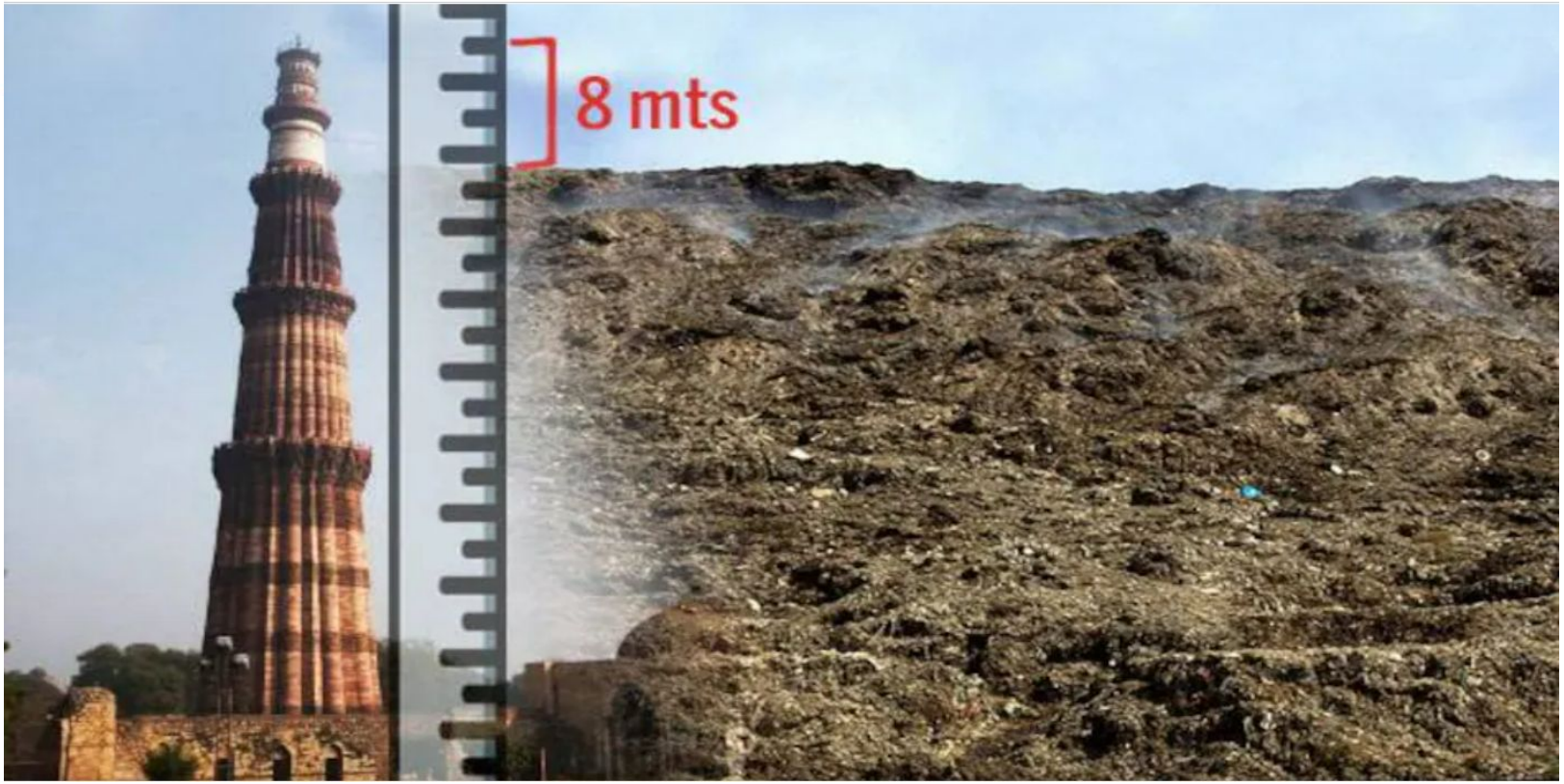
nothing is waste

How is it (mis)managed?

WASTE DISPOSAL

nothing
is
waste

How is it (mis)managed?



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nothing
is
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Need to change the problem statement from:

"Where do we find space to dispose the huge amount of waste"

To

"Can we reduce, reuse & recycle the waste create close loop systems??"

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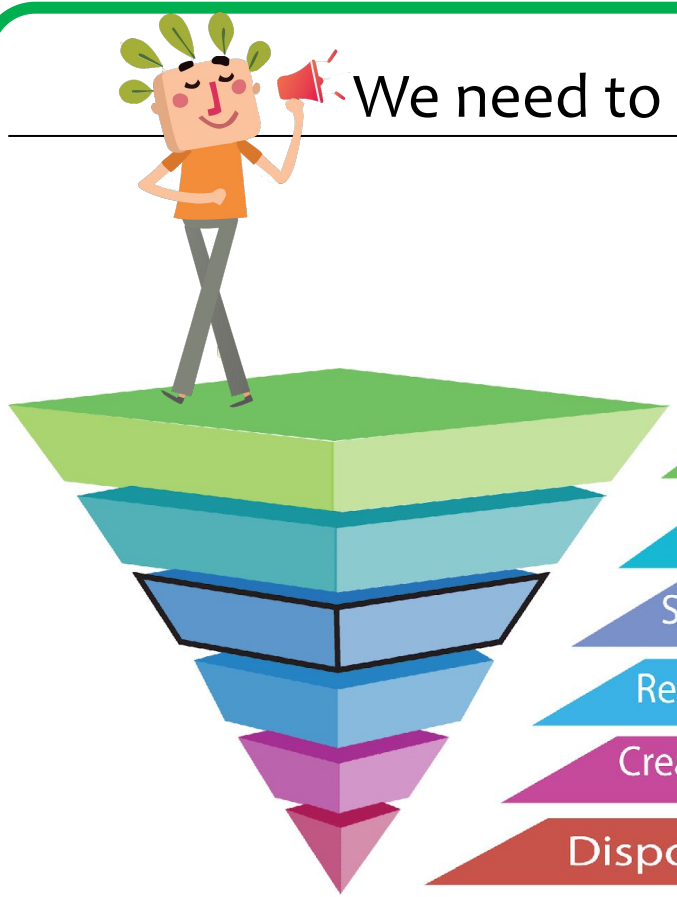
We need to invert the Waste Management Hierarchy



Reduce what you can. If you can't reduce it then...

Re-use what you can. If you cant re-use it then...

Segregate what you can. If you cant segregate it then...

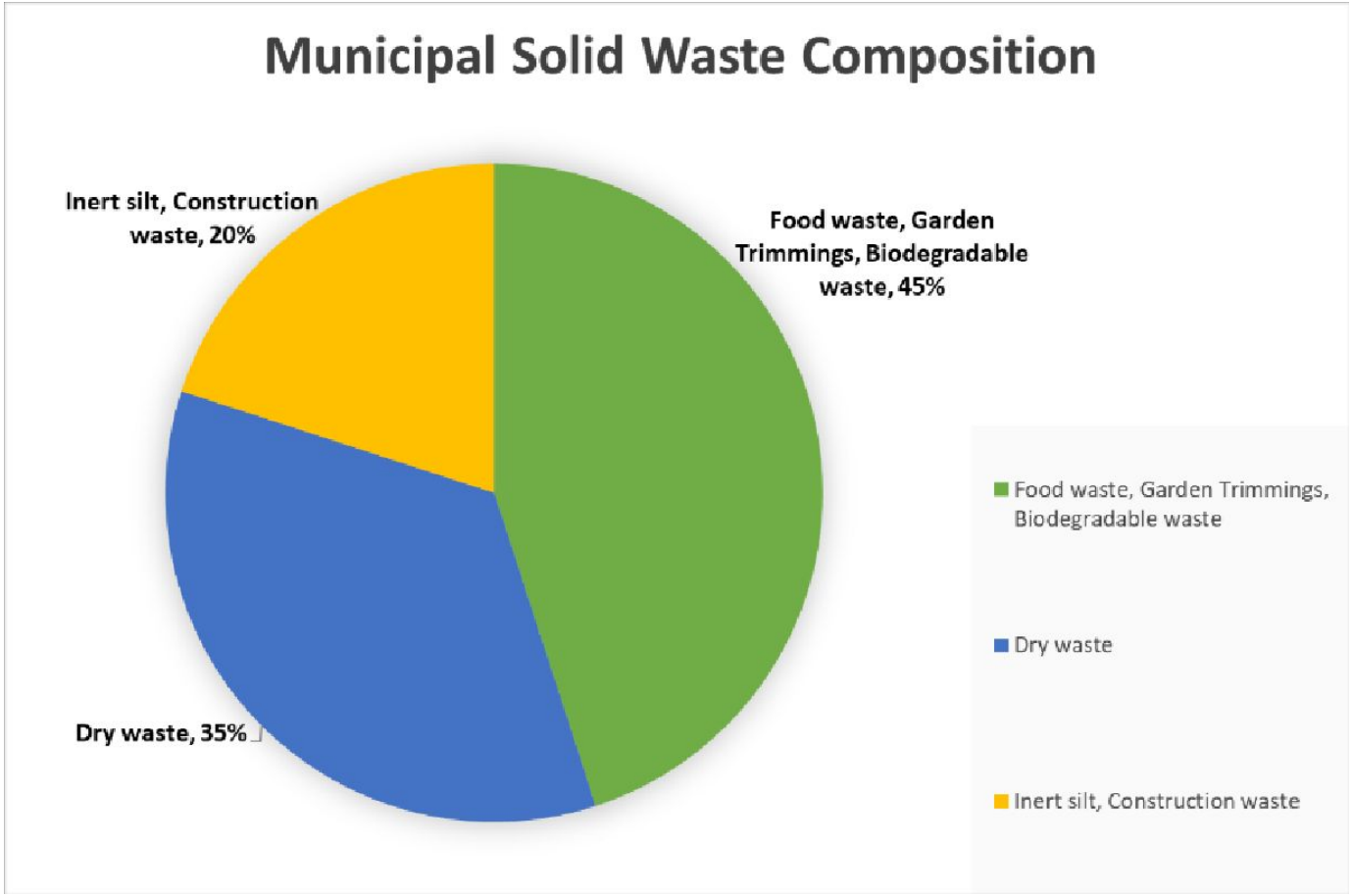
Recycle & Compost what you can. If you cant recycle & composte it then...

Create Energy for electricity. If it cant create energy then it is...

Disposed of in landfill. This is the LAST option

nothing is waste

Municipal Solid Waste Composition



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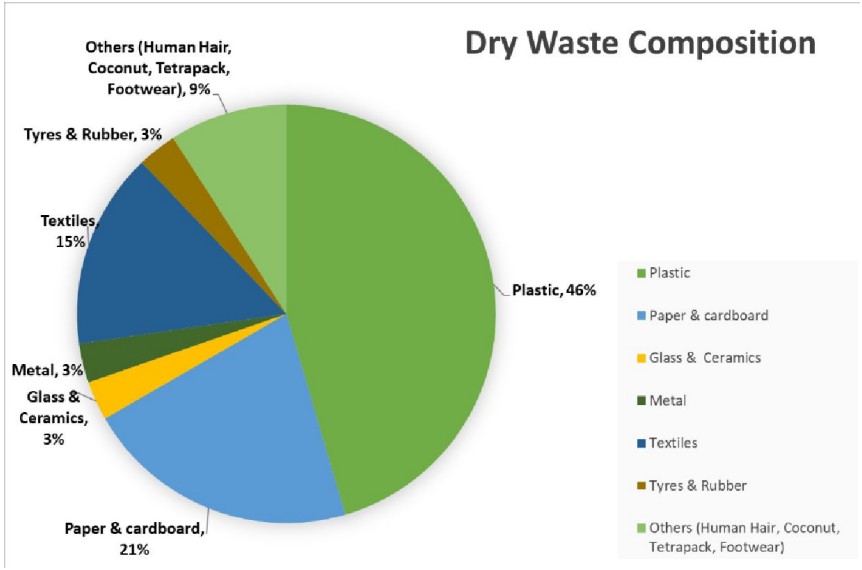
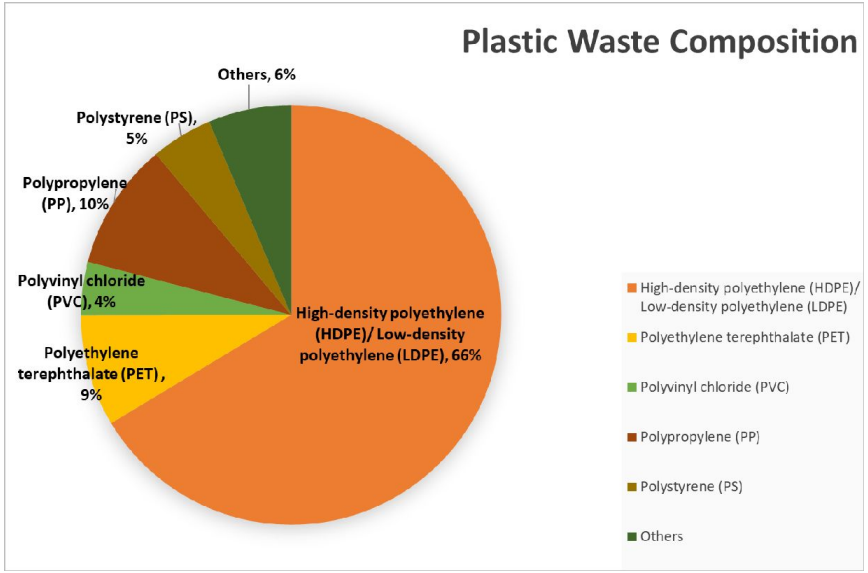
Dry waste and plastic waste composition





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Challenges in Dry Waste

Recycling of plastic waste

- Degradation of plastic due to recycling
- Recyclability of Plastic Categories
- Collection and Recycling of Single Use Plastics (SUPs) and Multilayer & laminated plastics (MLPs)
- Bioplastics
- Marine Plastic

Segregation of metals and unscientific recycling by informal sector

- Toxicity – contamination of metal with biodegradable waste

recycling of glass and ceramic waste

- Approximately 45% of glass is recycled in India
- **Less attractive: Injuries and breakages**
- Though glass segregated by colours has an established market, yet lack of segregation and availability of glass is neither reported nor is there an established mechanism of communication between cities and the glass recycling industry.

Segregated collection and processing of textile waste

- more than 1 million tons of textiles are discarded every year
- age-old circular (reuse and refurbish) barter system still exists in small towns, there is limited collection and recycling system for textiles.

Processing of tyres and rubber

- India currently produces about 6,50,000 tyres and discards 2,75,000 every day
- no tracking of discarded tyres and monitoring of their disposal across India

Localized processing facilities for Thermocol

- it is a technically recyclable material,
- its transportation is a challenge due to its ultra-low density and high volume resulting in limited
- processing/recycling.

Recycling of coconut waste

- 72% of world's production in India and coconut's role in Indian culture, it is an important waste component
- smaller and remote cities segregation, transportation and logistics cost of coconut waste act as significant barrier for coconut recycling

Collection and processing of human hair waste

- collection system limited to large generators of hair waste like large temple complexes, whereas
- small units generating hair waste such as salons, beauty parlours, etc are not connected

Coverage of Extended Producers Responsibility (EPR)

- Only Plastic and electronic waste management
- Complex EPR Framework
- Lack of unified digital platform for EPR
- EPR enforcement

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Opportunities: Closing Loops

Material Recovery Facilities

- can help improve recovery from ₹5,187 crores/annum to ₹17,023 crores/annum by 2025 thus adding ₹11,836 crores to economy per annum
- employment of 40 Lakh person-days during construction of MRFs
- ~80 Lakh person-days in perpetuity for operations & maintenance
- Formalisation of informal waste workers

Entrepreneurship - Redesign

- For example - Refillable.store - if 'refill' bottle designs and models were to be applied to all bottles in handwash, toilet cleaners, cosmetics, personal care as well as home cleaning
- Start up on share economy especially in textile sector Eg. Dresses on rent
- Product as a service - servitisation
- Coconut recycling unit in collaboration with municipality

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Recommendations: Closing Loops

- Standardisation: like Mandate use of mono-polymers in the production of the packaging products. e.g., PET bottles with HDPE cover/cap and PPP films avoided, to enhance recycling
- Policy for setting-up Waste Management Parks, Recycling zones, landfill tax for disposing recyclables
- Reduce GST to 5% for recycled products and alternate products
- Expand EPR to include other dry-waste components: Paper, Textile, Rubber, Metals and Glass etc.
- Funding for research & development of product redesign,
- remanufacturing and alternate materials based on Life Cycle Assessment (LCA) and Material Flow Assessment (MFA)
- Digital platform to capture end to end dry waste material flow data for transparency and traceability

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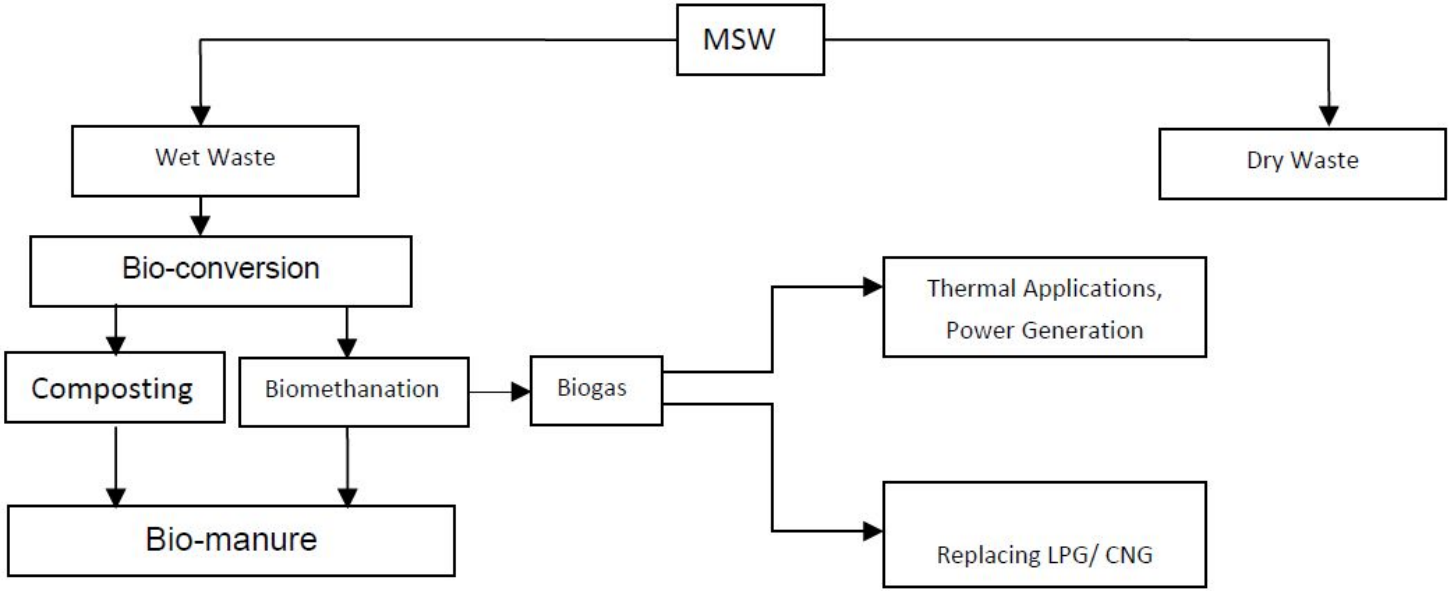
Biodegredable: Wet Waste



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Challenges: Wet Waste Management

- Poor segregation of waste at source
- Inadequate infrastructure to transport segregated wet waste
- Non-Compliance of SWM Rules 2016 by the Bulk waste generators
- Data on waste generation in terms of composition and quantities is still lacking with cities. This leads to difficulty in designing waste processing facilities.
- Models of collection, transportation, processing for wet waste processing lack financial feasibility.
- Production of compost from mixed waste leads to quality challenges in final product
- SWM Rules 2016 lack provisions for testing of Compost (methodology, frequency of testing etc).

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Potential Opportunities: Bio-methanation

Bio-methanation

- Net additional contribution to economy of ₹2,460 crores per annum if 50% wet waste is processed by bio-methanation in urban India
- Employment generation of about 1 crore man-days during construction and about 0.60 crore man-days for O&M, in perpetuity
- Reduction in GHG emissions by about 10.36 million tonnes CO2 equivalent

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Recommendations: Closing Loops

- Segregation is MUST! Unbundling SLF from SWM functions
- Concessioniare agreements: Lanfill tax, Revenue model on processing of waste
- Incentivizing close loop solutions like biogas plants Eg. Tax holiday for waste processing plants 5-10 years
- Waste processing plants to be listed in priority sector landing
- Customs and GST exemptions
- Incentivize by-products like compost from biogas and tag sale with chemical fertilizers
- Compost Testing facilities and Labs
- School Curriculum on Waste Management

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Business model	Description	Illustration
Circular Supply Chain 	Provide renewable energy, bio-based-or-fully recyclable input materials to replace single life-cycle inputs	BASF is replacing finite fossil resources with sustainably produced renewable resources through its innovative production Verbund Biomass Balance approach
Recovery & Recycling 	Recover useful resources / energy from disposed products or by-products	Nike reuses and recycles footwear manufacturing scrap and post-consumer shoe wastage, converting it into raw material for other sports equipment manufacturing players
Product Life Extension 	Extend working lifecycle of products and components by repairing, upgrading and reselling	Patagonia launched an online store where customers trade-in their used clothing in return for store credit, thereby extending the life of products
Sharing Platform 	Enable increased utilization rate of products by making possible shared use, access or ownership	Airbnb operates as an online marketplace for people to lease or rent short-term lodging, facilitate tourist experiences or make restaurant reservations
Product as a Service 	Offer product access and retain ownership to internalize benefits of circular resource productivity	Philips offers lighting as a service, wherein users are required to pay for the consumed intensity (rather than for the product)

Decentralised close loops?

- Dry waste – Reduce, Reuse, Recycle
  - 1. Know your waste types
  - 2. My go-to kit
  - 3. Say “No to fast fashion” – clothes, electronics etc.
  - 4. Say “No” to “use & throw” products
- Wet waste – Kitchen waste: Compost
  - 1. Home composting/ Biogas, Eg. LPG free Anaganwadis
  - 2. Bioenzymes

Excess Convenience is the mother of destruction!

Only One Earth!

Use reusable / compostable items

Use bamboo brush and wooden comb

Instead of tissues, wet wipes – **use handkerchief**. Can be washed and reused.

Replace **kitchen towels**, sponge wipes with **old/used cotton cloth.**

Carry your own containers while ordering takeaway food.

Rent reusable steel plates/cups for parties instead of using disposable cups and plates.

Use reusable cloth diapers

Try **menstrual cups or reusable cloth pads** instead of sanitary pads.

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Why you will do all this?

What does the law say? SWM Rules 2016

- All citizens and commercial establishments have to segregate their waste into 3 categories as biodegradable, non-biodegradable and hazardous
- Waste cannot be burnt or dumped
- All recyclable waste must be collected by the municipality and sent for recycling
- BWG generators shall process their wet waste in their premises via natural composting
- Only inert items can be sent to landfills which must be scientifically designed and operated to prevent air and water pollution
- Decentralised Aerobic Composting is most preferred while incineration is least preferred

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Why you will do all this?

Indian Constitution Mandates

DPSP

- Art 48A
- **The State shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country**

FR

- Art 21
- Right to Clean Environment: **the right to enjoyment of pollution free water and air for full enjoyment of life**.

FD

- Art 51A
- To protect and improve the natural environment including forests, lakes, rivers, wildlife and to have compassion for living creatures

Waste and Us

Let us be a part of the sol**U**tion, not a part of poll**U**tion

Happiness is Choice

Happiness is Closing Loops by adopting less waste lifestyle