

Sunway University





ZERO WASTE CITIES Role of 3R and CE

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Introduction

Zero-waste

- Is defined as “the conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning, and with no discharges to land, water, or air that threaten the environment or human health.”

Zero-waste city

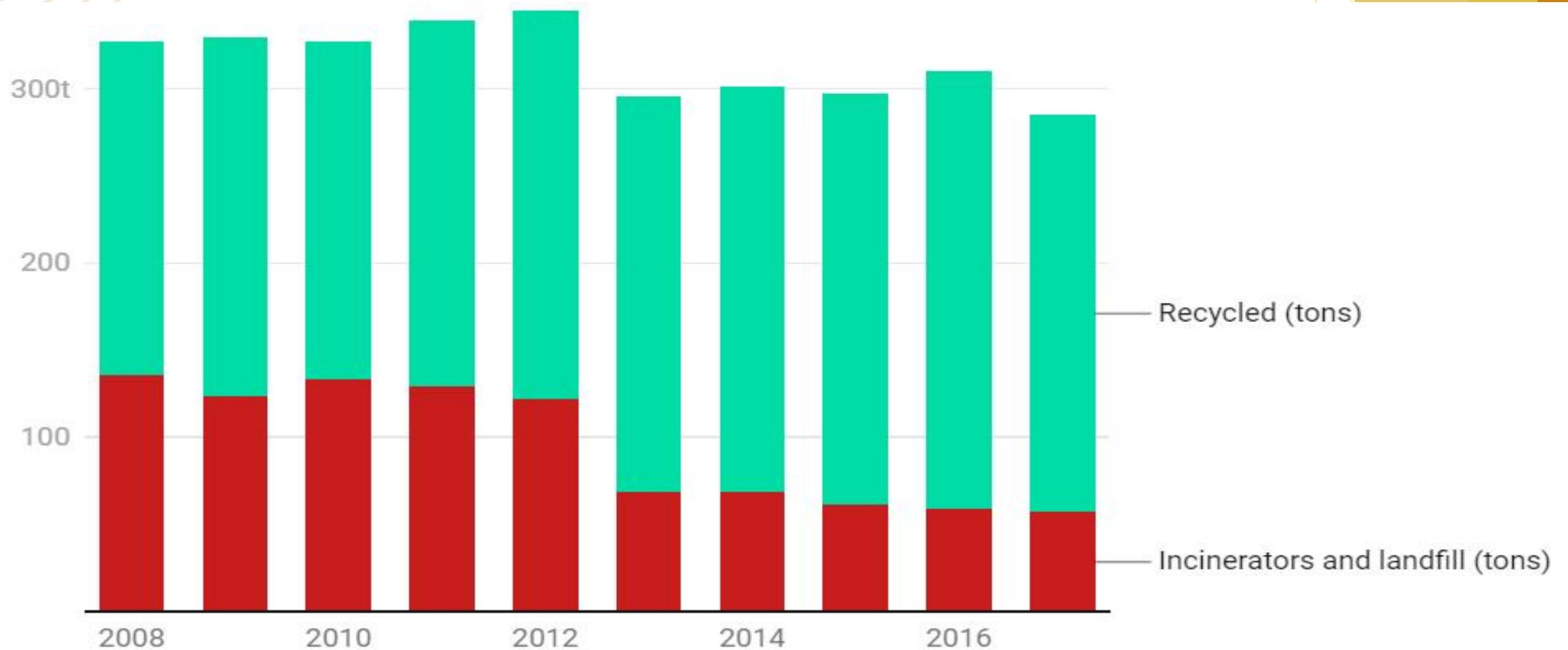
- Trash never ends up in landfills, incinerators, or the ocean
- It gets re-absorbed into the resource production process, creating a cyclical economy that operates without trash.

Zero-Waste City in Japan

Kamikatsu

- First municipality to establish a goal to become a zero-waste city in Japan.
- Accomplish their objective with an aggressive **waste separation program**
- Separate their garbage into a whopping 45 categories
- People turn food waste into compost
- The Kuru-kuru store provides free second-hand items
- Target to eliminate waste without resorting to incinerators or landfills

Eliminating incinerators and landfill and raised recycling



Zero-Waste City in India

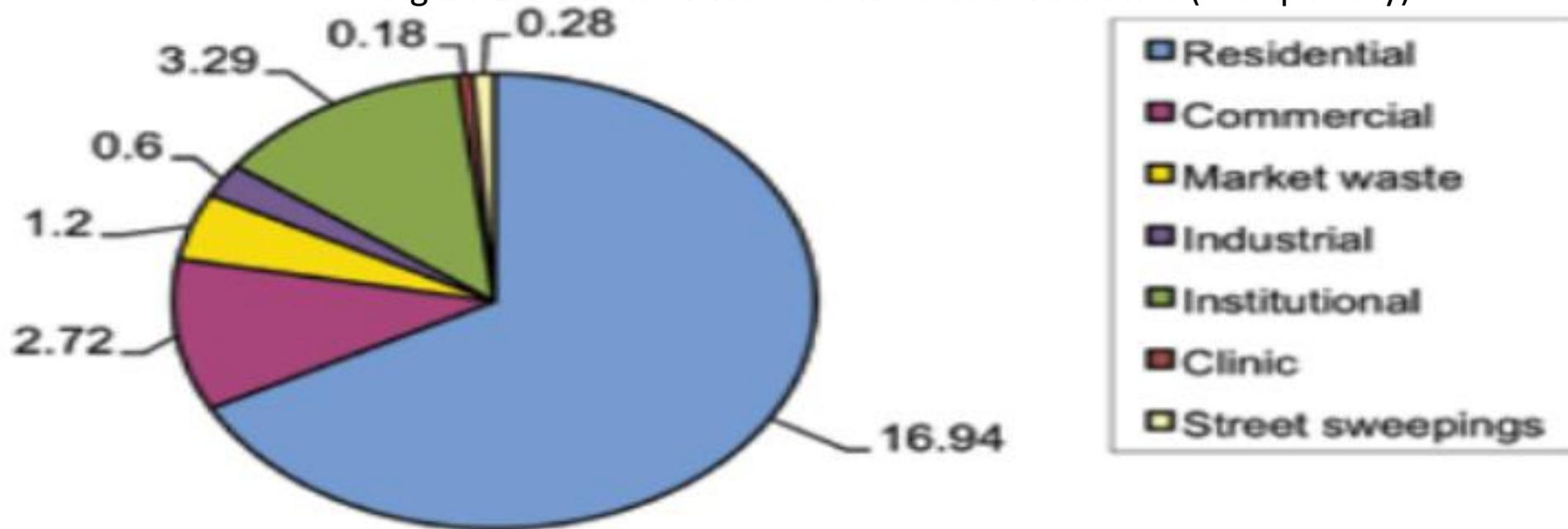
Pune

- Pune's waste pickers have created a remarkable transformation in their city's municipal waste management system
- 92 percent of waste pickers are women
- Waste pickers implement door-to-door collection, source separation, and separate treatment for organics
- Waste pickers worked at the landfill recovered recyclables from what the city dumped there
- Saved US\$2.8 million a year in costs from improved waste management

Zero-Waste City in Philippines

Alaminos

Figure 1. Sources of Waste Generated in Alaminos (tons per day)

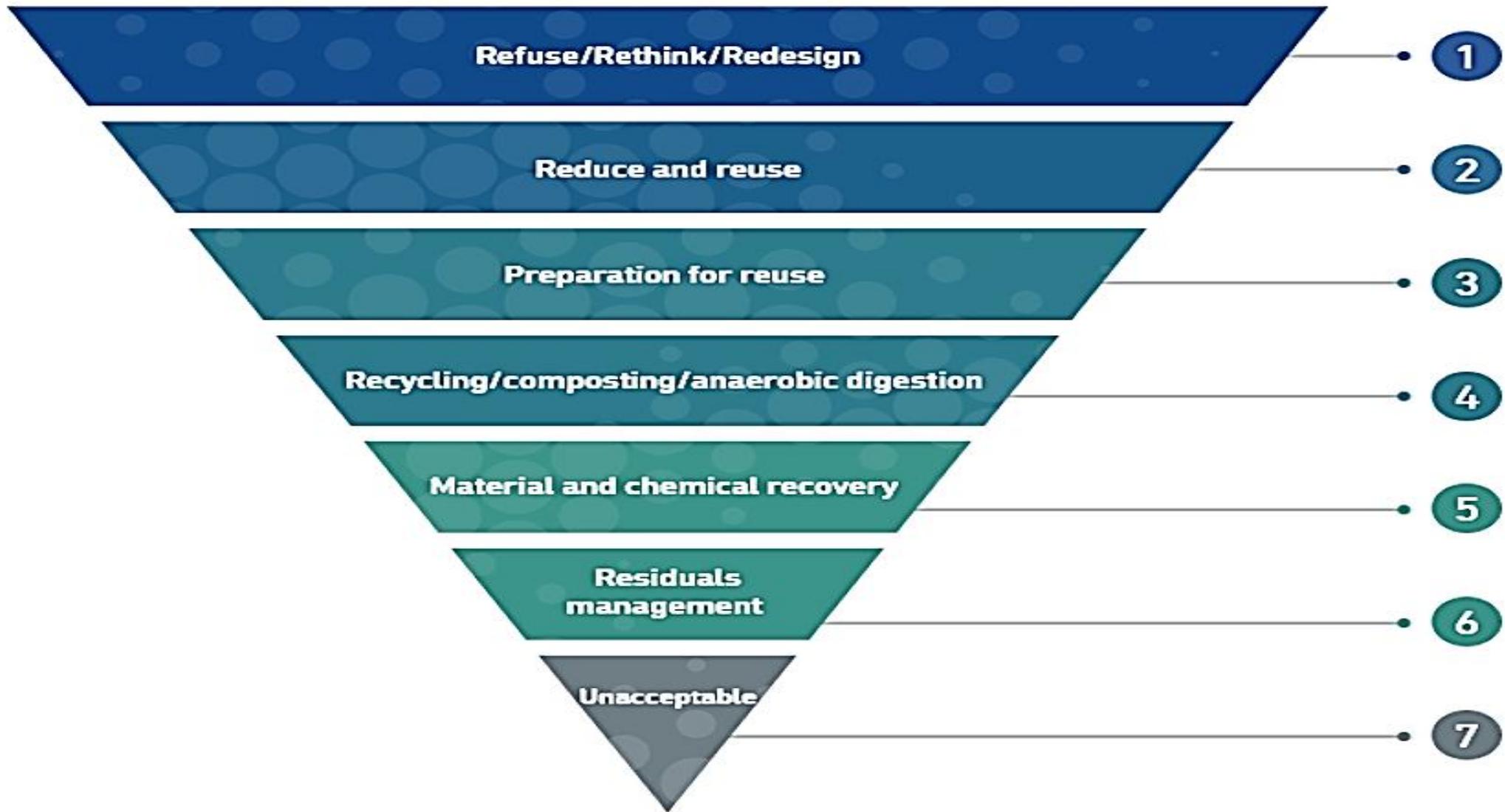


Zero-Waste City in Philippines

Alaminos

- To address the growing volume of waste
- Education was provided to residents on backyard composting and waste separation
- Small-scale sorting facilities were set up in different *barangays* recycle locally
- Survey found that 88% of surveyed residents were practicing waste separation
- For plastic that cannot be recycled, it is shredded, mixed with concrete, and turned into pavements

😊 BEST USE



☹️ WORST USE

Zero-Waste City in Germany

City of Tübingen

- Took the pioneering steps of introducing a zero waste city
- **Impose wide ranging tax on single-use plastic items**
- The tax applied to both single-use cutlery (20 cents) and single-use packaging for food and beverage containers (50 cents)
- Providing subsidies for dishwashers

Zero-Waste City in Europe

Europe

- The Zero Waste Masterplan created by Zero Waste Europe and its members to support the zero waste model on a local level and turn circular economy in reality in Europe.
- Providing the tools needed to implement a sustainable waste management, waste prevention activities, repair and reuse strategies and an overview on Zero Waste Business models.

Zero-Waste City in Indonesia

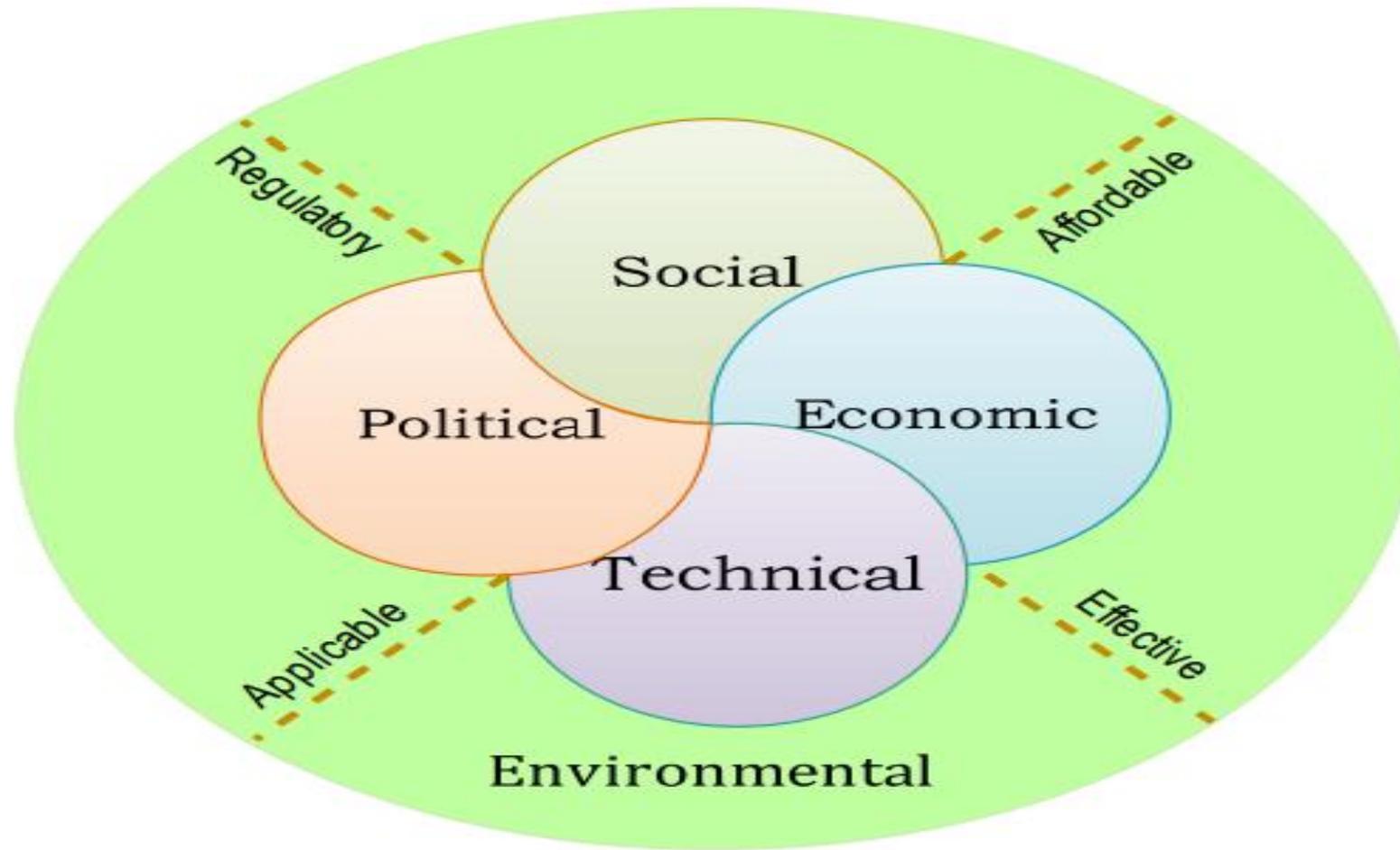
Surabaya

- **Organic waste materials are being recycled** by Surabaya and the compost is freely distributed to the Surabaya people
- There are **gasification machines** at several composting sites which turning waste into energy. For the moment, the produced electricity is only for the public lighting infrastructures at nearby parks
- The dustmen will sell the inorganic waste to waste sorters and the rest is deported to the landfill.

Challenges in Transforming Cities into “Zero Waste Cities”

- Waste management systems have social, economic, political, technological and environmental aspects
- Cities in one region are different from others due to geographical and environmental differences
- Holistic research approaches are required to understand the dynamic nature of the factors involved in city development

Figure 2: Spheres in a sustainable zero waste city



Recommendation

Recommendation 1:

- To **understand human behaviour** in the consumption of resources and generation of waste
- “Zero waste city” design influenced by lifestyle, values, and personal behaviour
- **Raising awareness and educational programs** to trigger behaviour change are becoming important

Recommendation 2:

- In zero waste city design, **material flow of the city should be designed or controlled in a balanced way**, considering sustainable design and product stewardship concepts
- **Technology applied in waste management systems needs to be adaptable to the context of future volume reduction and resource recovery from waste.**

Recommendation

Recommendation 3:

- **Policies and regulations** have significantly influenced the development of waste management systems and cities should continue to use them

Recommendation 4:

- Selection or application of waste treatment technologies for zero waste cities should **consider holistic inter-generation resource recovery and product stewardship**

Recommendation 5:

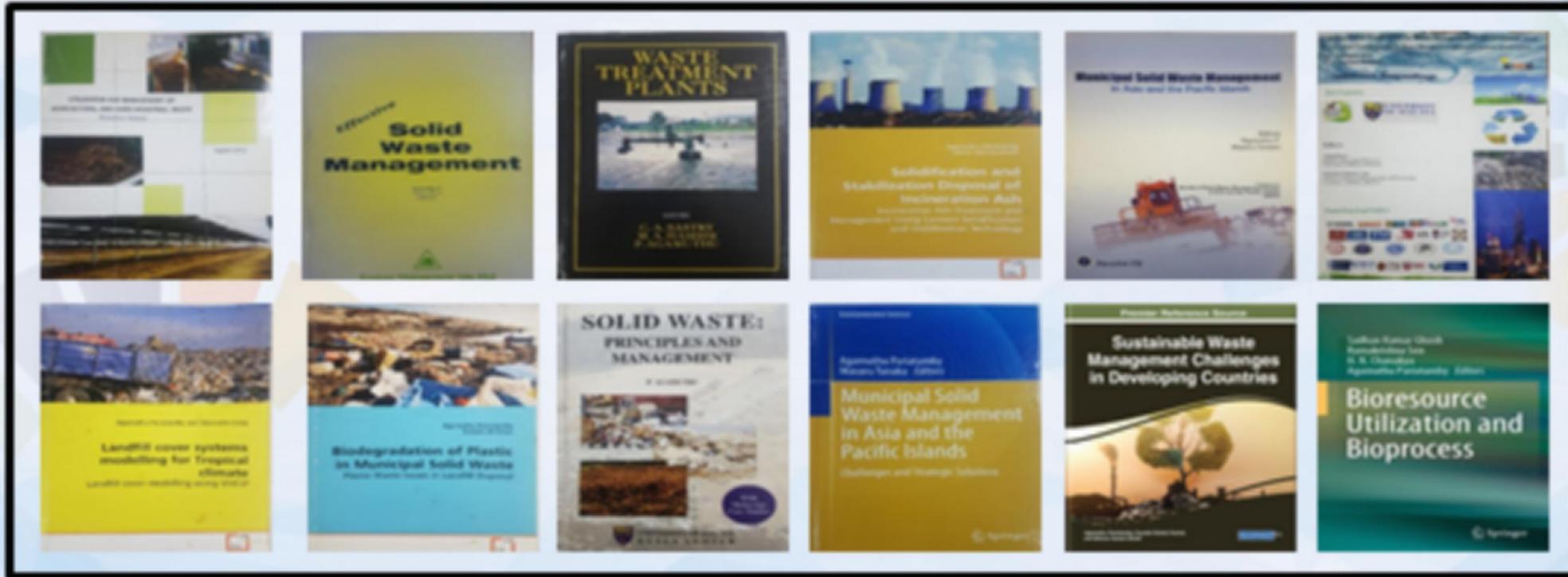
- **Holistic zero waste management strategies based on integrated tools, systems and technologies are required for the transition phase of a city**

THANK YOU

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Some of My Books



Senior Editor in
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Sadhan Kumar Ghosh
Pariatamby Agamuthu *Editors*

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