



# CIRCULARITY AND SUSTAINABILITY

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## HOW CAN WE MAKE CIRCULARITY AND SUSTAINABILITY A PART OF OUR VALUE CHAIN

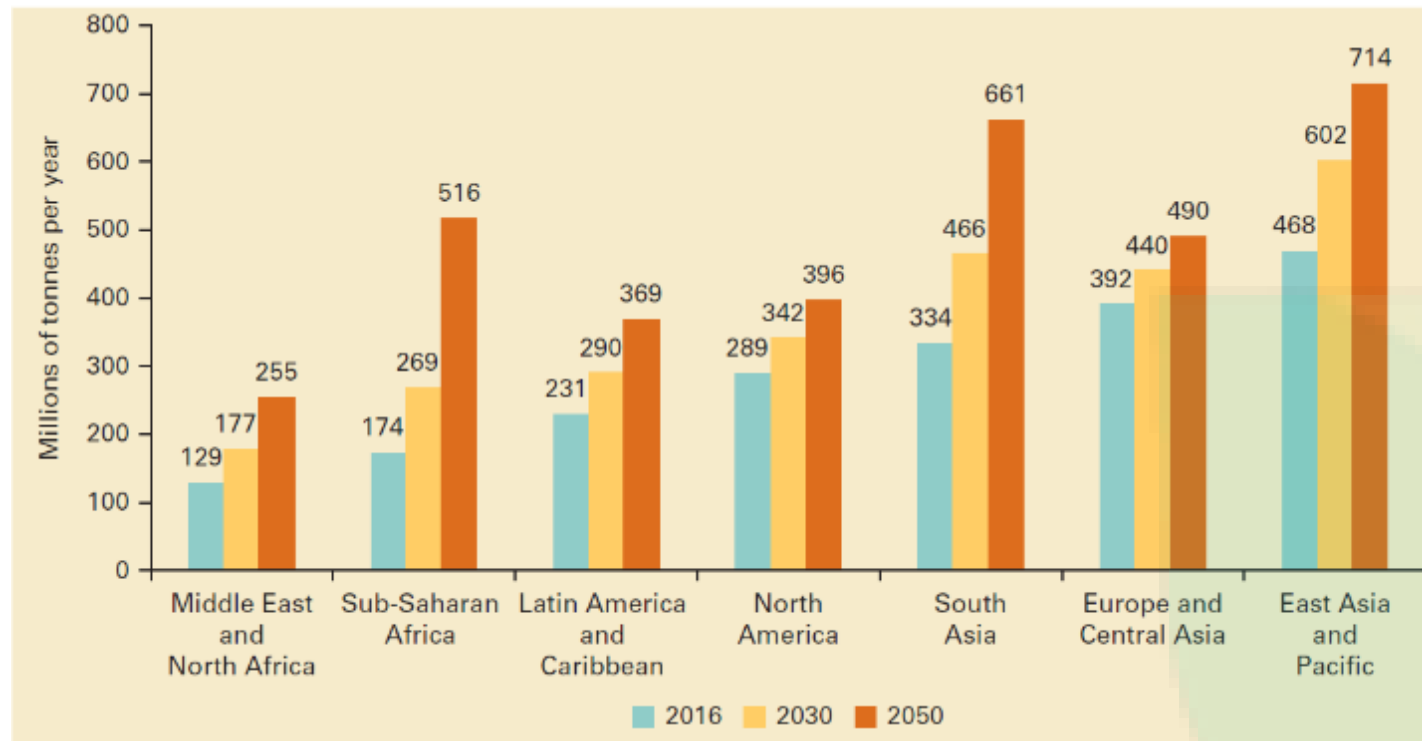
1. Global Trends in waste management
2. What is circularity ?
3. Revisiting Ecosystem of waste management
4. Know your waste
5. Challenges in Linear economy
6. Opportunities in implementing circularity in Waste Management
7. Ideal Scenario for a city

**Circularity to optimize the resources for the city and reduce the waste going to the landfill**



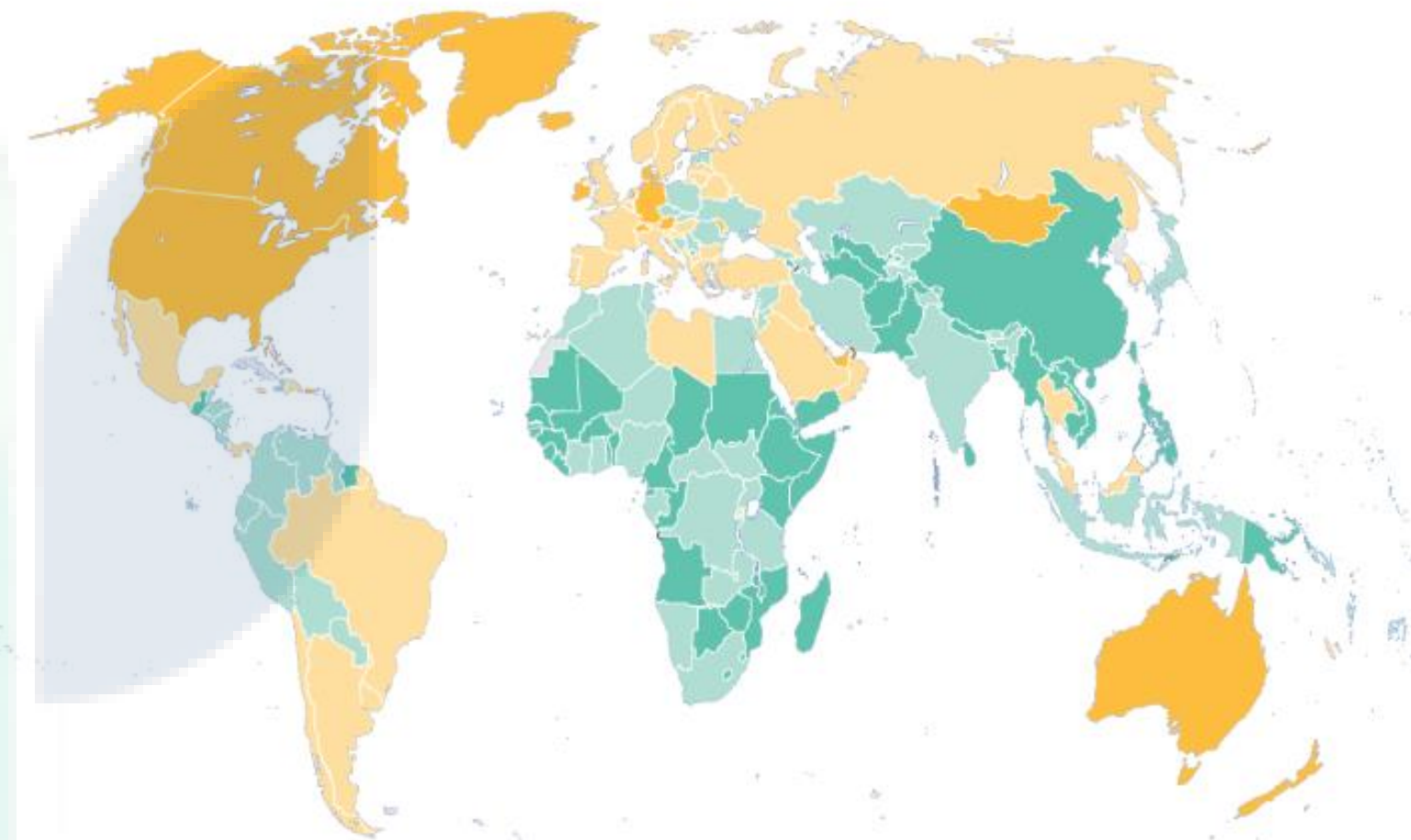
**“Technology changes at the rate more than what humans can adapt to !”**

# GLOBAL TRENDS IN WASTE MANAGEMENT



Annual municipal solid waste generated per capita (kilograms/capita/day)

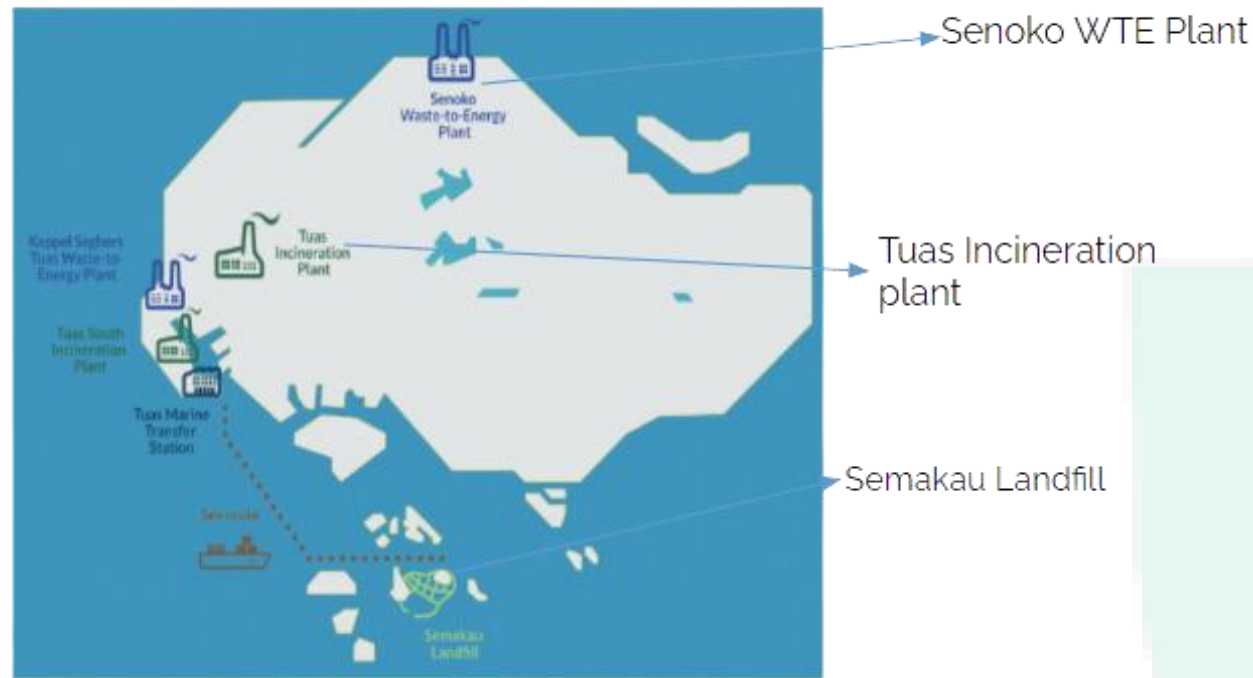
0-0.49    0.50-0.99    1.00-1.49    Greater than 1.50    No data



Waste generation will increase from 2.01 billion tonnes in 2016 to 3.40 billion tonnes in 2050.....

**At present around 8.6% of the waste is coming into circular economy highlighting a potential of more than 90% increase in the waste circularity business**

# CASE OF SINGAPORE - WASTE QTY - 8000MTS PER DAY



The dumping grounds at Sia Su Lin and Tampines filled up

1979, 1986, 1992

Semakau Landfill commissioned & Closure of Lorong Halus Landfill

2009



1975

Three incinerator plants set up at three locations

1999

One incinerator discarded and two added

## Three Pillars for Change

Enforcement

Infrastructure



Citizen Participation

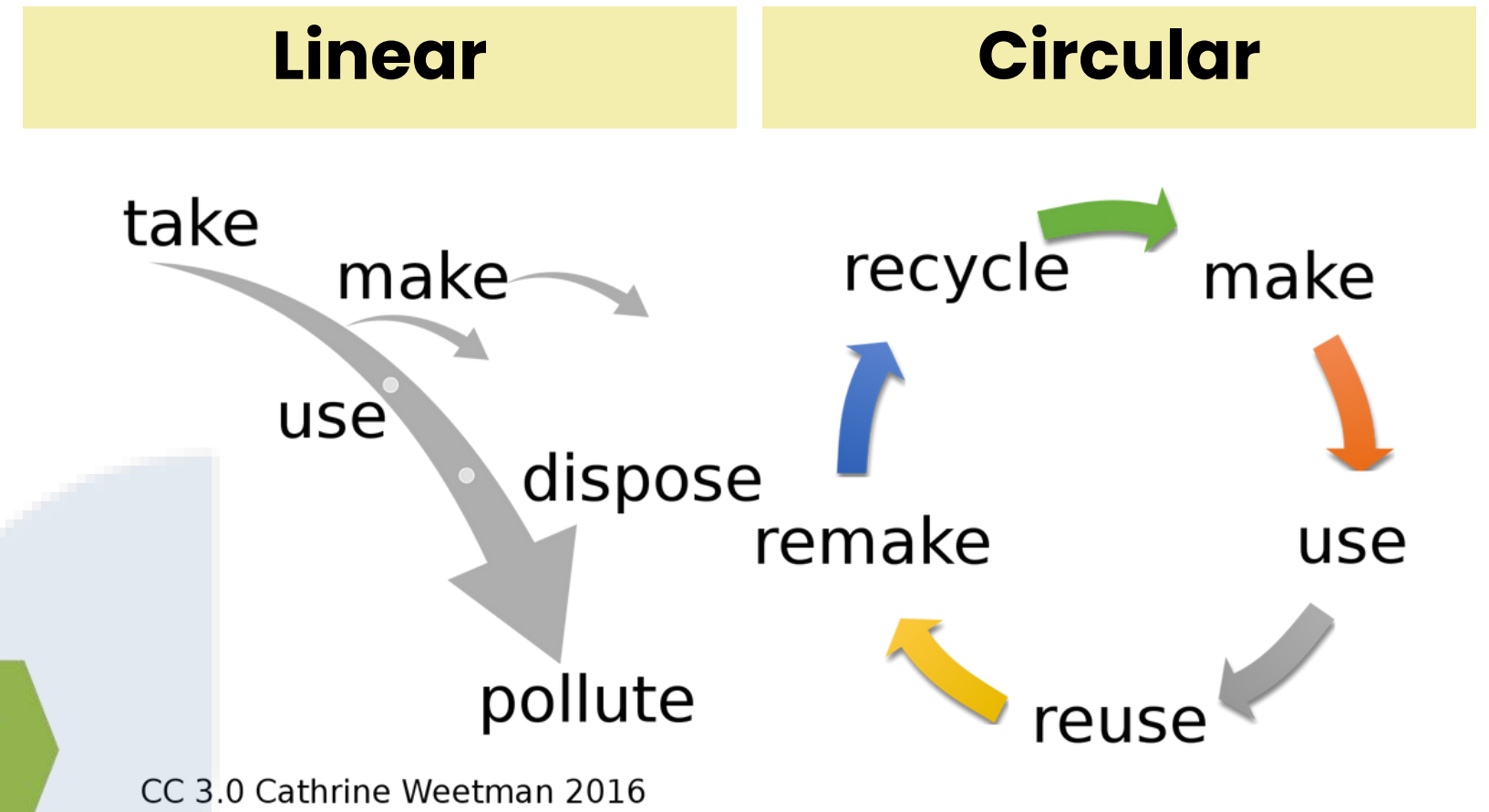
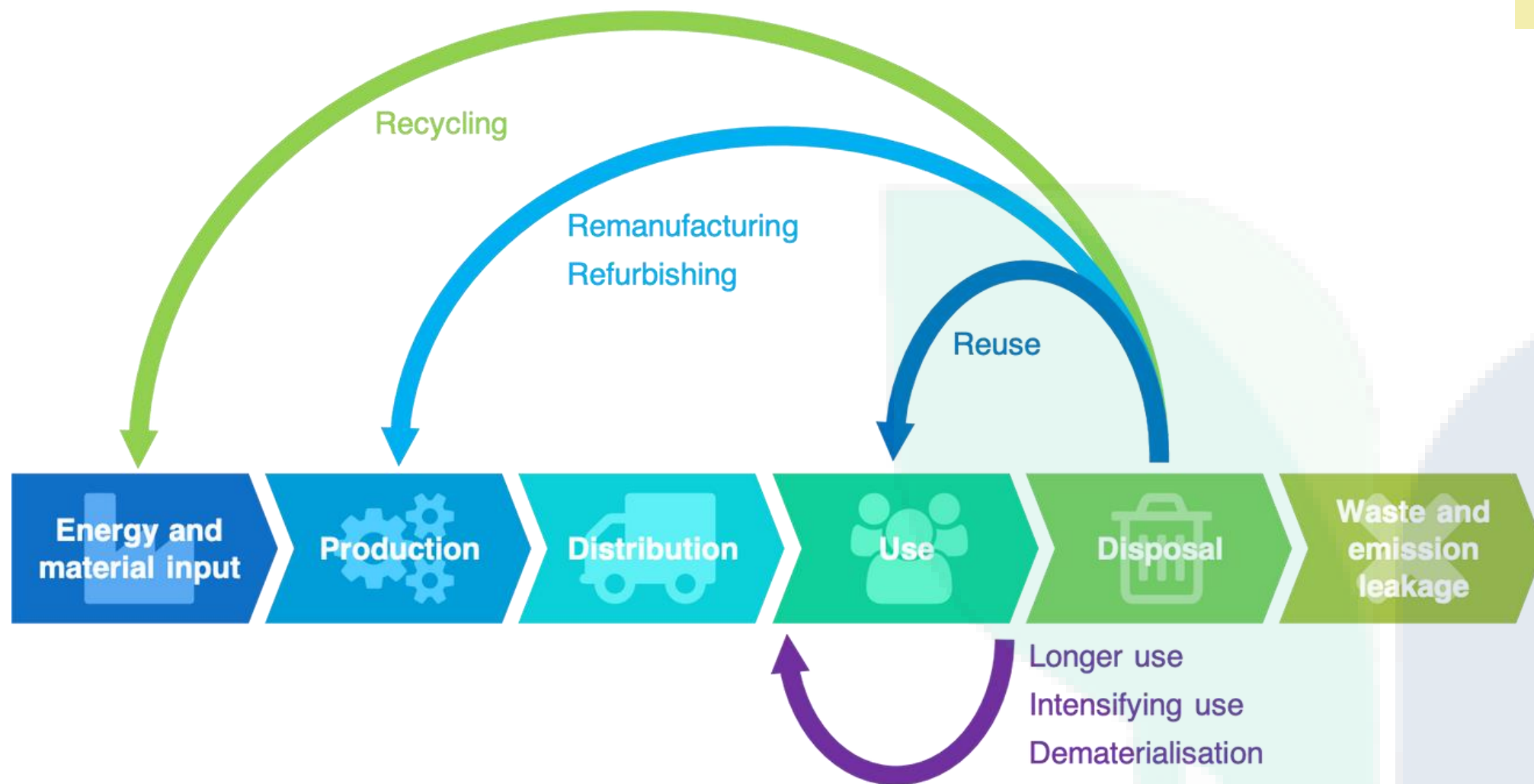
Waste Type	Total Generated ('000 tonnes)	Total Recycled ('000 tonnes)	Recycling Rate	Total Disposed ('000 tonnes)
Ferrous metal	1,338	1,331	99%	7
Paper/Cardboard	1,064	394	37%	671
Construction & Demolition	1,424	1,419	99%	5
Plastics	1,001	57	6%	944
Food	813	146	18%	667
Horticultural	221	188	85%	32
Wood	419	298	71%	121
Ash & sludge	241	27	11%	213
Textile/Leather	254	5	2%	249
Used slag	169	166	99%	2
Non-ferrous metal	92	91	98%	2
Glass	73	11	14%	63
Scrap tyres	26	25	95%	1
Others (stones, ceramics, etc.)	249	30	N.A. <sup>1</sup>	219
<b>Total</b>	<b>7,395</b>	<b>4,195</b>	<b>57%</b>	<b>3,197</b>

2022

- TOTAL WASTE GENERATION - - 7.39 MN TONS
- TOTAL WASTE RECYCLED - 4.19 MN TONS

57% Recycling

# WASTE IS CIRCULARITY



**Implementation of circularity on field for waste management can open up opportunities for public private partnership thus optimizing resources and finances available with the government and creating positive environmental and social impact**

# REVISITING ECOSYSTEM OF WASTE MANAGEMENT

Facilitators



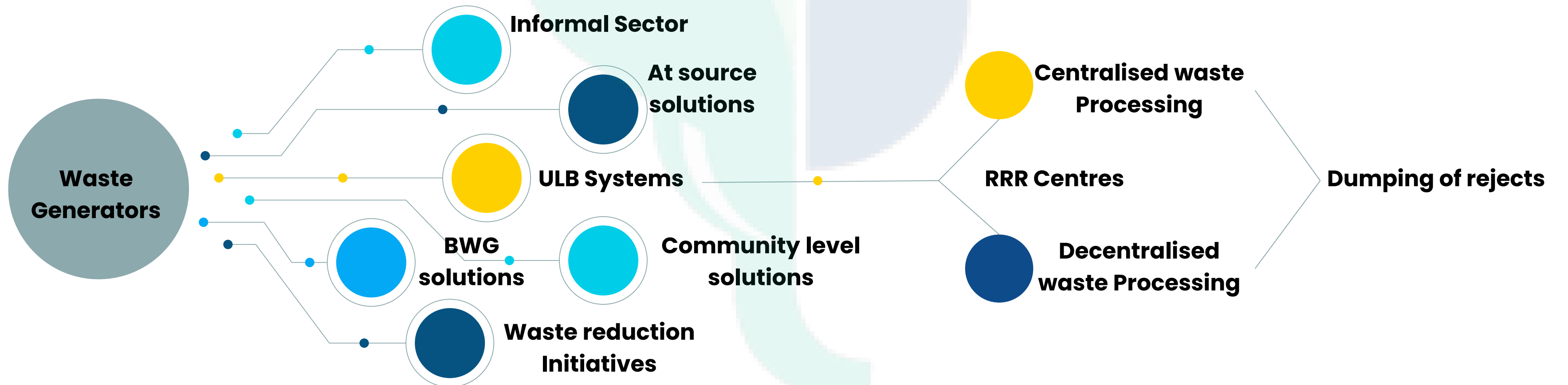
Implementors

Participants

Linear Value Chain for waste management



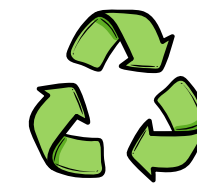
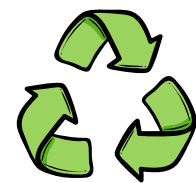
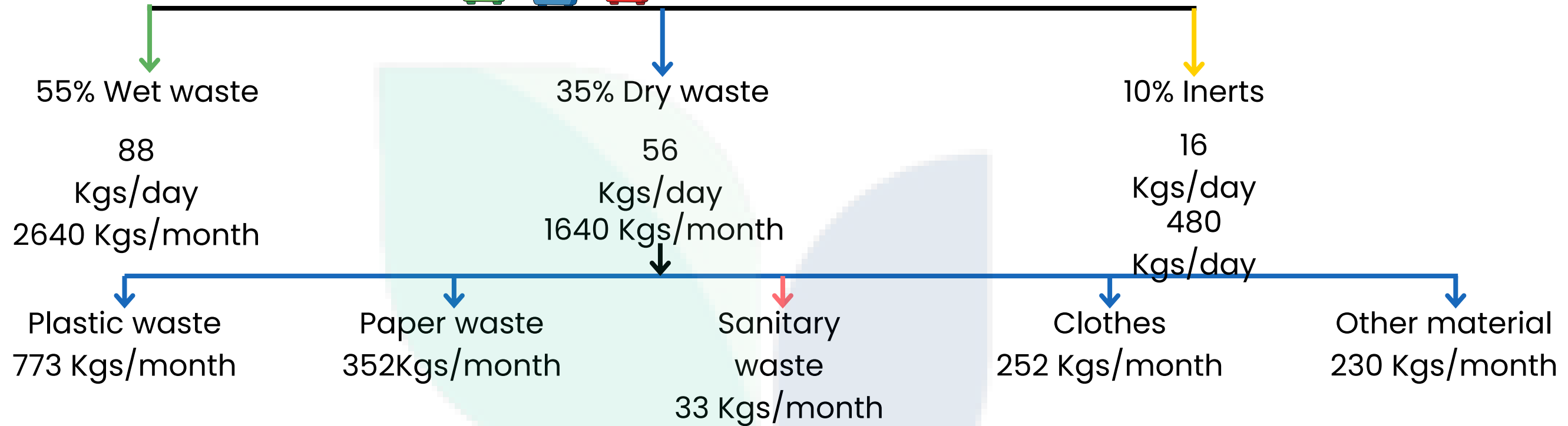
Circular Value Chain for waste management



# KNOW YOUR WASTE



## Waste Generation from Society of 100 Households



**Total Waste -  
4800 Kgs per month**

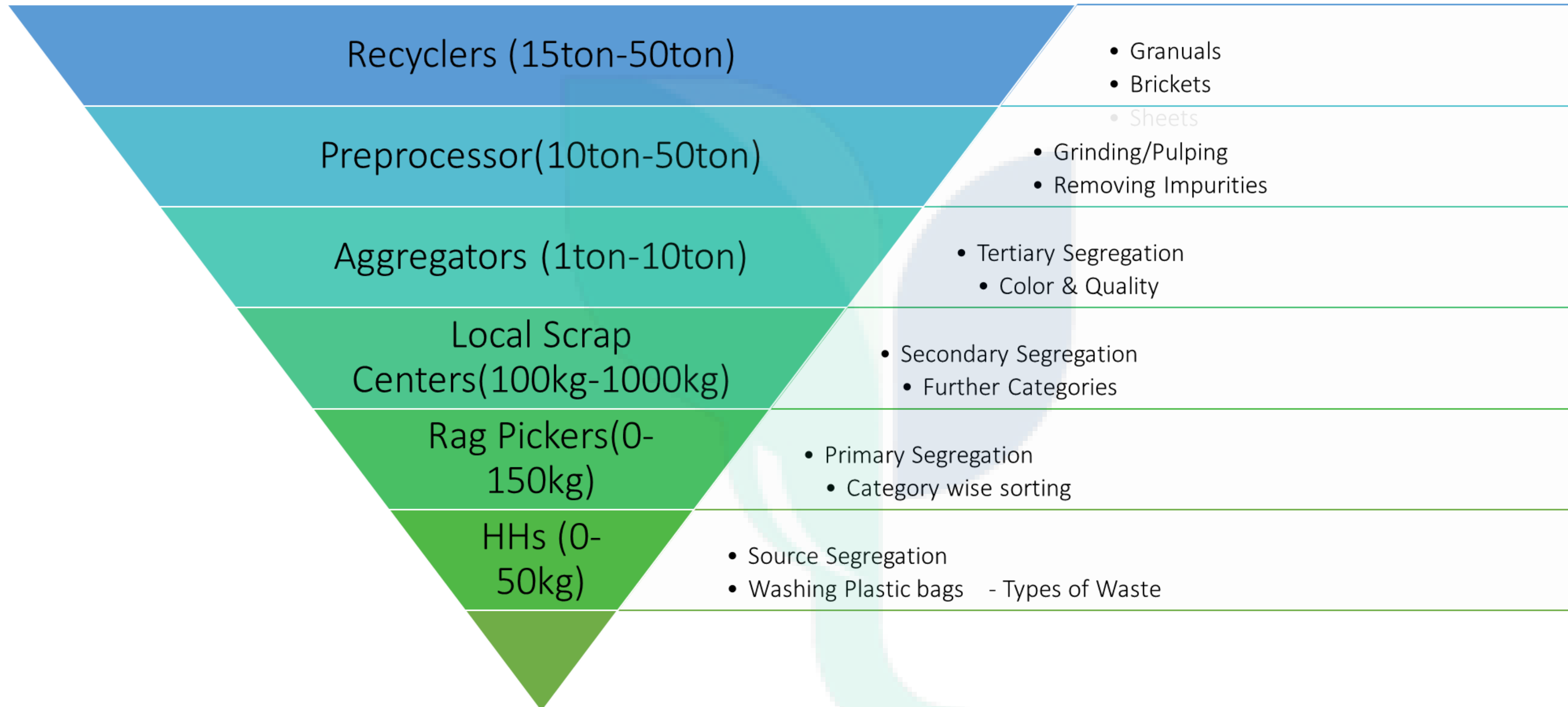
**Total waste that can be recycled -  
4050 Kgs per month**

**85%  
Recyclables**

Inerts - Silt, ceramics, contaminated material, other material that cannot be recycled

Other Material - Glass , Metal , Tyre , Thermocole

# Levels in Plastic waste aggregation



# IDEAL SCENARIO FOR A CITY

