



# PLASTICS CIRCULAR ECONOMY INITIATIVES IN GHANA

.....

## THE ZOOMLION EXPERIENCE

MOLE XXXIV WASH CONFERENCE, 30<sup>TH</sup> OCT – 2<sup>ND</sup> NOV.  
2023

*Abena N. Asomaning, Yahaya Yakubu, Glenn K. Gyimah*  
Africa Environmental Sanitation Consult Limited, Accra, Ghana.

Connect with us via  
[www.zoomlionghana.com](http://www.zoomlionghana.com) for more.  
Email: [info@zoomlionghana.com](mailto:info@zoomlionghana.com)



[www.zoomlionghana.com](http://www.zoomlionghana.com)

# PRESENTATION OUTLINE

- ABOUT US
- INTRODUCTION
- PROBLEM STATEMENT
- THE SITUATION - REFLECTION
- DRIVERS OF THE PROBLEM
- GENERATION METHODOLOGY
- SOLUTION STATEMENT – TRANSITION TO THE CIRCULAR ECONOMY
- GHANA CONCEPTS – ZOOMLION INITIATIVES
- CONCLUSION OF CIRCULAR CONCEPTS
- THE WAY FORWARD



# Brief facts on Zoomlion



Established  
In 2006



Integrated Waste  
Management  
Solutions Provider



Generated over 85,000  
Job opportunities with  
a Core Staff of 3,500



Footprints in 6  
African Countries



Presence in all 260  
MMDA's  
across the country



Silver Member -  
International Solid Waste  
Association (ISWA)



Received Numerous  
Awards Locally and  
Internationally



Silver Member – Ghana  
National Chamber of  
Commerce and Industry



# INTRODUCTION

- The circular economy is a system where materials never become waste and nature is regenerated.
- In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting.

## **The circular economy is based on three principles, driven by design:**

- Eliminate waste and pollution
- Circulate products and materials (at their highest value)
- Regenerate nature

Fig 2: World Consumption



# The Global World Is Only 7.2% Circular 2023

Today, **the world is 7,2% circular**, a percentage that is getting worse year on year, driven by rising material extraction and use.

Rising material extraction has **SHRUNK** global circularity: **from 9.1% in 2018, to 8.6% 2020, and now 7.2% in 2023.**

**This means more than 90% of materials are either wasted, lost or remain unavailable for reuse for years as they are locked into long-lasting buildings and machinery.**

**The world population increased from 1 billion in 1800 to 7.7 billion in 2020 (World Bank, 2020).**

Source: *The Circularity Gap*



IMPROVING LIVES OF PEOPLE



# PROBLEM STATEMENT

# PROBLEM STATEMENT

- **8.3 billion tonnes** of plastic have been produced, using **17 million barrels of oil** each year.
- **80% remains in landfills** or the environment,
- It takes **100 years** for plastic to degrade in the environment, and **13 million tonnes** of plastic enter the ocean each year.
- **1 million plastic bottles**, 10 million plastic bags bought every minute.
- **50% of consumer plastics** are single-use, and
- **10% of all human-generated** waste is plastic
- **100,000 marine animals** are killed by plastics each year.
- **90% of bottled water** found to contain plastic particles, 83% of tap waste



The image shows a screenshot of a BBC News article. At the top, the BBC logo is visible, along with navigation links for News, Sport, Reel, Worklife, Travel, and Future. Below this is a red banner with the word 'NEWS' in white. Underneath the banner are more navigation links: Home, Video, World, Asia, UK, Business, Tech, Science, Stories, and Entertainment. The article is categorized under 'Asia', with sub-links for 'China' and 'India'. The main headline reads 'Famous dugong dies after eating plastic'. Below the headline, the date '17 August 2019' is shown, along with social media sharing icons for Facebook, WhatsApp, Twitter, and Email, and a 'Share' button. The main image of the article shows a dugong (manatee) underwater, appearing to be in distress. The image is credited to AFP in the bottom right corner. At the bottom of the screenshot, a search bar with the text 'Type here to search' and several application icons (Edge, File Explorer, Store, Mail, Chrome) are visible.



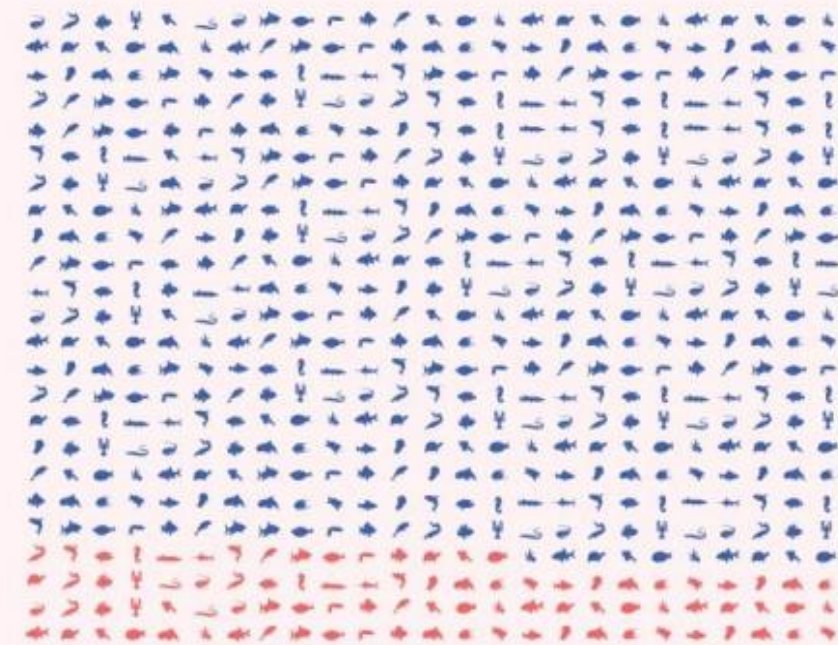
# PROBLEM STATEMENT

## Marine litter: A mammoth challenge for our oceans

By 2050, an estimated  
**99%**  
of seabirds will have  
ingested plastic



Marine litter harms over  
**600**  
marine species



**15%**  
of species affected by  
ingestion & entanglement  
from marine litter are  
endangered

#CleanSeas



By 2050, **99% of seabirds** will have ingested plastic

Marine litter harms over **600 marine species**

**15% of species** affected by ingestion & entanglement from marine litter are endangered







# THE SITUATION - Reflection



Dumping and BURNING of E-WASTE  
**INDISCRIMINATELY** was a norm leading to various  
health problems, Carting of Waste was not dignified...





Dumping of LIQUID WASTE into STREAMS and OPEN FIELDS **INDISCRIMINATELY** was a norm leading to various health problems, Carting of Waste was not dignified...



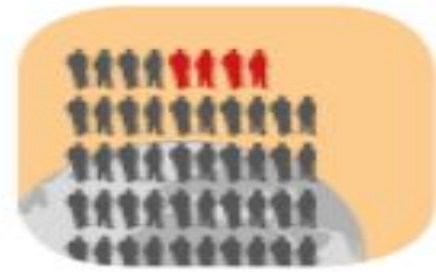
TRANSPORTING of SOLID WASTE. Dumping **INDISCRIMINATELY** was a norm leading to various health problems, Carting of Waste was not dignified!...





# DRIVERS OF THE PROBLEMS....

# DRIVERS OF THE PROBLEMS....



**Growing population**  
from 7 billion today  
to 9 billion by 2050



**Economic develop-  
ment** and increasing  
global trade



Growing middle-class  
with **changing con-  
sumption patterns**



Increasing  
**consumption  
of biomass**



# DRIVERS OF THE PROBLEMS....



# WASTE GENERATION METHODOLOGY





# Waste Generation Projection Methodology

To ensure cross-comparability of waste generation data and to develop projections for global waste generation, available waste generation data were adjusted from a variety of origin years to 2016, 2030, and 2050.

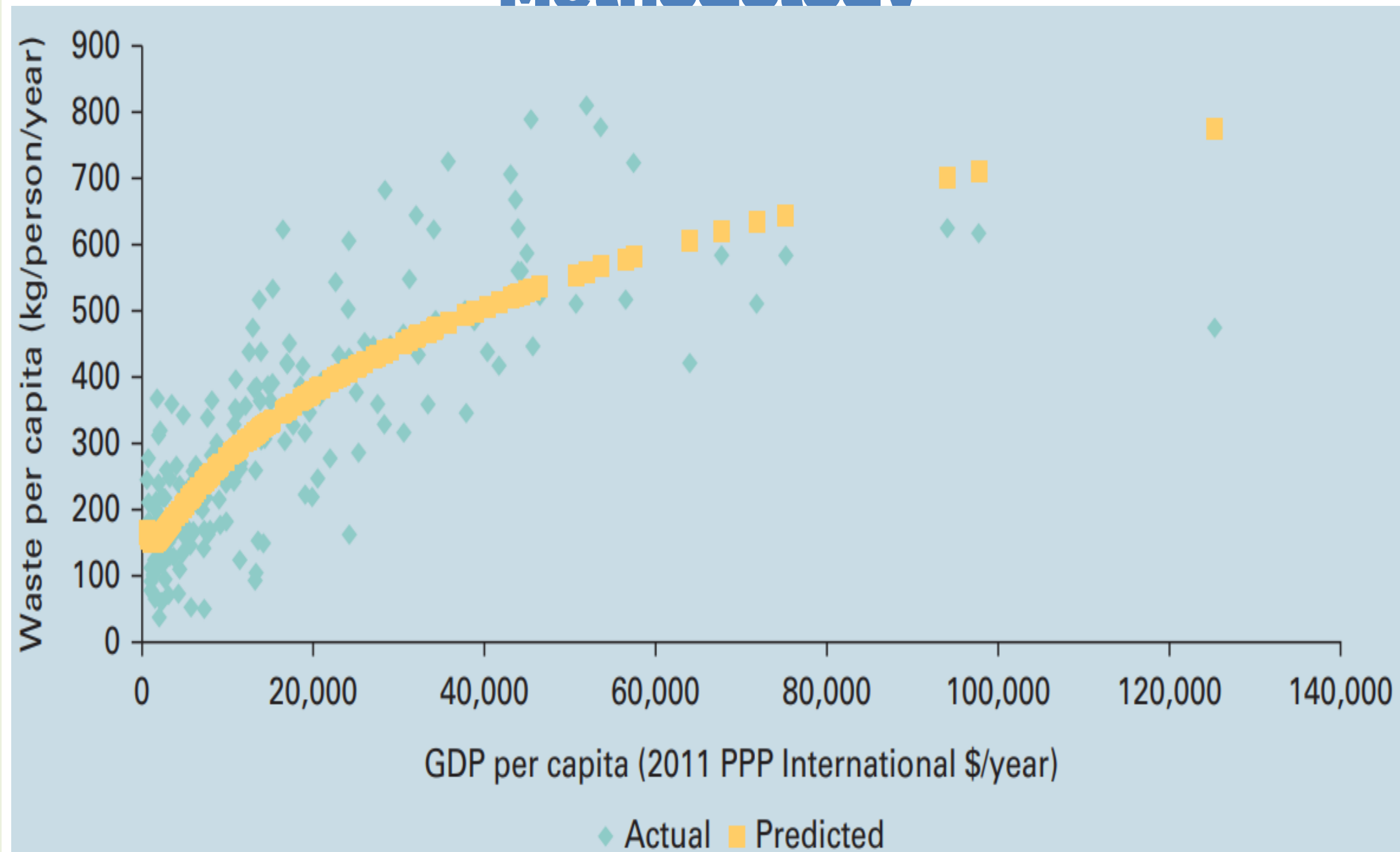
## Key Assumptions

This analysis assumes that waste generation grows primarily based on two factors:

- **Gross domestic product (GDP) growth:**

As a country advances economically, its per capita waste generation rates increase. Economic growth is reflected using GDP per capita, with a purchasing power parity adjustment to 2011 to allow for comparison across countries.

- **Population growth:** As a country's population grows, amounts of total waste generated rise accordingly.



Note: GDP = gross domestic product.

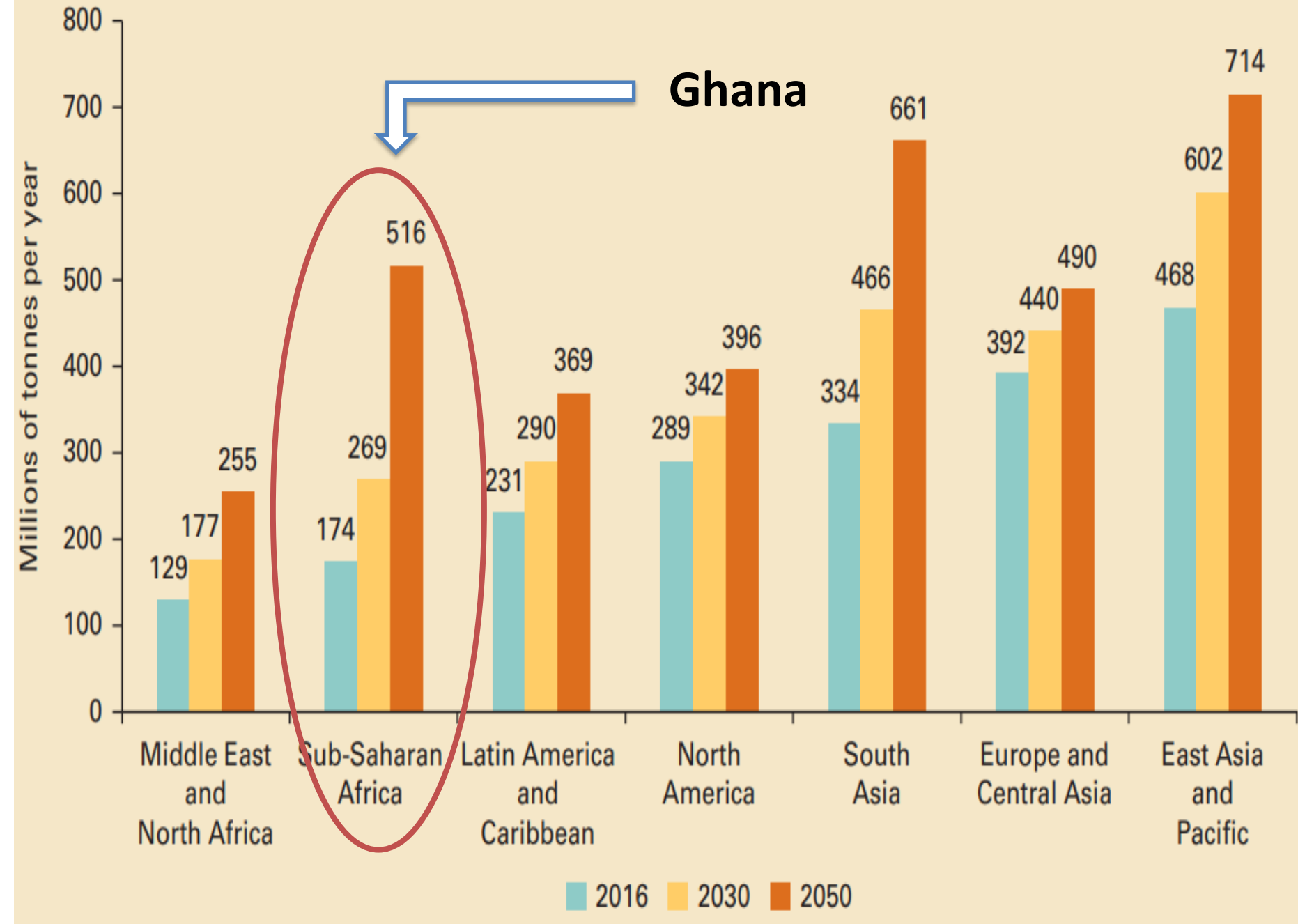


IMPROVING LIVES OF PEOPLE

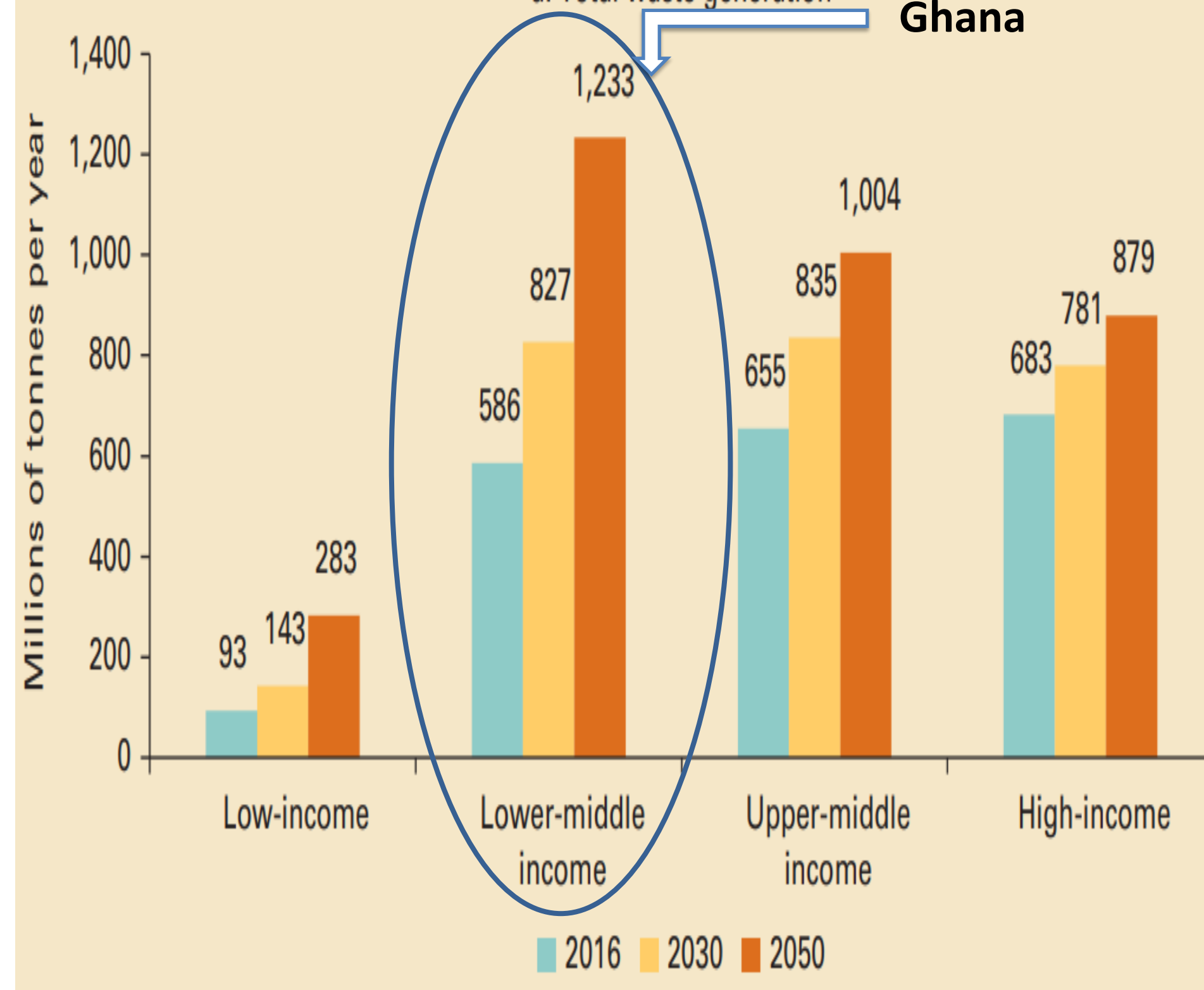


# Waste Generation Projection

a. Total projected waste generation



a. Total waste generation

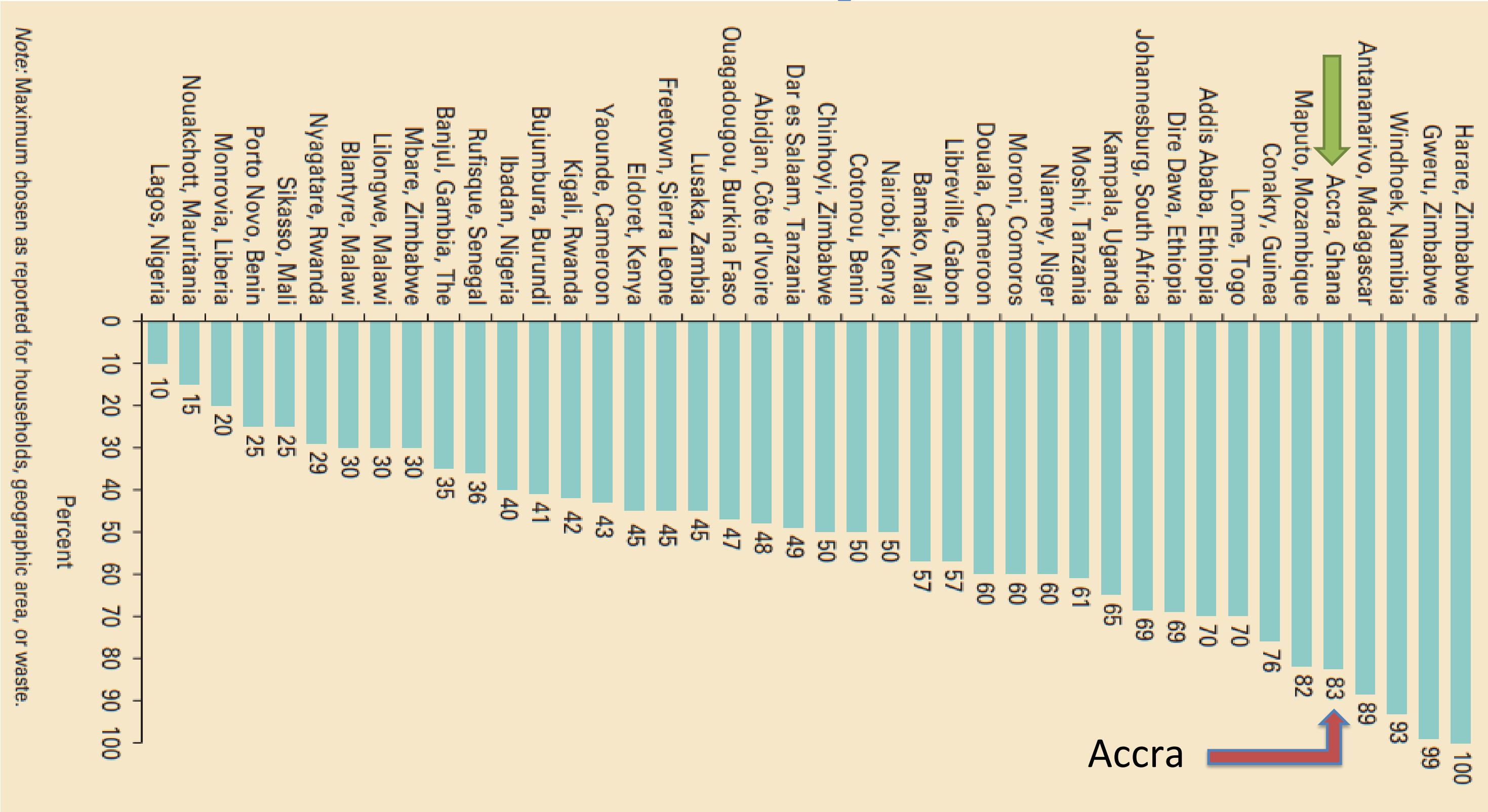


**Data Sources** • Waste Generation: Best available national waste generation data from current study • Base Year and 2016 Population: World Bank Open Data • 2030 and 2050 Population: UN Population Projections, Medium Variant, 2017 Revision • GDP per Capita, PPP (constant 2011 international \$): World Bank's World Development Indicators • GDP per Capita, PPP (constant 2005 international \$): OECD What a Waste: A Global Snapshot of Global Municipal Waste to 2050



# Waste Collection Rates for Select Cities in Sub-Saharan Africa

## per cent



Accra came 5<sup>th</sup> in the waste collection rates for selected cities in Sub-Saharan Africa.

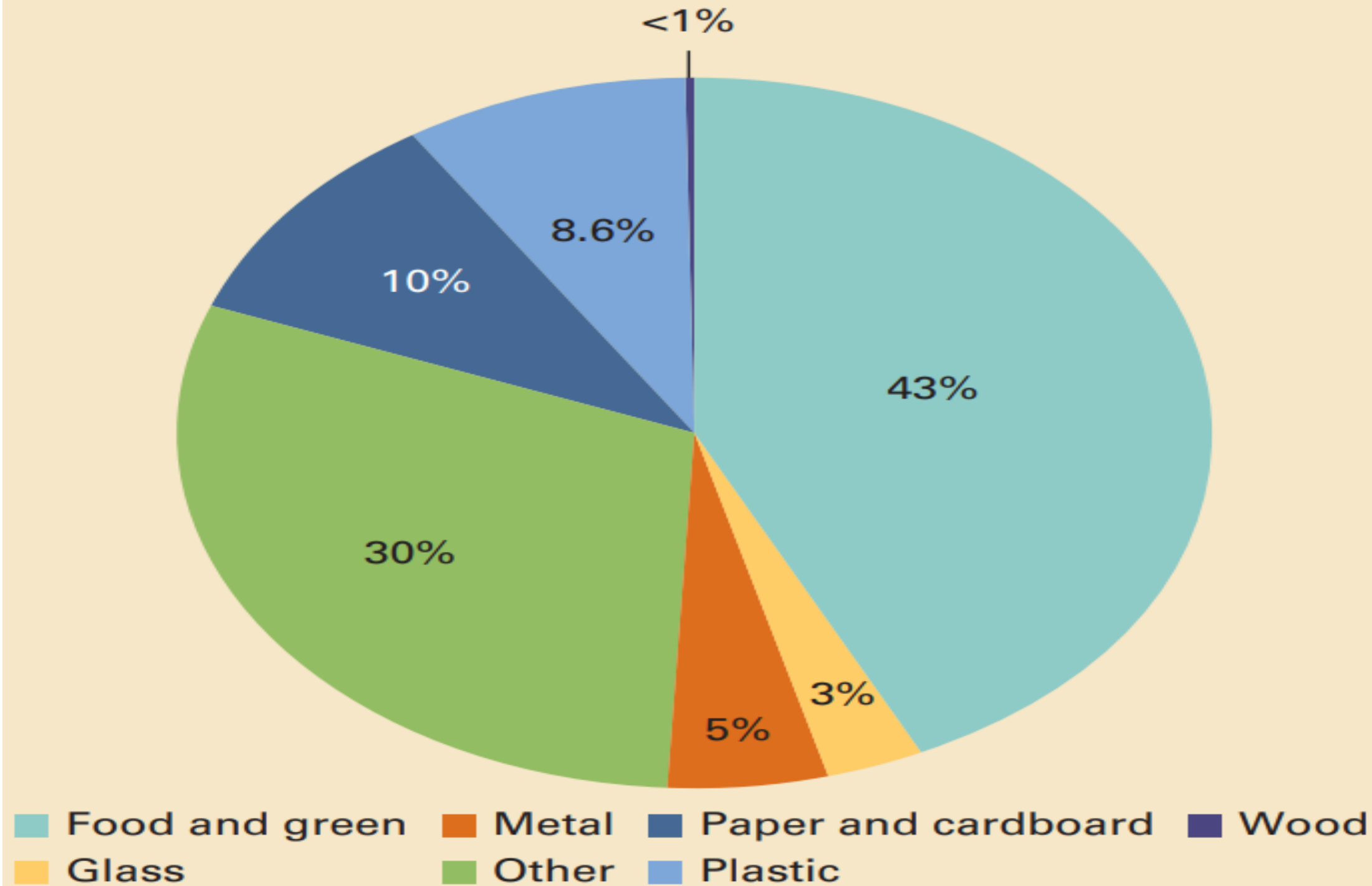
I think it is a collective effort of GoG, MSWR, ESPA, Zoomlion, and others.

Data Sources • Waste Generation: Best available national waste generation data from current study • Base Year and 2016 Population: World Bank Open Data • 2030 and 2050 Population: UN Population Projections, Medium Variant, 2017 Revision • GDP per Capita, PPP (constant 2011 international \$): World Bank's World Development Indicators • GDP per Capita, PPP (constant 2005 international \$): OECD. What a Waste: A Global Snapshot of Global Municipal Waste to 2050



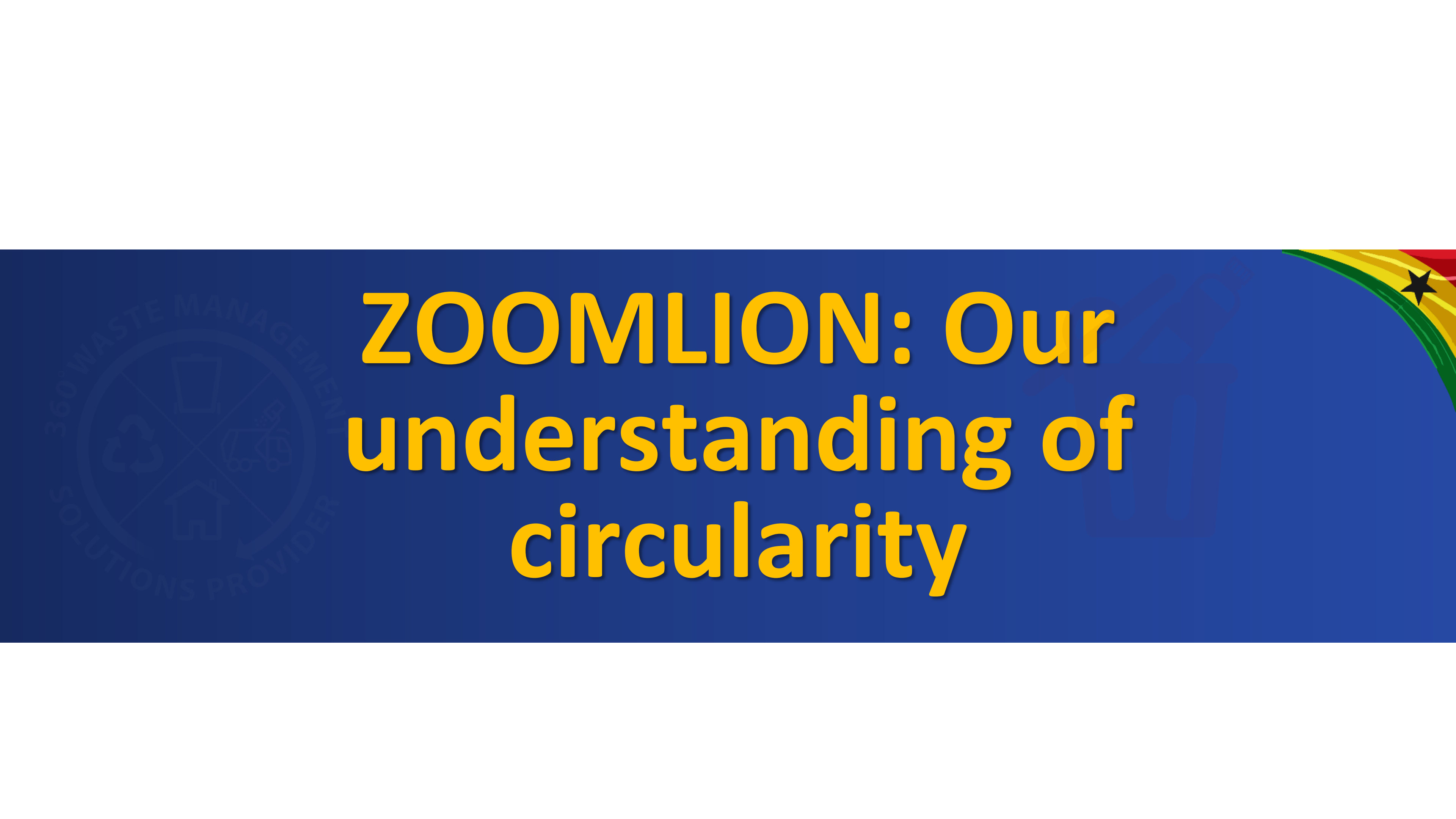
# Waste Collection Rates for Select Cities in Sub-Saharan Africa per cent

3.33 Waste Composition in Sub-Saharan Africa  
nt



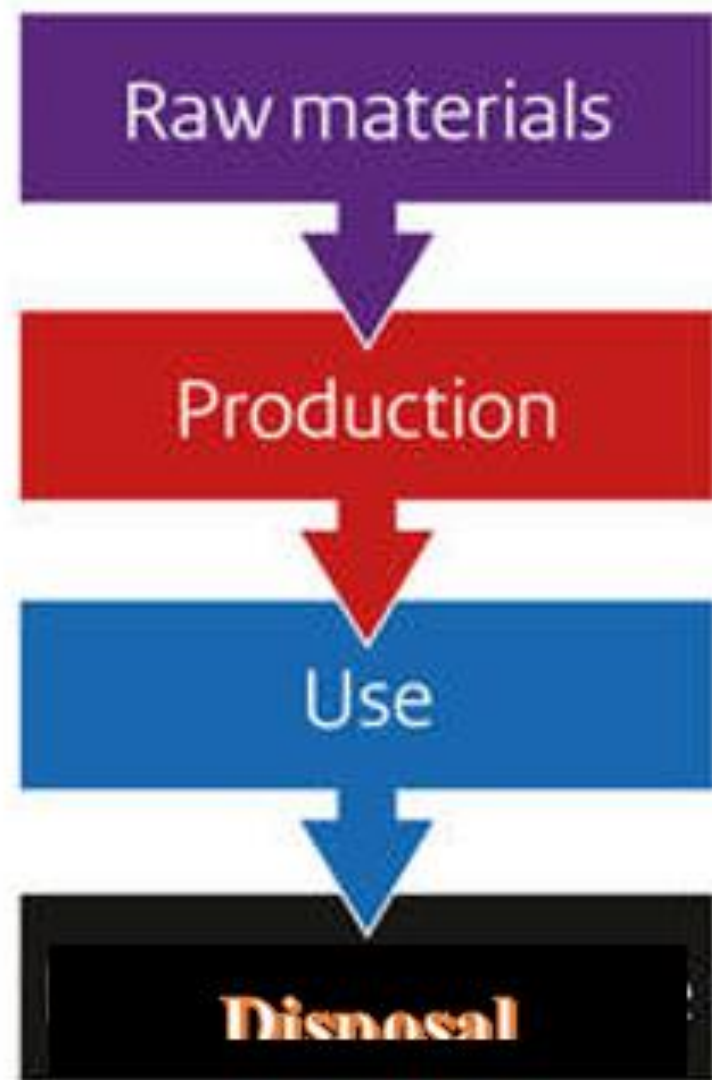
Data Sources • Waste Generation: Best available national waste generation data from current study • Base Year and 2016 Population: World Bank Open Data • 2030 and 2050 Population: UN Population Projections, Medium Variant, 2017 Revision • GDP per Capita, PPP (constant 2011 international \$): World Bank's World Development Indicators • GDP per Capita, PPP (constant 2005 international \$): OECD. What a Waste: A Global Snapshot of Global Municipal Waste to 2050



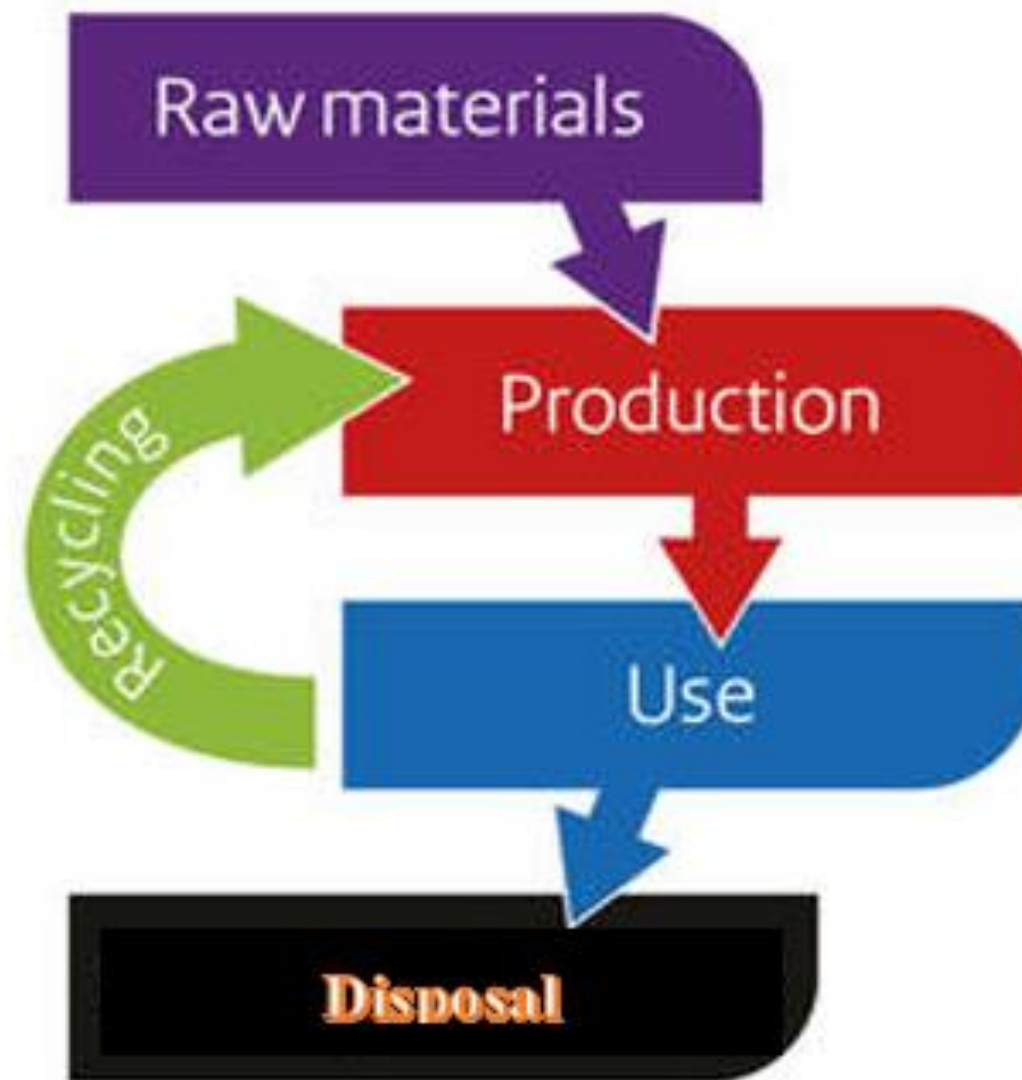


# ZOOMLION: Our understanding of circularity

# Transition to Circular Economy Business



Linear Business Model



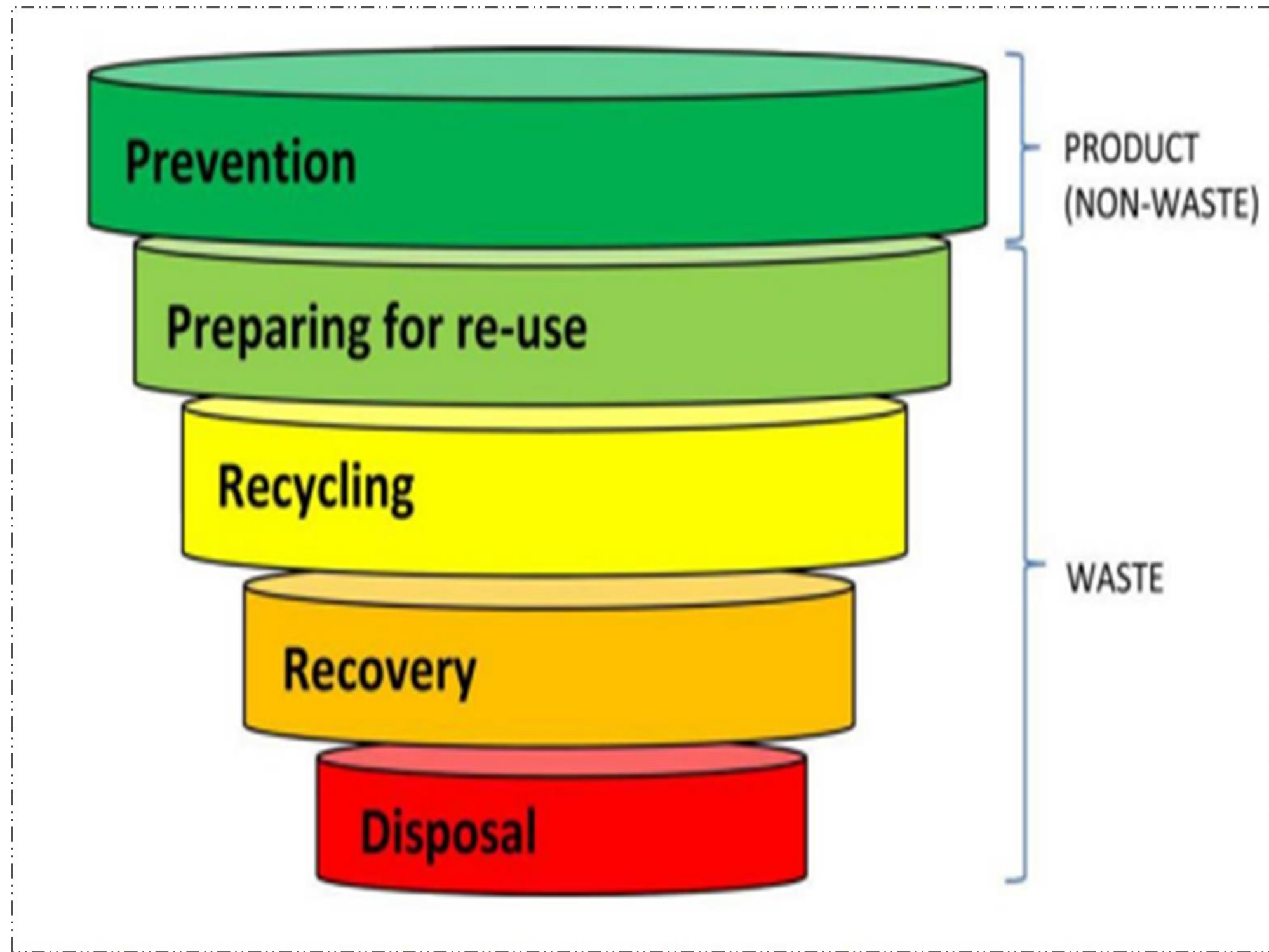
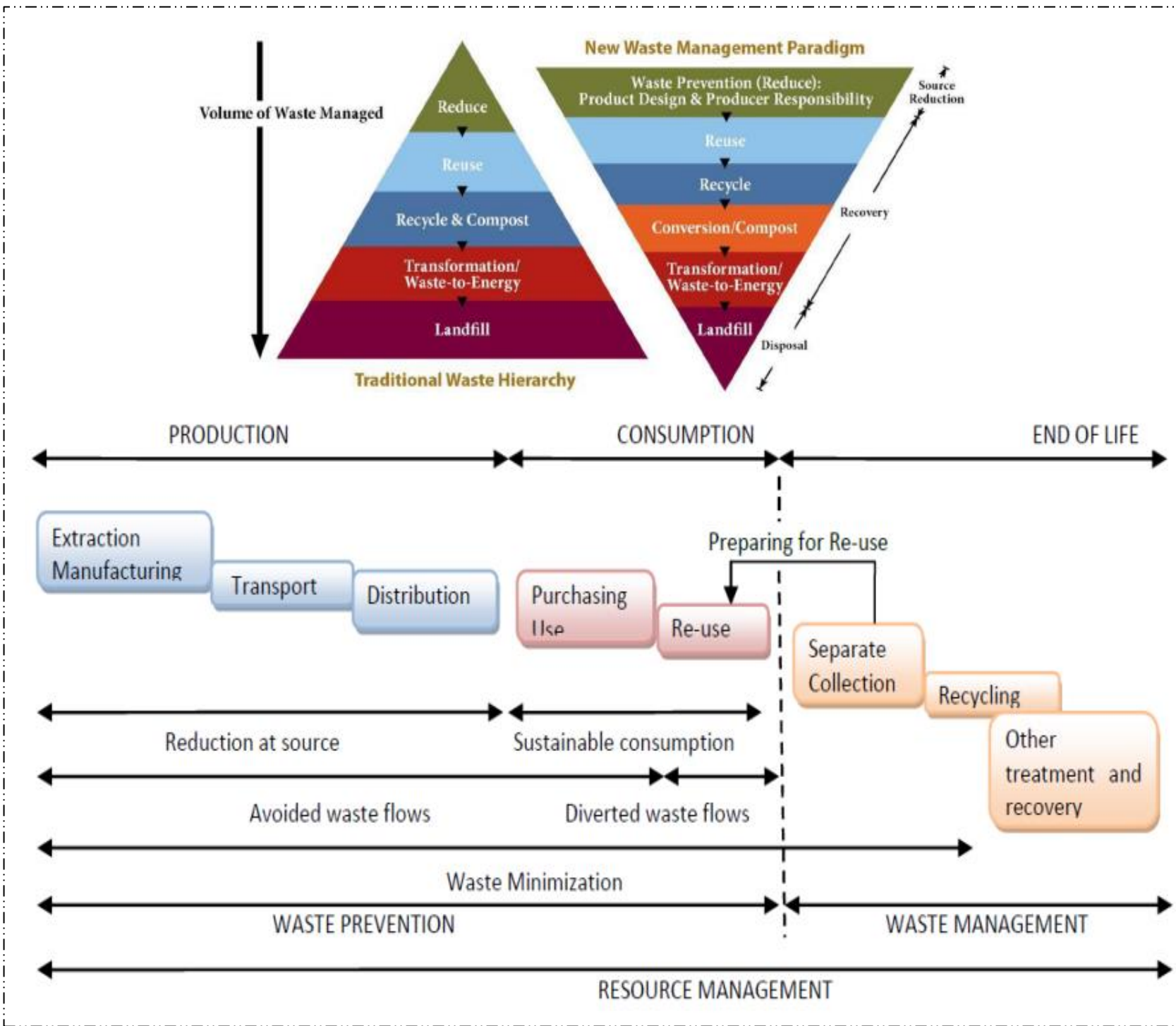
Recycling Business Model



Circular Economy Business Model

# SOLUTION STATEMENT

Circular Economy is a paradigm shift from Waste Management to Resource Management



**Data Sources** • Waste Generation: Best available national waste generation data from current study • Base Year and 2016 Population: World Bank Open Data • 2030 and 2050 Population: UN Population Projections, Medium Variant, 2017 Revision • GDP per Capita, PPP (constant 2011 international \$): World Bank's World Development Indicators • GDP per Capita, PPP (constant 2005 international \$): OECD. What a Waste: A Global Snapshot of Global Municipal Waste to 2050



# SOLUTION STATEMENT

(20th century)

**Mass consumption society**



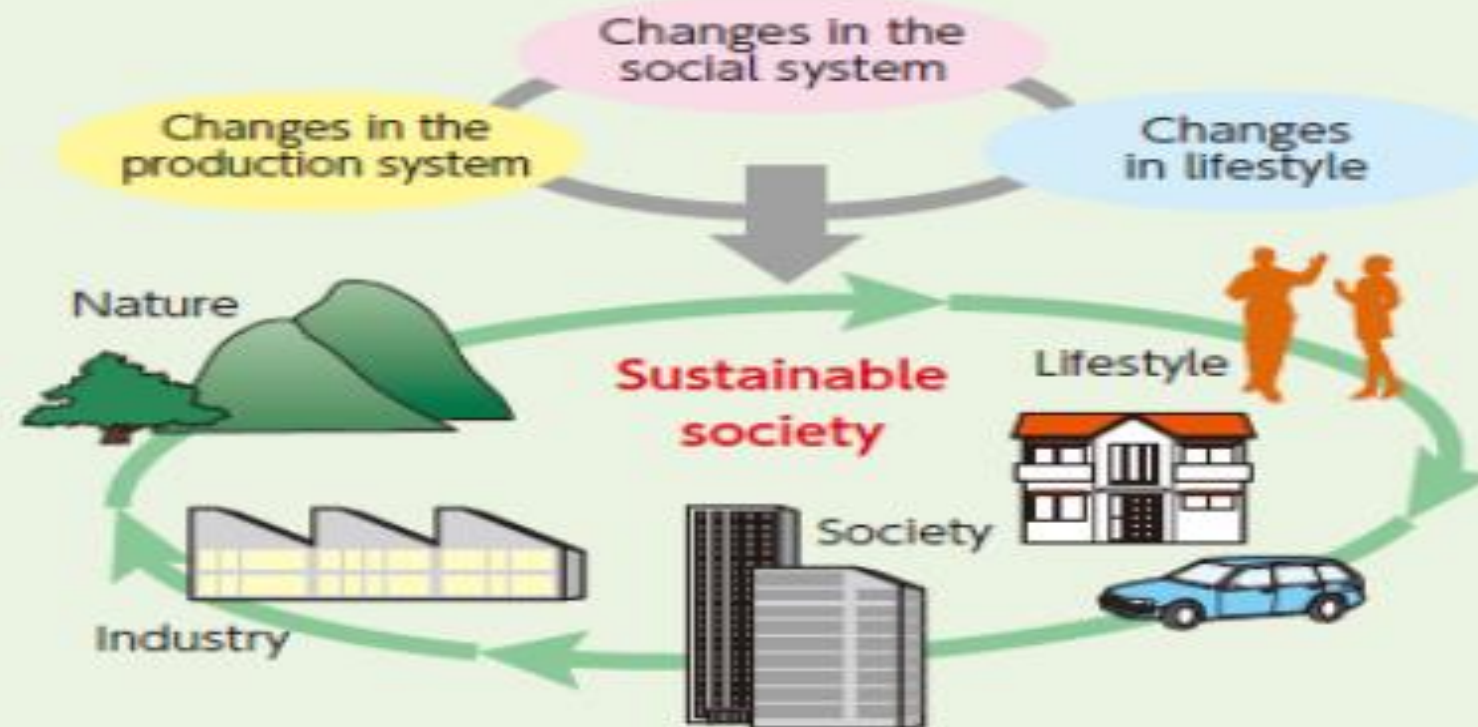
**Increase in environmental impact**

**Expansion of resource consumption**

(21st century)

**Sound material-cycle society**

- Promotion of 3R (Reduce, Reuse, Recycle) and proper waste disposal



**Reduction in natural resource consumption**

**Reduction in environmental impact**





# SOLUTION STATEMENT

## **Ghana Government and CONIWAS Initiative:**

The Minister for Sanitation and Water Resources launched the Ghana WASH Sector Development Programme (GWASHSDP) which aims to ensure effective coordination and implementation of WASH activities in Ghana.

The population with access to basic drinking water services has increased from 79% in 2017/2018 to 87.7% in 2021.

Population with access to improved toilet facilities, including public toilets has also increased from 66% to 80.8% within the same period.

The Government, through the MSWR, is investing an amount of US\$ 1.4 billion in several water and sanitation projects nationwide”.

Data Sources • Waste Generation: Best available national waste generation data from current study • Base Year and 2016 Population: World Bank Open Data • 2030 and 2050 Population: UN Population Projections, Medium Variant, 2017 Revision • GDP per Capita, PPP (constant 2011 international \$): World Bank's World Development Indicators • GDP per Capita, PPP (constant 2005 international \$): OECD. What a Waste: A Global Snapshot of Global Municipal Waste to 2050



# SOLUTION STATEMENT

Zoomlion **revolutionized** the Waste Management Industry in Ghana .....



IN THE YEAR





# ZOOMLION CIRCULARITY PRINCIPLE

# The Waste Management Cycle



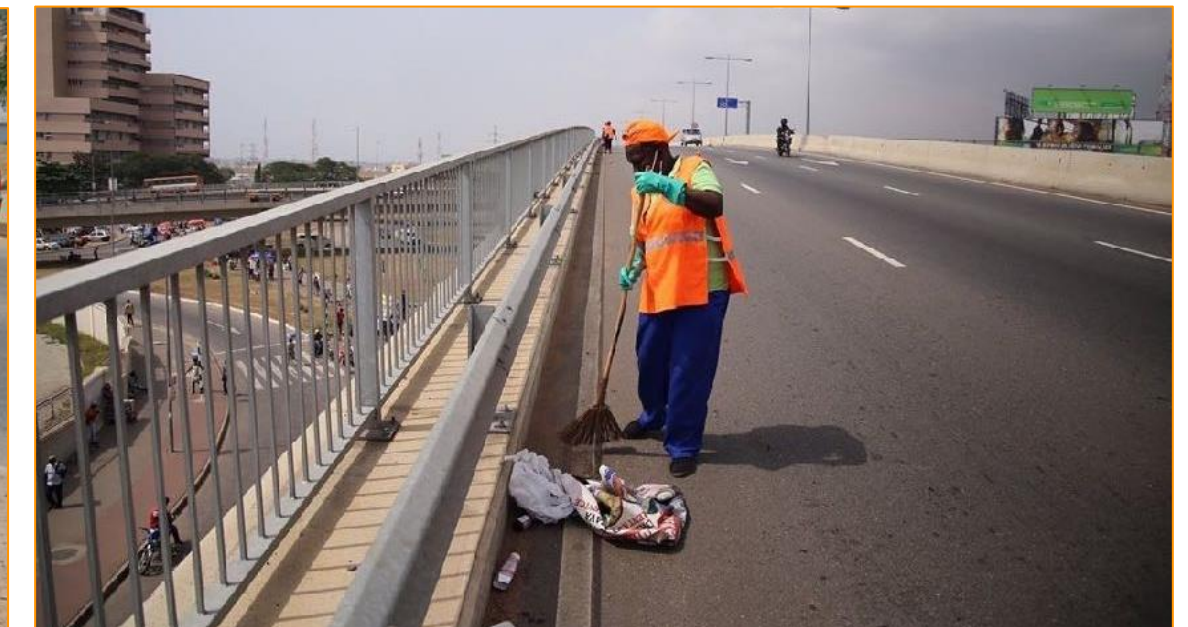
a 360 degrees solution to Waste Management





# **CLEANING, COLLECTION & STORAGE**

# Public Cleansing & Provision of Standard Waste Bins for Waste Storage



# 1 Million Bin Concept

We have embarked on a **nationwide distribution of Free Waste Bins** to households in Ghana. The distribution of one **(1) million waste bins** to various households in Ghana seeks to significantly improve solid waste

collection in the country.

**ZL** | **1 MILLION FREE DUSTBINS**

**#Stopthetrash**  
**#getabin**

**Dial \*857#**

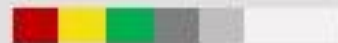
**Click to get a BIN**

T & C apply

Powered by



IMPROVING LIVES OF PEOPLE



# OUR CIRCULARITY PRINCIPLE

Haulage, Transportation, Waste Transfer & Treatment



# Haulage Transport &

Collection of Waste From  
Households, Streets And Public  
Places



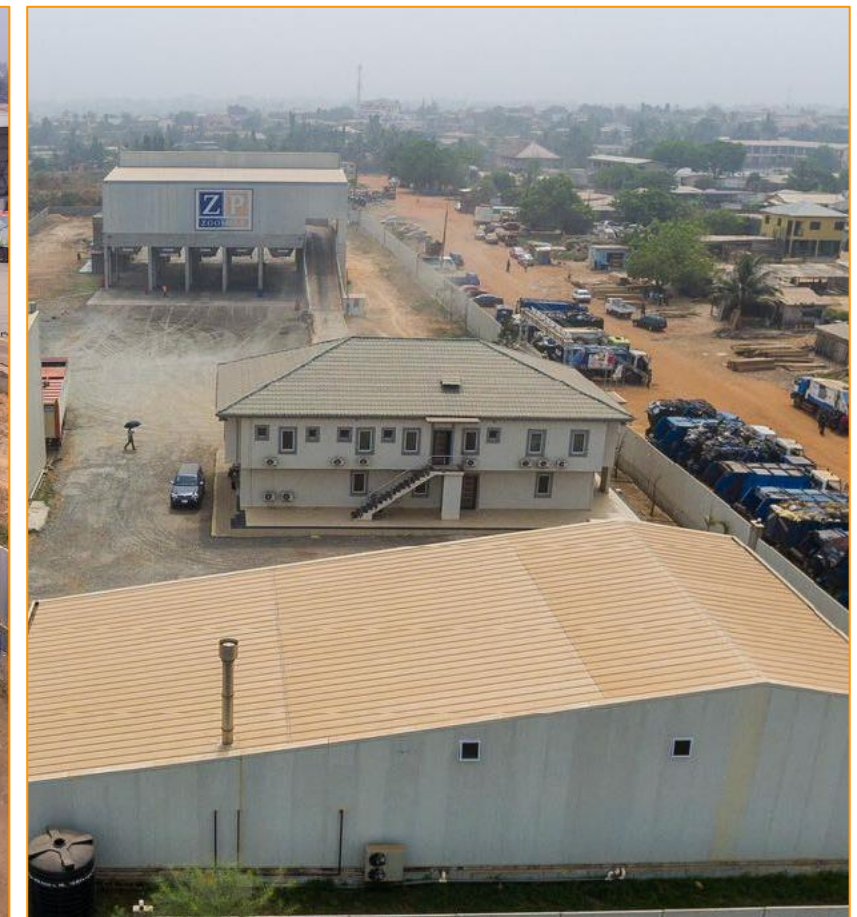
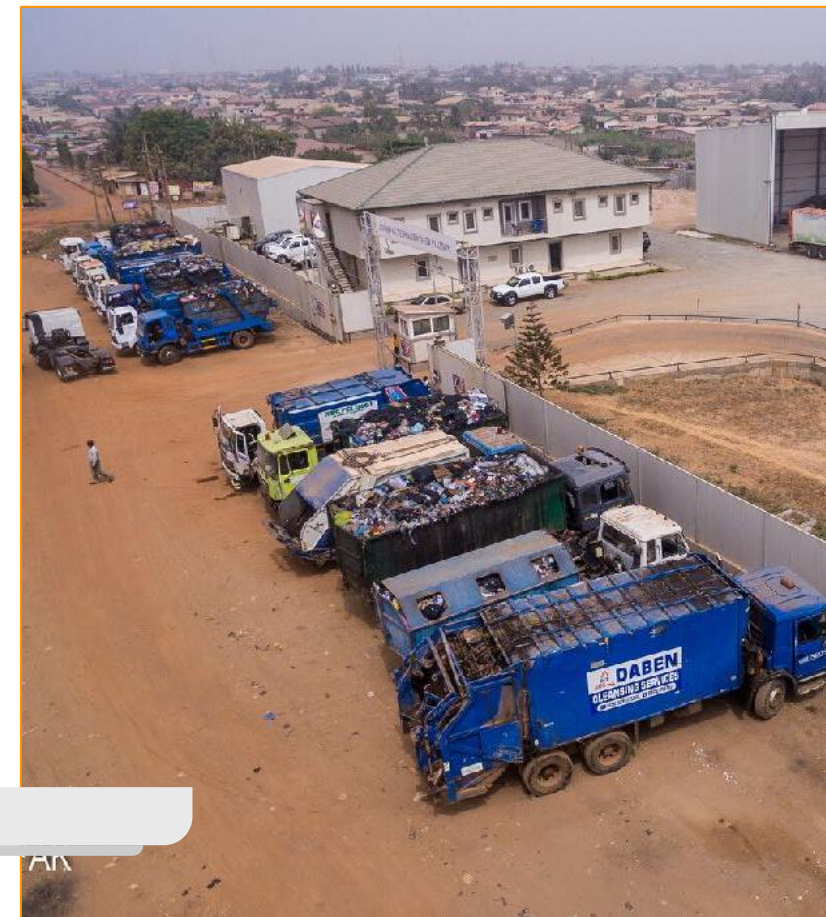
IMPROVING LIVES OF PEOPLE





Achimota & Teshie

# Waste Transfer Stations



IMPROVING LIVES OF PEOPLE



# ACCRA COMPOST AND RECYCLING PLANT



Capacity = 600T/D



*... Truly Natural*



IMPROVING LIVES OF PEOPLE



# EXPANSION OF ACCRA COMPOST AND RECYCLING PLANT

October, 2021

Capacity = 2,000T/D



# KUMASI COMPOST AND RECYCLING PLANT

September, 2021

Capacity = 1,000T/D



# INTEGRATED RECYCLING AND COMPOST PLANT

April, 2019



# Construction of Compost and Recycling Plants in all 16 Regions of Ghana



Oti Region



Ahafo Region



North East Region



Bono Region



# PLASTIC WASTE TREATMENT OPTIONS

# Plastic Waste Treatment

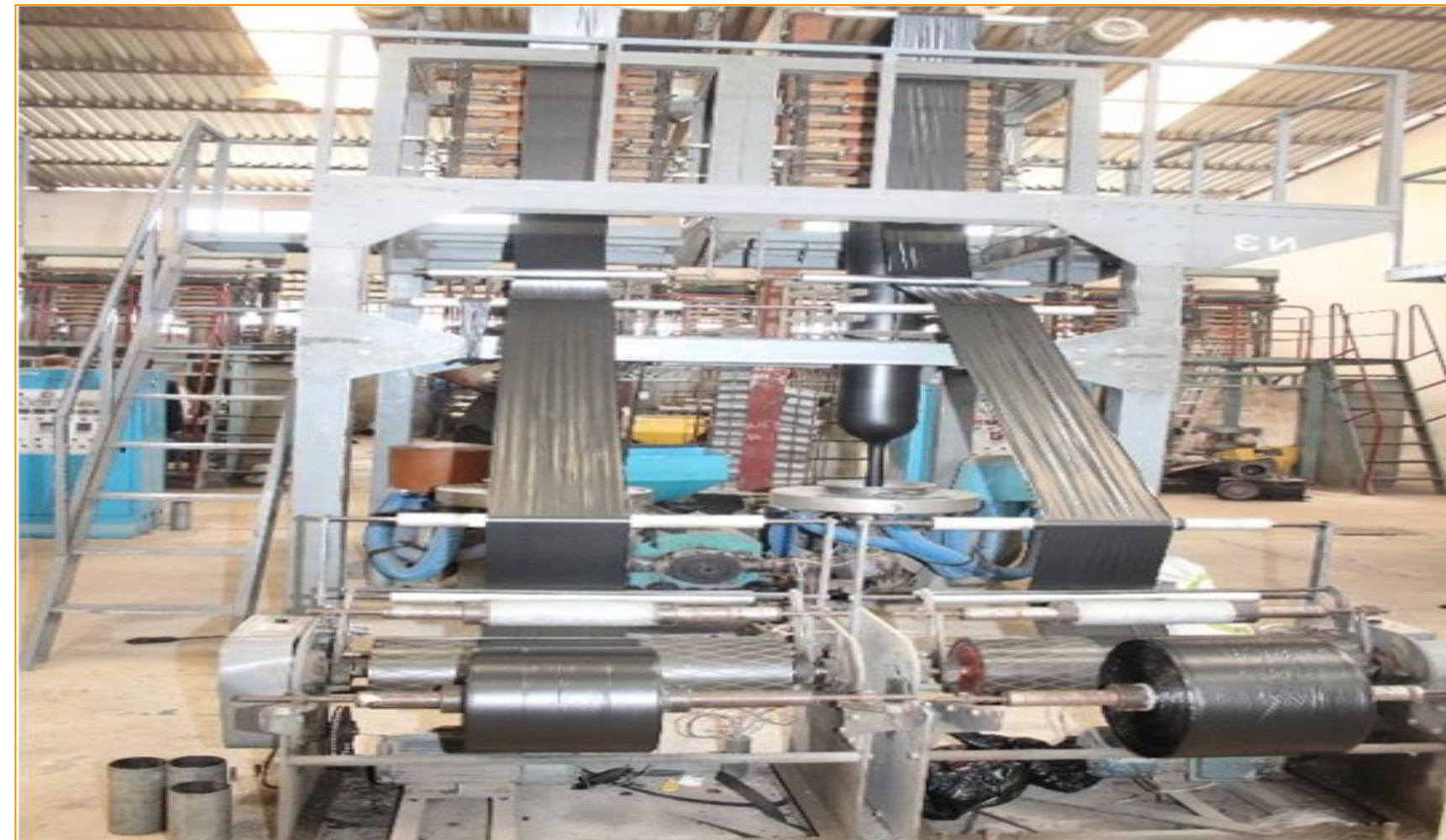
## Bin Production





# Plastic Waste Treatment

Bin Liner Production



IMPROVING LIVES OF PEOPLE





# LIQUID WASTE TREATMENT OPTIONS

# Sewerage Systems Ghana Limited



sewerage systems ghana Ltd  
clean environment . green energy

Establishment of **LAVENDER HILL  
FECAL and WATER WASTE  
TREATMENT PLANT**



IMPROVING LIVES OF PEOPLE





**sewerage systems ghana Ltd**  
clean environment . green energy



## SLUDGE PROCESSING FOR BIOCHAR



IMPROVING LIVES OF PEOPLE



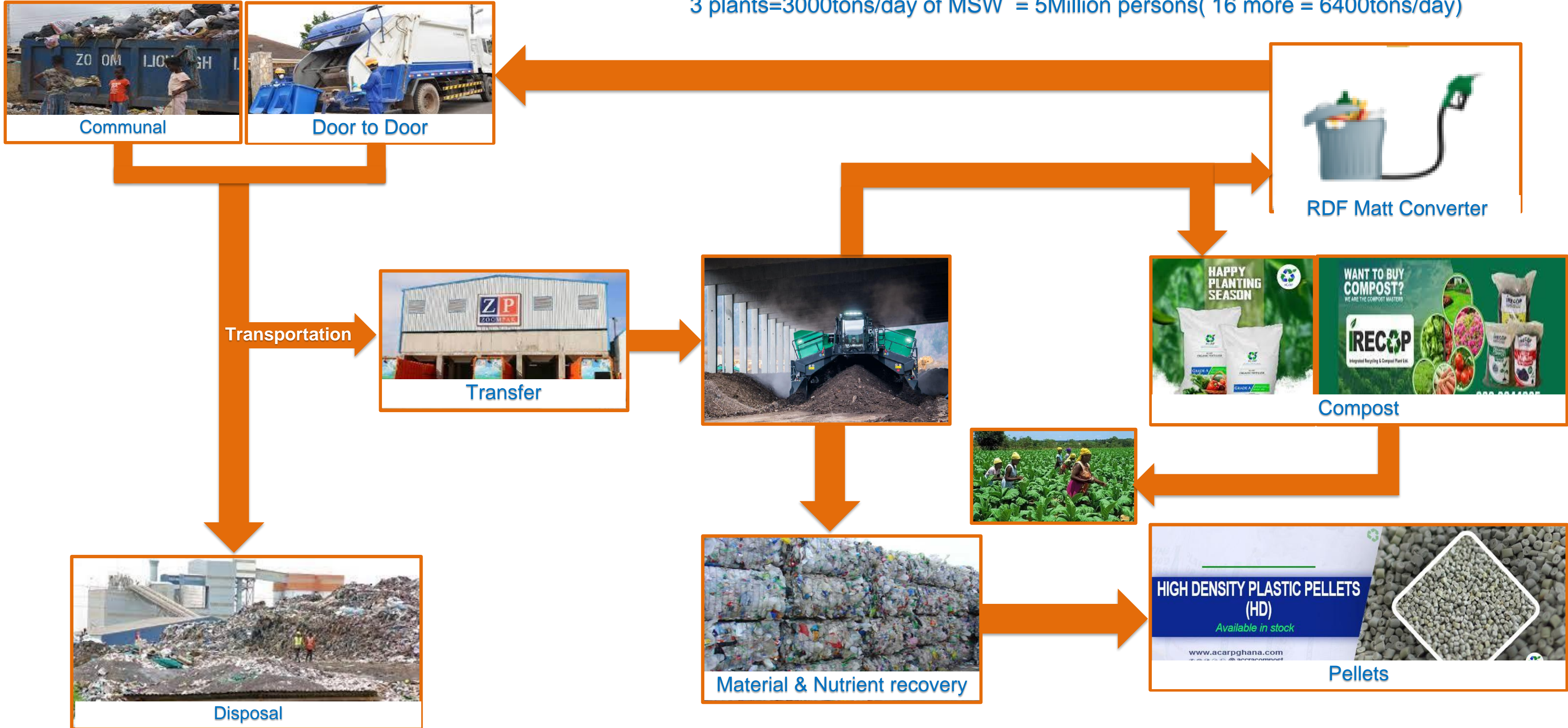


**In Conclusion...**

# Initial system: Linear

# Circularity: Recovery and Composting, RDF

3 plants=3000tons/day of MSW = 5Million persons( 16 more = 6400tons/day)



# COMMUNITY-BASED CIRCULAR ECONOMY - IRECOP

Community



1H1Bin



MSW Generated



Waste Collection/Trans



IRECOP



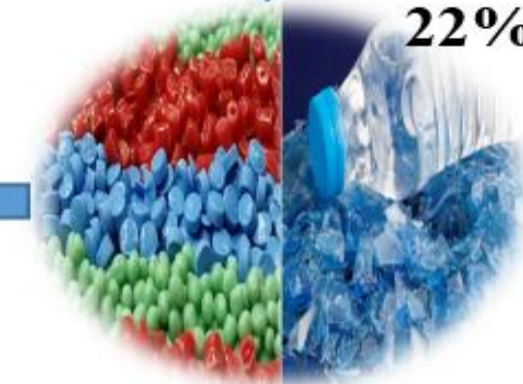
RDF Mat Convertor



RDF/Residual

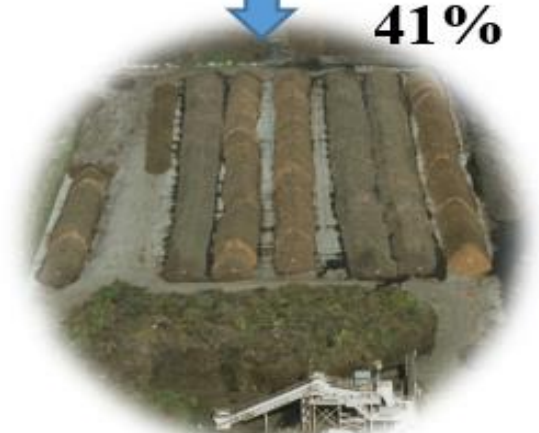
21%

Metal/Paper/Oth 16%



Pelletized/Flaked – 122  
Crushers, 40 Pelletizers

22%



Organics

41%



Plastic Manufacturing Plant - UPPR

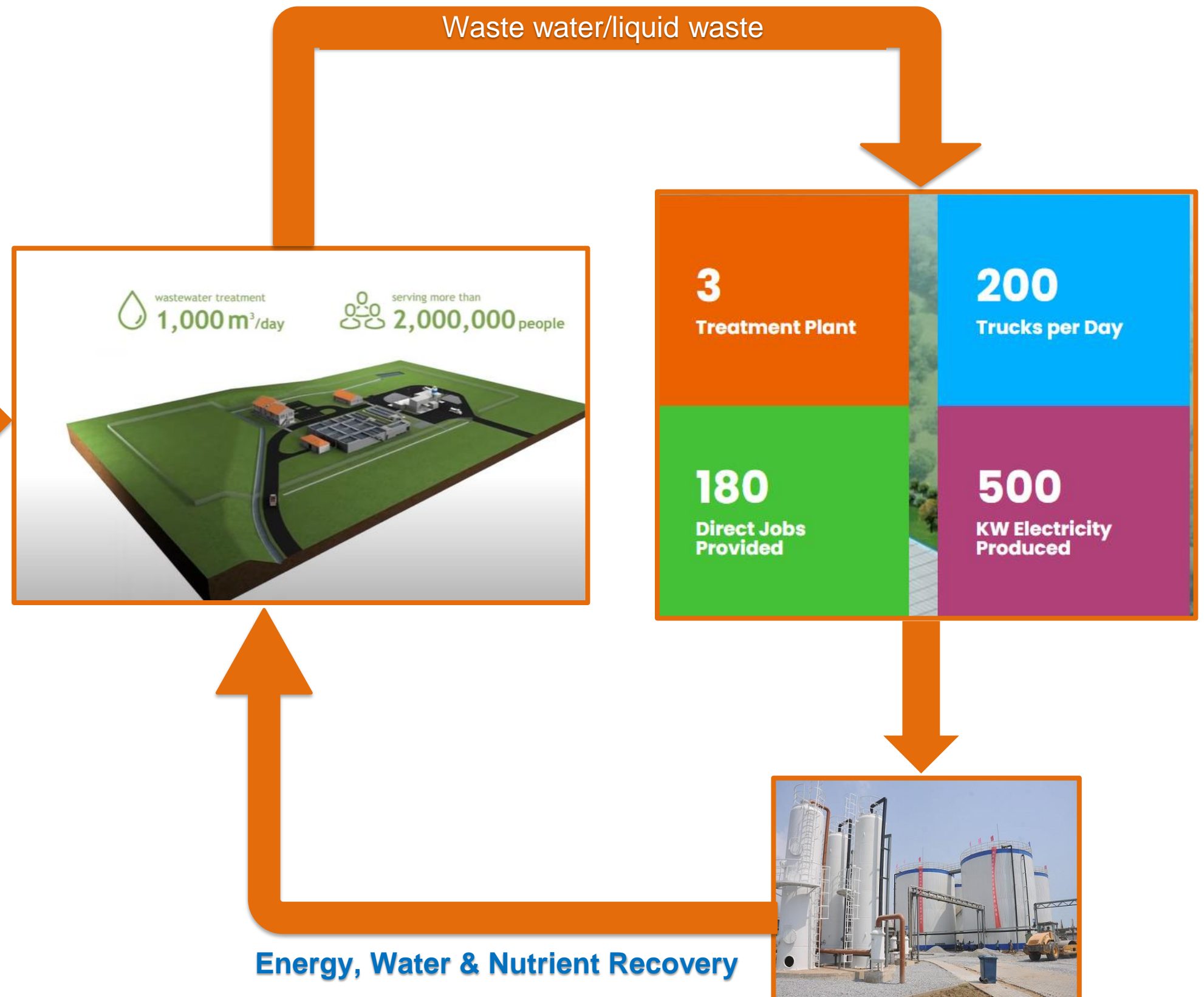
# Initial System: Linear



Transportation



# Application of Circularity: Liquid Waste Treatment & Energy Recovery





# Zoomlion's Initiative on Plastics Circularity

Location	Project	Plant description	Capacity	Plastic recoverables	other recoverables	Total recycleables
Accra	ACARP	MSW	1,200.00	103.2	180	283.2
James Town	IRECOP	MSW	400.00	34.4	60	94.4
Kumasi	KCARP	MSW	2,000.00	172	300	472
Dambai	IRECOP	MSW	400.00	34.4	60	94.4
Damango	IRECOP	MSW	400.00	34.4	60	94.4
Ho	IRECOP	MSW	320.00	27.52	48	75.52
Goaso	IRECOP	MSW	400.00	34.4	60	94.4
Sefwi	IRECOP	MSW	400.00	34.4	60	94.4
<b>Total</b>				<b>474.72</b>	<b>828.00</b>	<b>1,302.72</b>
	<b>Plastics (Tonnes)</b>	<b>Other Recycleables</b>	<b>Total recycleables</b>			
<b>Daily</b>	474.72	828.00	1,302.72			
<b>Yearly</b>	123,427.20	215,280.00	338,707.20			



# Zoomlion's Initiative on FSM Circularity

Location	Project	Plant description	Capacity (Cubic meters)
Accra	SSGL	FSM	3500
Adjen Kotoku	SSGL	FSM	1000
Kumasi	SSGL	FSM	1000
Takoradi	SSGL	FSM	1000
Tamale	SSGL	FSM	1000
<b>Total/Day</b>			<b>7500</b>
	<b>FSM (Cubic meters)</b>		
<b>Daily</b>		7500	
<b>Yearly</b>		1950000	



# Way forward

# WAY FORWARD

- Buy-Back scheme for plastic waste, Metals and Paper.
- Corporate Collection of plastic materials.
- On-site segregation using a Material Recovery Facility (MRF).
- Schools Outreach Programme to foster Education on circularity.
- Sustainability certificate issuance to domestic and corporate donors of plastics to encourage circularity.
- Tyre recycling initiatives to encourage circularity.
- Distribution of waste bins to enhance storage of waste at generation point as well as increase access and coverage for collection.
- Partnerships with the informal sector to move towards 100% collection and increase recycling rate.
- Research Development and innovation to enhance recovery and cyclic value addition (RDF, Plastic to Diesel, Anaerobic digestion).

***“ There is nothing like  
away, if your throw  
something away it  
must go somewhere”***

*- Annie Leonard*



# Thank You

FOR YOUR ATTENTION



WASTE MANAGEMENT EXPERTS



@zoomlionltd

For Enquires Call us now!  
**+233 544 326 770**

Visit our Website now!  
**[www.zoomlionghana.com](http://www.zoomlionghana.com)**

