

GAUTENG WASTE INDABA 2026 • OPENING ADDRESS

Beyond the Crisis, Exploring the Opportunities

Together strengthening waste management systems in Gauteng: A spatial diagnostic and economic pathway.

Dr. Pali Lehohla | Pan African Institute for Evidence / Lehohla Ledger

Lohelling Boxiness of Cauteng Provins

[1. DIAGNOSTIC] → [2. CO-DESIGN] → [3. ITERATIVE DEPLOYMENT] → [4. PRECINCT MESH]

SPATIAL MAP OF ARCHETYPES OF MATTER TRANSFORMATION: GAUTENG PROVINCE WASTE ECONOMY DIAGNOSTIC

1. THE INFORMAL RECLAMATION ECONOMY.

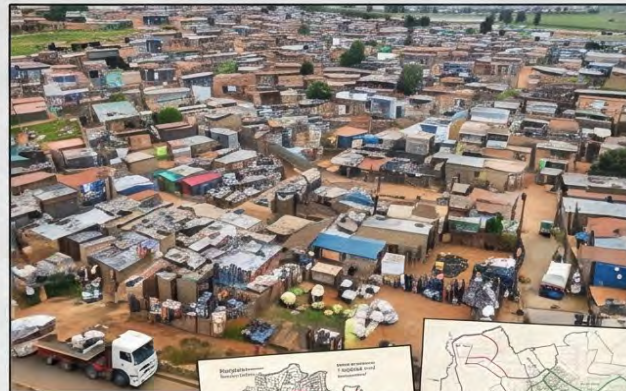
Source of >90% of collected recyclables

High density, low service access

Reclaimer networks ('African Reclaimers Association') as primary actors

Routes: Door-to-door collection on foot

Nodes: Makeshift buy-back centres



2. THE LINEAR DISPOSAL BOTTLENECK

Final sink for 89% of waste

Landfill airspace depletion by 2026

Point source of pollution (leachate, gas)

Infrastructure strain

High volume, low value



3. THE CIRCULAR ECONOMY HUB

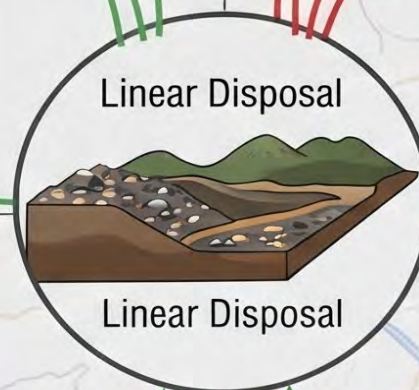
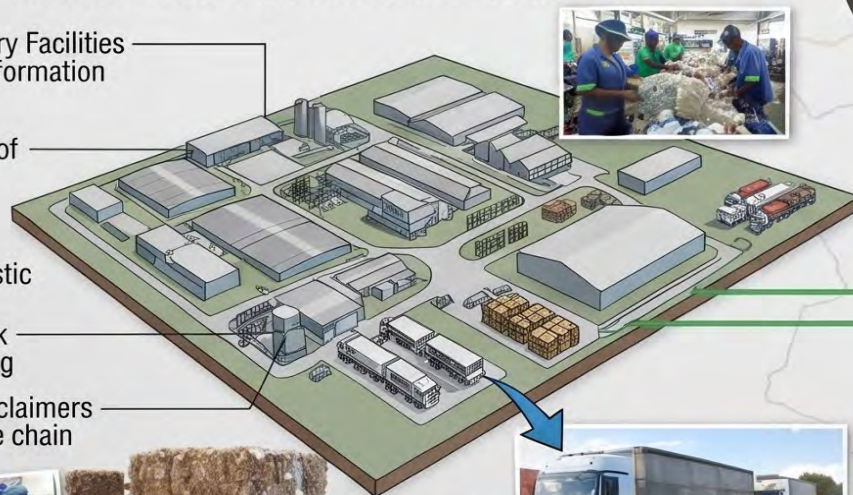
Material Recovery Facilities (MRFs) as transformation nodes

Regionalisation of processing

Value addition: Baled paper/plastic

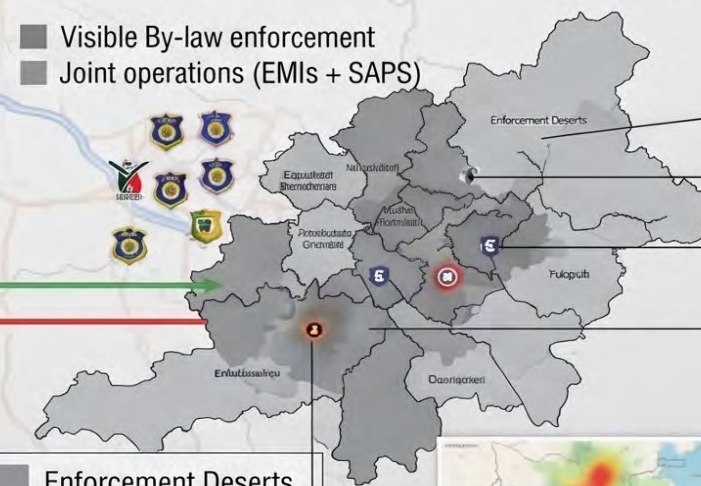
Nodes: Buy-back centres upscaling

Integration of reclaimers into formal value chain



4. GOVERNANCE & COMPLIANCE LAYER

- Visible By-law enforcement
- Joint operations (EMIs + SAPS)



Ekurhuleni EMPD visibility

Capacity building for municipalities

Anti-litter campaigns

Gauteng City-Region

- Valuable Material (green arrow)
- Residual Waste (red arrow)

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Image 5: Wateshy

The Linear Disposal Bottleneck

89%

Landfill Sink Dependency

Major metropolitan landfills reach capacity by late 2026.

6.26M

Annual Tons Generated

Severe strain on municipal collection fleets and infrastructure.

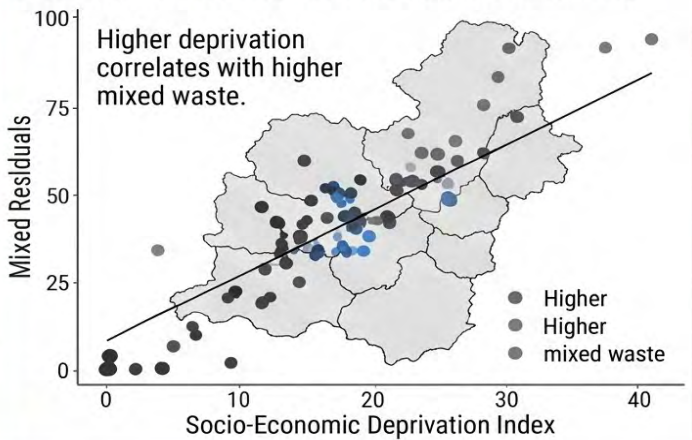
11%

Current Recycling Rate

Substantial economic deadweight loss of recoverable materials.

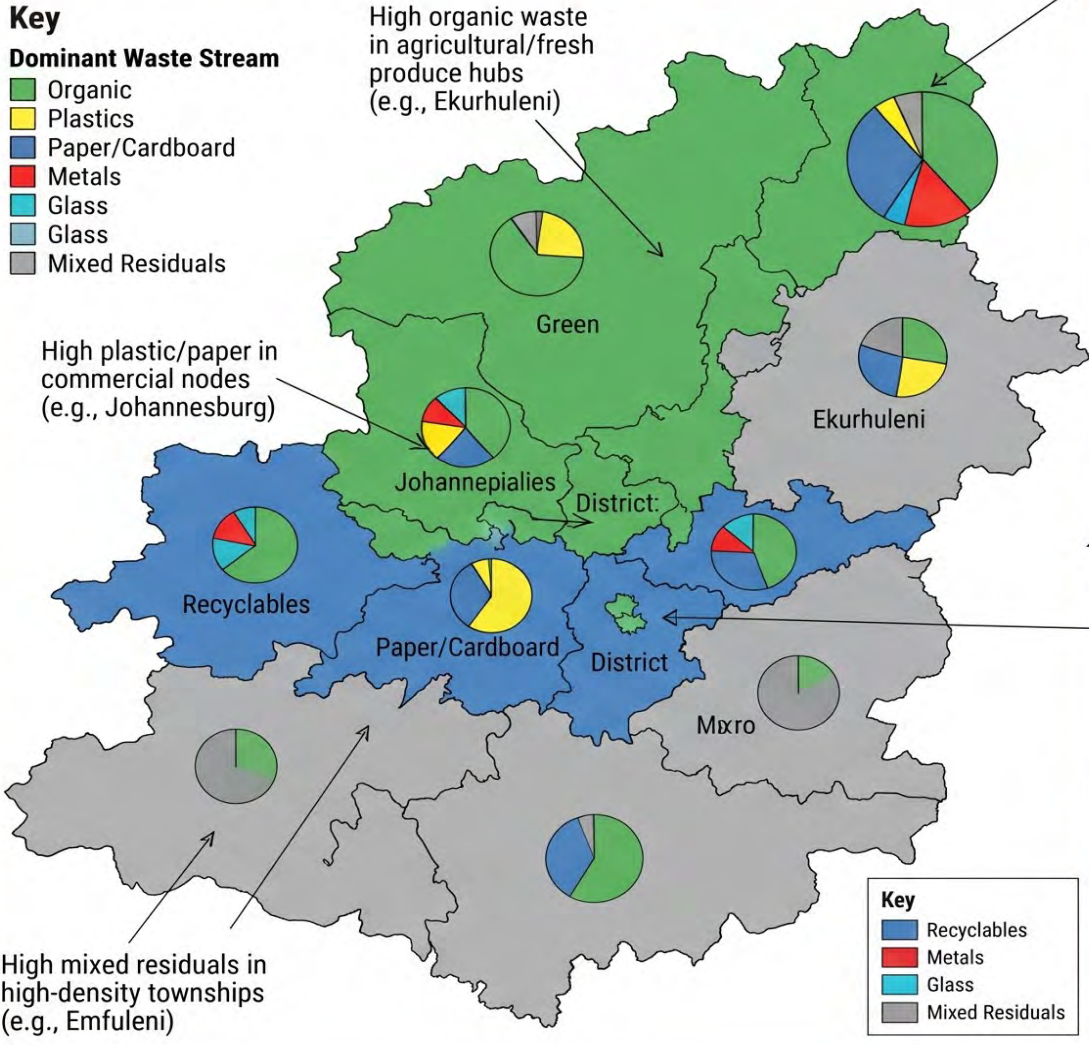
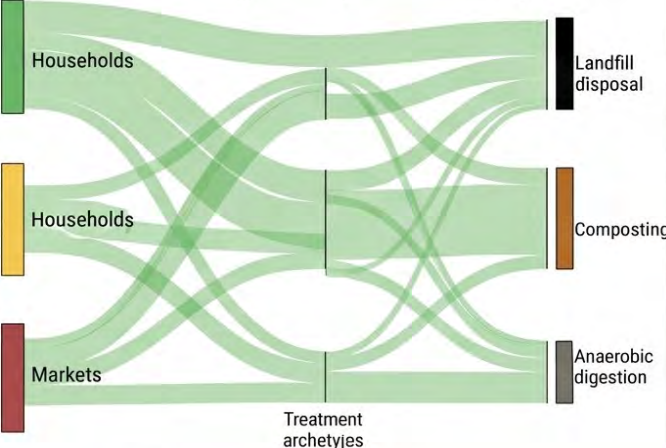
SPATIAL DIAGNOSTIC: GAUTENG PROVINCE WASTE COMPOSITION BY TYPE

TYPE CORRELATION: WASTE TO DEPRIVATION.

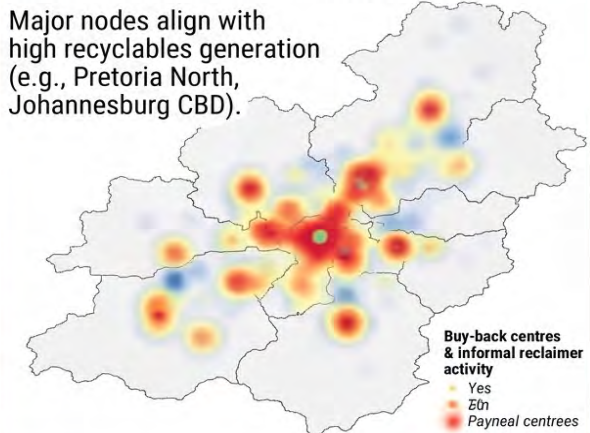


FLOW DIAGRAM: ORGANIC DIVERSION.

Only 5% of organic waste diverted; significant potential for regionalisation.



SOURCE INTENSITY: RECYCLABLES.



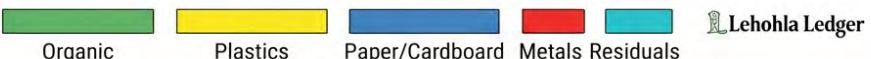
Organic

- Organic
- Plastics
- Paper/Cardboard
- Metals
- Glass

Mixed Residuals



Waste Hierarchy



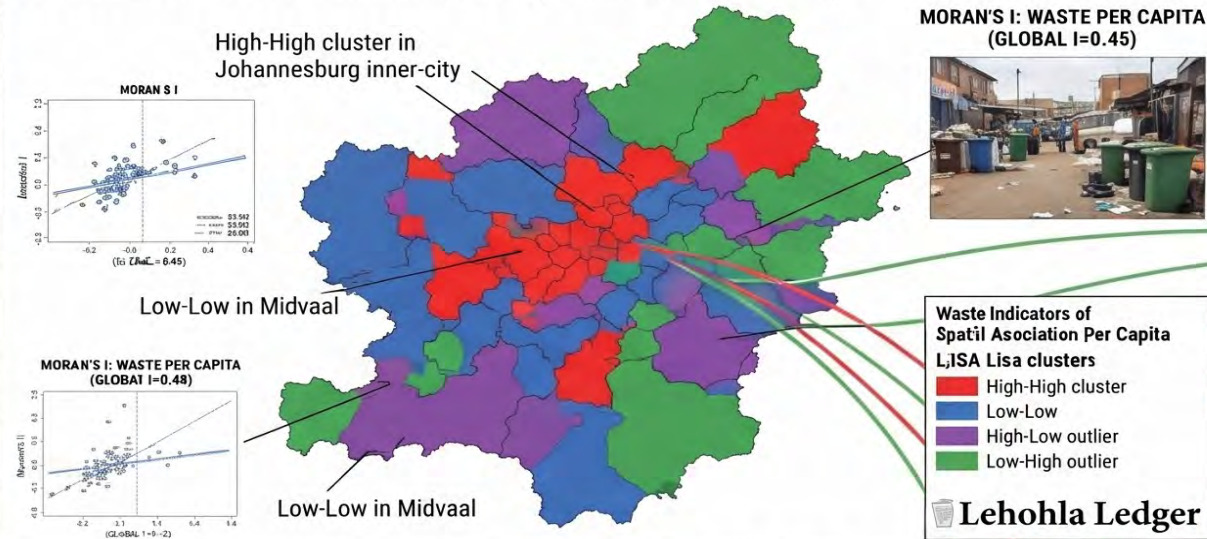
SPATIAL ANALYTICS: GAUTENG WASTE, LISA HOTSPOTS & CORRELATES

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Local Indicators of Spatial Association ■ Low-Low ■ High-Low outlier ■ Low-High outlier

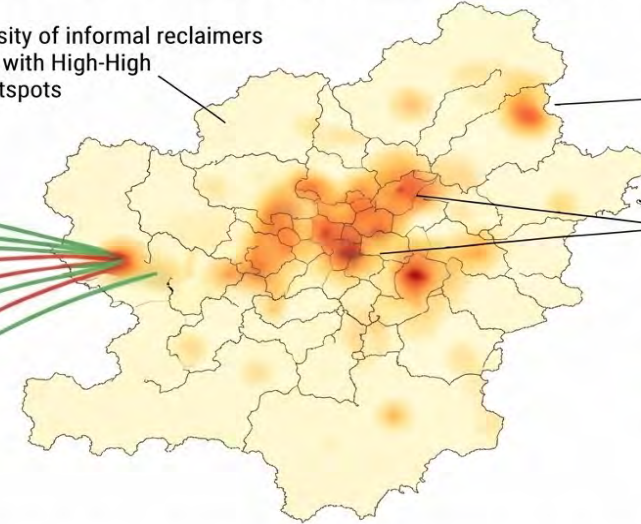
Local ing Proviners of Gauteng Province

WASTE SOURCE HOTSPOTS (LISA CLUSTERS)



INFORMAL RECLAMATION NETWORKS (SOURCE TYPE)

High density of informal reclaimers correlate with High-High waste hotspots



SOCIO-ECONOMIC DEPRIVATION PER CAPITA SQ.

High deprivation areas correspond to areas with lower recycling rates (less than 11% diversion).

Correlates with illegal dumping hotspots (as seen in <MAGE>

Composite deprivation index (combining income, education and service service access from census mesh kilometer)

High

Low

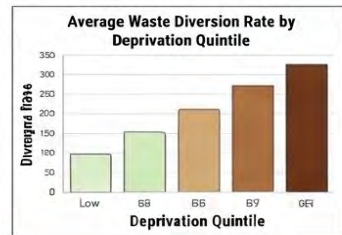
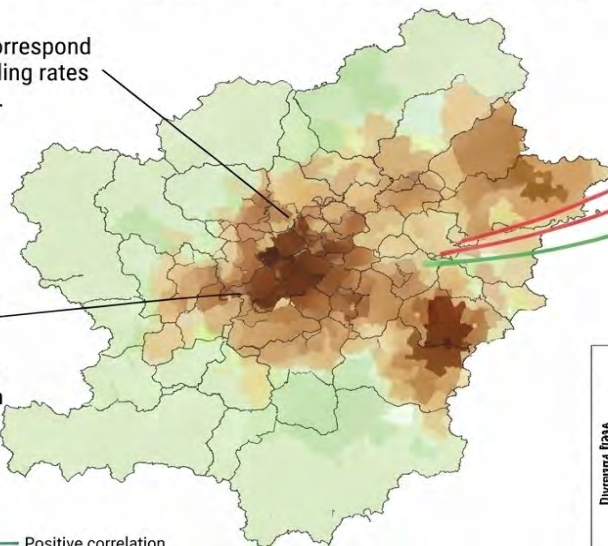
Low

Low

Low

Positive correlation

Negative correlation



GOVERNANCE & ENFORCEMENT RESPONSE (LISA HOTSPOTS)

Enforcement hotspots do not fully overlap with waste hotspots

Significant enforcement gap in high deprivation areas

LisL clusters. of enforcement by-law enforcement visibility, eEMI and EMPD patrols, LISA cluster

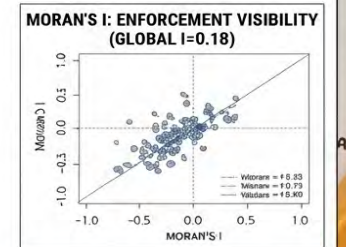
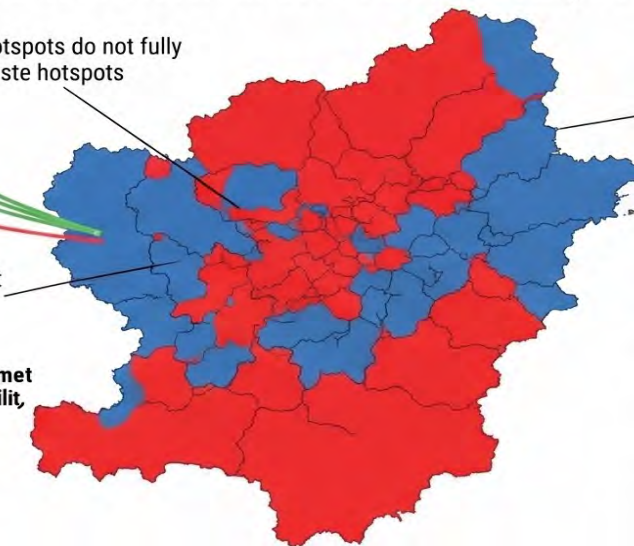
High-High cluster of

Low-Low

Low-Low

Low-Low

Low-Low



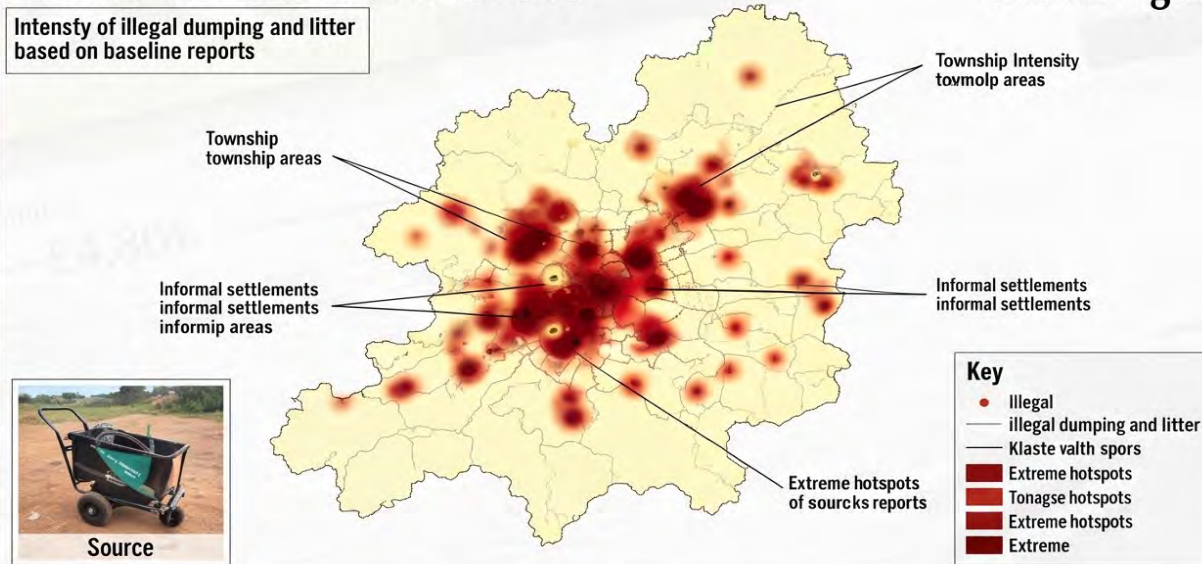
ALIGNMENT MAP: WASTE HOTSPOTS & ENFORCEMENT DEPLOYMENT

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WASTE GENERATION HOTSPOTS

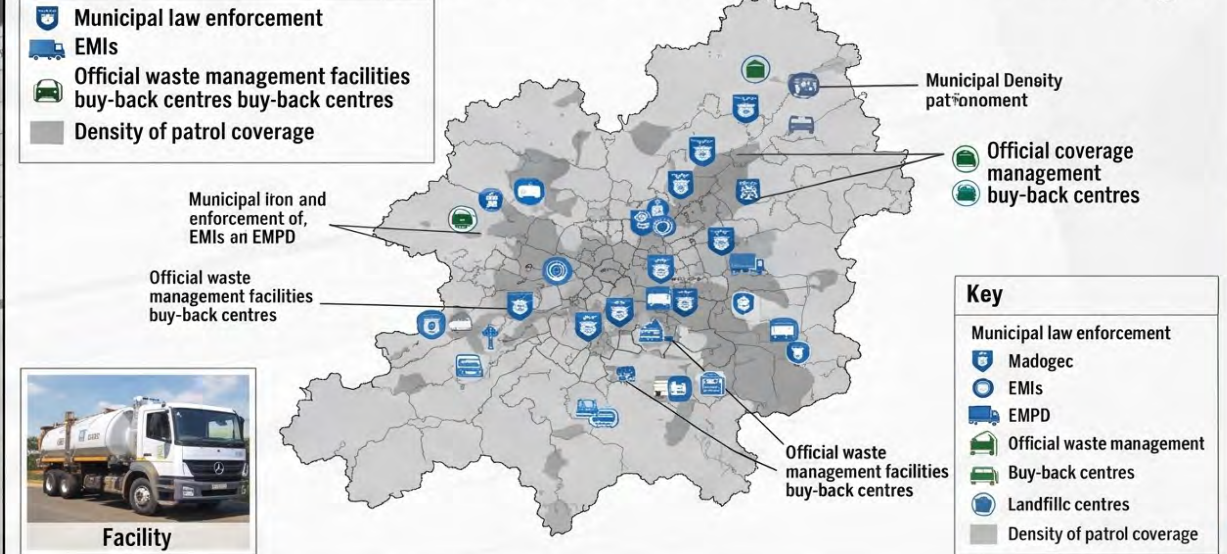
Intensity of illegal dumping and litter based on baseline reports

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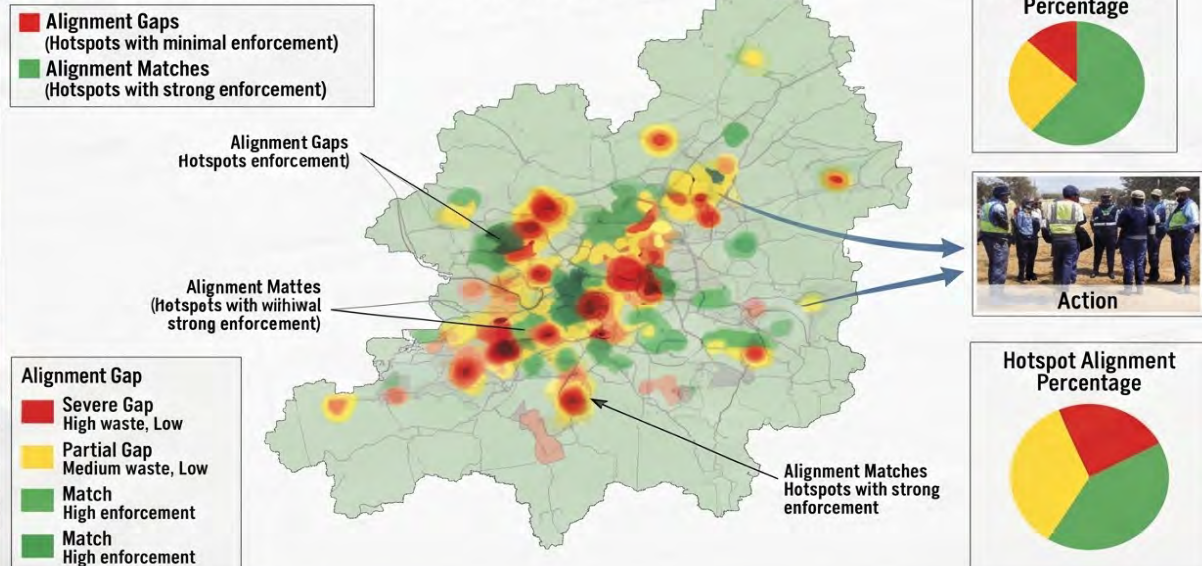


ENFORCEMENT DEPLOYMENT & VISIBILITY

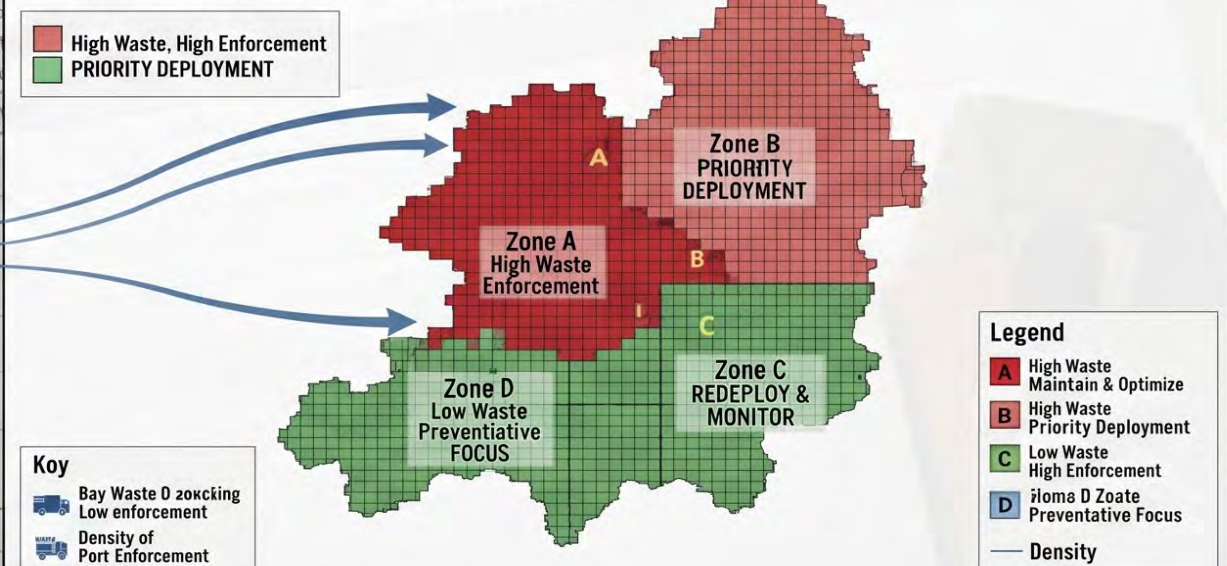
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OVERLAY & ALIGNMENT DIAGNOSTIC



TARGETED INTERVENTION GRID



Spatial Correlates & Deprivation

0.45

Global Moran's I

Statistically significant spatial clustering of waste generation in core hubs.

R500M

Annual Public Health Cost

Direct externalities from illegal dumping and uncollected waste in townships.

-0.18

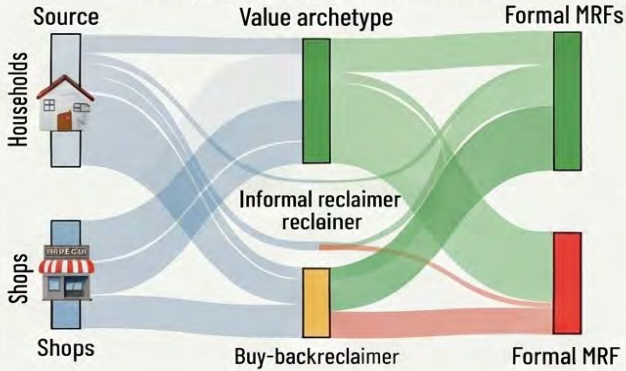
Enforcement Mismatch

Negative spatial alignment between enforcement patrols and waste hotspots.

RATIO OF SOURCE OF VALUE BY WASTE CREATED: GAUTENG PROVINCE DIAGNOSTIC

VALUE CHAIN: RECLAIMER ECONOMY.

Capturing >90% of recyclables, but only 11% of total waste value.



Value-to-Waste Intensity

- High value (high/low recycling)
- Per capita of waste created

Value Lost

- Low value (no landfilling)
- Low capita of from landfilling

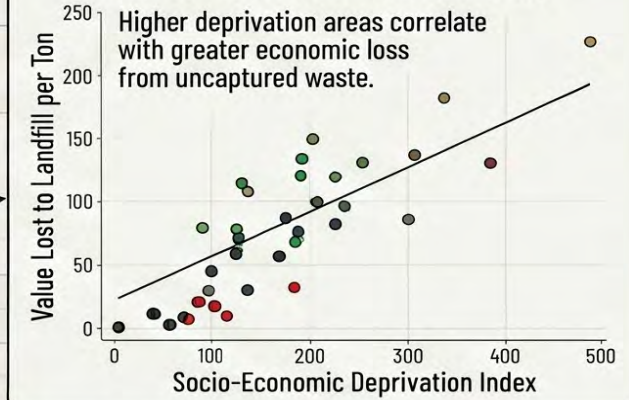


Reclamal reclaimer



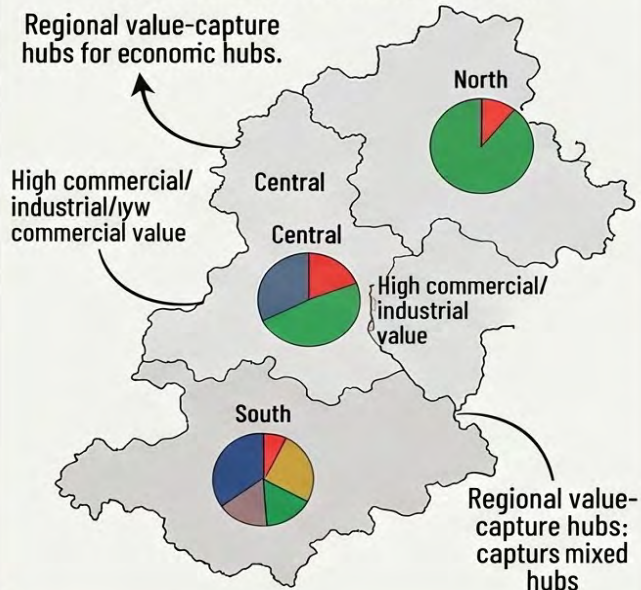
Lenhohla lanfiler

ECONOMIC CORRELATE: DEPRIVATION vs. VALUE LOST.



REGIONALISATION OF VALUE.

Regional value-capture hubs for economic hubs.



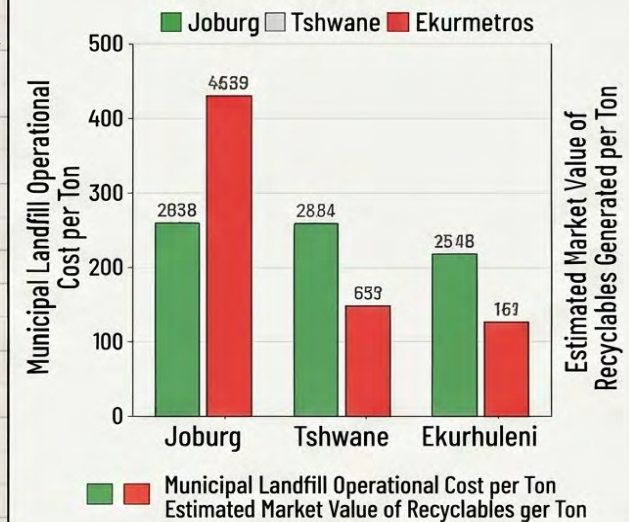
Waste Hierarchy

Value-to-Waste Intensity



LANDFILL COST vs. RECYCLING REVENUE.

Landfilling is a high-cost sink; significant untapped revenue in recyclables.



The Circular Economy Pathway

10×

Value Multiplier

Recycling yields significantly higher economic output per ton than landfilling.

20K

Green Jobs by 2030

Unlocking formal employment through provincial circular transition.

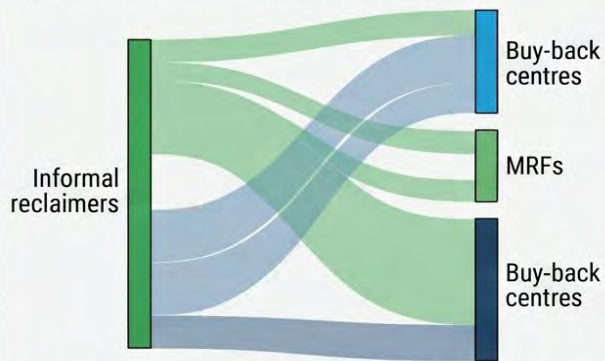
35%

Organic Diversion Target

Scaling composting and anaerobic digestion across regional hubs.

EMPLOYMENT & LIVELIHOODS: RECLAIMER ECONOMY.

Formalizing the **>6,000** informal reclaimers could increase sector GDP contribution by **40%**.



► Formalizing the >6,000 informal reclaimers could increase sector GDP contribution by 40%.

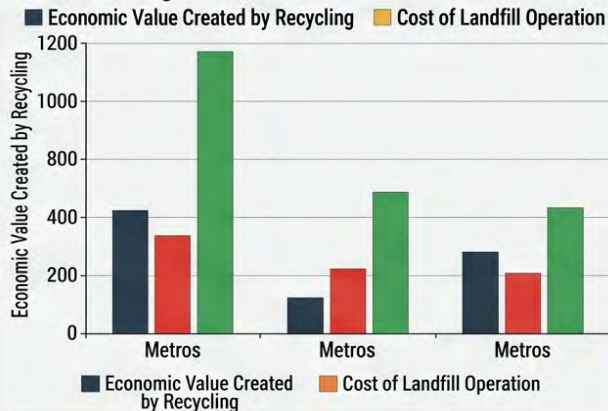


Positive Impact

- High positive
- Low positive/ impact
- Low negative impact

ECONOMY SIZE: WASTE-TO-VALUE CHAIN.

Recycling generates **10x** more economic value per ton than landfilling.



ECONOMIC VALUE OF WASTE MANAGEMENT: GAUTENG PROVINCE DIAGNOSTIC

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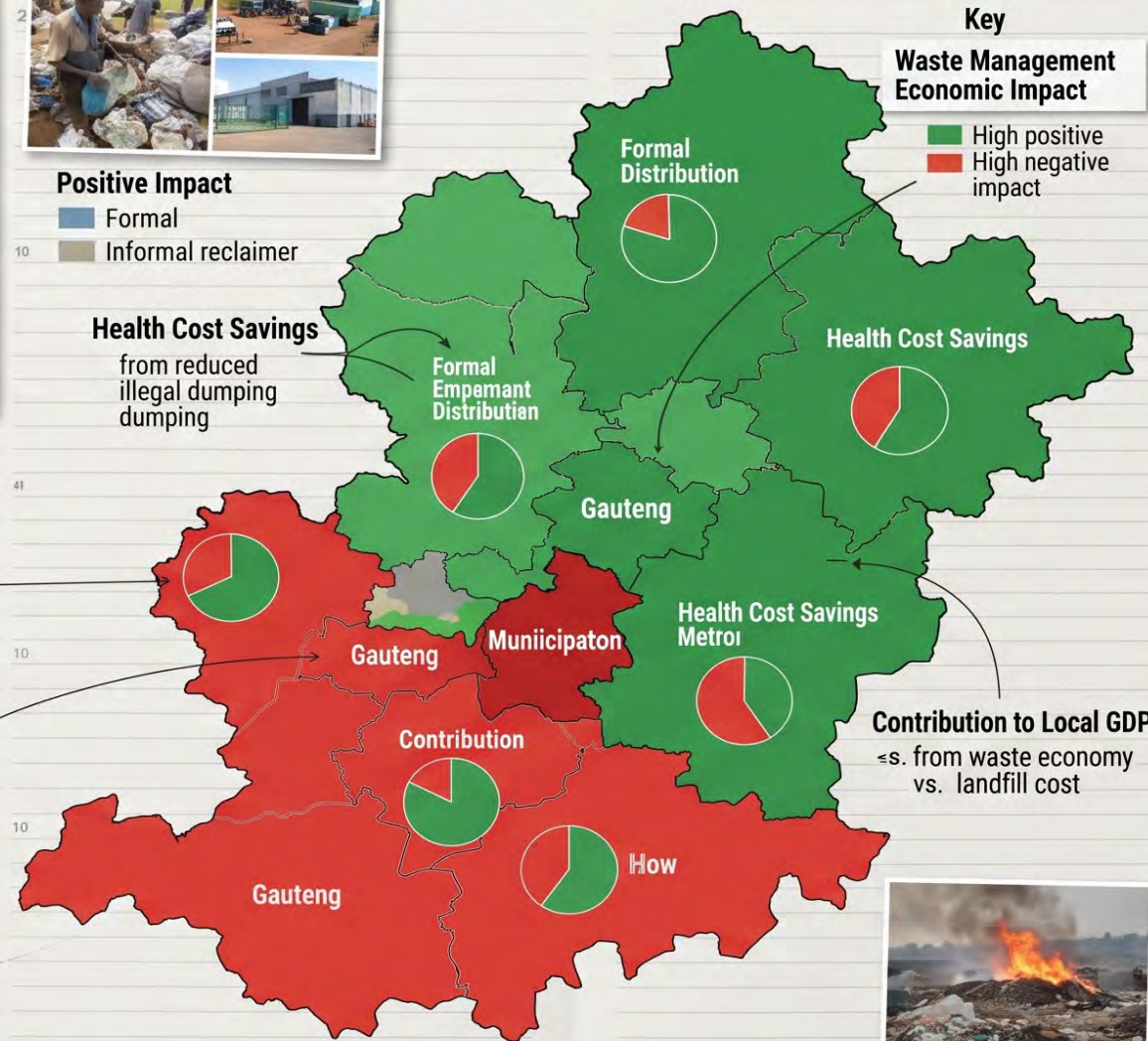


Positive Impact

- Formal
- Informal reclaimer

Health Cost Savings

from reduced illegal dumping dumping



Key

Waste Management Economic Impact

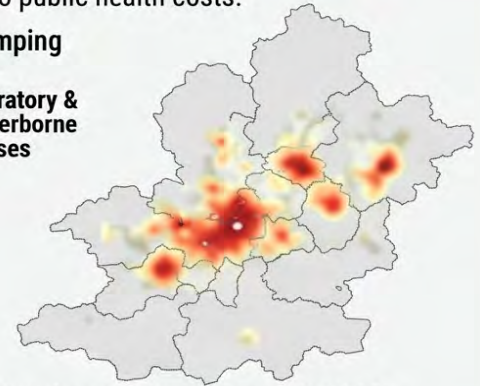
- High positive
- High negative impact

HEALTH IMPACT: THE COST OF DUMPING.

Illegal dumping adds an estimated **R500M** annually to public health costs.

Illegal dumping hotspots:

Respiratory & Waterborne illnesses



► Illegal dumping adds an estimated R500M annually to public health costs.

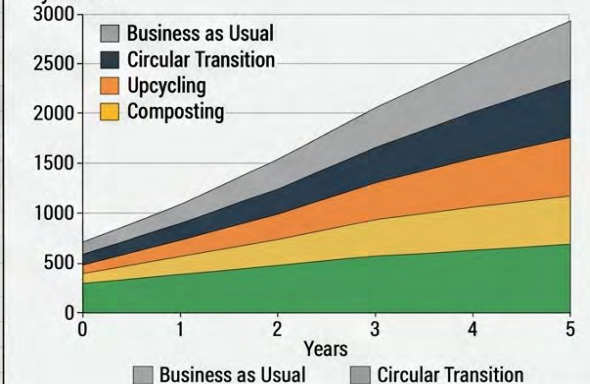
Negative Impact

- High positive/
- Low positive
- Health Cost
- High negative impact cost



GROWTH TRAJECTORY: CIRCULAR ECONOMY POTENTIAL.

Circular transition can unlock 20,000 new green jobs by 2030.



Positive Impact

Waste Management Economic Impact

Waste Hierarchy

High positive impact

Low pogiitive impact

High negative impact

Dispose



The Informal Reclamation Economy

>90%

Recyclables Captured

Informal networks act as the primary structural buffer against system collapse.

6,000+

Active Reclaimers

Door-to-door collection sustaining provincial secondary material streams.

40%

GDP Multiplier Gain

Formalization through municipal MRFs unlocks massive economic growth.

GAUTENG WASTE INDABA 2026

Reclaiming the Rusted Gold Together

Thank you. Let us commit to evidence-based execution and robust municipal partnerships.

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