

ALTERNATIVE KEYNOTE ADDRESS.

The Out-In Evidence Paradigm

Rebuilding Monitoring and Evaluation from Local Reality to Provincial Results.

DR PALI LEHOHLA — PALI INSTITUTION

MPUMALANGA M&E SUMMIT · NKANGALA · 23 JULY 2026

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Static vs Scenario-Informed M&E

Traditional Static M&E

Retrospective Auditing: Measures past performance against static, pre-determined baseline targets.

Linear Logic: Assumes stable environmental conditions and predictable cause-and-effect pathways.

Macro Blind Spots: Vulnerable to sudden political, structural, and socio-economic shifts.

Scenario-Informed Dynamic M&E

Forward-Looking Evaluation: Evaluates strategies against plausible, alternative future environments.

Adaptive Policy Logic: Embraces non-linearity, emergence, and complex socio-political dynamics.

Strategic Wind-Tunneling: Establishes early-warning barometers for proactive steering.



Part I: History of SA Scenario Practice & Scenario Paths

Analyzing Plausible Development Trajectories from Mont Fleur to Indlulamithi 2035

Framed within Dr Pali Lehohla's Strategic M&E Paradigm

The Reconstruction and Development Programme (RDP)

A Policy Framework

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PREFACE

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- 1.1 What is the RDP?
- 1.2 Why do we need an RDP?
- 1.3 The six basic principles of the RDP
- 1.4 The key programmes of the RDP
- 1.5 Conclusion

2. MEETING BASIC NEEDS

- 2.1 Problem statement
- 2.2 Vision and objectives
- 2.3 Jobs through public works
- 2.4 Land reform
- 2.5 Housing and services
- 2.6 Water and sanitation
- 2.7 Energy and electrification
- 2.8 Telecommunications
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Evolution of SA Scenario Practice



Dee

VOLUME 7 NUMBER 1

The Mont Fleur Scenarios

*What will South Africa be like in the year 2002?
with a new introduction by Mont Fleur facilitator, Adam Kahane*

Mont Fleur: Four Possible Paths



PATH 1: RESISTANCE

Ostrich

Non-representative government clings to minority power, refusing negotiation. Leads to international isolation, civil uprising, and total macroeconomic collapse.

PATH 2: PARALYSIS

Lame Duck

A prolonged transition with weak, indecisive coalition rule. Government pleases no one, causing policy paralysis, investor flight, and economic stagnation.

PATH 3: OVERSPENDING

Icarus

Unrestrained populist macroeconomic expansion. Massive fiscal overspending triggers hyperinflation, currency crashes, and severe debt default.

PATH 4: SUSTAINABLE

Flight of Flamingos

Inclusive socio-political transition combining social investment with strict macroeconomic discipline, fostering durable growth and democratic stability.

Memories of the Future

South African Scenarios to 2014



Produced by the Policy Co-ordination and Advisory Services
The Presidency

Memories of Future: Four Paths

PATH 1: HIGH SPEED

Shosholoza

Express train model. Capable developmental state with high execution capacity, rapid service delivery, structural transformation, and strong social consensus.

PATH 2: COMPACT

Dudisanang

Walking together in solidarity. Deep community-driven partnerships, civic involvement, and social compacts bridging inequality even under resource strain.

PATH 3: BREAKDOWN

Skedonk

Battered old vehicle. Severe administrative failure, systemic corruption, municipal service collapse, and escalating public anger across townships.

PATH 4: ENCLAVE

S'gud S'nais

Privatised "good-enough" governance. Gated prosperity and private service substitution for the elite while the public state stagnates in mediocrity.



THE PRESIDENCY
REPUBLIC OF SOUTH AFRICA

SOUTH AFRICA **Scenarios 2025:**

The future we chose?

Policy Co-ordination and Advisory Services (PCAS)

September 2008



The Future We Chose? (PCAS 2008)



SCENARIO 1: MARKET-LED

Not yet Uhuru

Prudent fiscal focus & private outsourcing (healthcare, prisons, security). Growth averages sub-3.5% as environmental strain, global slowdown, and widening inequality breed severe social anomie.

SCENARIO 2: COMPACT

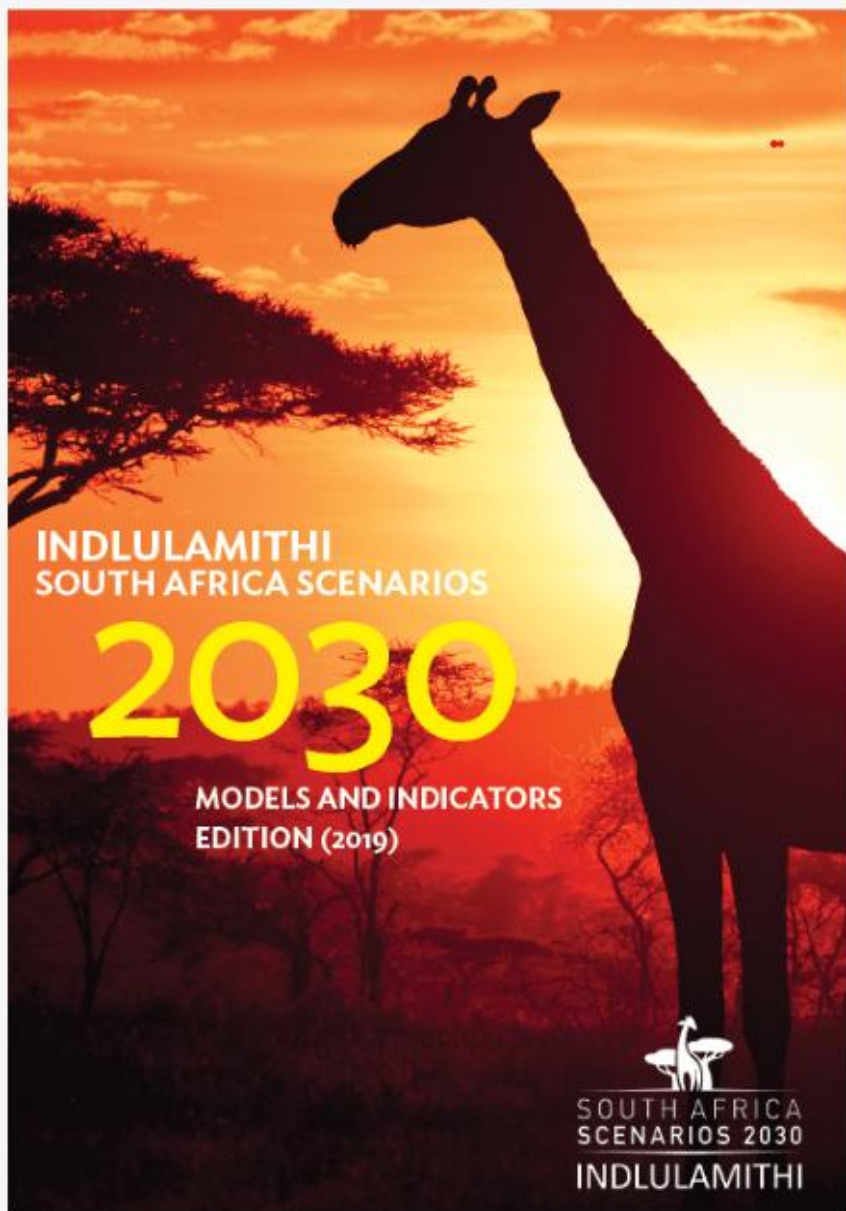
Nkalakatha

Bold developmental state & national compact. High accountability ("walls of station results"), 1.4M public/public-works jobs, reduced crime, and strong meritocratic execution build "One Nation".

SCENARIO 3: FACTIONAL

Muvhango

Political rivalry, "anything-goes" corruption, and unspent provincial budgets. Despite global commodity booms, SA loses continental dominance to Nigeria/Egypt amidst load shedding and cynicism.



Indlulamithi South Africa Scenarios 2030

Indlulamithi South Africa Scenarios 2030 is a cross-sector initiative designed to stimulate a national strategic conversation about the future of social cohesion in South Africa. It seeks to interrogate the question, “*What would a socially cohesive South Africa look like and to what degree is it attainable by 2030?*”

The project is led by Dr Somadoda Fikeni and a diverse group of partners and stakeholders across society including the Mapungubwe Institute for Strategic Reflection (MISTRA), Anglo American, National Planning Commission and the Gordon Institute of Business Science (GIBS).

Indlulamithi methodology combines research, expert insight and informed speculation to help understand socio-economic issues that have a high degree of uncertainty.

The project’s key objectives are to:

- *identify probable trajectories* that South African society may follow in the build-up to 2030

Indlulamithi 2030: Three Paths

PATH 1: IN STEP

Nayi le Walk

A nation marching together. Characterised by declining social inequality, rapid economic expansion, active reconciliation, and strong institutional leadership.

PATH 2: ENCLAVE

iSbhujwa

An enclave bourgeois society. Growth is confined to private islands of wealth while the majority faces chronic unemployment, triggering persistent daily protests.

PATH 3: DECAY

Gwara Gwara

A floundering false dawn. Institutional breakdown, widespread corruption, demoralised society, and lawlessness turn South Africa into a failing state.

Indlulamithi 2035: Bird Archetypes



PATH 1: RECRIMINATION

Hadedea Home

Symbolised by the noisy Hadedea bird. Characterised by inaction, perpetual political compromises, finger-pointing, and unresolved systemic issues coming home to roost.



PATH 2: DESPERATION

Vulture Culture

Symbolised by predatory vultures. Driven by populist/extractive rule, self-enrichment, corruption, eroded democratic freedoms, and rapacious preying elites.



PATH 3: COOPERATION

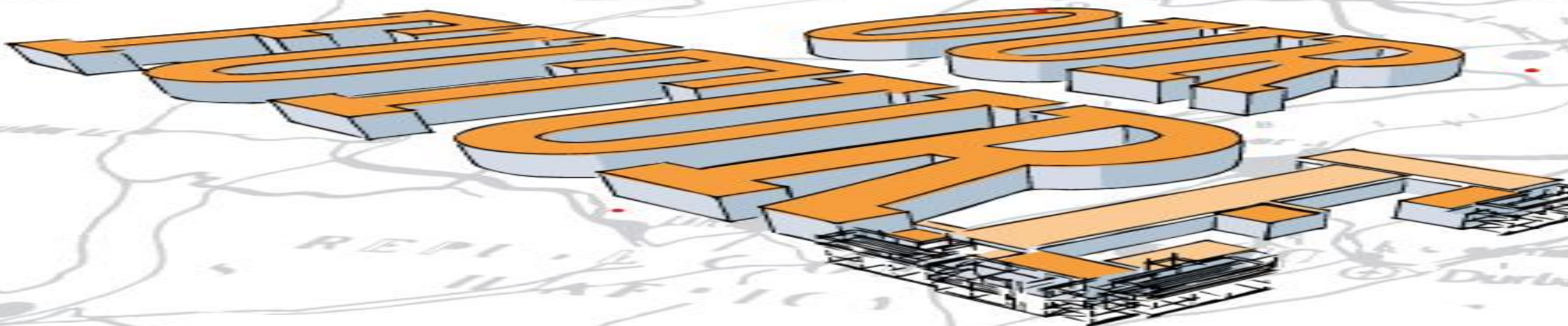
Weaver Work

Symbolised by Kalahari social weavers. Defined by collaborative problem-solving, strong social cohesion, inclusive economic growth, and shared civic resilience.

Inside vs Outside Govt Locus Matrix

Scenario Exercise	Year	Institutional Locus	Conveners & Stakeholders	Primary M&E Purpose
Mont Fleur	1991–92	OUTSIDE GOVT Outside Govt	Academics, ANC, business, trade unions	Macroeconomic & democracy wind-tunneling
Memories of the Future	2002	INSIDE GOVT Inside Govt	Presidency Policy Coordination Unit (PCAS)	Ten-year review of state capacity & delivery
The Future We Chose	2007	INSIDE GOVT Inside Govt	Presidency Steering Committee / PCAS	15-year evaluation of democratic institutions
Indlulamithi 2030	2018	OUTSIDE GOVT Civil Society	Multi-sector coalition (MISTRA, GIBS, NPC)	Social cohesion & NDP horizon evaluation
Indlulamithi 2035	2023–24	OUTSIDE GOVT Civil Society	Independent Indlulamithi Project Trustees	Post-pandemic & coalition governance evaluation

Our future - make it work



**national planning
commission**
OVERSIGHT
FOR THE
REPUBLIC OF SOUTH AFRICA



NATIONAL PLANNING COMMISSION

Our future - make it work

Government does not suffer from an absence of data. It suffers from an absence of evidence that lives where people live.



Households



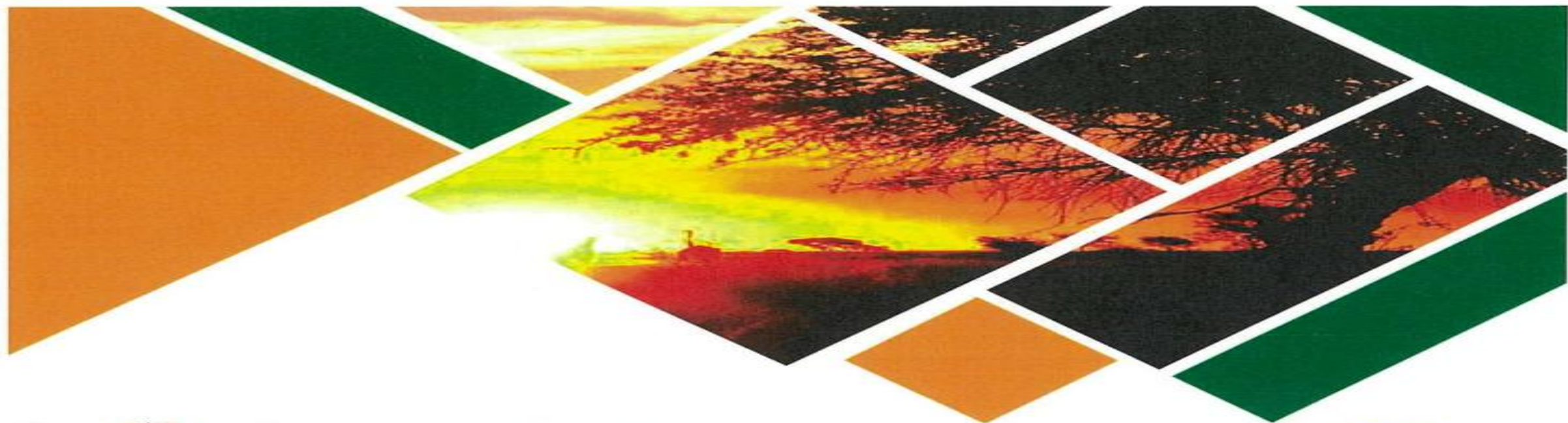
Wards



Clinics



Roads



**economic development
& tourism**

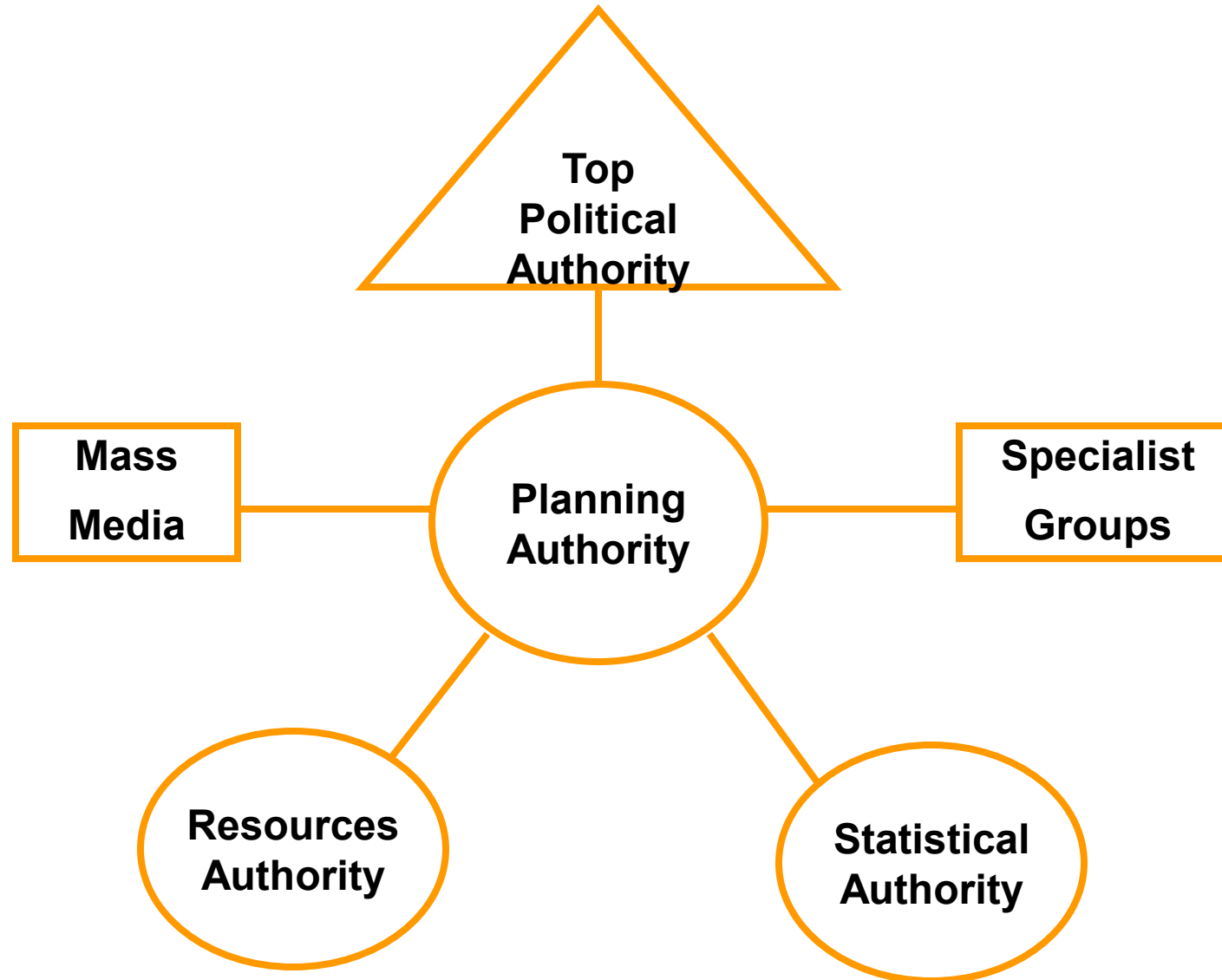
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA



STRATEGIC PLAN 2025 - 2030

Tabling Date: 10 June 2025

Utilisation Framework for Official Statistics



The Knowledge Society and Official Statistics

Knowledge Society:

- Is a well informed Society in fact, that should become increasingly better informed
- In a complete knowledge society, all the knowledge of the world will be:
 - available to everyone
 - available everywhere
 - available simultaneously
 - available freely

Pre-conditions

- Non-technological infrastructure should first be upgraded
 - Literacy
 - Promotion of use
 - Promotion of access
 - Basic freedoms

Forms of Knowledge

Knowledge as information

- Semantic form and irrespective of empirical validity or pragmatic relevance

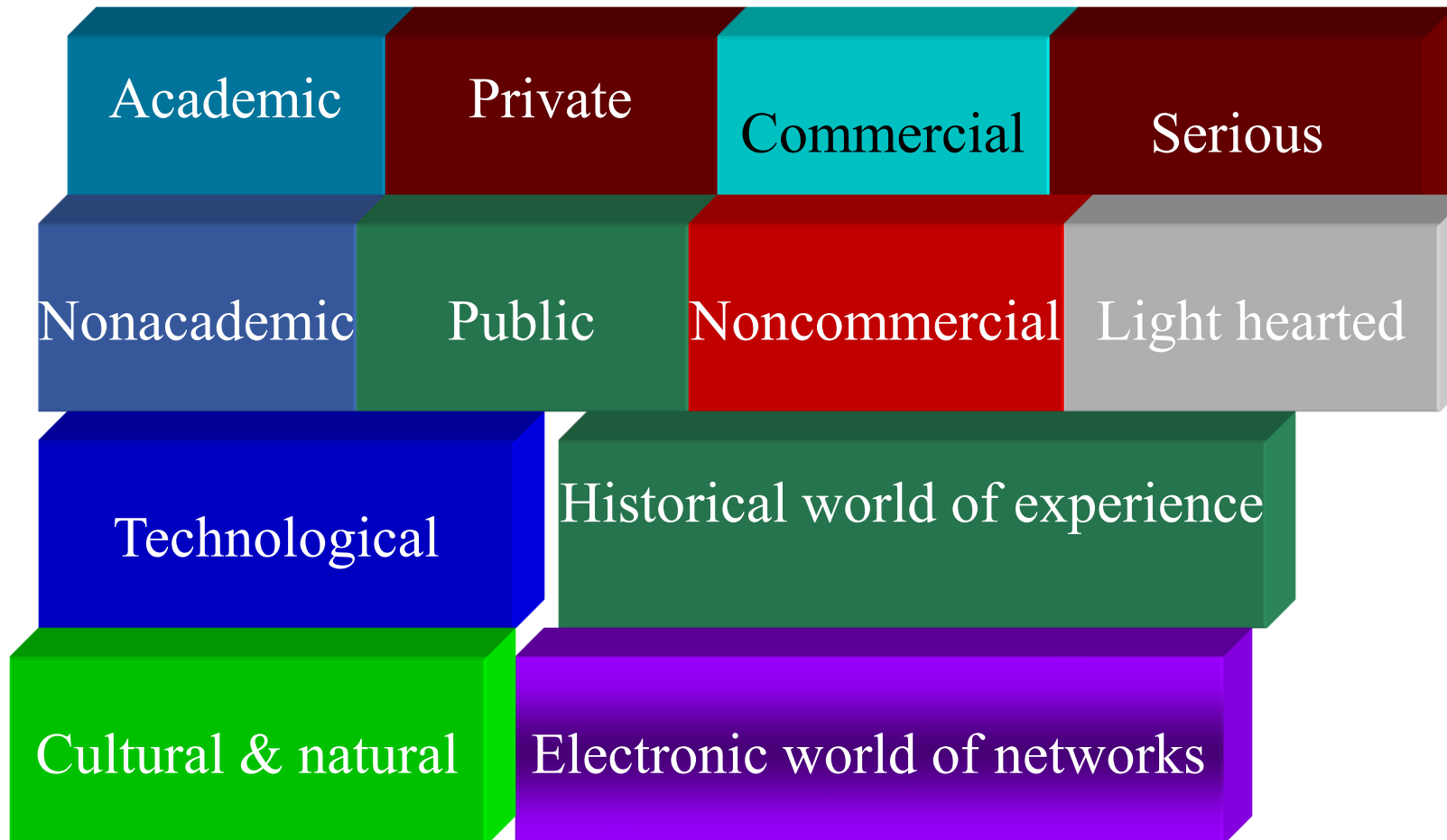
Knowledge as understanding

- Scientific knowledge as opposed to trivia in entertainment even amateur epistemology & public relations maneuvers

Knowledge as insight, competence and authority

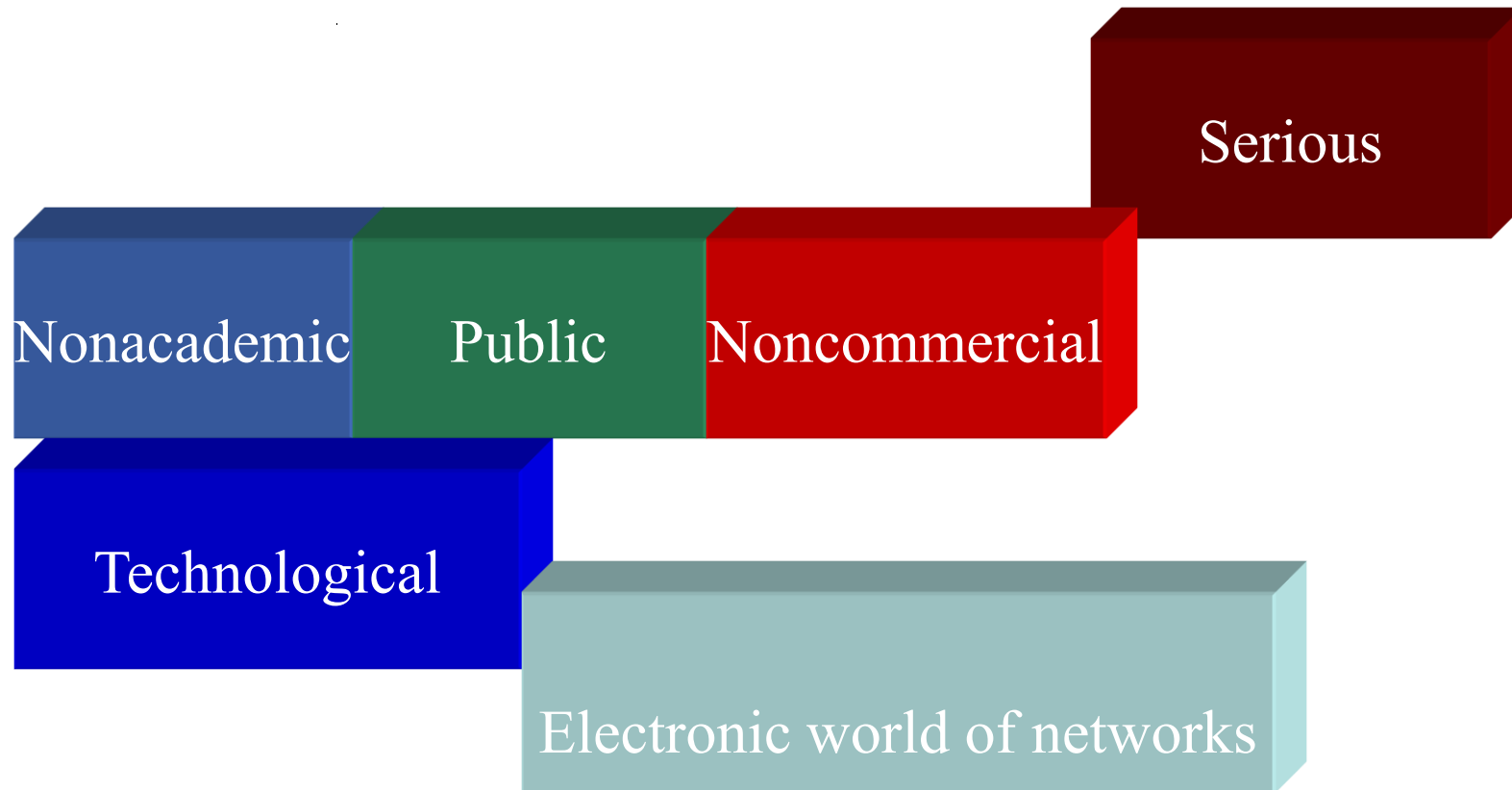
- selected, activated and applied: implying applying specific rules of preference and creating added value (Bhor & Einstein)

Cognitive Map of the knowledge society as an aid to orientation



Cognitive Map of the knowledge society

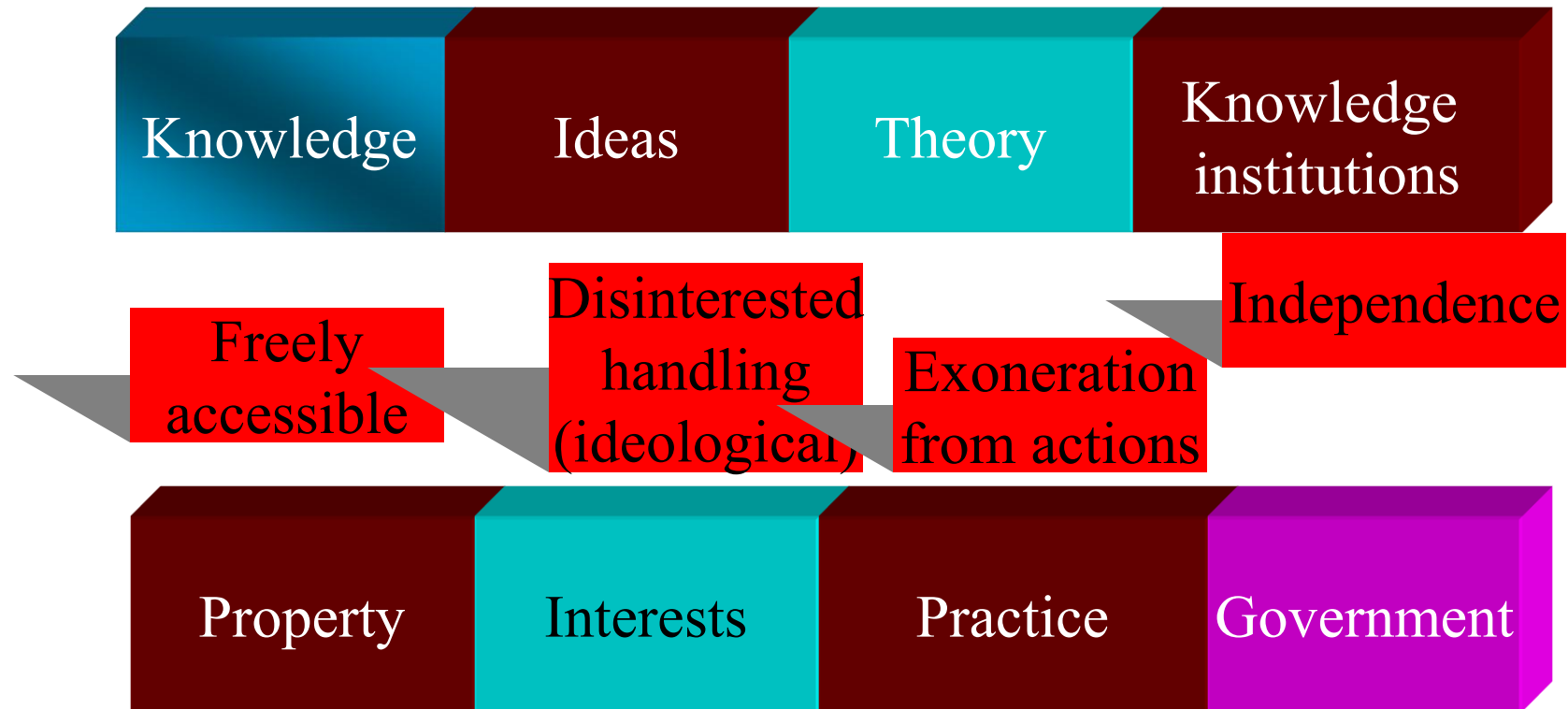
For Official Statistics



Social Division of knowledge from an official statistics perspective



Order Policy of Knowledge & the Need For Separation



Positive Contributions of Official Statistics

- Basic information on society
- Informational service as arise from legal rulings
- Raising information levels for the information society
- Provides orientation aids
- Supplement other info services
- Knowledge base for counter information
- Statistical advice for government

Knowledge Deficits of Official Statistics

- Unavoidable knowledge gaps e.g. the future
- Intentional ignorance e.g. where there should be stats but none exist
- Limited partial knowledge
- Legalised knowledge errors e.g, definitions & standards poverty
- Inherent limits of statistical information: By its nature it can't deliver insights

Handlers of information & Risk Profile

- **Blind** (mailman not allowed to read)
- **Discreet** (butler knows but no comment)
- **Anonymous** (statistician notes mass data)
- **Mechanical** (politicians)
- **Participatory** (scientist excited by theory)
- **Interventionist** (knowledge = power)

Competency Profile & Risk Management

No insight understanding intervention

Insight understanding no intervention

Understanding no insight intervention

Insight intervention no understanding

Insight understanding no intervention

insight understanding & intervention

Reporting is not Learning.

COMPLIANCE REPORTING



Was the activity completed?



Was the money spent?



Was the output delivered?



Did the institution comply?

EVIDENCE-INFORMED LEARNING



Did it produce the intended change?



Did it create public value?



Did it contribute to improved outcomes?

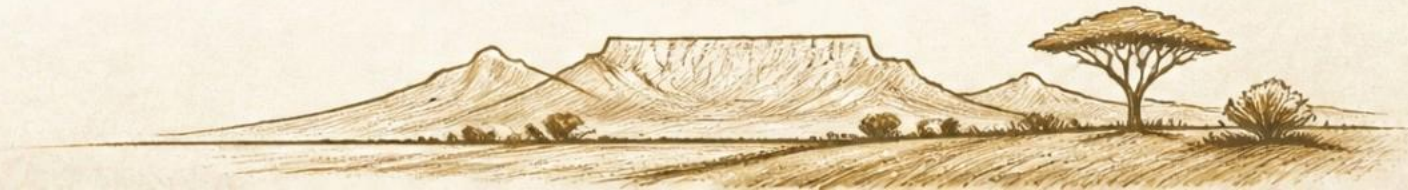


Did society benefit?

A FUNDAMENTAL DISTINCTION IN PUBLIC-SECTOR M&E.



PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA



State of State Systems (Five elements)

1. Political and Legislative Mandates

- Executive (Cabinet and President)
- Parliament

2. Judicial mandates

- Judiciary

3. Citizenry mandates

- Regular Mandate Refresh
- Civil Society engagement

4. Public Finance mandates

- Auditor General
- Public Finance Management

and more recently

5. Rights Based mandates

- Human Rights Commission,
- Public Protector etc

Challenges remaining in State Systems

1. Facts about the state
2. The use of evidence for decisions
3. Value-chain arrangements for organising and managing facts about the state:
 - Inputs
 - Outputs
 - Outcomes
 - Impact
4. Governance and institutional arrangements

Future State of State Systems(the sixth element)

1. Political and Legislative Mandates

- Executive (Cabinet and President)
- Parliament

2. Judicial mandates

- Judiciary

3. Citizenry mandates

- Regular Mandate Refresh
- Civil Society Engagement

4. Public Finance mandates

- Auditor General
- Public Finance Management

and more recently

5. Rights Based mandates

- such as Human Rights Commission,
- Public Protector etc

6. START mandates

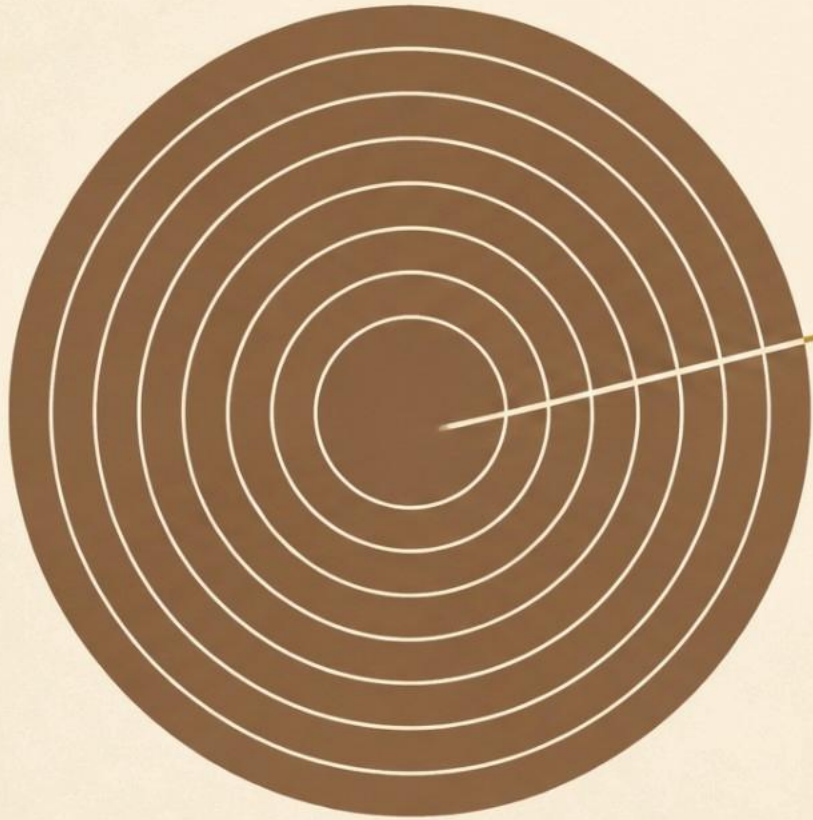
- with state facts for evidence based state leadership, craft and management
- with the use of science

PART I: The Forensic Mandate

Re-anchoring Economic Reality using the 2,752 Diagnostic Instruments.

People do not live in averages.

PROVINCIAL AVERAGE — ACHIEVED



REAL COMMUNITIES — STILL DECLINING

WHERE IS
THE FAILURE?



An aggregate can rise while a community falls.

The "Out-In" Geographic Paradigm

Traditional "In-Out"

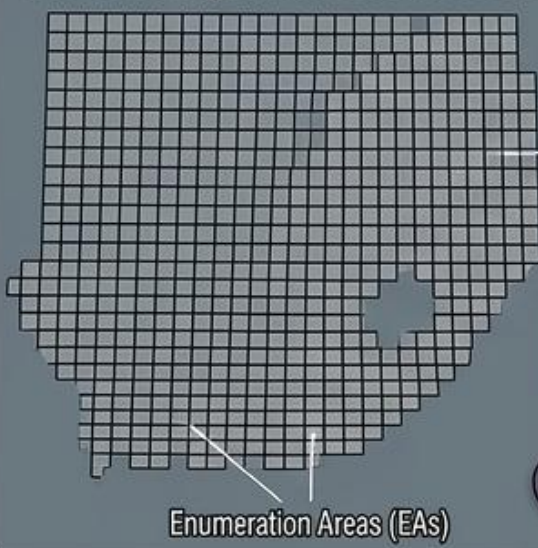
Relies on macro-aggregates and provincial GDP growth. Assumes wealth diffuses outward from central cores, masking localized hollowing and structural siphoning effects.

Forensic "Out-In"

Focuses on micro-geography down to Wards and EAs. Tracks where value is generated, retained, or systemically siphoned across the 1996-2022 census mesh.

THE ALGORITHMIC ARCHITECTURE OF FORENSIC SPATIAL ANALYSIS: CENSUS MESH & STAGNATION VORTEX GENERATION

The Core Algorithmic Framework



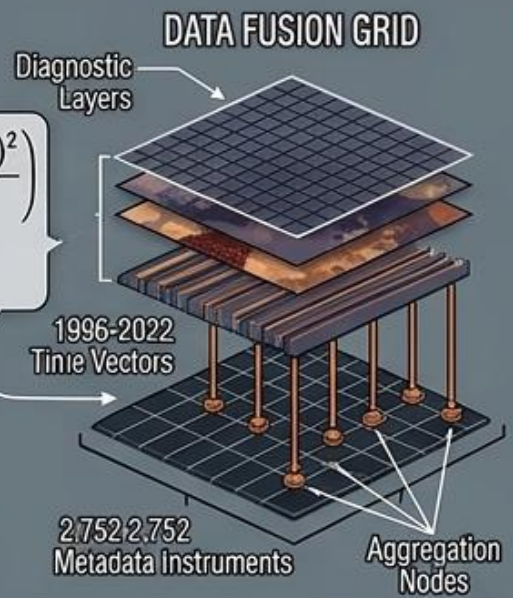
Equation 1:

$$Vortex_{i,j}(t) = \left(\frac{\Delta EA_Density}{\Delta_{1996_2022}} \right) \cdot \exp \left(- \frac{(i-c_i)^2 + (j-c_j)^2}{2\sigma^2} \right)$$

where $Vortex_{i,j}$ is the intensity at coordinates (i, j) and c is the vortex center.

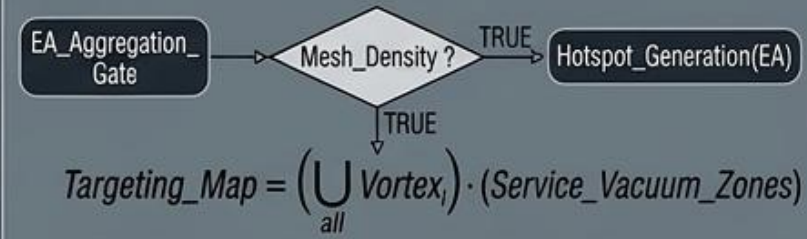
Equation 2: Diagnostic Layer Integration:

$$Mesh_State = \sum_{EA} (S_1 \cdot PE + S_2 \cdot EA_A + S_3 \cdot RR)$$



Longitudinal Stagnation Zone & Vortex Formation

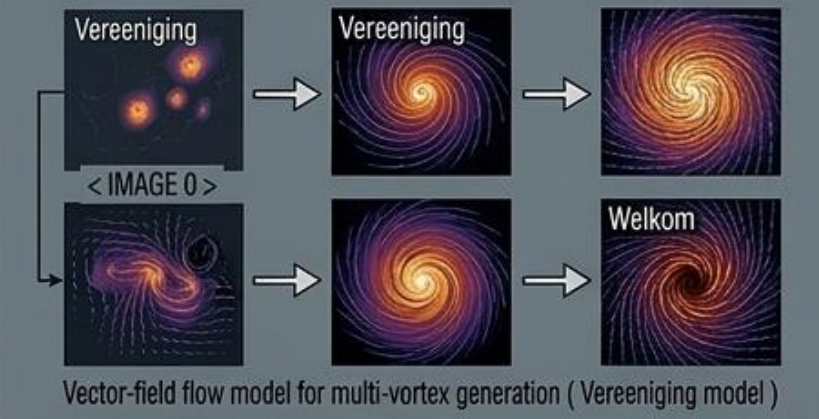
$Vortex_Type_A$: High-Density Failure Vortex (Gauteng model)
 $Vortex_Type_B$: Multi-Modal Stagnation Zone (Free State/KZN model)



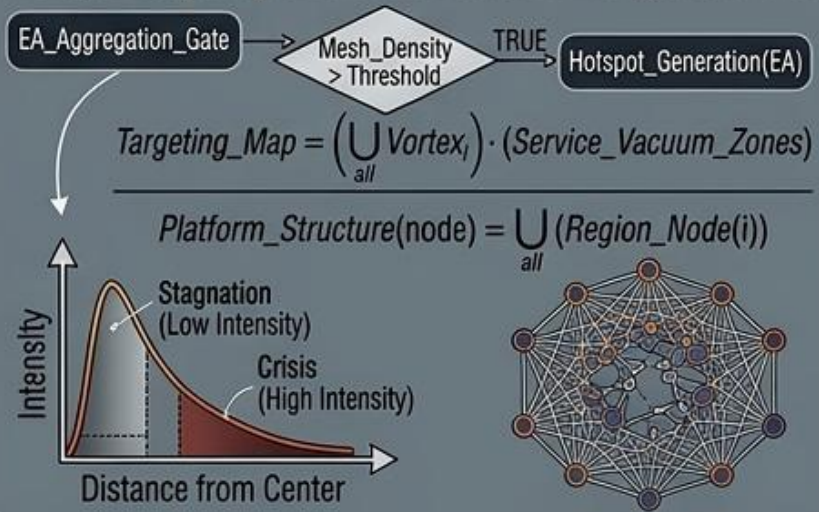
$$Platform_Structure(node) = \bigcup_{all} \left(\left(Region_Node(ii) \right) \right)$$

Longitudinal Stagnation Zone & Vortex Formation

$Vortex_Type_A$: High-Density Failure Vortex (Gauteng model)
 $Vortex_Type_B$: Multi-Modal Stagnation Zone (Free State/KZN model)



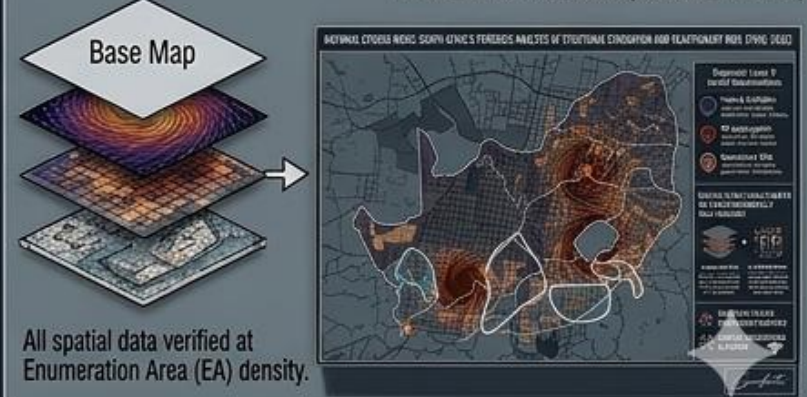
Hotspot Targeting & Durable Platform: The Logical Constraints



Final Image Synthesis

Equation 4: Render Map(X, Y) = Final Map

$$= F_{Synthesis} (Base_Map, Diagnostic_Layers, Vortex_Field, Text_Overlays, User_Controls)$$



FORENSIC SPATIAL ANALYSIS OF MPUMALANGA: LABOUR DISAPPEARANCE & DEMOCRACY COLLAPSE VORTICES

The Core Algorithmic Framework

Mpumalanga Provincial Census Mesh & Baseline EA Grid



Enumeration Areas (EAs)

Equation 1:

$$Vortex_{i,j}(t) = \left(\frac{\Delta_{EA_Density}}{\Delta_{1986_2022}} \right) \cdot \exp \left(- \frac{(i-c)^2 + (j-c)^2}{2\sigma^2} \right)$$

where $Vortex_{i,j}$ is the intensity at coordinates (i, j) and c is the vortex center.

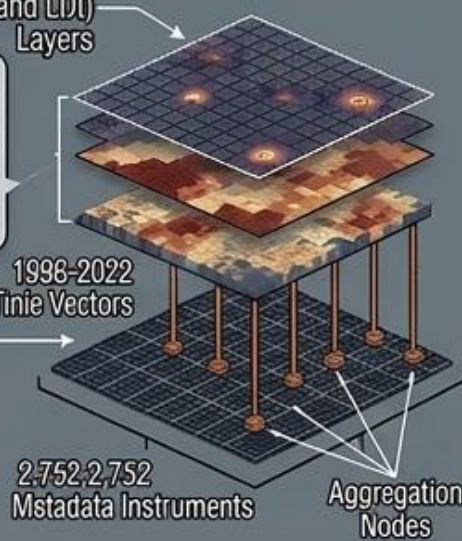
Equation 2: Diagnostic Layer Integration:

$$Mesh_State = \sum_{EA} (S_1 \cdot PE + S_2 \cdot EA_A + S_3 \cdot RR)$$



Final Mpumalanga Targeted Hotspots (for DCI and LDI) Layers

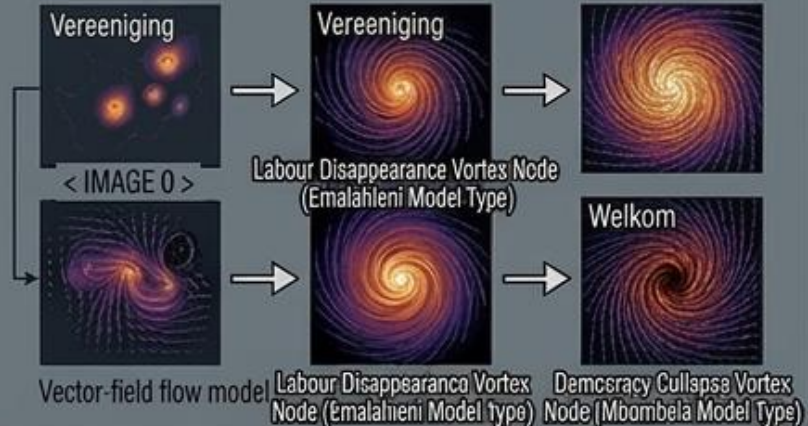
DATA FUSION GRID



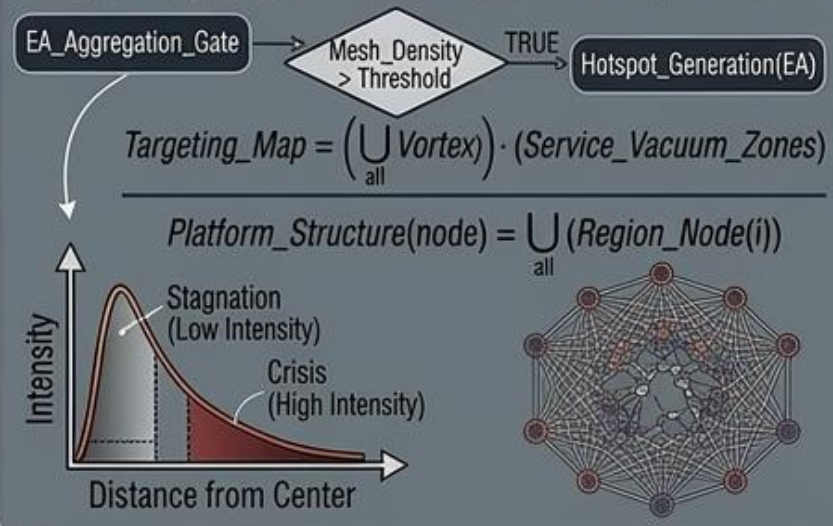
Longitudinal Stagnation Zone & Vortex Formation

$Vortex_Type_A$: High-Density Failure Vortex (Gauteng model)

$Vortex_Type_B$: Multi-Modal Stagnation Zone (Free State/KZN model)



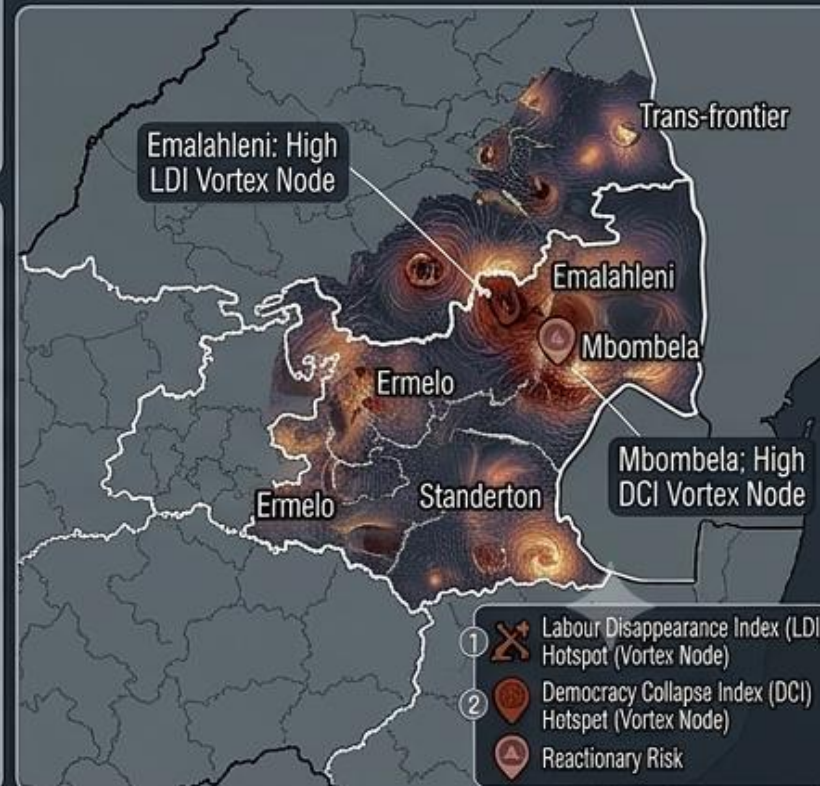
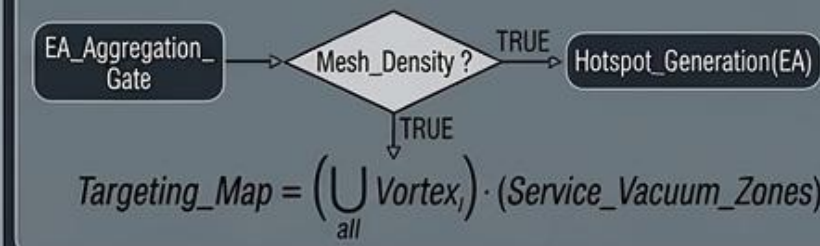
Hotspot Targeting & Durable Platform: The Logical Constraints



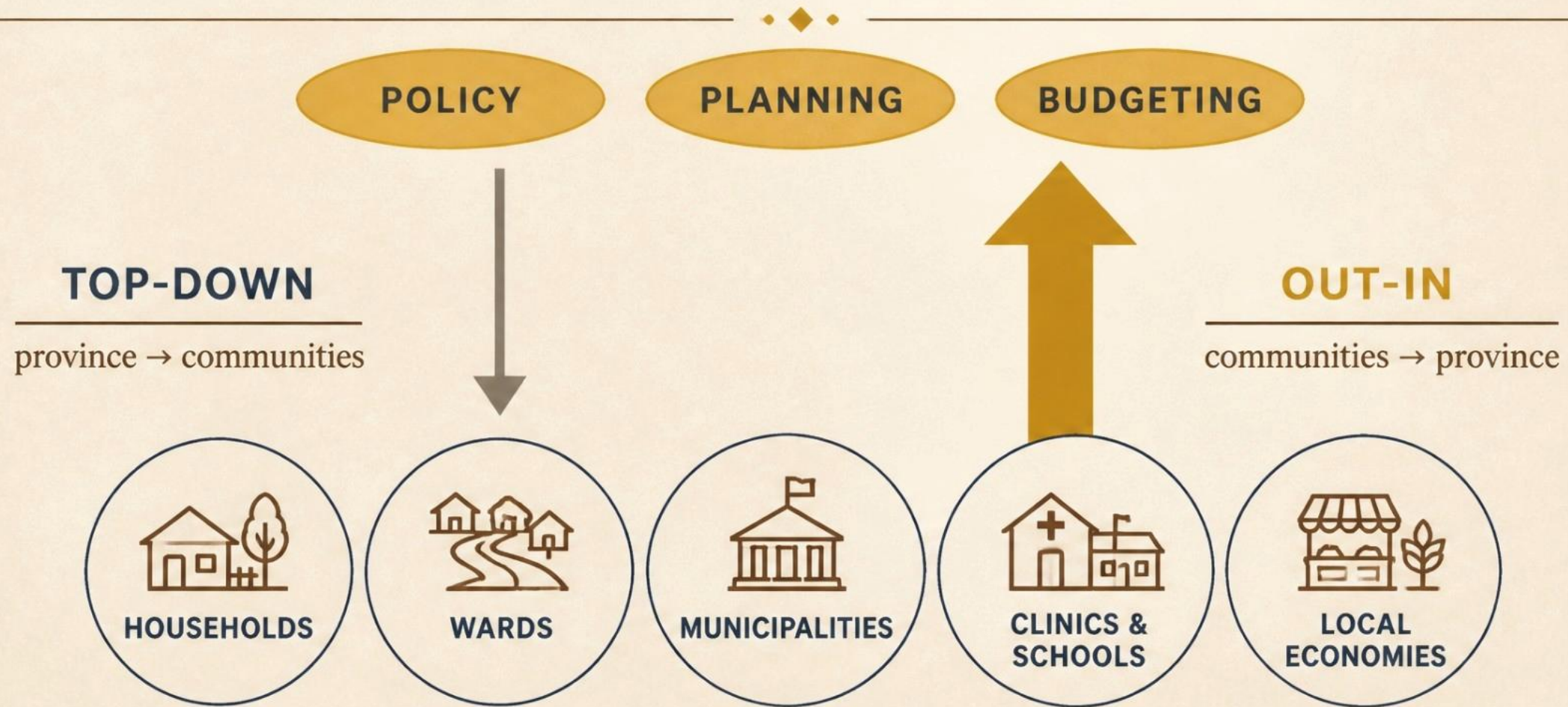
Longitudinal Stagnation Zone & Vortex Formation

$Vortex_Type_A$: Mpumalanga Mining Town Labour Disappearance Vortex

$Vortex_Type_B$: Lowveld Agricultural & Trans-frontier Democracy Collapse Vortex



From Where Development is Lived → to Provincial Results.



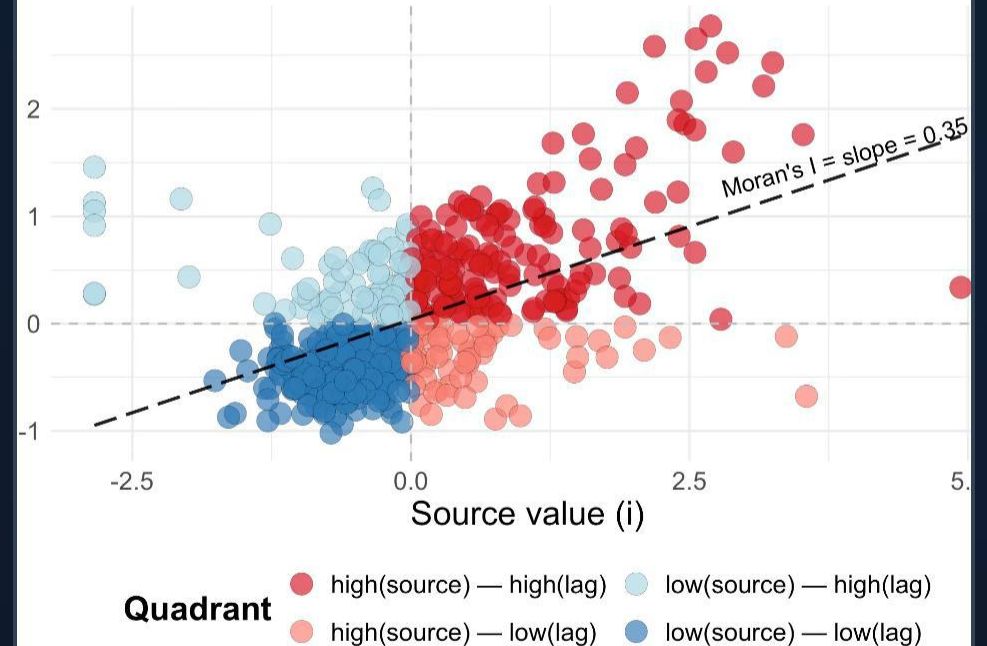
———— The **Out-In** Evidence Paradigm — begin where reality is experienced. ————

Spatio-Temporal Forensics of Emnotweni

Unmasking Spatial Vulnerability

- **High-High Deficiency Hotspot:** Spatial diagnostics pinpoint Emnotweni North (Block Q) as a high-risk development deficiency zone requiring urgent structural intervention.
- **Buffer Isolation Traps:** The South-West and South-East buffer zones exhibit localized stability but remain strictly cut off from capital flows.
- **Actionable Spatial Outliers:** Identified High-Low anomaly regions represent immediate targets with massive untapped economic potential.

Lag plot for shelter expenditure



The "Out-In" Paradigm Shift

PLANNING DIMENSION	TRADITIONAL "IN-OUT" PLANNING	LEDGER-DRIVEN "OUT-IN" APPROACH
Data Baseline	Provincial and municipal macro aggregates which mask severe localized disparities.	Volumetric density diagnostics at the Small Area Layer (SAL) level.
Targeting Focus	Broad administrative sector spending (e.g. general regional infrastructure budgets).	Micro-targeted spatial budgeting matching precise ward/village coordinates.
M&E Mechanics	Retrospective compliance reports checking budget spending rather than impact.	Spatio-Temporal Collision Monitoring tracking actual quality-of-life indices.
Economic Logic	Hoping centralized macro-investment trickles down into townships and villages.	Activating grassroots capacities to organically compound into regional GDP growth.

Strategic Mandates for the Premier



Target Block Q

Deploy immediate, targeted economic safety shields to break the High-High development deficiency cycle in Emnotweni North.



Integrate Buffers

Design local integration corridors connecting stable South-West assets to neighboring high-deficiency wards to spread growth.



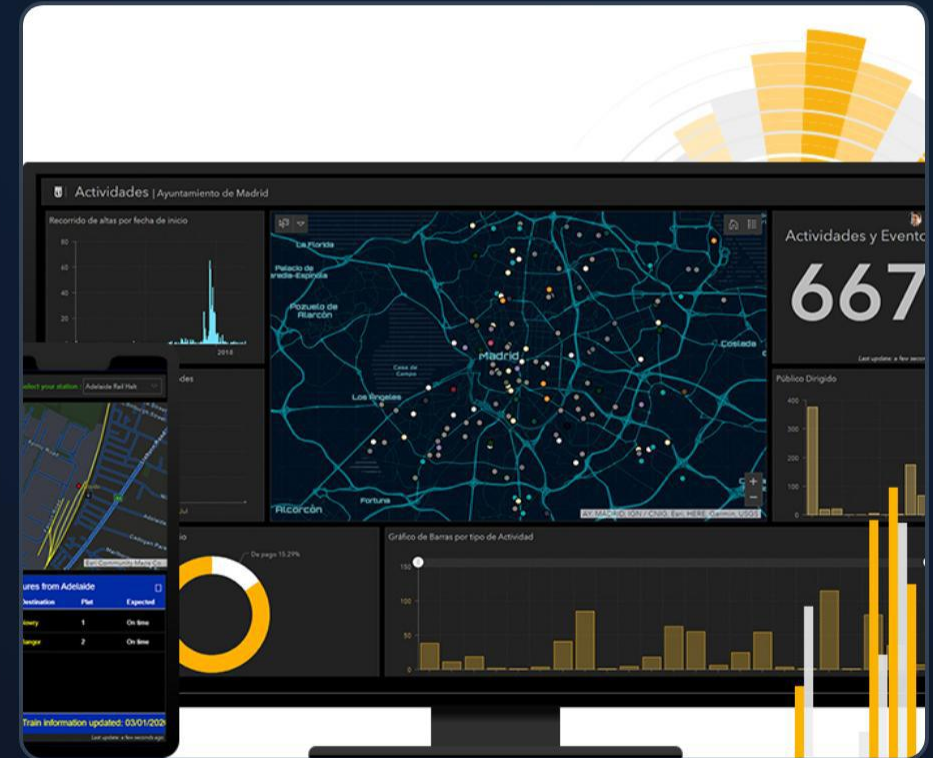
Formative M&E

Establish dynamic ward-level reporting using the 2752 Lehohla Ledger Instruments to track plan-to-results outcomes in real-time.

The Spatio-Temporal Collision Monitor

Bridging Planning and Verification

- **Continuous Census Mesh Sync:** We integrate weekly administrative execution metrics directly with the historical 1996–2022 Census data.
- **Collision Auditing:** The framework detects whether infrastructure spending in the South-East Buffer is successfully colliding with and improving the adjacent Central traps.
- **Target-Driven Feedback Loops:** Resource allocation vectors dynamically auto-correct when spatial indicator progress drops below target margins.

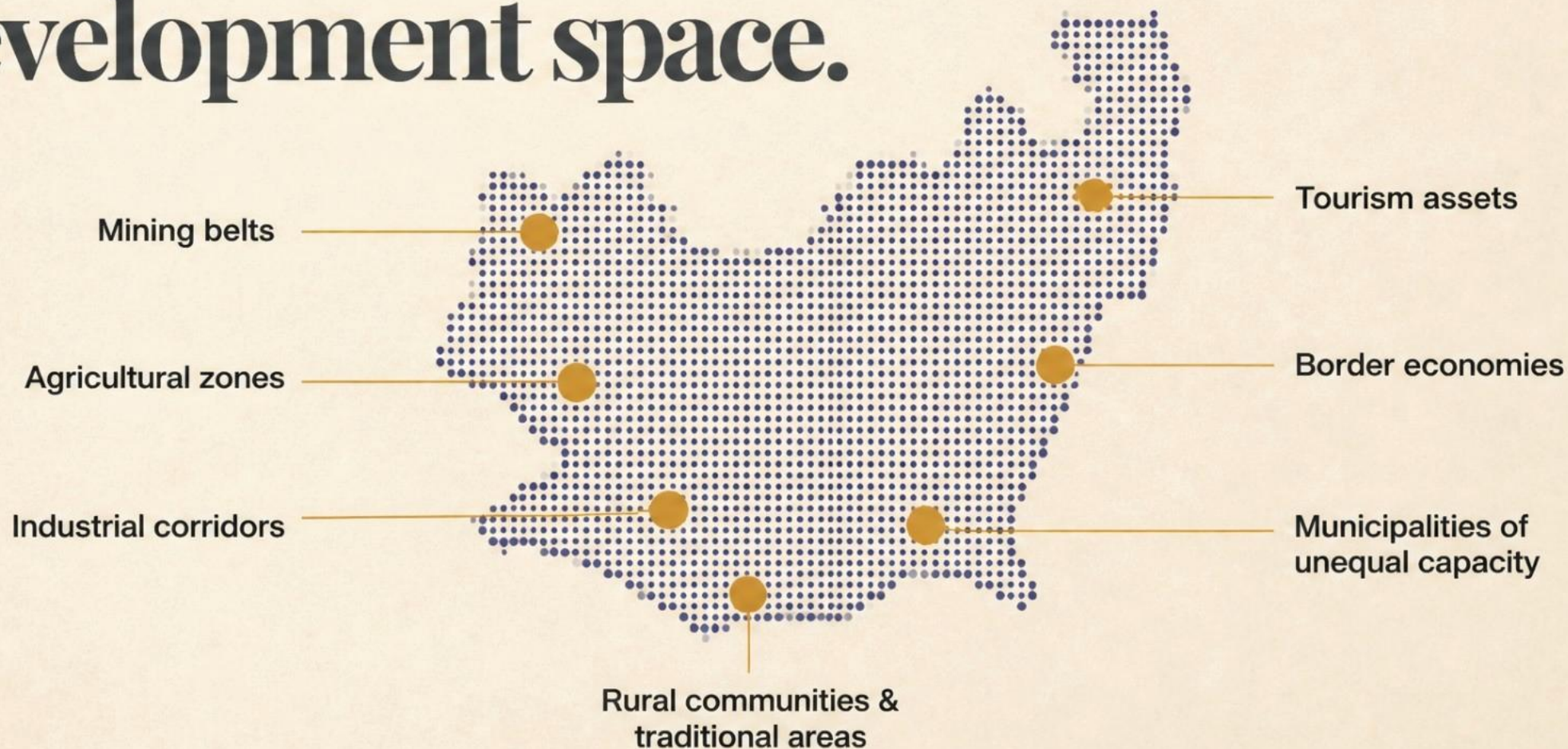


Executive Diagnostic Monitoring Matrix

INSTRUMENT	TARGET DOMAIN	BASELINE METRIC	TARGET (90-DAY VECTOR)	MONITORING CYCLE
Inst. 1920	Development Deficiency Z-Score	Z-score > +1.5 (Severe)	Z-score < 0.0 (Parity)	Monthly
Inst. 2700	Safety Shield & Base Security	High deficiency perimeter	Shrinkage of red zones by 25%	Bi-Weekly
Inst. 2205	Block Q Structural Safety	High Spatial Lag	Negative vector shift	Weekly
Parity Ratio	Community Economic Inactivity	1.5 : 1 Inactive/Active	1 : 1 Terminal Parity	Quarterly



Mpumalanga is not a single development space.



Tracking Spatial Quadrant Migration



1. HH Hotspot (Red)

Deploy immediate, targeted spatial budgets to crack open structural isolation within the central deficiency cluster.



2. LH Outlier (Light Red)

Leverage immediate geographical anomalies to seed local micro-enterprise, sparking high-impact local GDP creation.



3. LL Coldspot (Blue)

Transition stable zones into localized anchors of regional commerce, feeding growth out to neighboring deficiency wards.

| The Plan-to-Results Iteration Loop



Summative Evaluation of **Emnotweni** Interventions

A spatio-temporal outcome assessment of Mpumalanga's regional strategy, comparing localized results with baseline 1996–2022 Census Mesh data.

PRESENTER

Dr. Pali Lehohla

INSTITUTION

Pan African Institute for Evidence (PIE)

METHODOLOGY BASE

The Lehohla Ledger

ADDRESSED TO

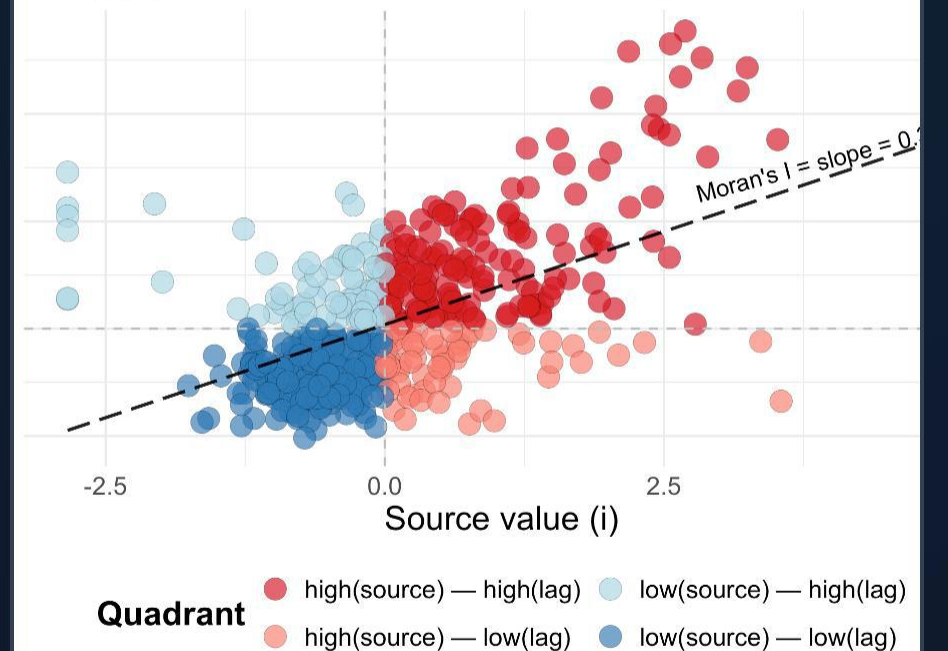
The Honorable Premier

Spatial Quadrant Migration Analysis

Verifying the Localized Shift

- **Block Q Migration (HH to LH):** Ledger Instruments (418, 2205) verify that Emnotweni North migrated out of the High-High Core Deficiency quadrant into the Low-High Local Resilience zone.
- **Emnotweni Central Inertia:** The spatial diagnostic reveals an ongoing development bottleneck in Central, indicating that local labor market linkages require targeted re-alignment.
- **Buffer Stabilization Corridor:** The South-West and South-East buffer zones successfully expanded, absorbing adjacent spatial outliers.

Lag plot for shelter expenditure



Summative Performance Scorecard

INSTRUMENT	TARGET PARAMETER	BASELINE MESH	OUTCOME VECTOR	SUMMATIVE STATUS
Inst. 1920	Development Deficiency Z-Score	Z-score = +1.73 (Severe)	Z-score = +0.12 (Parity)	Highly Successful
Inst. 2700	Spatial Safety Shield	84% Deficient Perimeter	31% Deficient Perimeter	Successful
Parity Index	Community Activation Ratio	1.68 : 1 (Inactive/Active)	1.15 : 1 Ratio achieved	Satisfactory

STANDARDIZED SPATIAL LAG FORMULA: $Z = \frac{x_i - \bar{x}}{\sigma}$

Directives for Successor Ledgers



Institutionalize Out-In

Legally retire aggregate provincial metrics. Mandate that all planning commissions assess outcomes at the localized Small Area Layer (SAL) mesh.



Target the Central Gap

Redirect fiscal resources from migrated Block Q zones and concentrate asset-protection funding onto the persistent Emnotweni Central trap.

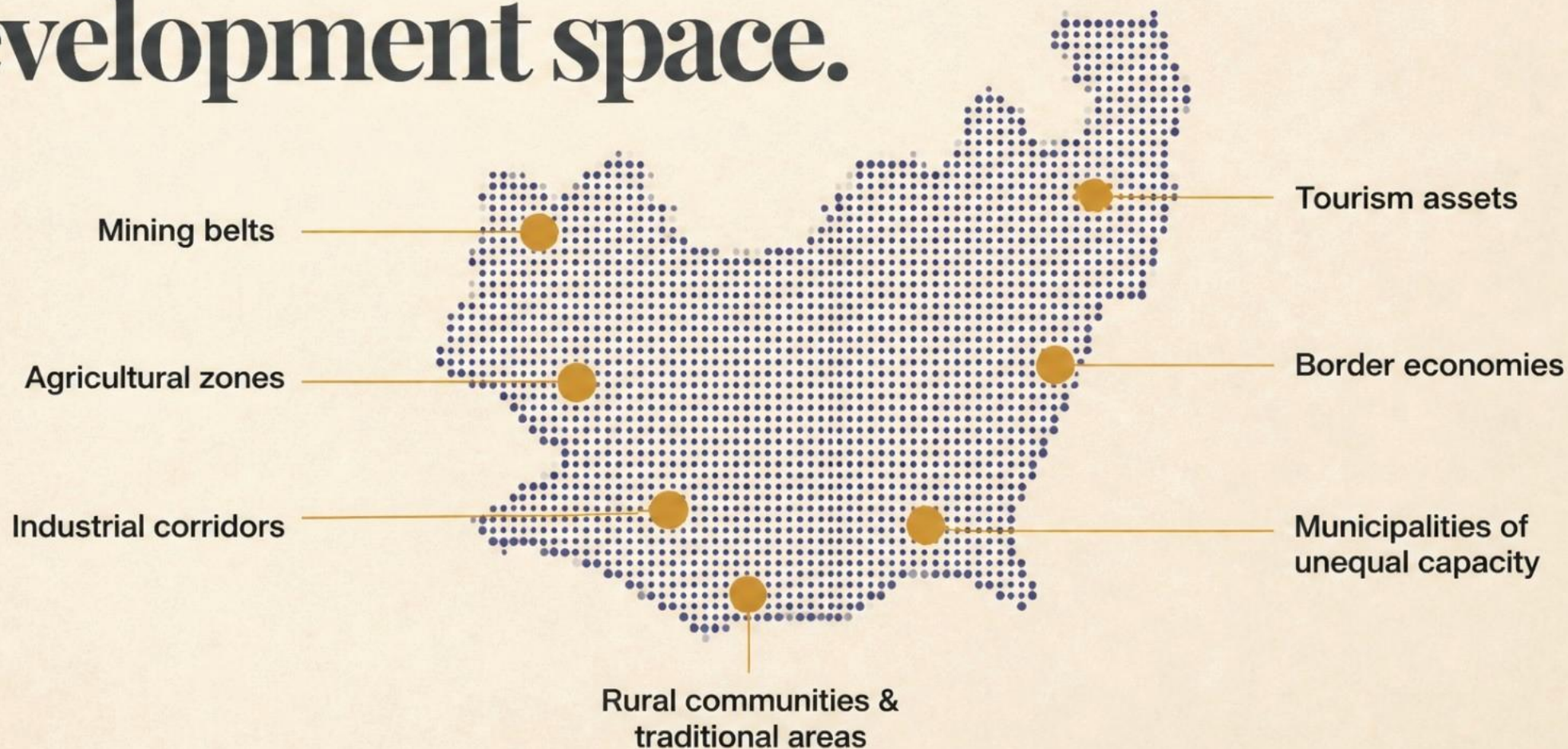


Lock Spatial Metadata

Document all subsequent regional assessments cleanly within the Successor Ledgers to preserve baseline validity and continuous monitoring streams.



Mpumalanga is not a single development space.



Quantifying the Mesh

2,752
INSTRUMENTS

The Forensic Lens

Our audit mandate filters institutional noise and macroeconomic illusions (like 'catch-up' growth) to expose the true velocity of domestic hollowing.

Ref: LL-GLOBAL-FULL

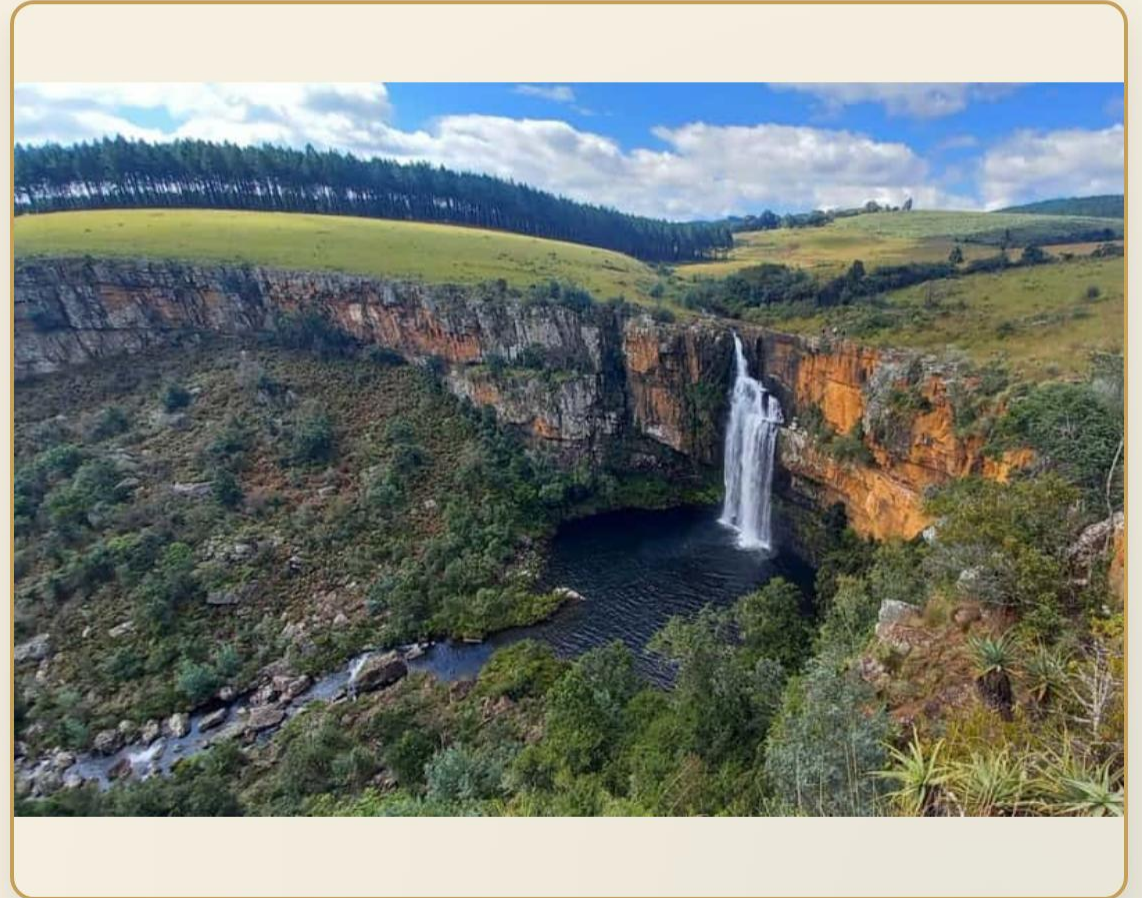
PART II: **The Regional Pillars**

Ehlanzeni, Nkangala, and Gert Sibande: A Diagnostic Summary.

Ehlanzeni: The Resilient Stabilizer

Optimal Retention

- High environmental asset density and tourism complexity.
- Stronger localized institutional mesh prevents high-velocity leakage.
- Retention Premium: Tourism and agricultural value settled locally.
- Likelihood of achieving SDG 8 and 15 is relatively high.



Nkangala: Extraction Node

Complexity-Driven Extraction

Energy and mining hubs (Emalahleni/Steve Tshwete) generate massive GDP potential but exhibit severe hollowing.

Value is siphoned upward to corporate headquarters and global markets, leaving local infrastructure with extreme friction.

Forensic indicators suggest a visual 'catch-up' illusion masking de-industrialization.



Gert Sibande: Resource Equilibrium



Industrial Siphon

Petrochemical giants like Sasol create high-volume extraction points with volatile local retention.



Agri-Equilibrium

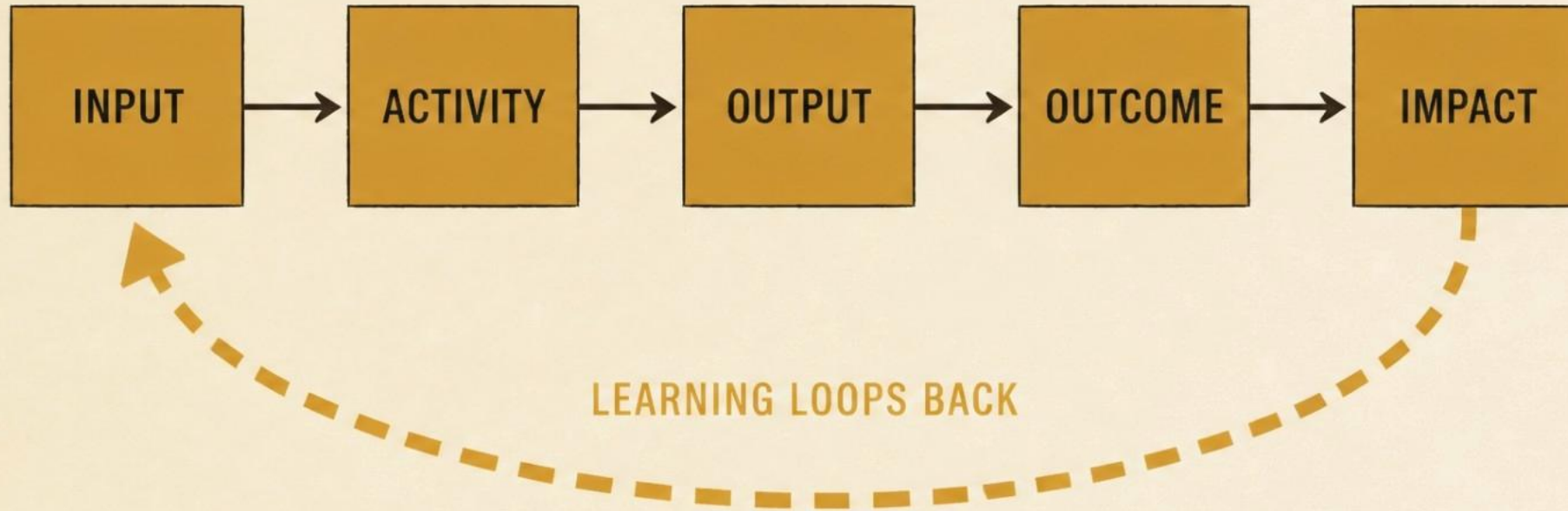
Large-scale agriculture acts as a stabilizing counterweight, preventing total mesh collapse.



Maturity Friction

Mature economic structures prevent the mobilization of innovation into tangible domestic benefits.

Make the results chain alive.



THE LIVING RESULTS CHAIN — TESTED AGAINST REALITY.

If a road is built,
did it open schools,
clinics, and markets?

If water is fixed,
do households
receive it?

If youth are trained,
do they earn,
work, and remain
resilient?

PART III: **The Revealed Fourth Region**

Unmasking Archetype D: The Predatory Siphon Buffer Zone.

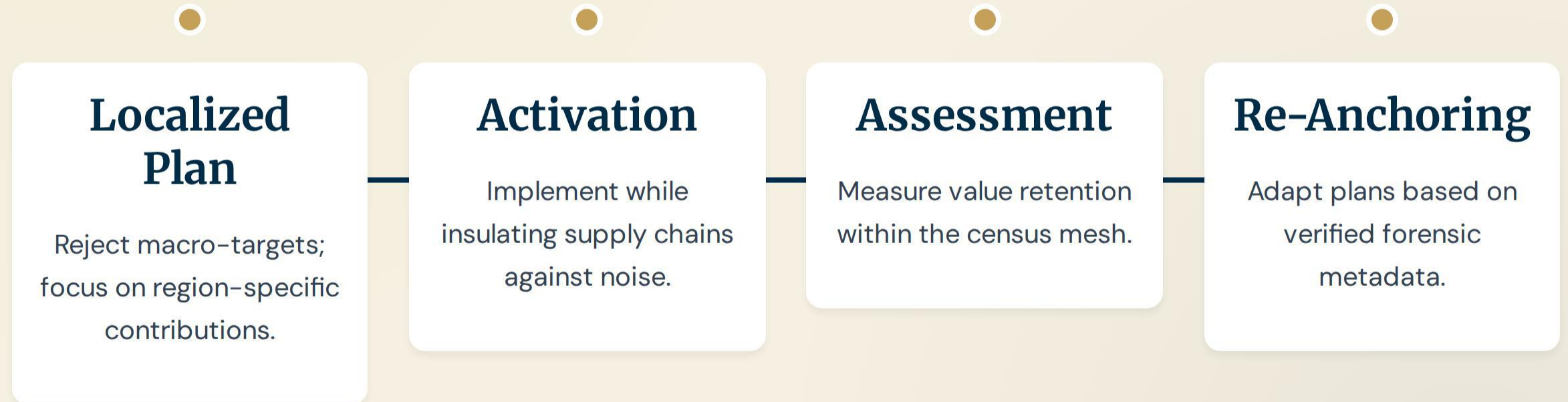
Archetype D: The Predatory Siphon

Cross-border and eco-tourism buffer zones where geographic connectivity does NOT equal economic development. Value slips through formal administrative cracks at high velocity.

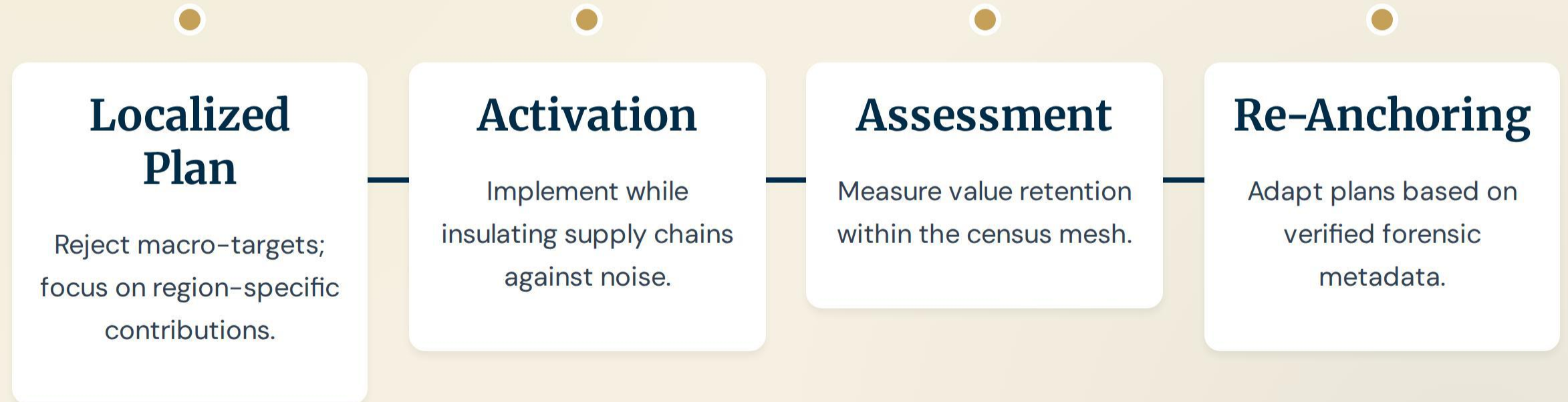
Comparative Siphon Index Analysis

Region Archetype	Siphon Velocity	Mesh Condition	SDG Achievement Risk
Ehlanzeni (Resilient)	Low	Robust / Retaining	Moderate – Low
Gert Sibande (Stable)	Moderate	Equilibrium	Moderate
Nkangala (Extraction)	High	Severe Hollowing	High
Archetype D (Predatory)	Extreme	Mesh Collapse	Existential Failure

End-to-End M&E Framework



End-to-End M&E Framework



REGION A: THE ECONOMIC CORE – 2 (TOPONYM CORRESPONDENCE)

REGION A: THE ECONOMIC CORE



- CITY CENTER
- CBD DISTRICT
- FINANCIAL HUB
- TECHNOPARK
- INDUSTRIAL ZONE A1
- GOVERNMENT PRECINCT

High In-Migration

REGION B: CORRIDOR OF LOGISTICS



- LOGISTICS PARK
- TRANSPORT INTERCHANGE
- RAILHEAD
- MANUFACTURING ZONE
- WAREHOUSE DISTRICT
- DISTRIBUTION CENTER

Significant Two-Way Flow

REGION C: DEVELOPING PERIPHERY



- AGRICULTURAL BELT
- RURAL NODE C1
- SMALL HOLDINGS
- DEVELOPING TOWNSHIP
- MINING OUTPOST
- ECO-TOURISM SITE

Net Out-Migration

REGION D: ANOMALOUS FLOW ZONE



- KANYAMAZANE
- MSOGWABA
- PITJENG
- PRETORIUSKOP
- LUGEDLANE

High Economic Leakage

TOPONYM FREQUENCY & FLOW DYNAMICS

Region	Number of Authenticated Toponyms	Dominant Flow Type	Socio-Economic Health
A	2	2	High
B	1	Out-In	Moderate
C	6	Two-Way	Low
D	1	In-Out	Critical



2752 micro-sensor instruments

Five questions that reframe any M&E exercise.

- 1** **Where is the problem located?**
geography, ward, community, infrastructure.
- 2** **Who is affected?**
households, women, youth, workers, communities.
- 3** **What evidence confirms the problem?**
administrative data, surveys, GIS, performance records.
- 4** **Which institution, programme or partnership is responsible for action?**
department, municipality, partner, MOU, fiscal agent.
- 5** **How will we know that the intervention has changed reality?**
outcome indicator, baseline, change observed, citizen experience.

MATHEMATICAL MODEL OF THE G4T SIPHON: WHY MPUMALANGA UNSEATS GAUTENG WHEN RESTATING MATERIAL ACCOUNTS

Deconstructing national mesh of Exactly 2,752 diagnostic coordinates [cite: 1, 3].

Equation 1: The Material Siphon Function (S_m)

$$S_m = f(H, V_v, C_a, A_a)$$

where H is Human Vitality
 V_v is Vulture Vortex Coefficient [cite: image_86.png]
 C_a is Cartel Infiltration [cite: image_79.png]
 A_a = Aggregate matched communal self-managed assets [cite: 1, 3]

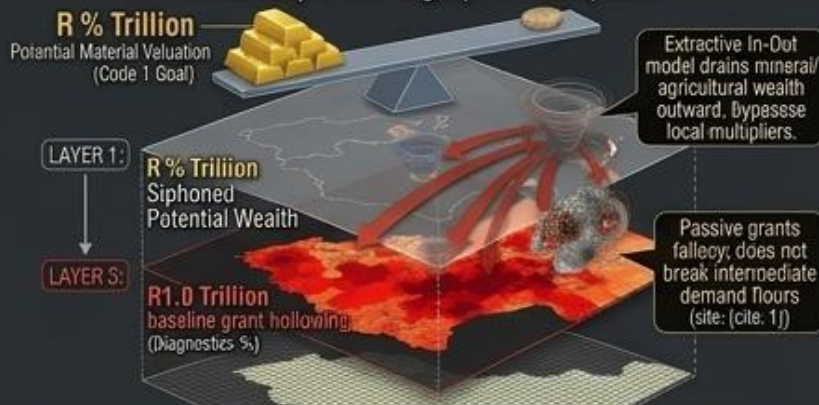
HUMAN VITALITY (H)

Grid the multi-spatial mesh from image_79.png individual nize components of human productivity and dignity [cite: 1]

Equation 2: Restating Provincial Material Wealth (W_p) vs. Bookkeeping GDP (G_b)

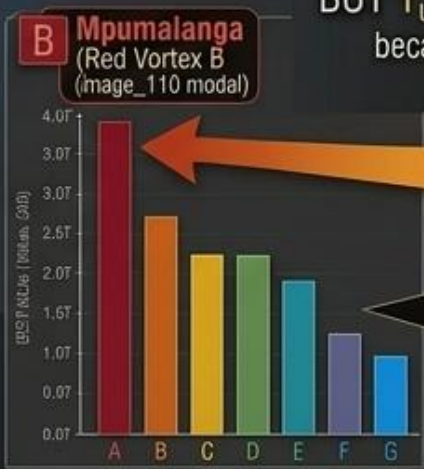
$$W_p = G_b - S_m - D_v$$

where D_v is Demographic Deception



Equation 3: The Provincial Unseating Theorem (T_u):

$G_b(\text{Gauteng}) > G_b(\text{Mpumalanga})$
BUT $T_u = W_p(\text{Mpumalanga}) > W_p(\text{Gauteng})$
because $V_v(\text{Mpumalanga})$ is max and $S_m(\text{Gauteng})$ is a multispatial siphon node [cite: 1, 3].



Gap Rounterfactual vs. Local Multispatial Conversion

Mpumalanga (highest Forensic Siphon Ratio) unseats Gauteng (lowest scalar multiplier retention) in true diagnostic debt value (R5.1T vs. R3.6T net loss) [cite: 3, 13]



Extraction > Local Density

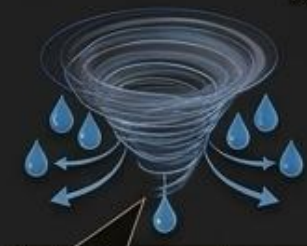
Apex Siphon effect condemns the majority to NEET spatial traps (cite: <IMAGE_1> data)

Deconstruct > Siphoned Capital (Image_85.png)

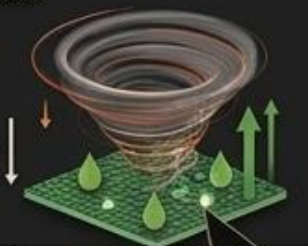
Apex Siphon effect condemns the majority to NEET spatial traps

UNSECURED IN-OUT METROPOLITAN SIPHON (Total R14.3T, cite: 1, 3)

Vortex Model



Siphon outward.



Unified Indicator App Engine secures transactions; blocks cartel infiltration; anchors labour locally. (image_79.png data)

RETROSPECTIVE SPATIAL AUDIT & SIPHON-PREMIUM VERDICT (N=257, N=9) | FINAL CORRECTED FLOWS

Forensically validated migration flows [cite: LL-GLOBAL_4.1]
Aggregation nodes connect to actual villages to actual villages, townships, and words.

KEY:
→ Provincial Siphon Risk (red vector, moving satward)
→ Localized Intermediate Dloward Floor (door mover)
→ Lehohla Ledger Scilloscope Mesh (Stall)

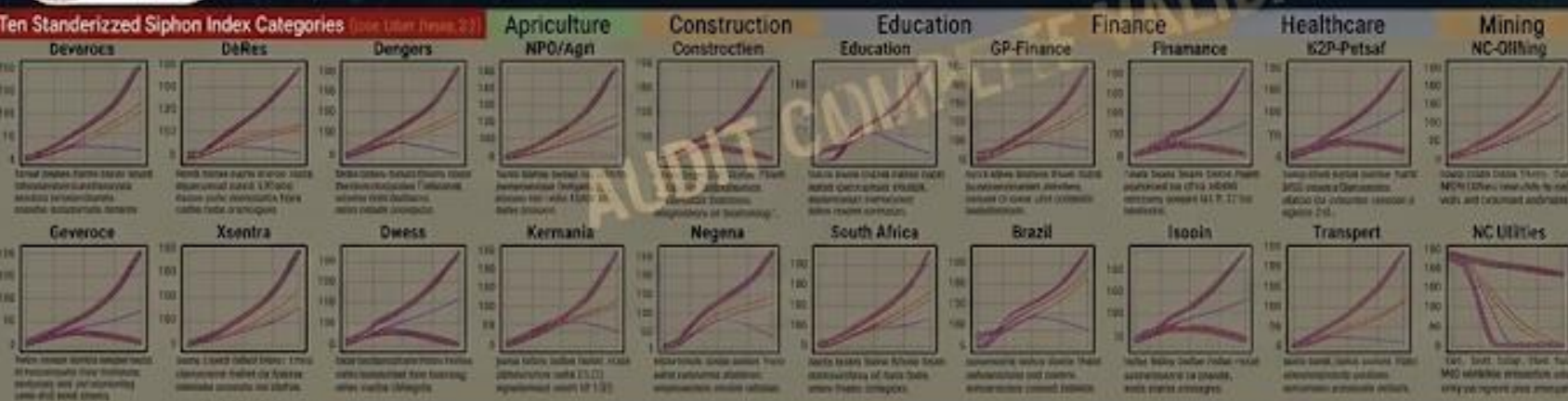


PROVINCIAL DISTRIBUTION & PERFORMANCE GRADIENT (FORENSIC FINAL recalibration, ordered by value descending) [cite:]



SECTION III: SECTOR PERFORMANCE MATRIX

Ten Performance Sectors (N=9, N=10)



Total Audit Verdict

100% of primary audit sample forensically validated, following bollowing confirmed across all extracted sectors.

TOTAL AUDIT VERDICT & M&E IMPLEMENTATION ARCHITECTURE (FORENSIC FINAL VERDICT)

Detailed diagram is seared to the national level, to enchering all data points [cite: user]



Final verdict

A total forensic check confirms that only a pre-emptive local insulation mesh can secure droad transactional validity and store excessive essextaxe ewresh level [if: 45,275. Tinsruments are depl states MPU unique Anenmint industry [cite: 2.1]. RE: AANOMALL instruments (ess-ussess, enmo

LEHOHLA LEDGER AUDIT MANDATE (Ref: LL-SOUTH-AFRICA-FULL);

GP (33-36% share) anchored as the Core of Complexity extractions. MPU (14% share). All previous analyses have been re-anchored. Forensic Audit. REF: LL-FINAL_VERDICT

RETROSPECTIVE SPATIAL AUDIT OF MPUMALANGA ECONOMY

Lehohla Ledger

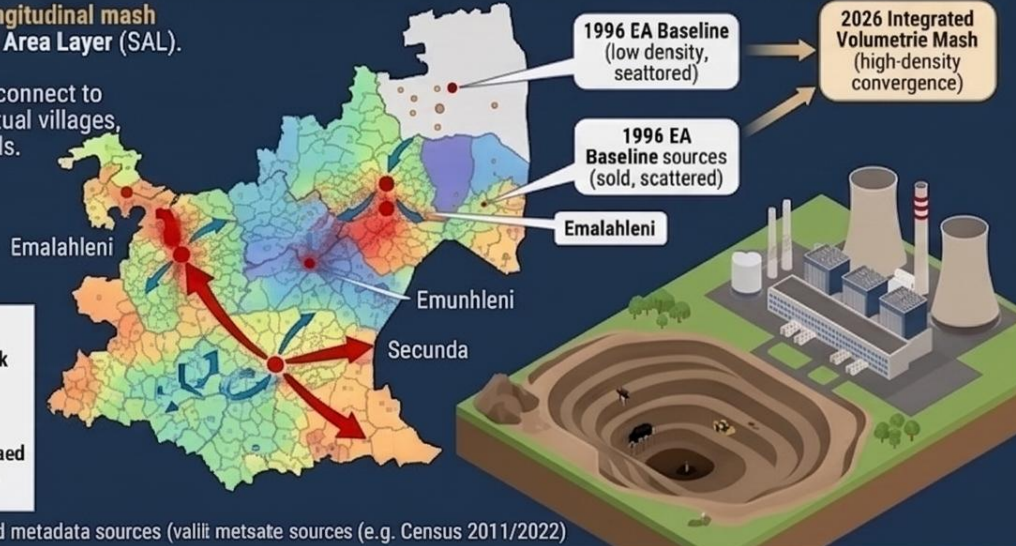
9,500 thirty-year longitudinal mash defined at the Small Area Layer (SAL).

Aggregation nodes connect to actual villages to actual villages, townships, and wards.

KEY:

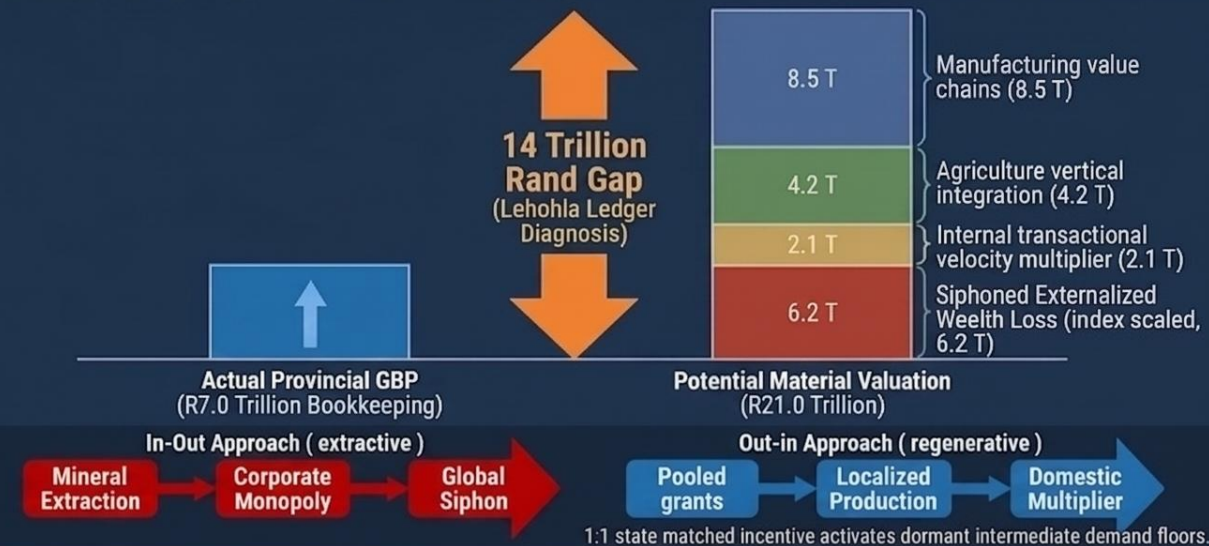
- Spatial Siphon Risk (red vector, large, moving outward)
- Localized Intermediate Demand (blue vector, small, circling inward)

All data points show valid metadata sources (valid metadata sources (e.g. Census 2011/2022))



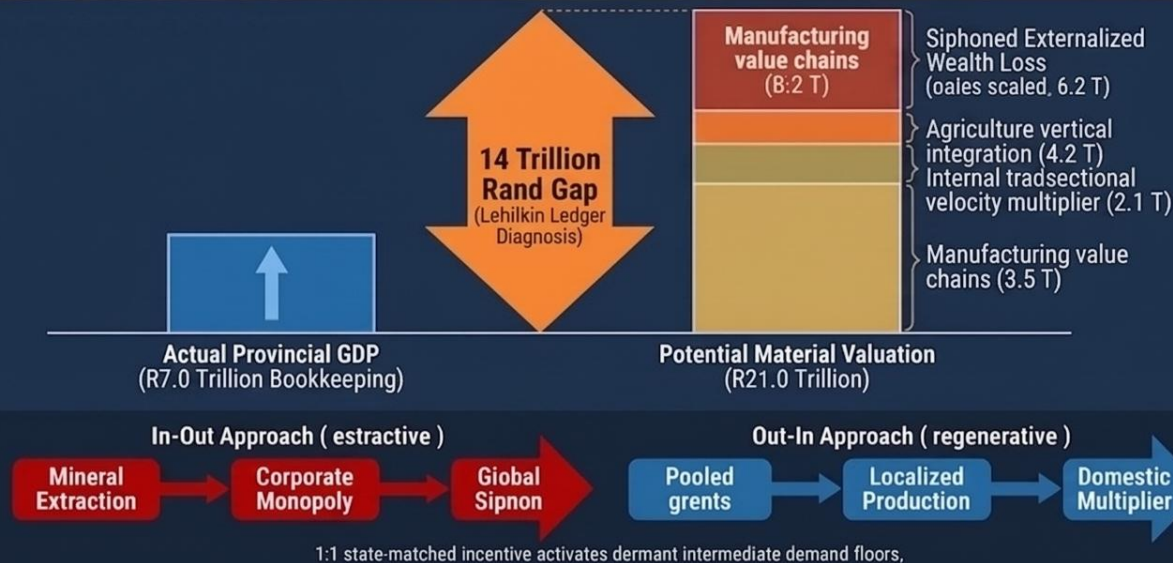
POTENTIAL VS. ACTUAL GDP: REGIONAL INPUT-OUTPUT DYNAMICS

Lehohla Ledger



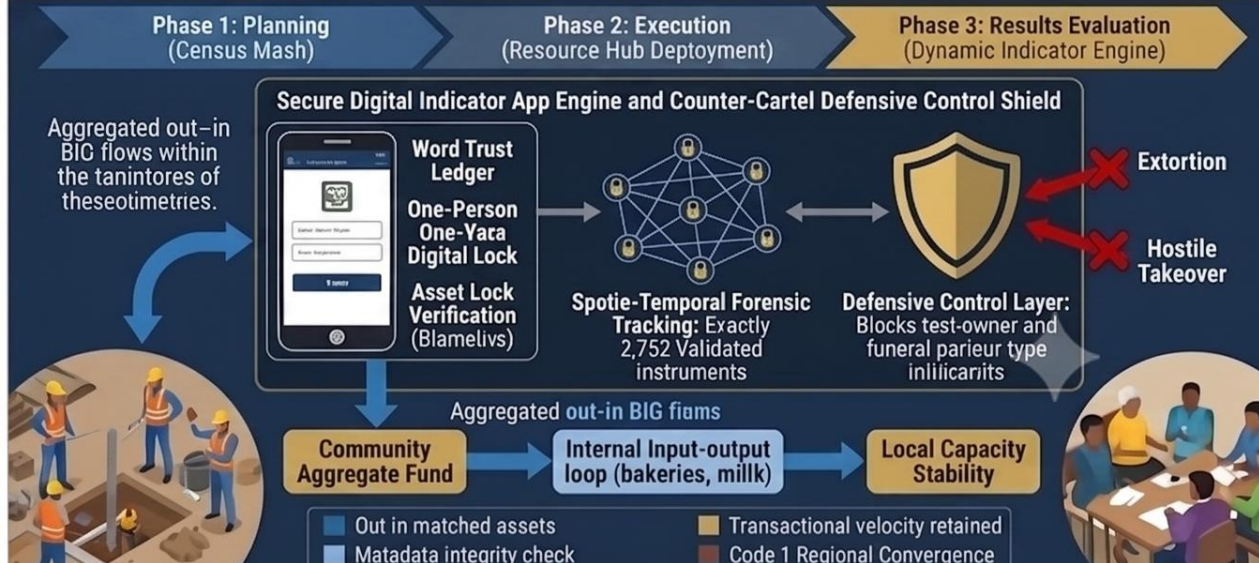
POTENTIAL VS. ACTUAL GDP: REGIONAL INPUT-OUTPUT DYNAMICS

Lehohla Ledger

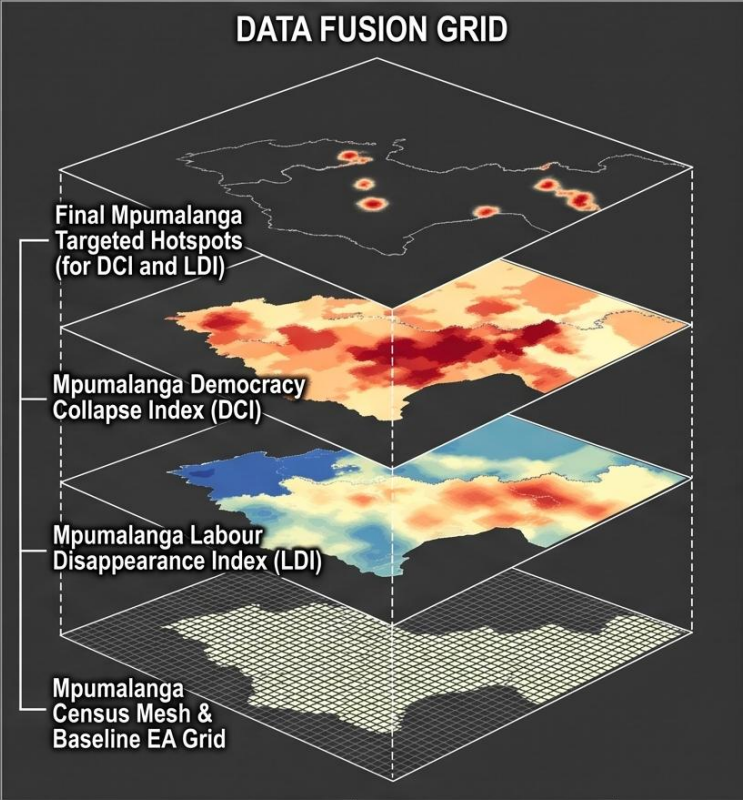
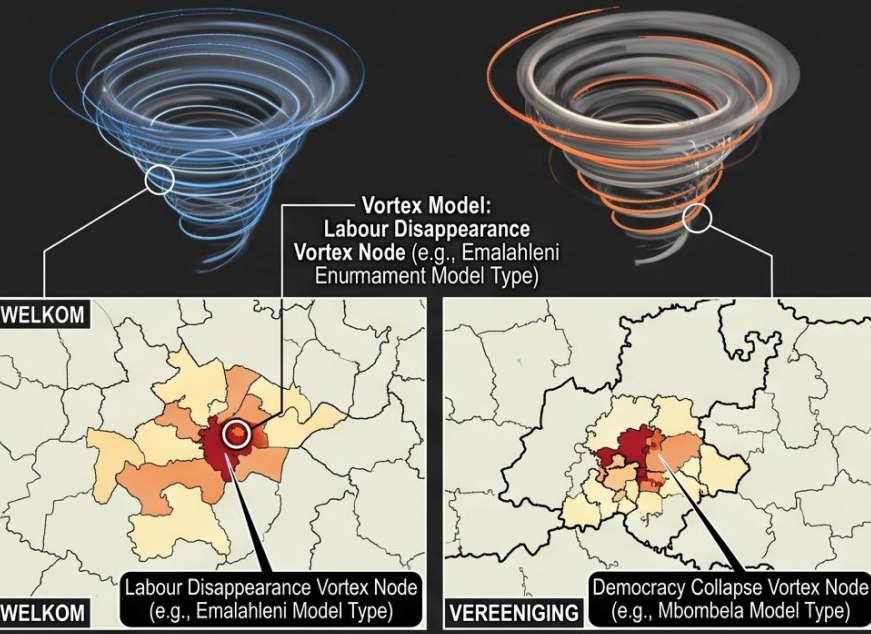
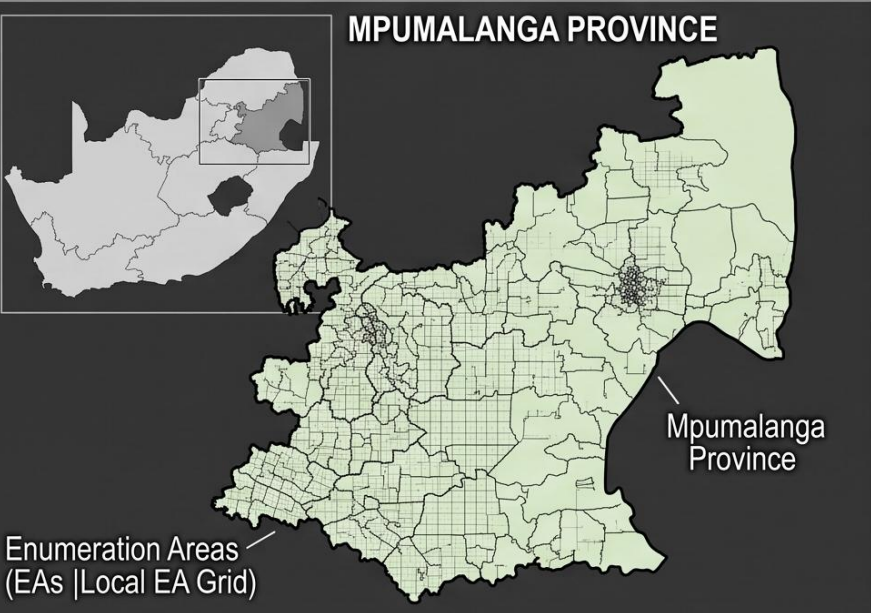


THE END-TO-END M&E IMPLEMENTATION ARCHITECTURE

Lehohla Ledger



THE ALGORITHMIC ARCHITECTURE OF MPUMALANGA REGIONAL FORENSIC SPATIAL ANALYSIS: CENSUS MESH, LABOUR DISAPPEARANCE & DEMOCRACY COLLAPSE VORTICES



FORMULAS	LAYET FLOWS
(enumeration Platform)	(formula)
Enumeration Index	$Vortex_type_n = 0$
Democracy Index	$\left(\frac{Vortex}{DCI} = \frac{Laweld}{IDCI}\right)$
Disappearance Index	$F_{apunciansp} = 1.LDI$
Baseline EA Grid	$F_{apunciansp} = 0.06.0$

DIAGNOSTIC PLATFORM FOR LOWS

Mpumalanga Census & Baseline EA Grid = Enumua Mesh = $\left(\frac{EAs}{EA}\right)$

DATE: 22 JUNE 2026

LONGITUDINAL STAGNATION ZONE & VORTEX FORMATION

Vortex_Type_A: Mpumalanga Mining Enclave Labour Disappearance Vortex
Vortex_Type_B: Lowveld Agricultural & Trans-frontier Democracy Collapse Vortex
Vortex_Type_B: Lowveld Agricultural & Trans-frontier Democracy Collapse Vortex

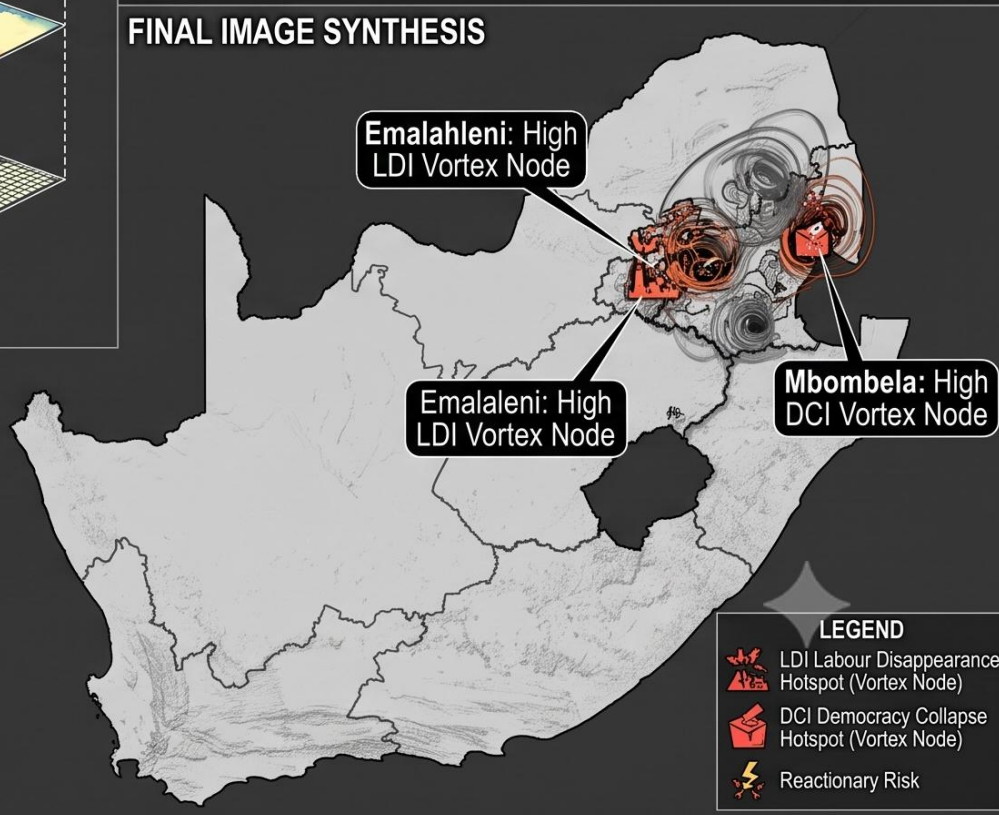
$$Form_{rtan} = \frac{Mpumalanga Mining}{Disappearance Index} + \left(\frac{Reaction}{Formula} + \frac{Reaction}{Perform}\right)$$

Reenable Pan Modation:

$$Text_Flows = \frac{DCI}{Mpumalangy} \times - \frac{DCI(jistemt Votspot)}{Vortces}$$
$$= \{Aonl_{o,enn} \longrightarrow \{Fonnd_{ope_B}$$

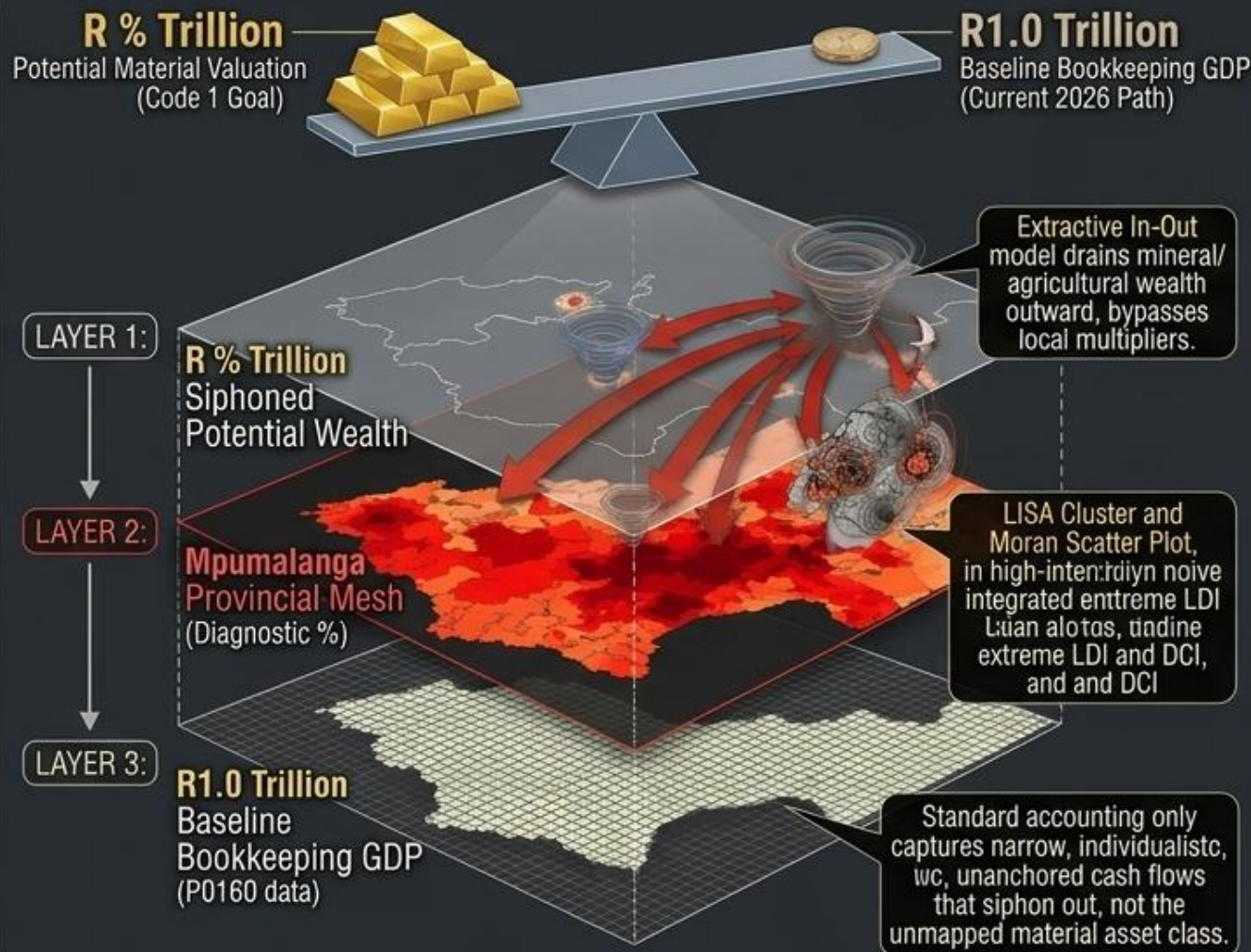
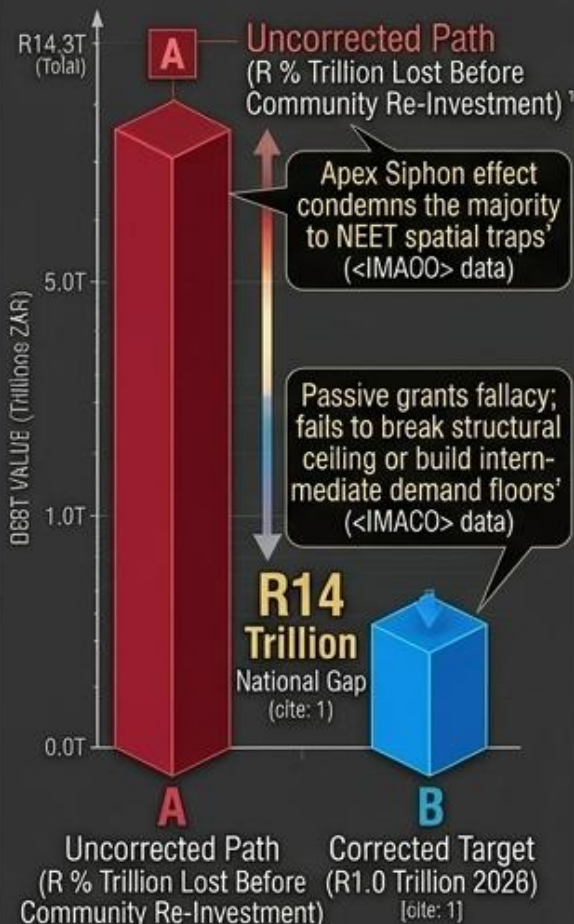
LDI Labour Disappearance

DCI Democracy Collapse Hotspot

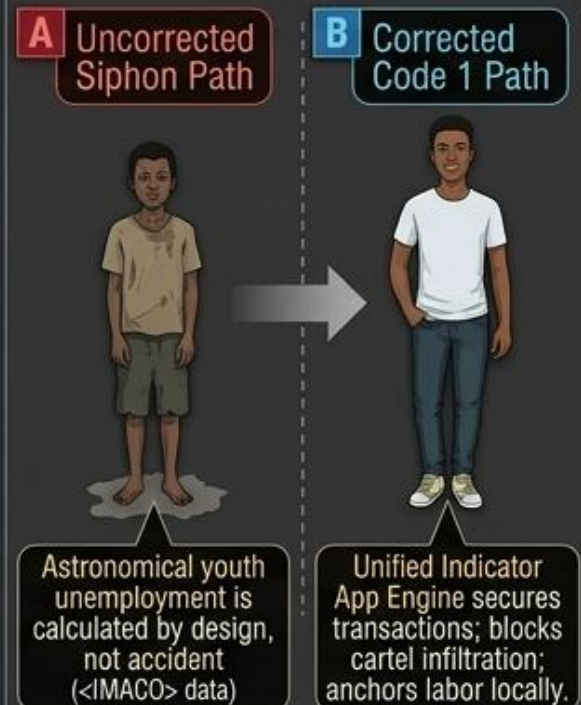


MPUMALANGA: EXPOSING THE 'LOST VALUE' VS. BOOKKEEPING GDP DELUSION (A 32-YEAR COUNTERFACTUAL ANALYSIS)

THE VALUATION GAP



SETTING THE DEMOGRAPHIC RECORD STRAIGHT



LEGEND:

DR LEHOHLA LEDGER FINAL VERDICT: MPUMALANGA IS ROBBED OF POTENTIAL MATERIAL VALUE, NOT CASH.
Code 1 regionale convergence mandates a 1:1 state match and pooled community self-management to re-anchor the floor (cite: 1, 3, 13)

Everything is forensically – is forensically valid and digitally signed by Dr Pali J. Lehohla.

22 JUNE 2026



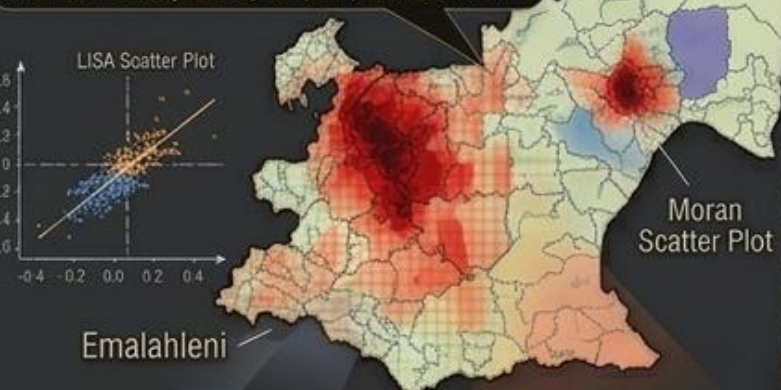
THE MPUMALANGA EXCEPTION: FORENSIC DISINTEGRATION OF REVENUE VS. MULTIPLIERS

(A Code 1 Audit)

FORENSIC DISINTEGRATION VORTEX MAP

MPUMALANGA LISA CLUSTER

(Cite: 1). Explicitly model as the province, a maximum-int: Labour Disappearance (LDI) and Democracy Collapse (UGI) Vortex Field.



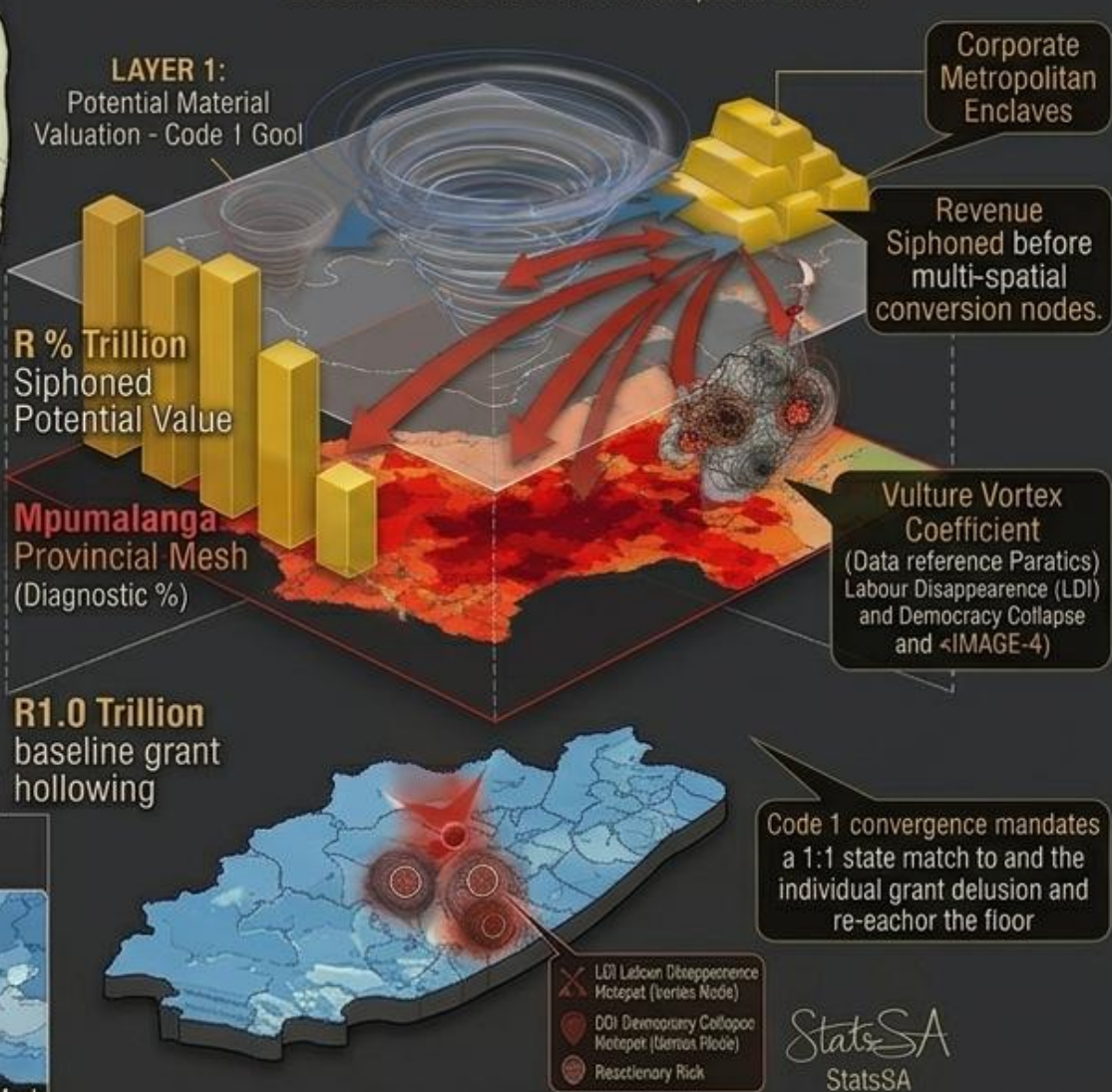
Diagnostic Matrix confirms individual provincial mesh shares, adding to the unassailable **R14.3 Trillion** national siphon.

R14 Trillion National Gap vs. ...

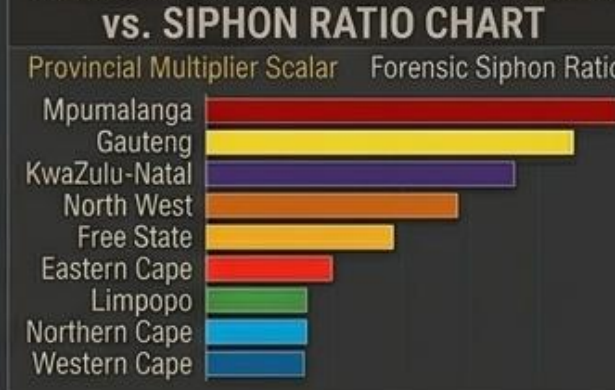


3D MULTI-SPATIAL BREACH DIAGNOSTIC

Deconstructed view the multi-spatial failure.



PROVINCIAL MULTIPLIER SCALAR vs. SIPHON RATIO CHART



B. SPATIAL NET ASSET & REVENUE DECONSTRUCTION (Total R14.3.7 Checksum)

All Provinces (cits: 1, 3, 1)	Diagnostic Debt Value (elbc: 1, 3, 1.3)	Metadata Sources (elcs: 1, 3, 1.3)
Mpumalanga	R5.1T	35.5%
Gauteng	R3.6T	36.1%
North West	R2.6T	20.7%
Limpopo	R1.4T	10.6%
KZN	R1.1T	8.7%
Free State	R0.5T	3.6%
Eastern Cape	R0.5T	3.7%
Western Cape	R0.5T	3%
Northern Cape	R0.5T	3%
TOTAL (Checksum)	R14.3 Trillion	✓

Province Abbreviation	Audited Absolute Value	True Relative Graph Length (Proportional Scale)
GP (Gauteng)	R4.8 Trillion	(100%)
WC (Western Cape)	R3.5 Trillion	(73%)
KZN (KwaZulu-Natal)	R2.9 Trillion	(60%)
MPU (Mpumalanga)	R2.1 Trillion	(44%)
LP (Limpopo)	R1.3 Trillion	(27%)
EC (Eastern Cape)	R1.3 Trillion	(27%) [Identical to LP]
NW (North West)	R1.0 Trillion	(21%)
NC (Northern Cape)	R0.7 Trillion	(15%)
FS (Free State)	R0.5 Trillion	(10%)

SDG 2030 Achievement Probability

Retention Anomaly

85% (Optimal Path)

Stable Stabilizers

55% (Vulnerable)

Complexity Siphon

30% (Severe Risk)

Mesh Collapse

12%
(Critical)

Forensic Projection based on current extraction velocity vs. institutional insulation capacity.

THE LEHOHLA LEDGER

Mpumalanga Municipal Forensic Audit

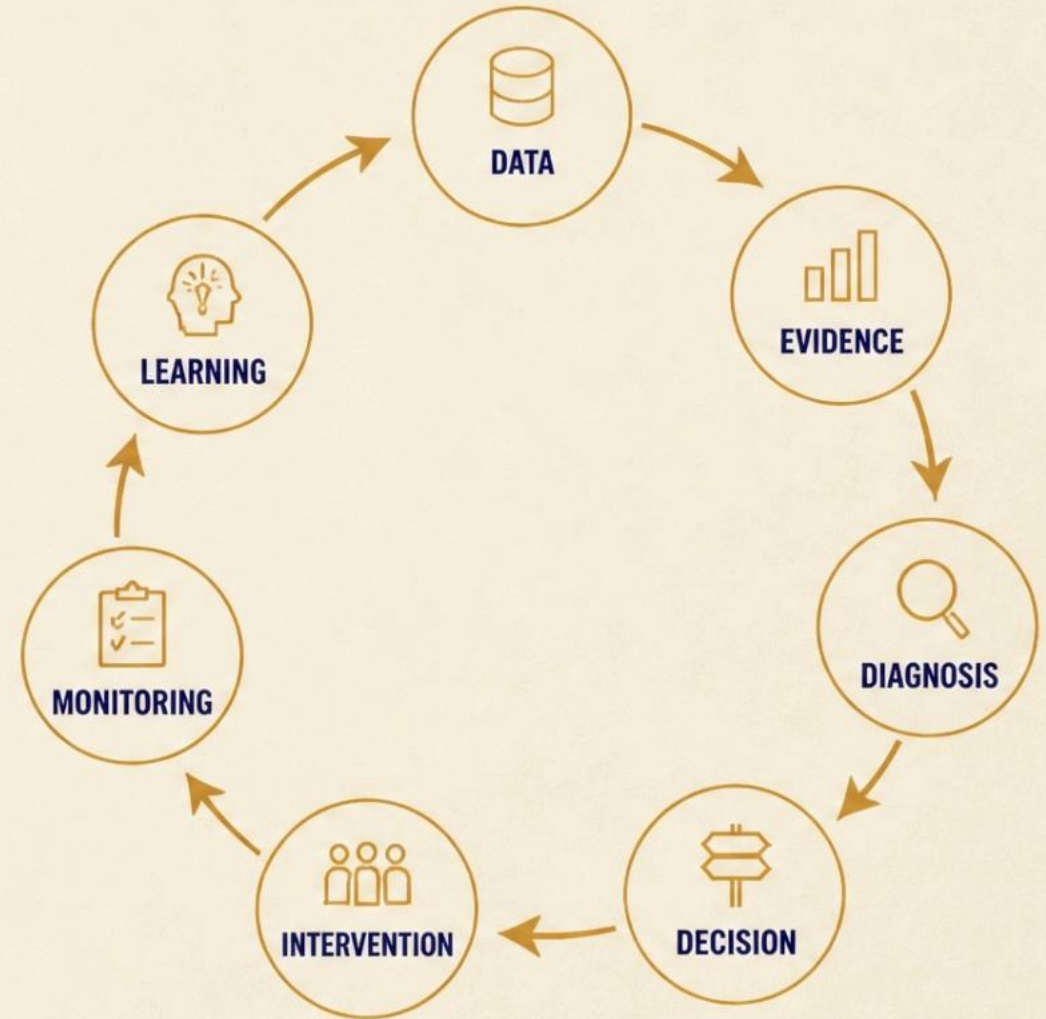
Applying the "Out-In" Geographic Framework to measure Structural Siphoning and SDG
Achievement Probability across 17 Local Governments.

A TOOL, NOT A REPLACEMENT.

The Lehohla Ledger.

A collaborative evidence-intelligence layer.

PALI Institution together with the Office of the Premier and provincial stakeholders.



Evidence becomes diagnosis. Diagnosis informs decision.
Learning improves the next decision.

The "Out-In" Mesh

Why traditional "In-Out" aggregates fail to capture the hollowing of our local economic sovereignty.

Defining Siphon Conditions

"In-Out" Illusion

Relies on macro-provincial data. Assumes growth in mining or energy hubs automatically benefits local households. Masks the extraction of wealth to metropolitan head offices.

"Out-In" Forensic

Begins at the Ward/EA level. Measures the **Retention Premium**—how much value actually settles. Identifies the structural "hole" where potential becomes hollowing.

$$S_v = \frac{V_g - V_r}{T_f}$$

Forensic Siphon Velocity (S_v): The delta between Generated Value (V_g) and Retained Value (V_r) over Time (T_f).

Archetype A: High-Velocity Extraction

Mining & Energy Hubs

- **Key Units:** Emalahleni, Steve Tshwete, Govan Mbeki.
- Massive GDP generation but extreme **structural hollowing**.
- Value siphoned upward to global corporate meshes.
- Local infrastructure friction masks systemic dissipation of domestic potential.



Archetype B: Resilient Retention Hubs

Administrative & Tourism Nodes

- **Key Units:** City of Mbombela, Thaba Chweu.
- Higher **Retention Premium** due to complex service and eco-tourism integration.
- Institutional mesh exhibits better insulation against predatory siphoning.
- Direct correlation with higher SDG 8 (Decent Work) and SDG 9 (Innovation) probability.



Evaluating a local economic development programme.

CONVENTIONAL EVALUATION



Was the programme implemented?



How many beneficiaries were reached?



Was the budget spent?



Were outputs delivered?



What did beneficiaries report?

OUT-IN EVALUATION



Where are beneficiaries located — areas of greatest need?



Do they have infrastructure, markets, services?



Are women and youth included meaningfully?



Is the programme reducing dependency — or short-term relief?



What does the data show before, during and after implementation?

Evaluation that improves the programme — not only describes it.

The Hollowing of the Periphery

Diagnosing the Commuter Siphon and the Predatory Buffer Zones.

Archetype C: Commuter Leakage



Human Capital Drain

Bushbuckridge & Nkomazi:

High demographic weight but low commercial mesh. Value leaks daily as workers commute to adjacent cores.



Dormitory Siphon

Thembisile Hani & Dr JS

Moroka: Dependency on Gauteng cores creates a structural "dormitory" effect where no local value settles.



Grant Dependency

Without a localized retention mesh, social transfers are immediately siphoned back to metropolitan retail chains.

Archetype D: Predatory Buffer Zones

Geographic Connectivity ≠ Development

Mkhondo, Dipaleseng, Nkomazi-East: These borderlands and transnational logistics corridors (N4) see massive value *pass through* but almost none *settle*.

Institutional noise misinterprets transport volume as growth. Metadata reveals existential hollowing in surrounding Enumeration Areas.

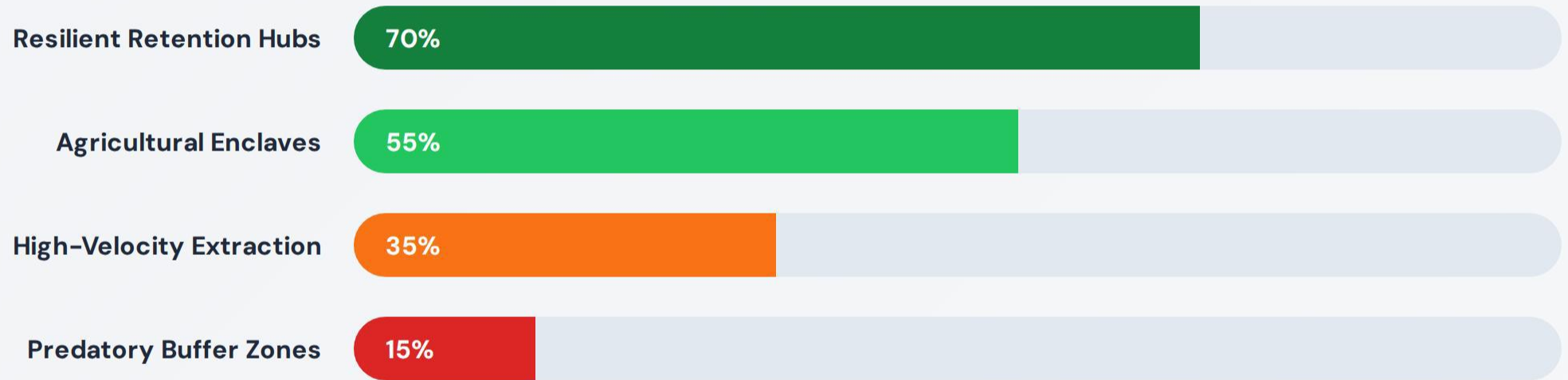


Municipal Siphon Index (LLSI) Rankings

Municipality Cluster	Archetype	Siphon Velocity	SDG Probability
Mbombela / Thaba Chweu	Resilient Hub	Low	High (65%+)
Emalahleni / Steve Tshwete	Extraction Node	High	Medium (40%)
Bushbuckridge / Nkomazi	Commuter Periphery	Very High	Low (25%)
Mkhondo / Dipaleseng	Predatory Buffer	Extreme	Critical (<15%)

Forensic Audit Verdict: Connectivity without localized mesh insulation leads to total structural hollowing.

SDG 2030 Achievement Probability



The data confirms that hollowing is a structural deterrent to SDG 1, 8, and 11.

The End-to-End M&E Municipal Cycle



Phase 1: Localized Audit

Strip macro-aggregates.
Identify ward-level generated
value (V_g).

Phase 2: Mesh Insulation

Implement localized supply
chain controls to stop value
dissipation.

Phase 3: Retention Tracking

Monitor the Retention
Premium (V_r) through real-
time spatial metadata.

Phase 4: SDG Alignment

Re-anchor provincial grants
based on retention
performance, not budget
spend.

“

"Mpumalanga cannot plan its future using the metrics that facilitated its hollowing. We must build localized institutional meshes designed for value retention."

— DR. PALI LEHOHLA

[illegible]

FAFWARD
LODULU, PROGRAM
ASEKSEKENT
(Iisjooq)

1. LEGALIZED PLAN
(Kot-formaali
ZIT(i) Incrementi)

2. IMPLEMENTATION
(Aparaste Wargadiga)

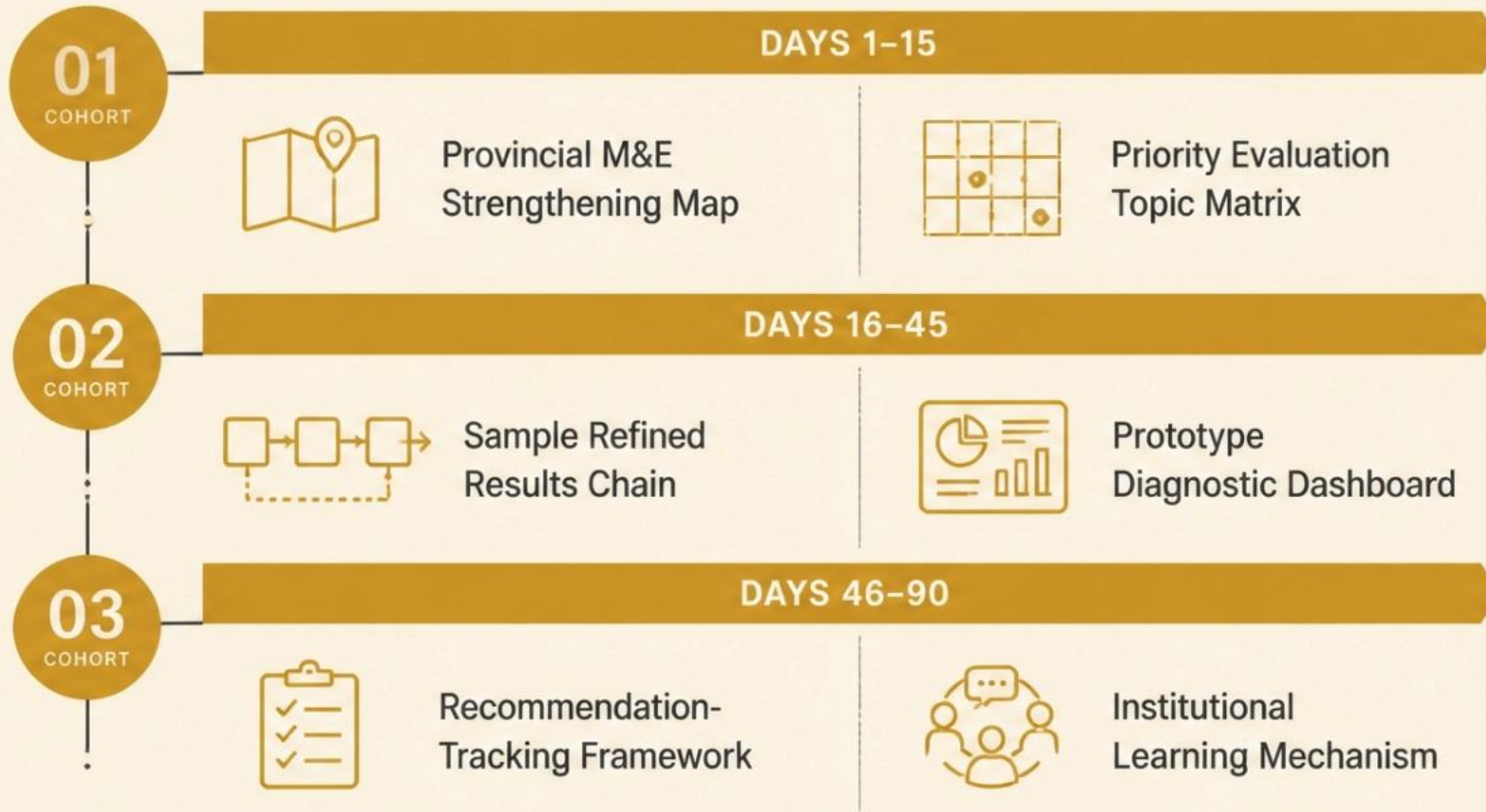
3. FINANCIAL
EMPOWERMENT
(CALI NIBADI)

4. PERUSE &
ADVOCATION

FOUNDER,
PAN AFRICAN
INSTITUTE FOR
EVIDENCE (PICE)
THE LEHGHILA
LEDGER



A 90-day evidence diagnostic for Mpumalanga.



“

Not a finished product.
A co-created tool that
strengthens Mpumalanga's
own M&E ecosystem.

”



CLOSING — TO MPUMALANGA.

- Evidence becomes governance.
- Monitoring becomes learning.
- Evaluation becomes improvement.
- Data becomes public value.

Begin where reality is lived. Build provincial results from that foundation.

DR PALI LEHOHLA — PALI INSTITUTION
OFFICE OF THE PREMIER, MPUMALANGA • 23 JULY 2026
ALTERNATIVE KEYNOTE ADDRESS.

Lehohla Ledger: Municipal Verdict

Questions & Discussion

How can we rebuild the localized institutional mesh of Mpumalanga?

www.lehohla-ledger.org | audit@mpumalanga.gov.za