

SYSTEMS THINKING
RESEARCH & LEADERSHIP
DEVELOPMENT INSTITUTE

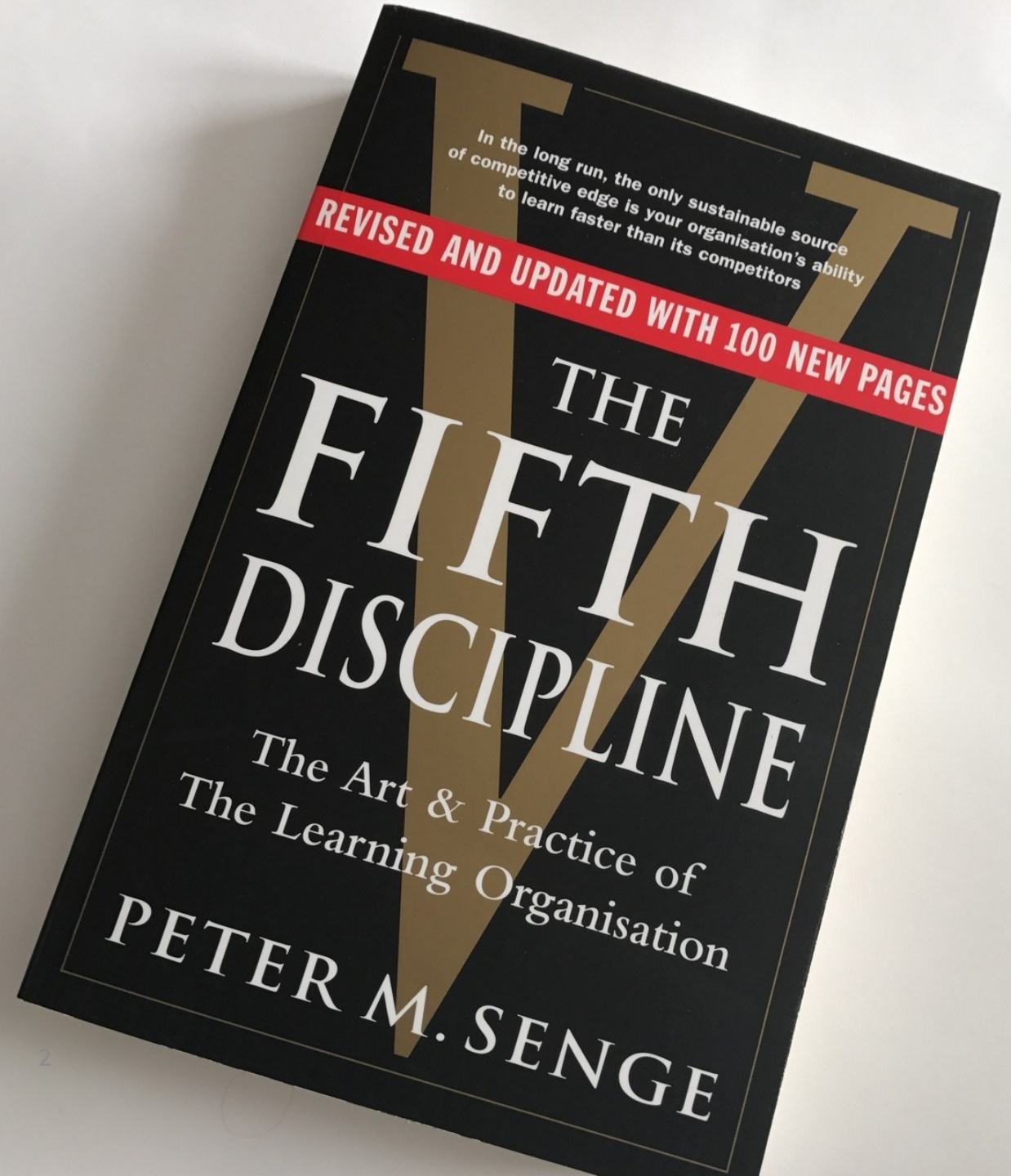
— THE NATIONAL STRATEGY FIRM —

STRLDi

**SHEILA
DAMODARAN
LEAD CONSULTANT**

**SYSTEMS THINKING
RESEARCH & LEADERSHIP
DEVELOPMENT INSTITUTE
(STRLDi), BOTSWANA**

Sheila Damodaran STRLDi – Systems Thinking
Research & Leadership Development Institute



PROFILE

STRLDi

- Systems Thinking Research Institute
- Leadership Development Institute
- On contract with Office of the President from 2008-2012, taught public servant leadership across the country The Fifth Discipline, pending research and strategy formulation for NDP input

PINNACLE FOODS:

- Food manufacturing & franchising (2012 in development)
- Brand conception and development (My Farmhouse Kitchens) as prelude to manufacturing
- Commercial horticulture seedlings production (2020 – 2023)
- Farmers' Learning Centre – short-term workshops for horticulture farmers (2022 – present)

STRLDi UNEMPLOYMENT STUDY PRESENTATION ROADMAP

1. Botswana's Historical Response to Unemployment
2. Why the Problem Persists Despite 50 Years of Intervention
3. Systems Thinking and the Study Methodology
4. Behaviour Over Time: What the Data Reveals
- 5. Structural Drivers of Persistent Unemployment**
- 6. Productive Sector Analysis:**
 - Agriculture • Manufacturing • Retail • Government
- 7. STEM Capability and Labour Absorption Constraints**
- 8. Household Stability and Long-Term Capability Formation**
9. The STRLDi Structural Recommendations
10. National Implementation Pathway
11. National Systemic Integration & NDP Alignment
12. Discussion: Implications for Botswana's Future Development Strategy



BOTSWANA: TYPICAL UNEMPLOYMENT STRATEGIES ADOPTED OVER THE PAST 50 YEARS

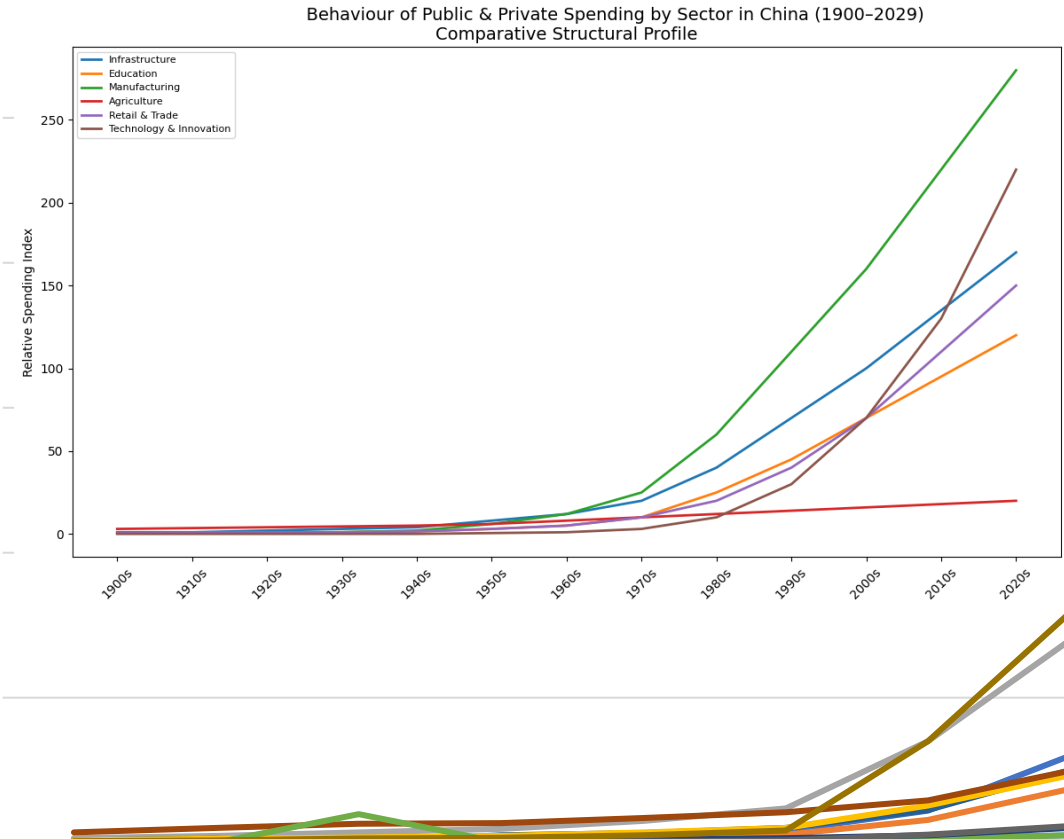
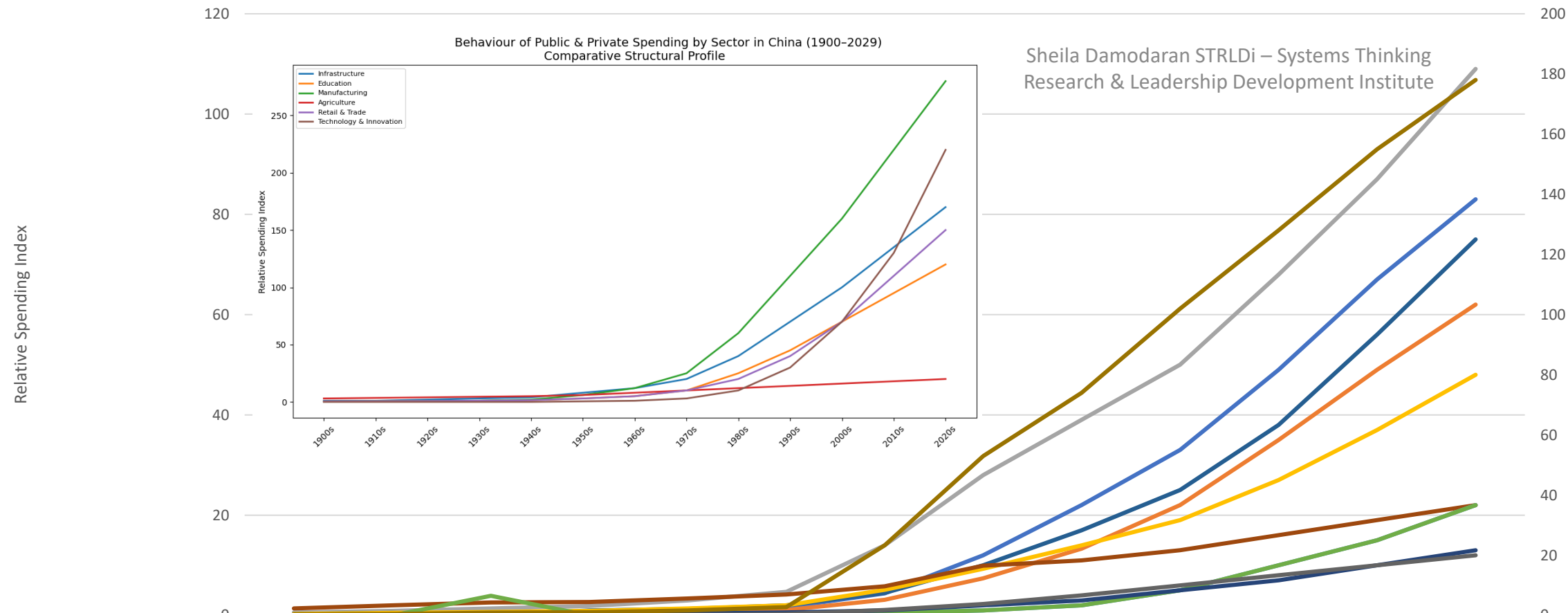
- Public Sector Expansion
- Education Expansion Strategy
- Youth & Labour-Based Public Works Programmes
- Citizen Economic Empowerment Schemes
- Economic Diversification Strategy
- Foreign Direct Investment (FDI) Attraction
- Agricultural Support Programmes
- Infrastructure-Led Development
- Poverty Alleviation & Social Protection Programmes
- National Planning & Reform Approaches



Behavior of Public & Private Spending By Sector in Botswana 1900 -2029

Years / Period	SOCIAL / ADMINISTRATIVE SECTORS							CORE PRODUCTIVE SECTORS			
	Education	Health	Infrastructure	Public Administration	Social Justice Programmes	Social Support Systems	Judiciary Systems	Agriculture	Manufacturing	Mining	Retail & Trade
1900–1909	0.2	0.1	0.6	0.3	0	0	0.1	1.4	0	0.3	0.3
1910–1919	0.3	0.2	0.9	0.5	0	0	0.1	2	0	0.5	0.5
1930–1939	0.6	0.4	1.9	0.9	0	0	0.5	2.7	0	1.1	1
1940–1949	0.9	0.7	3	1.4	0.1	0.1	0.4	3.4	0.1	1.7	1.3
1950–1959	1.6	1.1	4.7	2	0.2	0.2	0.6	4.2	0.3	2.8	2
1960–1969	4.4	3.1	14	5.1	0.6	0.5	1	5.8	1.1	23.3	4.5
1970–1979	12	7.4	28	9.3	1	1	2	9.9	2.3	53	10
1980–1989	22	13.3	39	14	2	2	3	11	4	74	17
1990–1999	33	22	50	19	5	5	5	13	6	102	25
2000–2009	49	35	68	27	10	10	7	16	8	128	38
2020–2029*	83	62	109	48	22	22	13	22	12	178	75
Rank	3	5	2	6	8	8	10	7	10	1	4
TOTAL	P274.50	P194.60	P407.50	P165.20	P55.90	P59.70	P42.90	P113.00	P43.80	P720.60	P230.60 P2308.3B

Behavior of Public & Private Spending By Sector in Botswana 1900 -2029



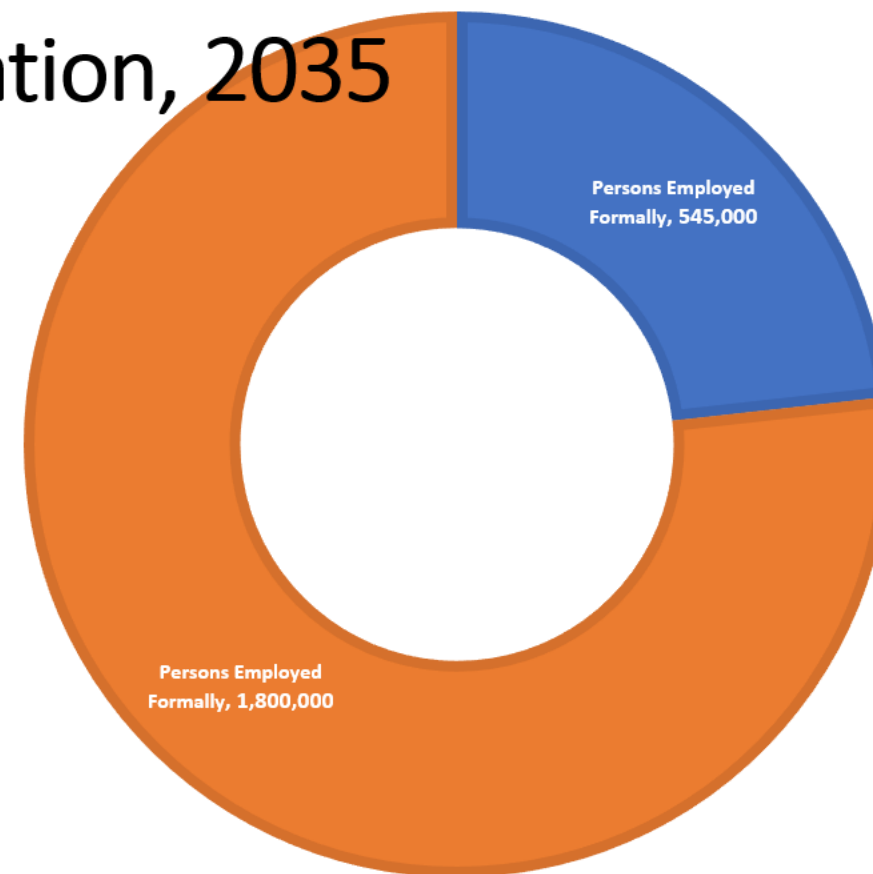
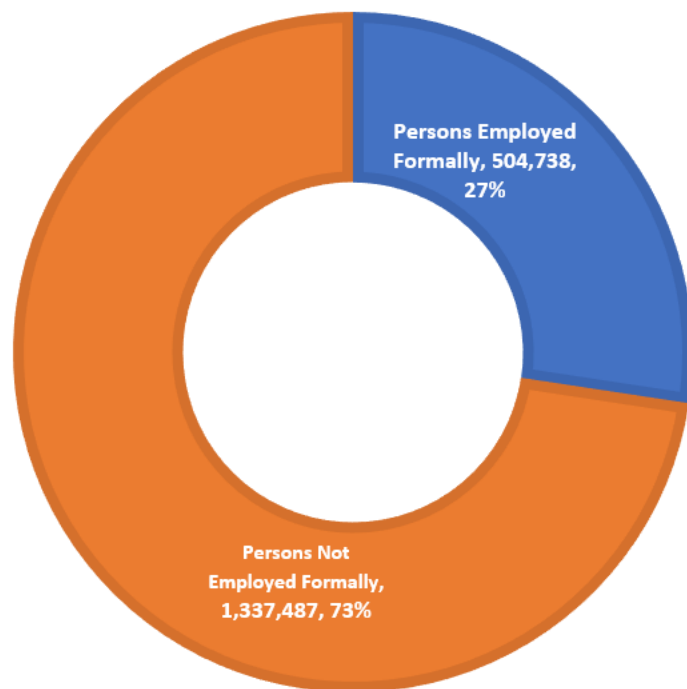
Sheila Damodaran STRLDi – Systems Thinking
Research & Leadership Development Institute

	1900–1909	1910–1919	1920–1929	1930–1939	1940–1949	1950–1959	1960–1969	1970–1979	1980–1989	1990–1999	2000–2009	2010–2019	2020–2029*
Infrastructure	0.6	0.9	1.4	1.9	3	4.7	14	28	39	50	68	87	109
Education	0.2	0.3	0.5	0.6	0.9	1.6	4.4	12	22	33	49	67	83
Retail & Trade	0.3	0.5	0	1	1.3	2	4.5	10	17	25	38	56	75
Health	0.1	0.2	0.3	0.4	0.7	1.1	3.1	7.4	13.3	22	35	49	62
Public Administration	0.3	0.5	0.7	0.9	1.4	2	5.1	9.3	14	19	27	37	48
Agriculture	1.4	2	2.6	2.7	3.4	4.2	5.8	9.9	11	13	16	19	22
Social Justice Programmes	0	0	0	0	0.1	0.2	0.6	1	2	5	10	15	22
Social Support Systems	0	0	3.9	0	0.1	0.2	0.5	1	2	5	10	15	22
Judiciary Systems	0.1	0.1	0.2	0.5	0.4	0.6	1	2	3	5	7	10	13
Manufacturing	0	0	0	0	0.1	0.3	1.1	2.3	4	6	8	10	12
Mining	0.3	0.5	0.9	1.1	1.7	2.8	23.3	53	74	102	128	155	178



BOTSWANA'S LARGEST UNTAPPED ECONOMIC RESOURCE

Distribution of Employable Population, 2035



Year	Population	Employable Population	%	Persons Employed Formally	%	Persons Not Employed Formally	%	Persons Likely Employed Informally	%	Unemployed	%
2024	2,763,338	1,842,225	67%	504,738	27%	1,337,487	73%	784,820	43%	552,668 ⁹	30%
2035	3,500,000	2,345,000	67%	545,000	23%	1,800,000	77%	1,058,000	45%	742,000	30%



THE OPPORTUNITY OF FULL PRODUCTIVE PARTICIPATION

Botswana's Largest Untapped Economic Asset

TODAY'S STRUCTURE

Current Per-Capita Monthly Income = P1,655

Average Wage = P6,620

25% of population in formal employment

FULL PRODUCTIVE PARTICIPATION

Per Capita Monthly Income: P10,344

Working-age population fully productively engaged

HOW WAS THIS ESTIMATED?

$$P10,344 = (P6,620 \times 25/100) \times 1.56$$

or

$$P10,344 = P1,655 \times 4 \times 1.56$$

Where:

- 4 = moving from approximately 25% productive participation to full productive participation
- 1.56 = estimated productivity gain from a fully utilised economy through higher production, investment, manufacturing activity and economic circulation

A fully utilised economy benefits from:

- Increased production
- Higher investment
- Manufacturing expansion
- Greater economic circulation
- Improved labour productivity

INSIGHT

Botswana's greatest economic opportunity is not discovering a new mineral deposit. It is unlocking the productive capacity that already exists within its people.



OBJECTIVE OF OUR RESEARCH STUDIES

Understanding Why Persistent Conditions Persist

- **Focus on persistent national, regional, and global conditions** such as unemployment, poverty, economic stagnation, declining institutional performance, environmental degradation, health outcomes, educational outcomes, and social fragmentation.
- **Study Behaviour Over Time** to distinguish recurring patterns from isolated events and identify how conditions reproduce themselves across years, decades, and generations.
- **Move beyond symptoms, events, and root causes** to uncover the reinforcing structures, feedback processes, systemic archetypes, and mental models sustaining persistence.
- **Help leaders develop structural understanding** of the conditions they seek to change, strengthening their ability to identify leverage points for lasting improvement.
- **Build capability while conducting research**, enabling participants to learn the tools, disciplines, and practices required to continue systemic inquiry independently.
- **Support cross-sector *strategy* development**, recognising that persistent conditions rarely originate within a single institution, ministry, industry, or stakeholder group.
- **Generate transferable learning** so that lessons from one region, nation, sector, or challenge can inform understanding elsewhere.



Core Research Question

- What structures, behaviours, assumptions, and feedback processes continue reproducing this condition across time — and what leverage exists to change its trajectory?

STRLDi Principle

- Persistent conditions cannot be understood through events alone. Systems Thinking begins by learning to see patterns before events, and structures before interventions.

THE INTENT OF THE FIVE DISCIPLINES

- **Why Peter Senge Called Them Disciplines**
- The Five Disciplines are called disciplines because they require **continuous practice**. They are not techniques to be learned once, but capacities that develop over a lifetime.
- Their purpose is not simply organisational improvement. Their deeper purpose is to expand our ability to **see, learn, and act within complex human systems**.
- The disciplines work together to help individuals, teams, organisations, and societies move beyond reacting to events toward understanding the structures producing those events.

What the Disciplines Help Us See

- Without disciplined practice, **attention** naturally gravitates toward:
 - Events
 - Crises
 - Symptoms
 - Operational pressures
 - Immediate fixes
- The disciplines **help us** develop the capacity to see:
 - Behaviour Over Time
 - reinforcing and balancing feedback
 - systemic archetypes
 - mental models shaping perception'
 - shared futures worth creating

Why This Matters Today

- Many institutions have become highly sophisticated at managing **detailed complexity**.
- Far fewer have developed the capacity to recognise **dynamic complexity** — the reinforcing structures and delayed consequences that quietly reproduce conditions across years, decades, and generations.
- As a result:
 - we often respond to consequences rather than causes
 - we treat recurring patterns as isolated events
 - we become trapped in cycles of reaction and intervention

The Deeper Purpose of the Five Disciplines

- The Five Disciplines help build the capacity to:
 - think systemically
 - learn collectively
 - surface assumptions
 - strengthen long-term vision
 - recognise recurring structures
 - act from understanding rather than reaction

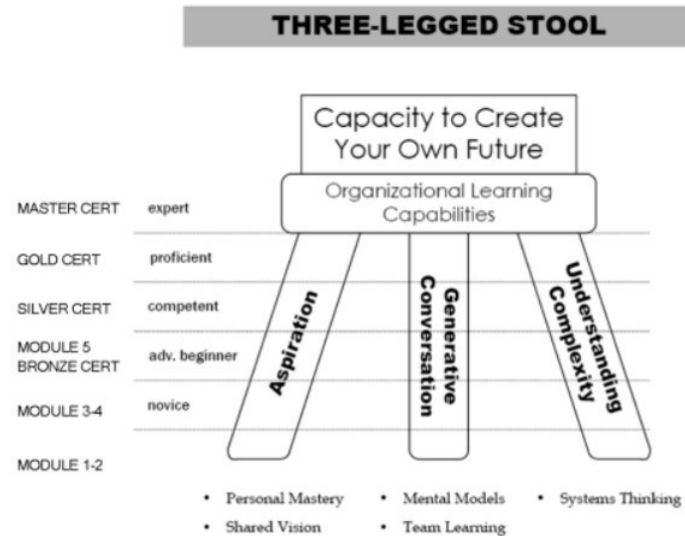
The Core Insight

- Systems Thinking begins by learning to see patterns before events.
- The Five Disciplines exist to help human beings develop that capacity together.

TOOLS OF THE FIFTH DISCIPLINE

THE FIFTH DISCIPLINE OVERVIEW – INTENT: MANAGE CHANGE SEAMLESSLY

Incredible Tools for Unlocking The Secret To Understanding & Learning To
Work With Our Realities



TOOLS OF A LEARNING ORGANIZATION

TOOLS OF THE LEARNING ORGANISATION!

A ONE-PAGE SUMMARY OF THE FIFTH DISCIPLINE, THE ART AND PRACTICE OF THE LEARNING

Personal Mastery	Shared Vision	Mental Models	Team Learning	Systems Thinking
PRACTICES AND PRINCIPLES:				
<ul style="list-style-type: none"> • CLARIFYING PERSONAL VISION • HOLDING CREATIVE TENSION (FOCUS ON RESULTS AND SEEK CURRENT REALITY) • MAKING CHOICES 	<ul style="list-style-type: none"> • VISIONING PROCESS • ACKNOWLEDGING CURRENT REALITY 	<ul style="list-style-type: none"> • DISTINGUISHING "DATA" FROM ABSTRACTION BASED ON DATA • TESTING ASSUMPTIONS • "LEFT-HAND COLUMN" 	<ul style="list-style-type: none"> • SUSPENDING ASSUMPTIONS • ACTING AS COLLEAGUES • SURFACING OWN DEFENSIVENESS • "PRACTICING" 	<ul style="list-style-type: none"> • SYSTEM ARCHETYPES • SIMULATION
PRACTICE TOOLS:				
<ul style="list-style-type: none"> <input type="checkbox"/> Personal Mastery goes beyond proficiency <input type="checkbox"/> Creative Tension Model <input type="checkbox"/> Personal Vision <input type="checkbox"/> Holding Creative Tension <ul style="list-style-type: none"> <input type="checkbox"/> Structural Conflict <input type="checkbox"/> Commitment to the Truth <input type="checkbox"/> Using the subconscious <input type="checkbox"/> Integrating Reason and Intuition <input type="checkbox"/> Seeing our connectedness to the world <input type="checkbox"/> Compassion <input type="checkbox"/> Commitment to the Whole <input type="checkbox"/> Centering long enough to focus on what we want <input type="checkbox"/> Crafting the Purpose Statement – 1stChoice 	<ul style="list-style-type: none"> <input type="checkbox"/> Encouraging Personal Vision <input type="checkbox"/> From Personal to Shared Visions <input type="checkbox"/> Spreading Visions <ul style="list-style-type: none"> <input type="checkbox"/> Enrolment <input type="checkbox"/> Commitment <input type="checkbox"/> Compliance <input type="checkbox"/> Guidelines for enrolment and commitment <input type="checkbox"/> Anchoring Vision to Purpose and Values <input type="checkbox"/> Positive versus Negative Vision <input type="checkbox"/> Creative tension and commitment to the truth <input type="checkbox"/> Why visions die prematurely 	<ul style="list-style-type: none"> <input type="checkbox"/> Planning as learning <input type="checkbox"/> Managing mental models at personal and interpersonal levels <input type="checkbox"/> Reflection Skills <ul style="list-style-type: none"> <input type="checkbox"/> Leaps of Abstraction or Ladder of Inference <input type="checkbox"/> Left Hand Column <input type="checkbox"/> Inquiry Skills <input type="checkbox"/> Balancing Inquiry and Advocacy <input type="checkbox"/> Espoused Theory versus Theory-in-Use <input type="checkbox"/> Double Loop Learning 	<ul style="list-style-type: none"> <input type="checkbox"/> Dialogue and Discussion <ul style="list-style-type: none"> <input type="checkbox"/> Participants suspend their assumptions <input type="checkbox"/> Seeing each other as colleagues <input type="checkbox"/> There must be a facilitator who "holds" the context <input type="checkbox"/> Dealing with Current Reality: Conflict and defensive <input type="checkbox"/> The Missing Link: Practice <input type="checkbox"/> Learning how "to practice" 	<ul style="list-style-type: none"> <input type="checkbox"/> 11 laws of complexity <input type="checkbox"/> Seeing circles of causality <input type="checkbox"/> Balancing Loop <input type="checkbox"/> Reinforcing Loop <input type="checkbox"/> Delays <input type="checkbox"/> Archetypes <ul style="list-style-type: none"> <input type="checkbox"/> Accidental Adversaries <input type="checkbox"/> Balancing Loop with Delays <input type="checkbox"/> Drifting Goals <input type="checkbox"/> Escalation <input type="checkbox"/> Fixes that Backfire <input type="checkbox"/> Growth and Underinvestment <input type="checkbox"/> Limits to Success <input type="checkbox"/> Shifting the Burden <input type="checkbox"/> Success to the Successful <input type="checkbox"/> Tragedy of the Commons <input type="checkbox"/> Behavior Time Graphs <input type="checkbox"/> Leverages
THE ESSENCE OF THE DISCIPLINE:				
The essence of Personal Mastery is learning how to generate and sustain creative tension in our lives	Shared Vision is a force of "impressive power" that emerges when people share a desire to be connected in an important undertaking.	The essence of Mental Models is Learning to uncover deeply held internal images we have about how the world works, altering forever the way we think and create new ideas.	Team Learning is the process of aligning and developing the capacity of a team to create the results it truly desire.	The Art of seeing the forest and the trees! Seeing through complexity to the underlying structures generating change.

As presented by Peter Senge in his signature book (compiled by Sheila)

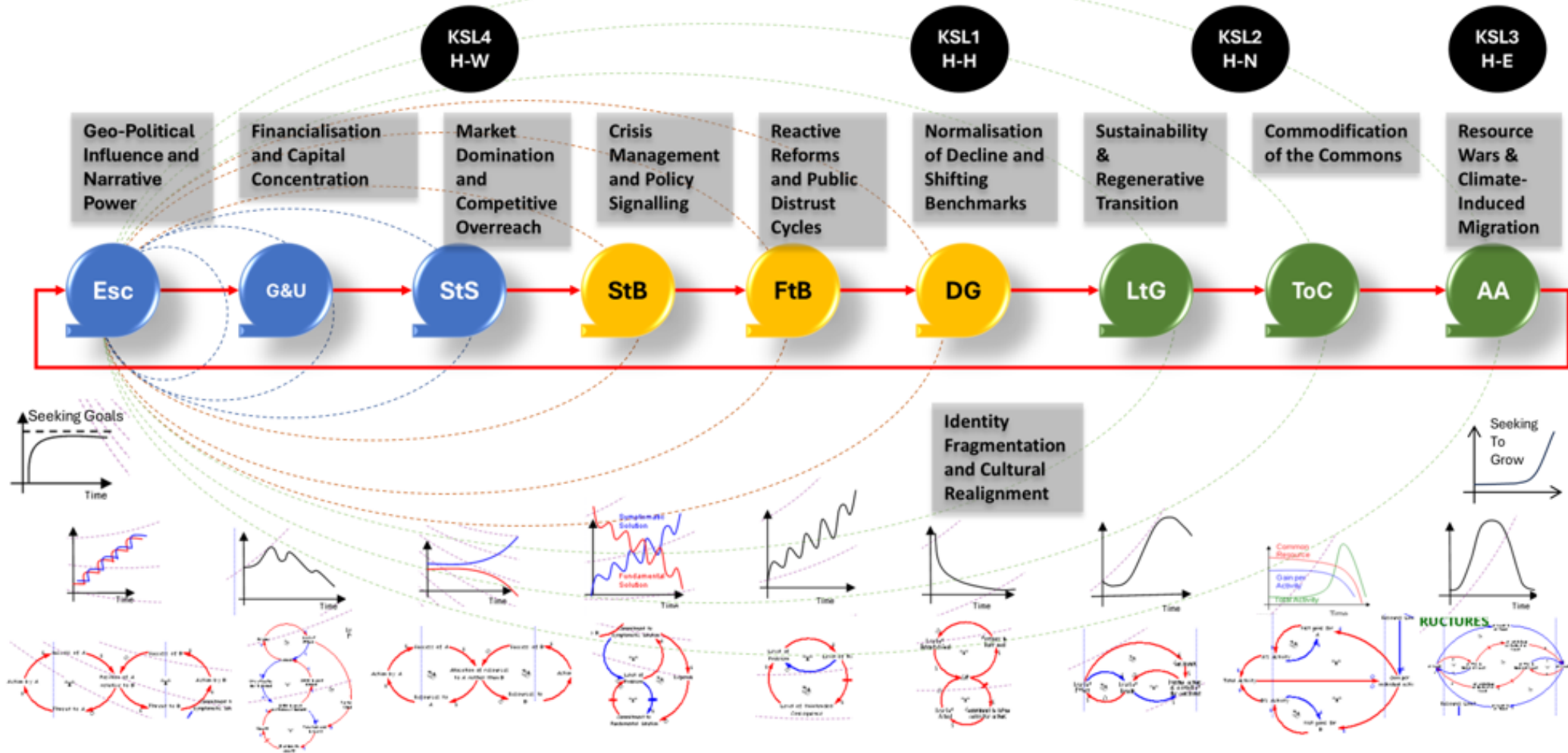
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THE CAPABILITIES OF A LEARNING ORGANIZATION

THE SYSTEMIC ONION FRAMEWORK

Understanding How Systemic Archetypes Drive Persistent Patterns of Growth, Decline, and Renewal

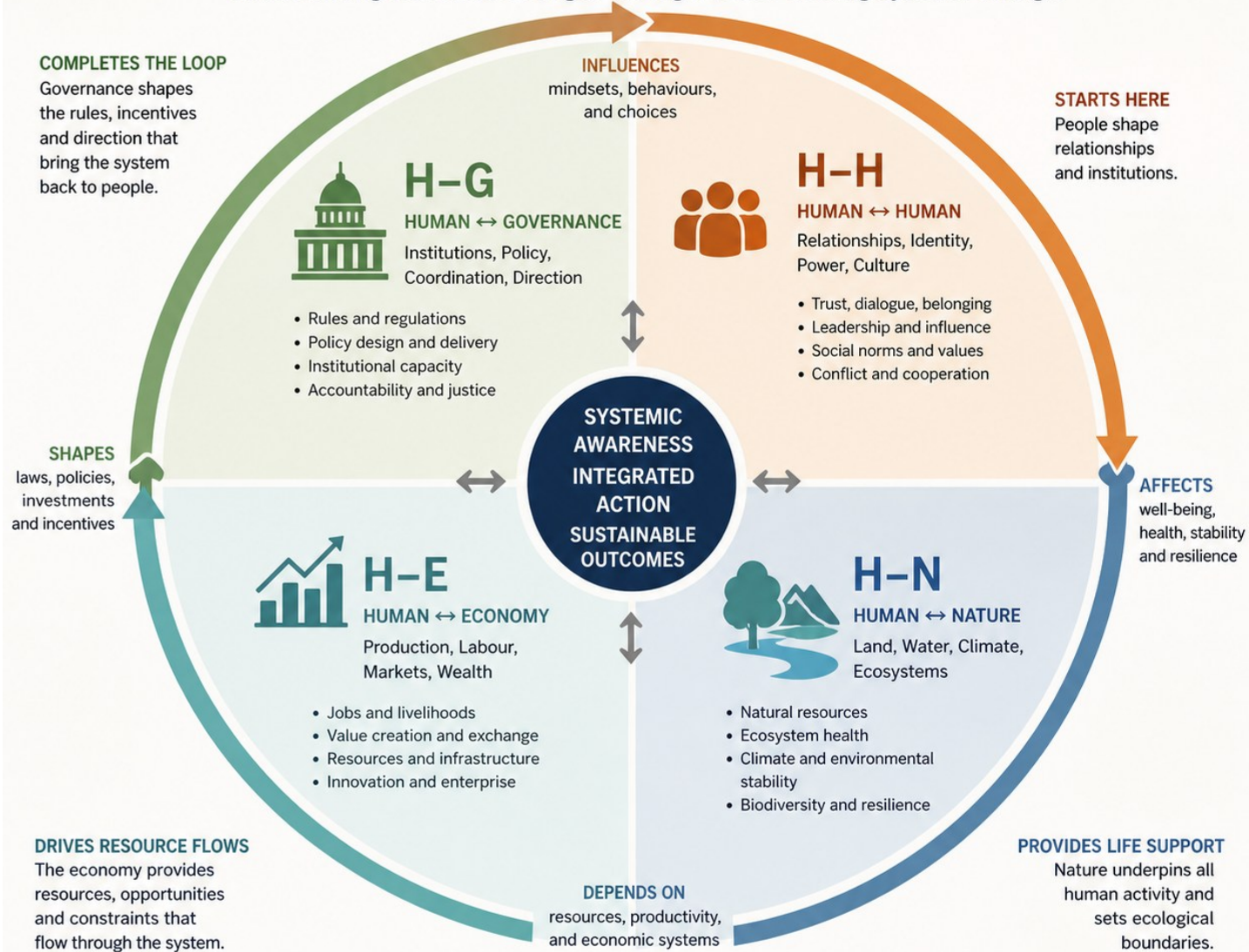
Developed by Ms Sheila Damodaran, STRLDi, integrating and extending the seminal systems archetype work of Peter Senge and his MIT team



THE FOUR-QUADRANT SYSTEMS FRAMEWORK

Created by STRLDi 1st produced May 2005

Understanding the Whole. Acting in the Right Place. Creating Systemic Change.



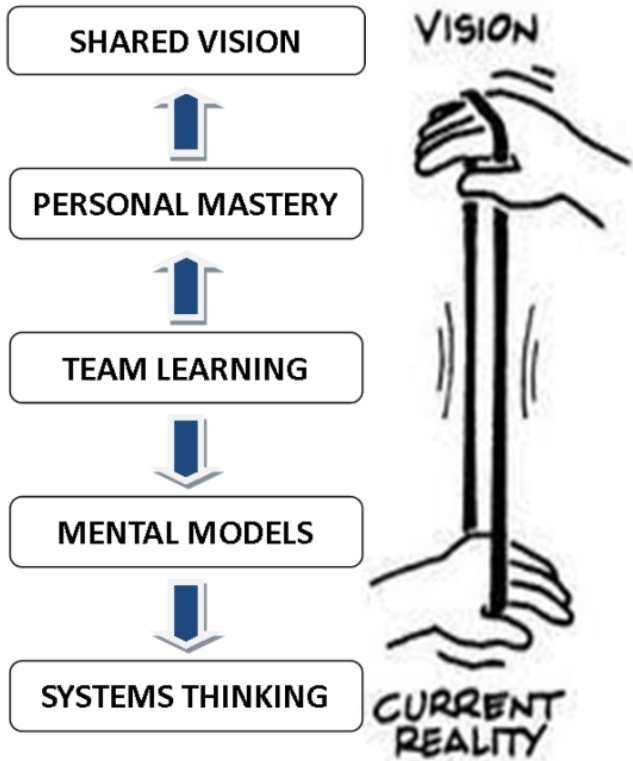
FEEDBACK LOOP: Every action in one quadrant creates effects in the others. The system grows or declines based on the quality of our choices.

**NOT WISELY.
CHOOSE SYSTEMICALLY.**

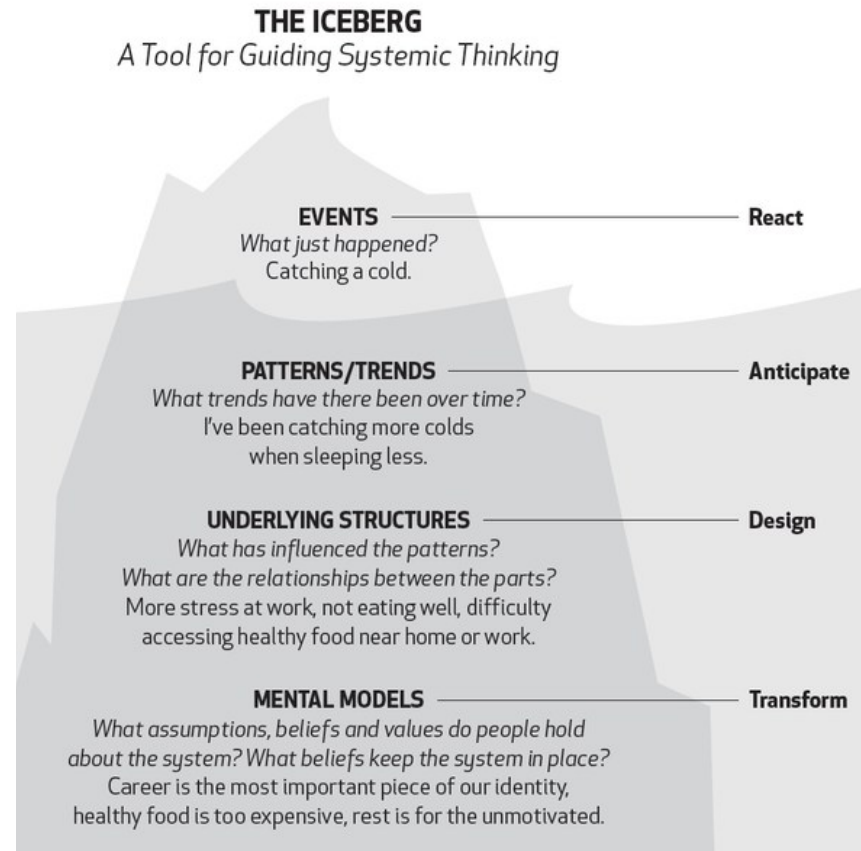


KEY POINTS OF PRACTICE

CREATIVE TENSION MODEL



THE ICEBERG



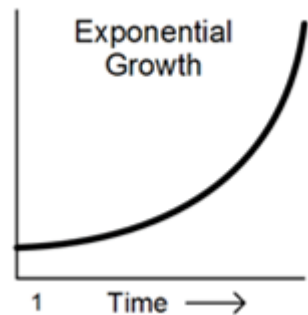
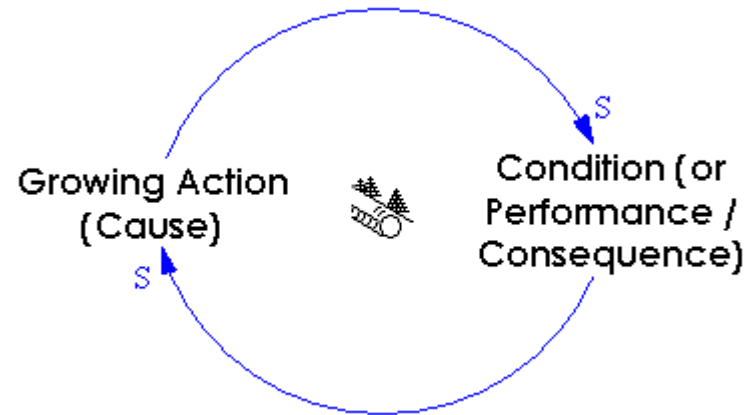
DEFINITION OF SYSTEMS THINKING

- Systems Thinking is to **discipline us in seeing and understanding patterns** – looking beyond events – to deeper “structures” that control events and, discovering the leverage that lies hidden in these structures.
- The **essence** of the discipline lies in a shift of mind (pg 68):
 - See **interrelationships** rather than linear cause-effect chains, and
 - See **processes of change** rather than snapshots

THERE ARE TWO DISTINCT PATTERNS IN SYSTEMS THINKING

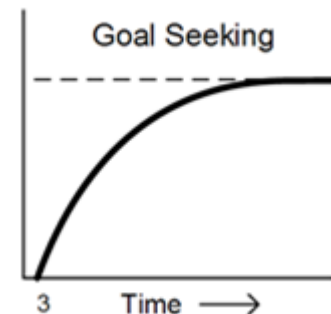
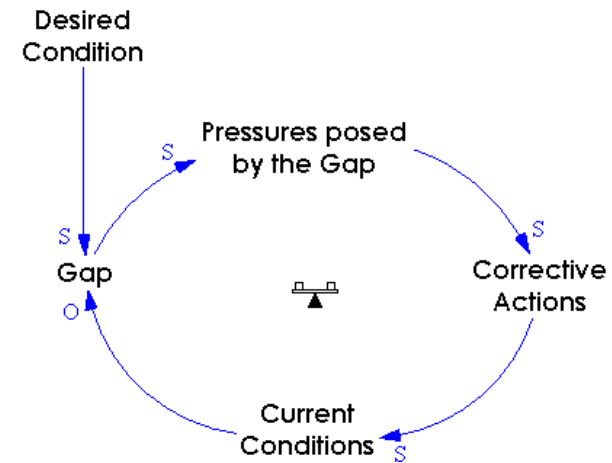
REINFORCING LOOP

SEEKS TO GROW (NOT STABILISE)



BALANCING LOOP

SEEKS TO STABILISE (NOT GROW)



TIMELINE OF STUDY & RESULTS

- APR 2008 **STUDY FIRST MOOTED**
- MAR 2012 **RESEARCH GROUP FIRST FORMED**
- 2012-2018 RESEARCH ON HOLD PENDING STATISTICS BOTSWANA FORMATION
- AUG 2018 RE-INITIATION OF STUDY
- DEC 2018 DATA RECEIVED FROM STATISTICS BOTSWANA
- JAN 2019 **STUDY COMPLETED (in 2 weeks)**
- MAY 2019 PRESENTATION AT PS's FORUM, OFFICE OF THE PRESIDENT
- OCT 2019 NATIONAL ELECTIONS
- APR 2020 – AUG 2021 COVID LOCKDOWNS
- DEC 2021 ANNOUNCEMENT OF IMPORT BAN OF HORTICULTURE PRODUCE
- JUL 2024 IMPORT BAN LIST IS EXPANDED AND PERIOD EXTENDED TO DEC 2025
- NOV 2024 CHANGE OF PARTY POLITICAL SYSTEMS
- MAY 2026 PRESENTATION TO NPC LEADERSHIP



BOTSWANA: PAST UNEMPLOYMENT STRATEGIES vs STRLDI STRUCTURAL RECOMMENDATIONS

FROM






- PUBLIC SECTOR EXPANSION
- EDUCATION EXPANSION
- YOUTH & PUBLIC WORKS PROGRAMMES
- CITIZEN EMPOWERMENT SCHEMES
- ECONOMIC DIVERSIFICATION POLICIES
- FDI ATTRACTION
- AGRICULTURAL SUPPORT PROGRAMMES
- INFRASTRUCTURE-LED DEVELOPMENT
- POVERTY & SOCIAL SUPPORT PROGRAMMES
- NATIONAL PLANNING & REFORMS

TO

- PRODUCTIVE-SECTOR DEEPENING
- STEM & PRODUCTIVE CAPABILITY STABILISATION
- LONG-HORIZON LABOUR ABSORPTION DESIGN
- PRODUCTIVE VALUE-CHAIN DEVELOPMENT
- STRUCTURAL DIVERSIFICATION CAPABILITY
- PRODUCTIVE-STRUCTURE READINESS
- AGRICULTURE–MANUFACTURING INTEGRATION
- PRODUCTIVE ECONOMIC ECOSYSTEMS
- REDUCING STRUCTURAL PRESSURE SOURCES
- SYSTEMS COORDINATION & BEHAVIOURAL LEARNING

WHAT THE COUNTRY GAINS

- **6.25× HIGHER PER-CAPITA PROSPERITY**

-  Higher National Production
-  Stronger Consumer Demand
-  Higher Government Revenue
-  Higher GDP Growth
-  Stronger Household Prosperity

STRATEGIC INSIGHT

- Unemployment is not merely a labour-market issue.
- It is one of the largest opportunity costs to national productivity, household income, fiscal sustainability, and economic growth.

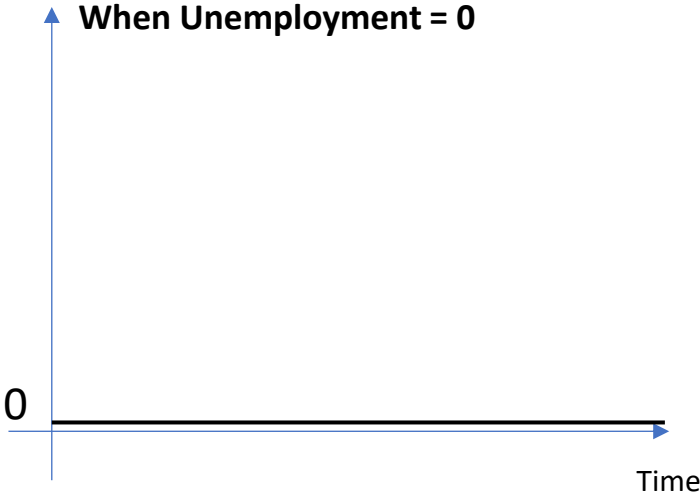
WHAT CAUSES PERSISTENT UNEMPLOYMENT

SELF WORK. QUESTIONS:

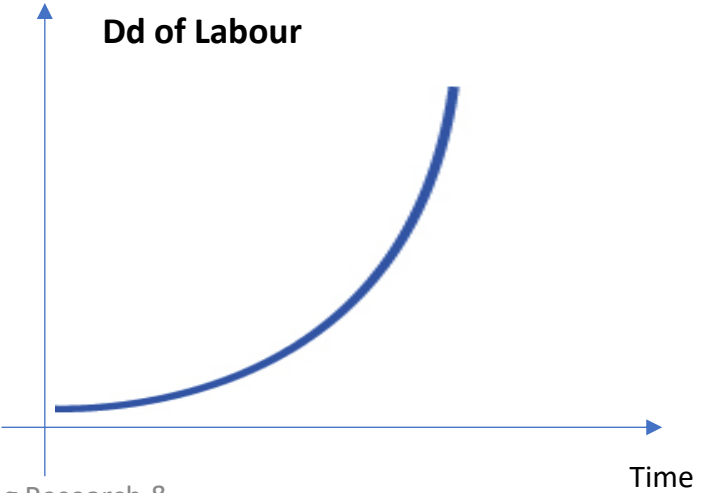
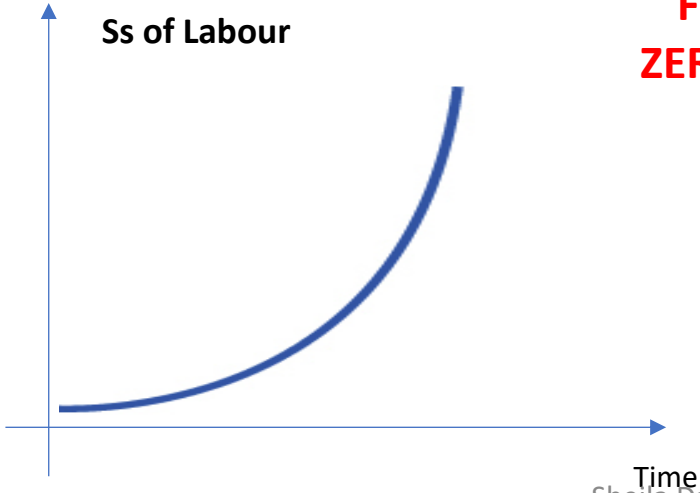
- IDENTIFY ORGANISATIONAL (GOVT, PTE, COMMUNITY, PROFESSIONALS) STAKEHOLDERS
- WHAT FILTERS TODAY MAY HAVE STOPPED THEM FROM LEARNING ABOUT THESE ALREADY?
- IDENTIFY IMPACT OF CAUSES THAT IMPACT YOUR ORGANISATION.



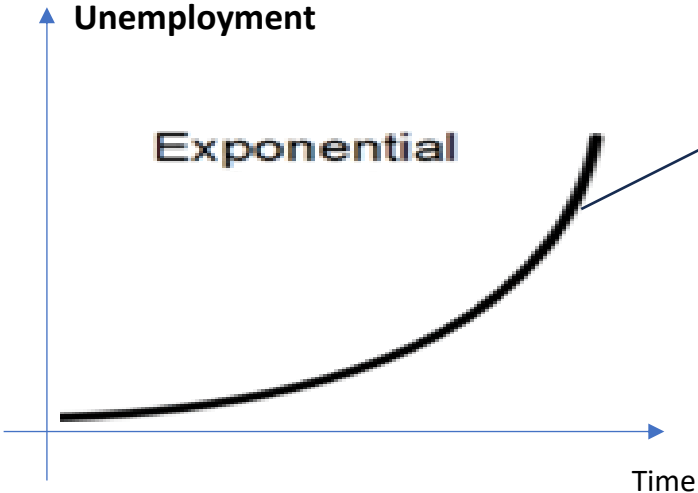
DRILLING DOWN PERSISTENT NATIONAL UNEMPLOYMENT



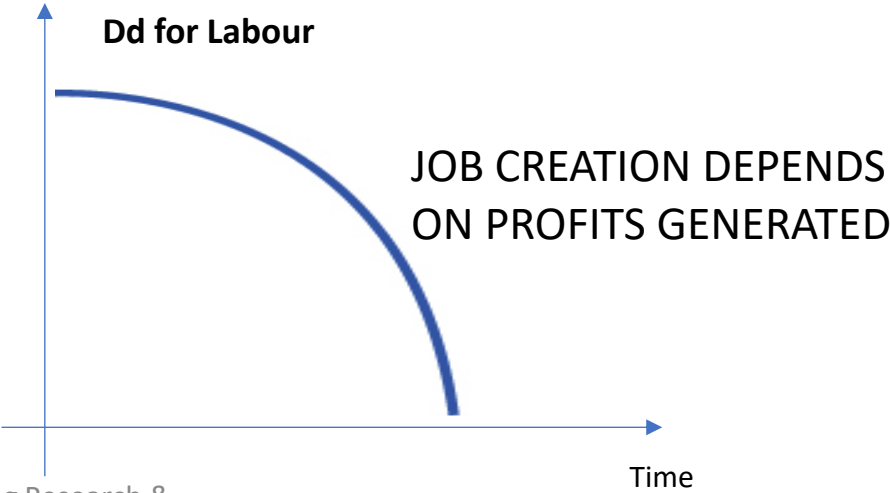
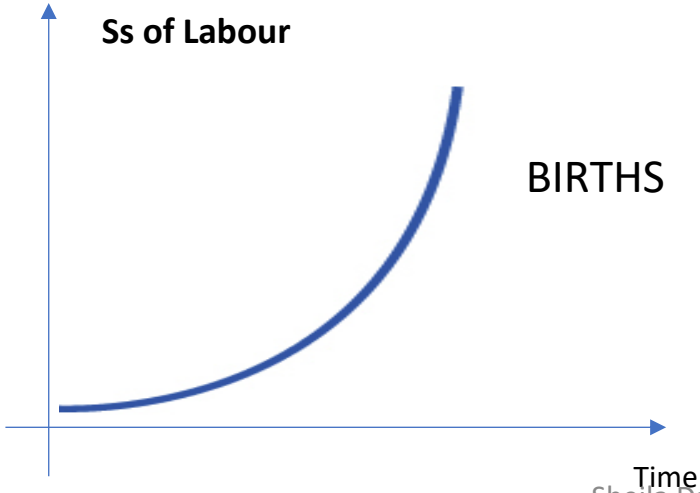
**SS = DD MEANS
FULL EMPLOYMENT
ZERO UNEMPLOYMENT**



DRILLING DOWN PERSISTENT NATIONAL UNEMPLOYMENT

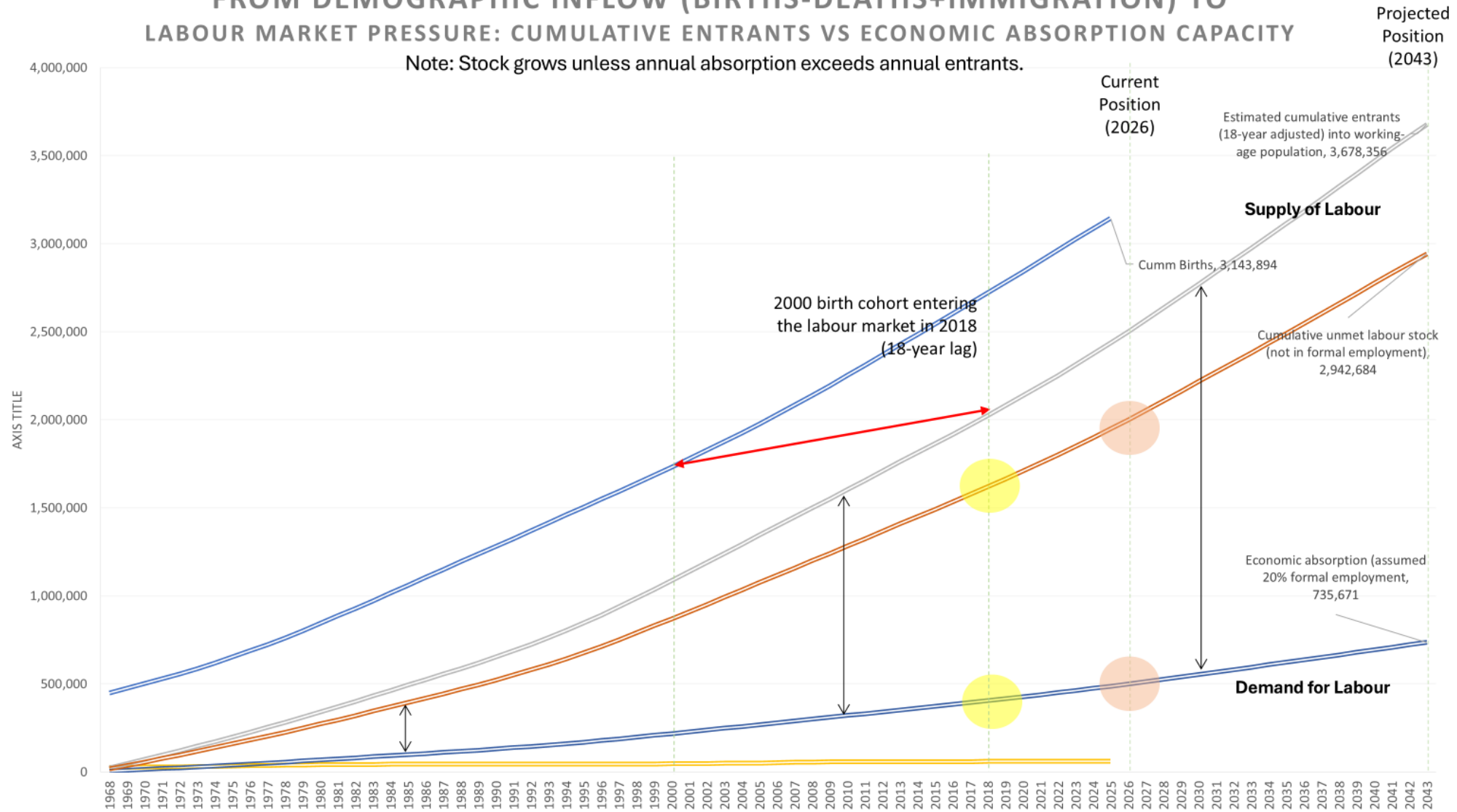


These graphs are indicating that a reinforcing causal loop structures are at play that are seeking to grow.



FROM DEMOGRAPHIC INFLOW (BIRTHS-DEATHS+IMMIGRATION) TO LABOUR MARKET PRESSURE: CUMULATIVE ENTRANTS VS ECONOMIC ABSORPTION CAPACITY



Note: Stock grows unless annual absorption exceeds annual entrants.

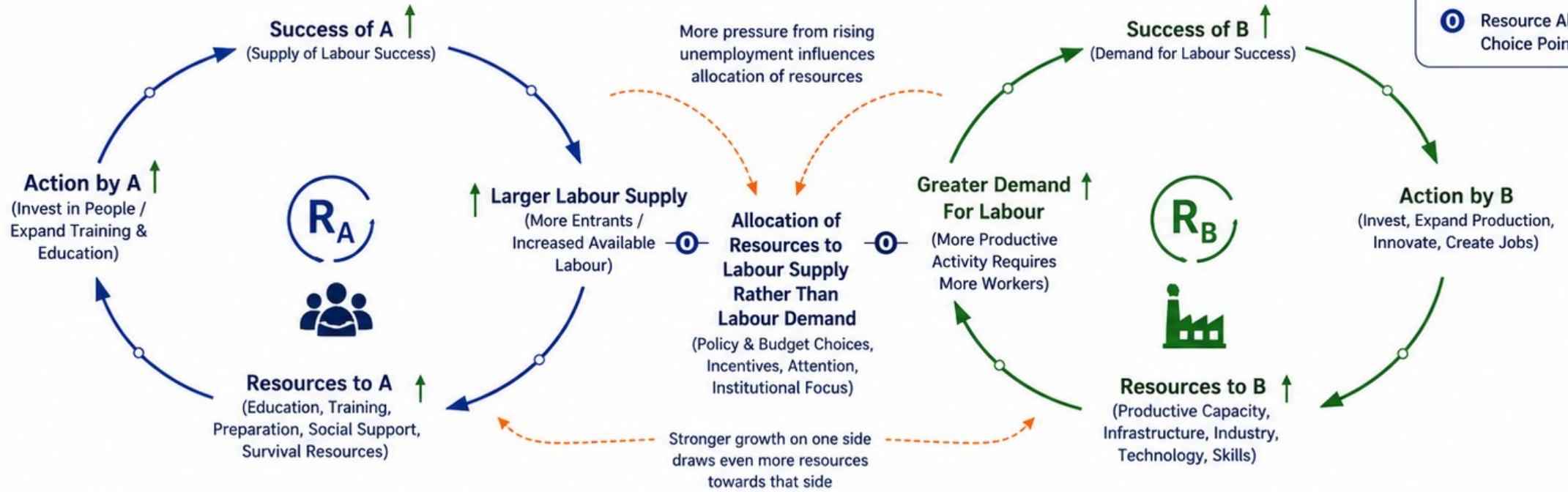


SUCCESS TO THE SUCCESSFUL (StS) ARCHETYPE

SUPPLY OF LABOUR vs DEMAND FOR LABOUR

LEGEND

-  Reinforcing Loop
-  Resource Allocation Choice Point



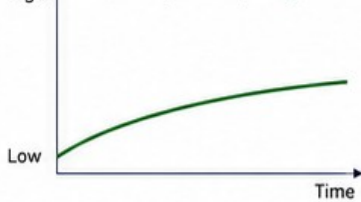
BEHAVIOUR OVER TIME (BOTS)

SUPPLY OF LABOUR
(Cumulative Entrants)



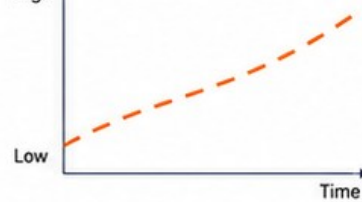
Rises faster over time

DEMAND FOR LABOUR
(Absorption Capacity)



Rises slower over time

RESOURCES ALLOCATED TO LABOUR SUPPLY



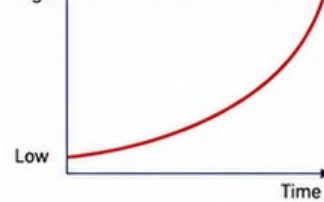
Increases over time

RESOURCES ALLOCATED TO LABOUR DEMAND



Stagnates or declines

WIDENING GAP
(Unemployment Gap)



Widens over time

RELEVANCE FOR BOTSWANA & SOUTHERN AFRICA



High labour supply from demographics and education expansion meets slower job creation in the productive sector.

Shifting resources towards productive capacity, innovation, and market expansion is essential to close the gap and create shared prosperity.

THE SHIFT From managing unemployment to building productivity.
➔ From resources to survival, to resources for opportunity.



Invest in People



Build Capabilities



Grow Productive Sectors



Expand Markets



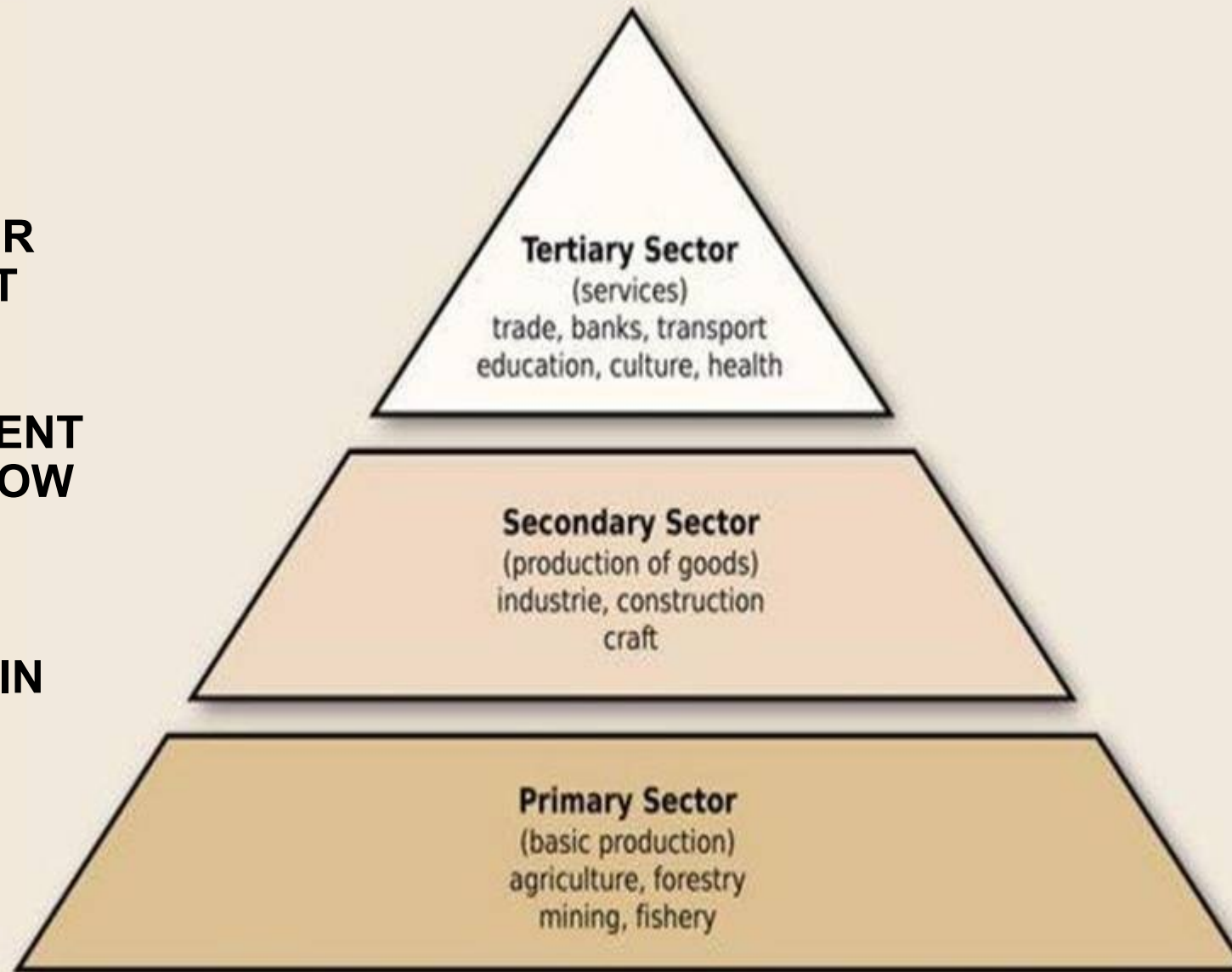
Create Jobs & Shared Prosperity



STRLDi

SYSTEMS THINKING FOR RELEVANT LEADERSHIP & DEVELOPMENT INSTITUTE

**CAPACITY FOR
EMPLOYMENT
BY SECTOR
WHEN
UNEMPLOYMENT
RATES ARE LOW
& A ROBUST
RESOURCE
DEPENDANT
ECONOMY IS IN
PLACE**

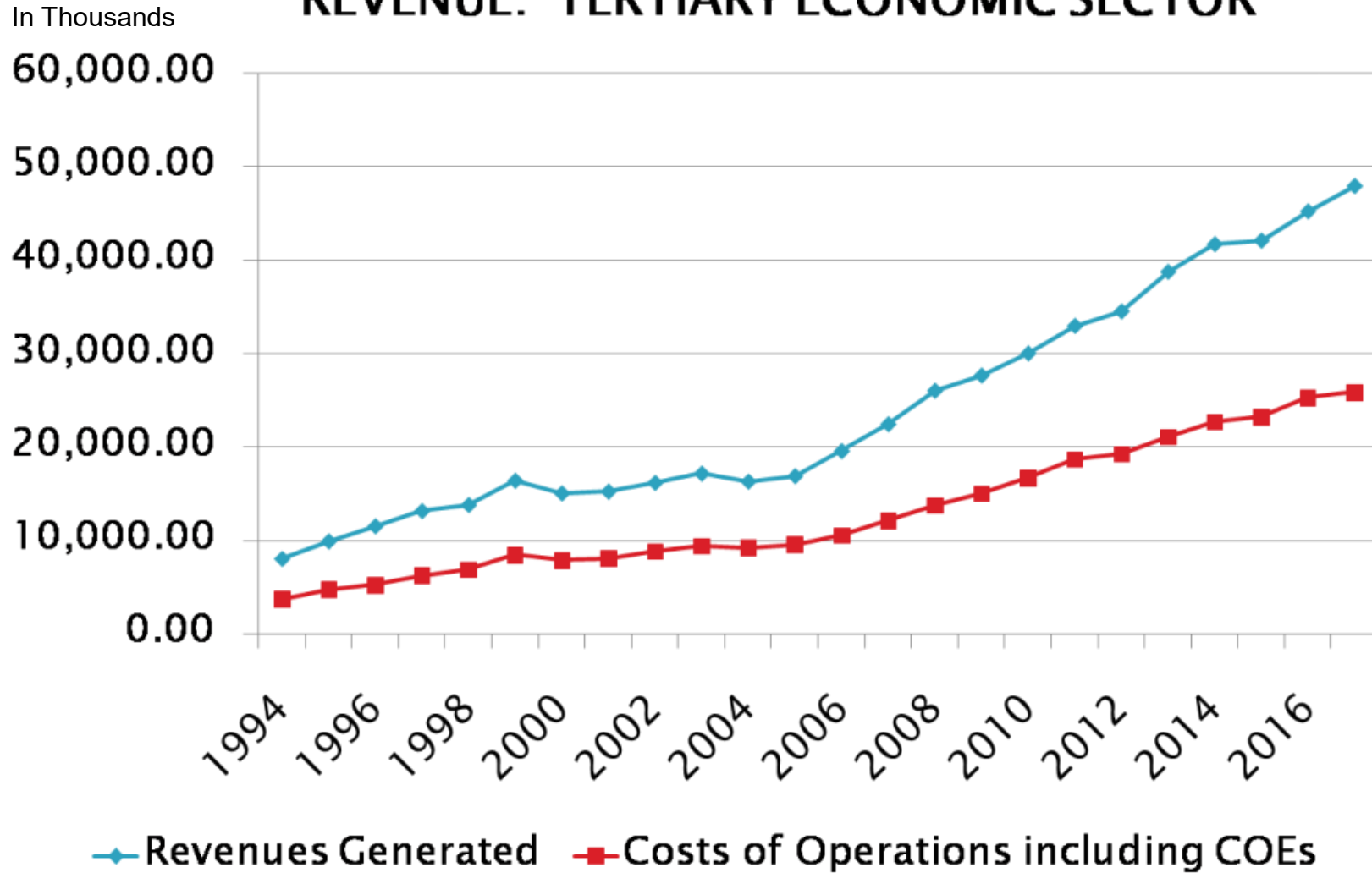


Sectoral structure of an economy

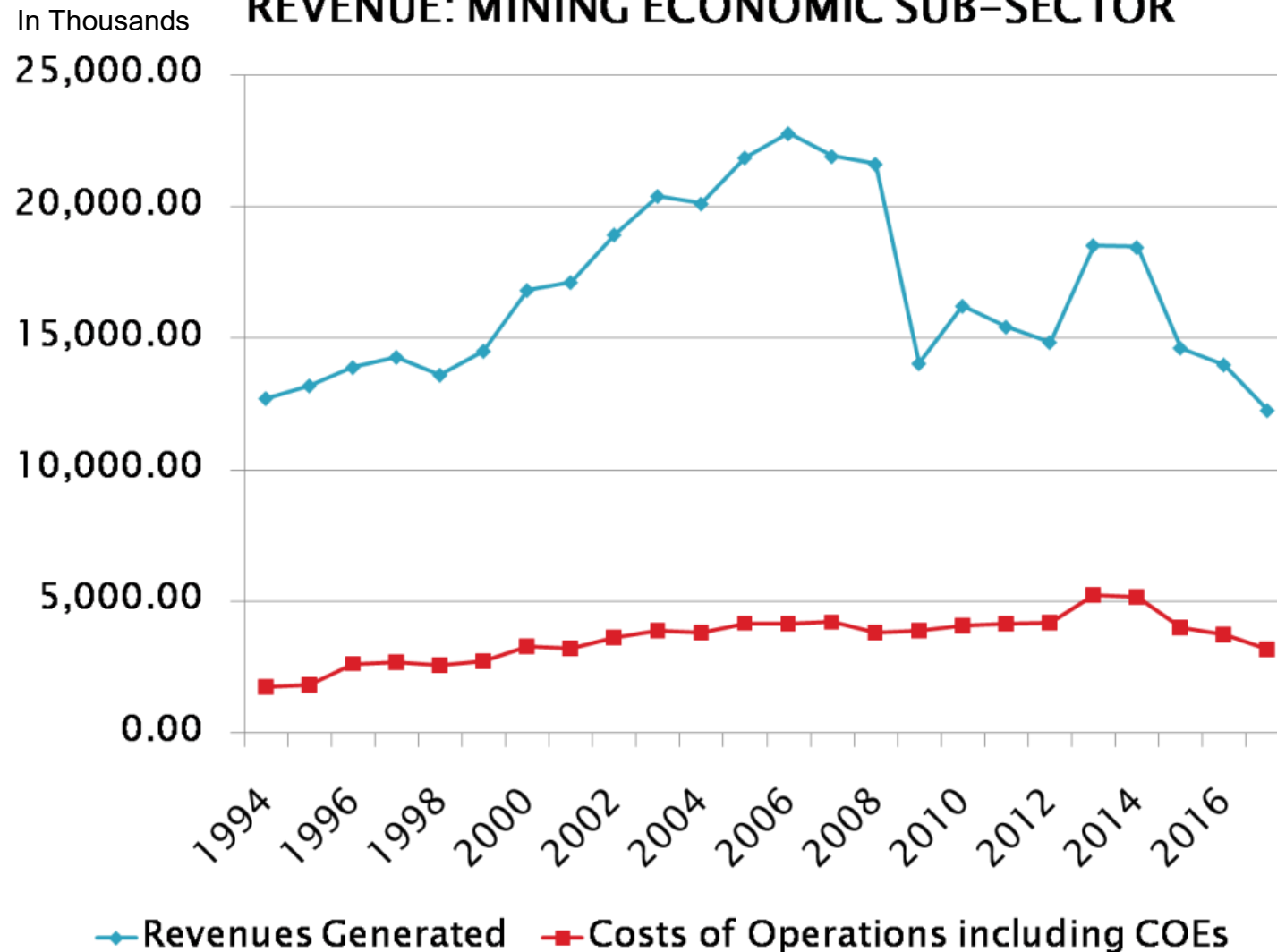
www.regionales-wirtschaften.de

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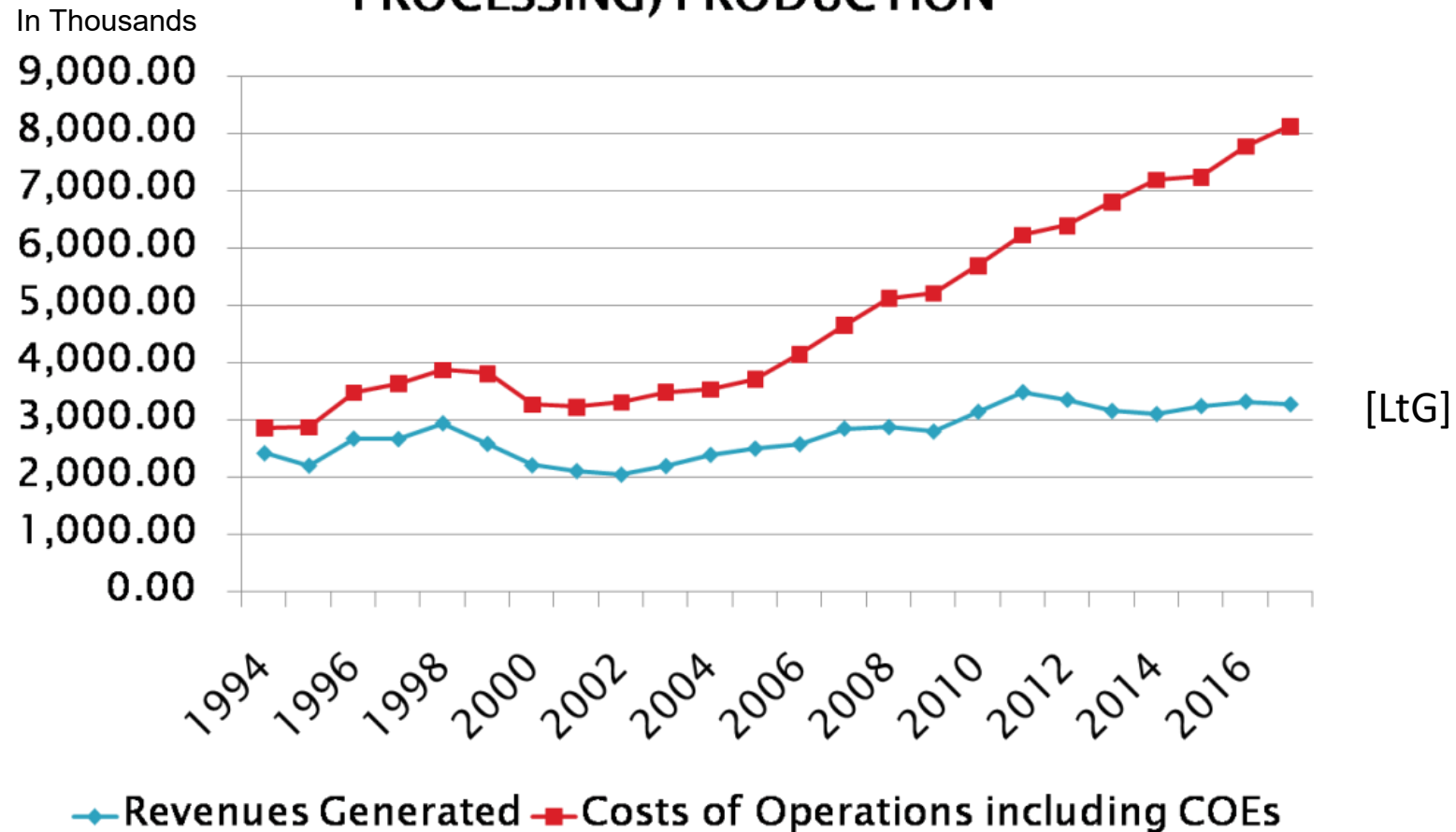
BEHAVIOUR OF COSTS OF PRODUCTION VS REVENUE: TERTIARY ECONOMIC SECTOR



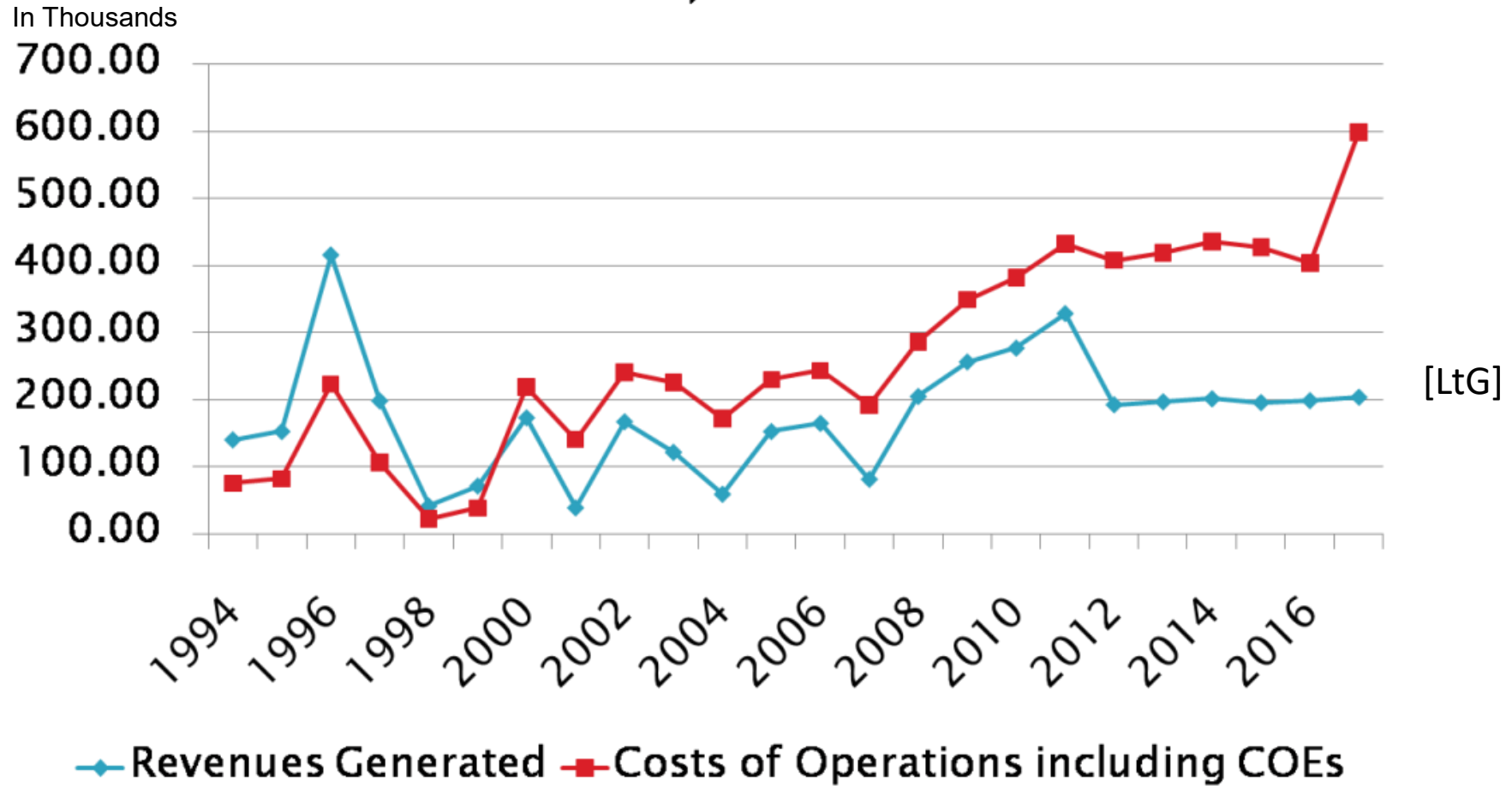
BEHAVIOUR OF COSTS OF PRODUCTION VS REVENUE: MINING ECONOMIC SUB-SECTOR



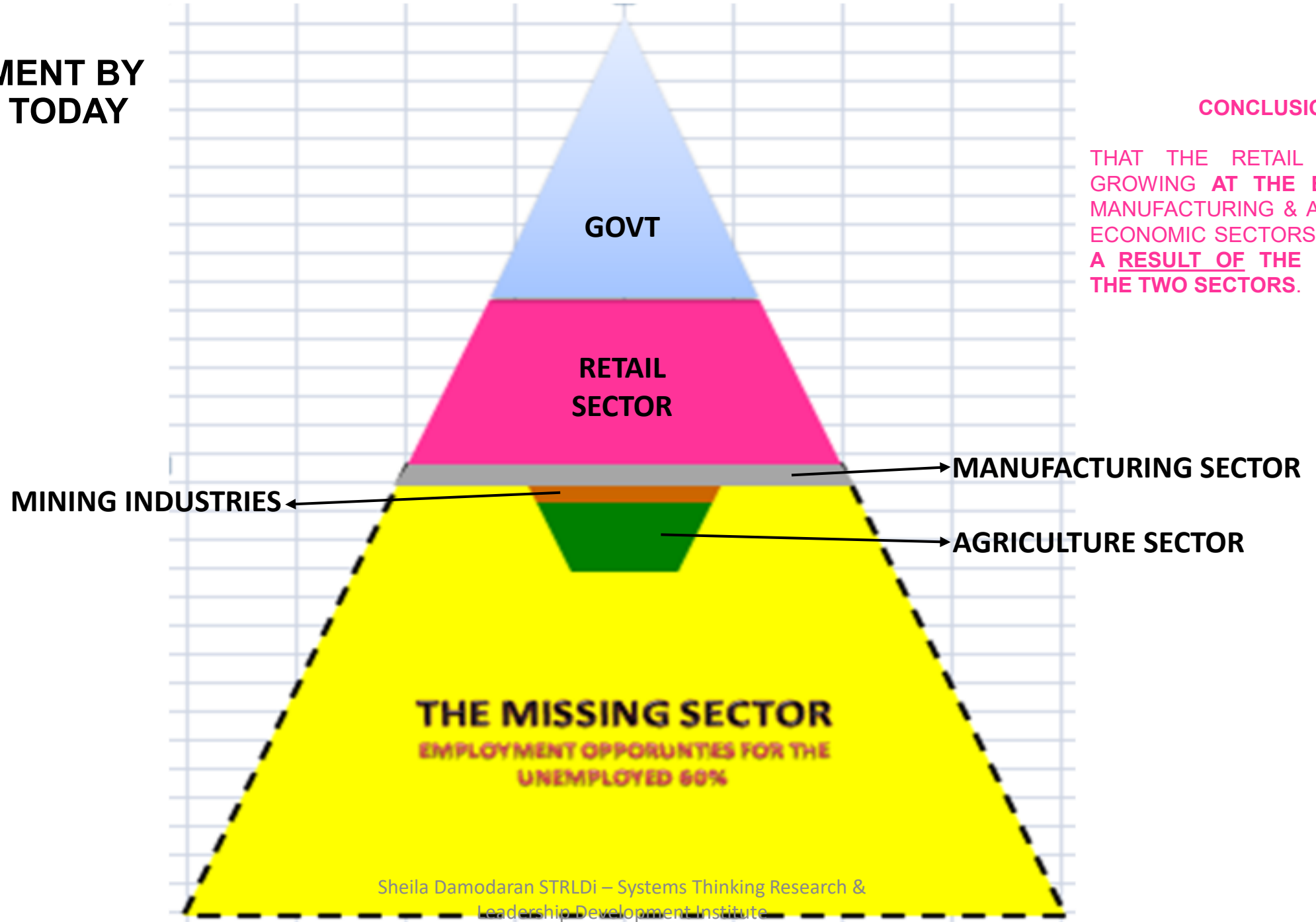
BEHAVIOUR OF COSTS OF PRODUCTION VS REVENUE: MANUFACTURING (NOT INCLUDING OTHERS / DIAMOND PROCESSING) PRODUCTION



BEHAVIOUR OF COSTS OF PRODUCTION VS REVENUE: PLANT (CROP+HORTICULTURE + FORESTRY) PRODUCTION



EMPLOYMENT BY SECTOR TODAY

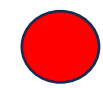
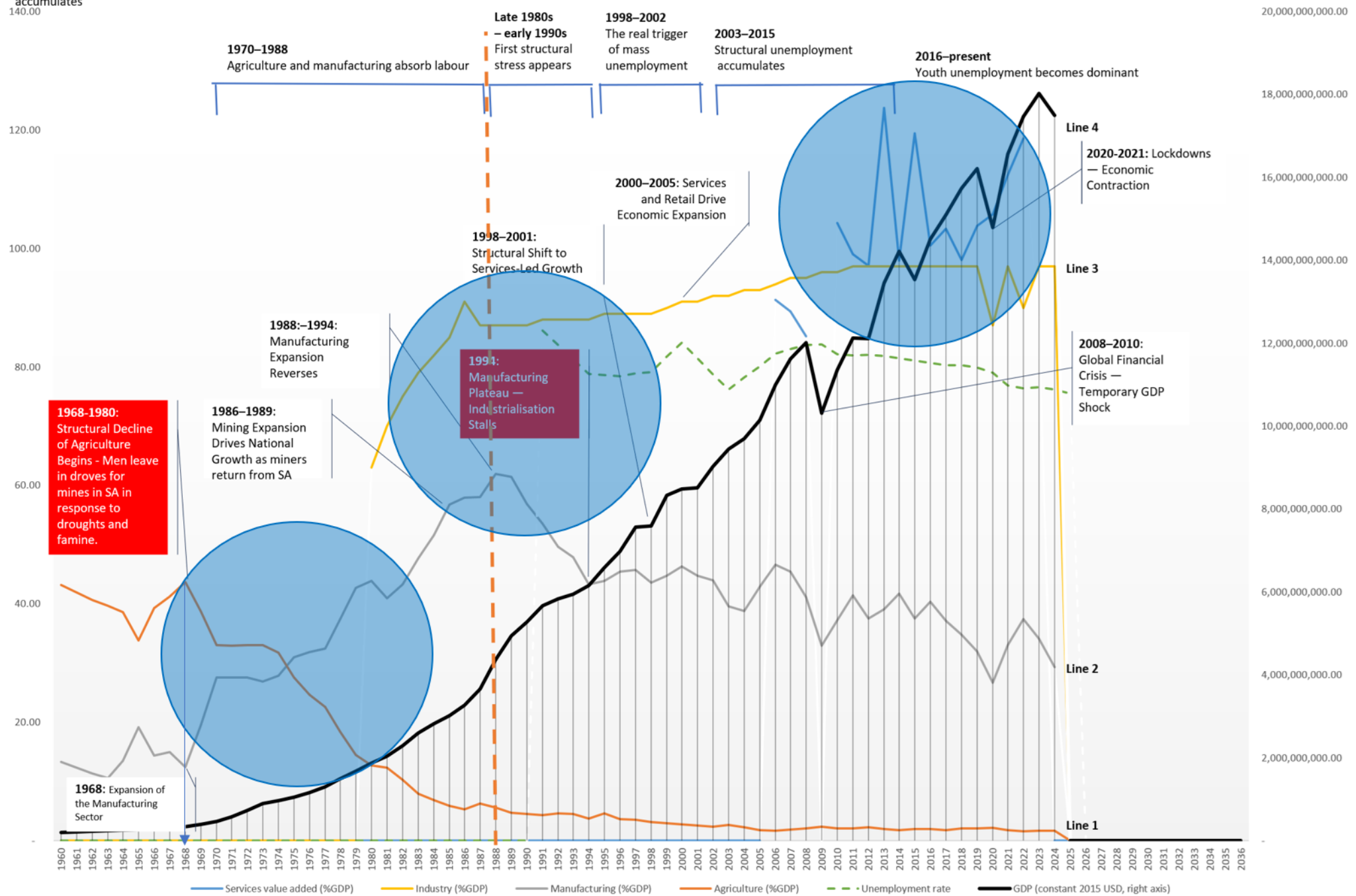


CONCLUSION:

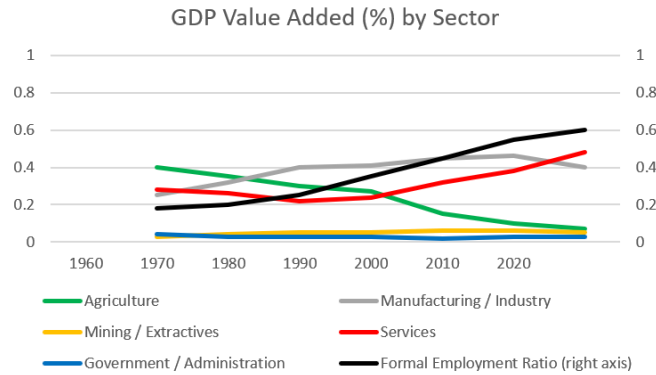
THAT THE RETAIL SECTOR IS GROWING AT THE EXPENSE OF MANUFACTURING & AGRICULTURE ECONOMIC SECTORS BUT NOT AS A RESULT OF THE GROWTH OF THE TWO SECTORS.

2003–2015
Structural unemployment
accumulates
140.00

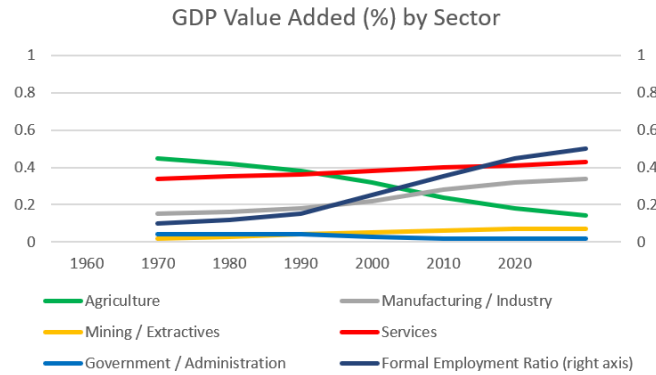
SECTION 3: PRODUCTIVE SECTORS



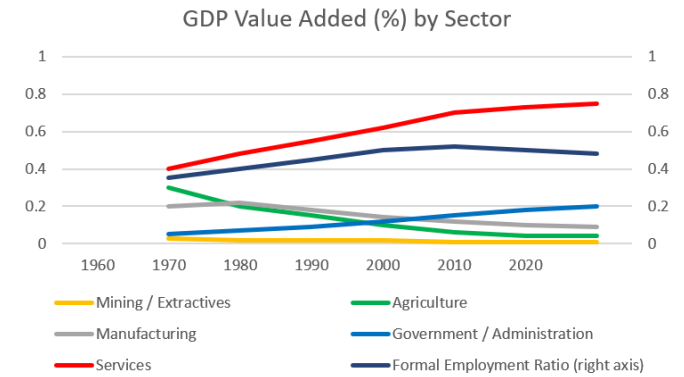
China – Pop: 1,41bil, GDP per capita: \$10.5K



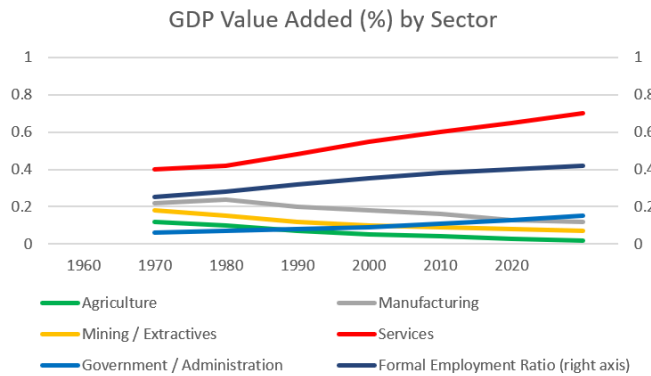
Vietnam – Pop: 97mil, GDP per capita: \$2.8K



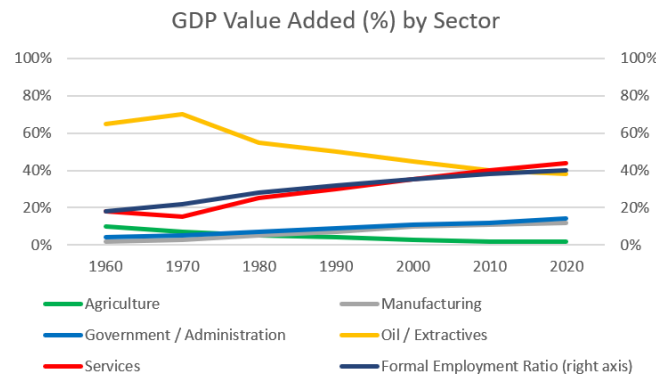
Greece – Pop: 10.7mil, GDP per capita: \$19K



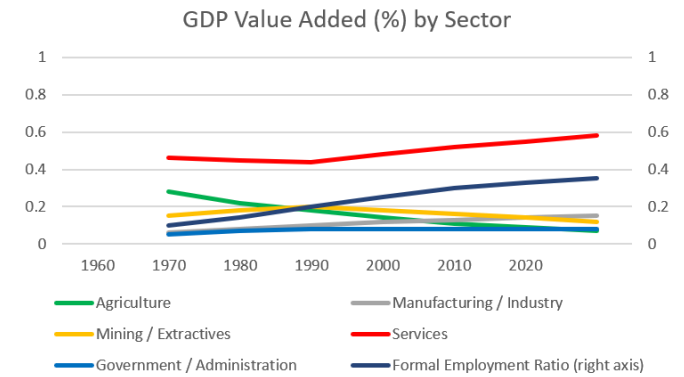
South Africa – Pop: 59mil, GDP per capita: \$6K



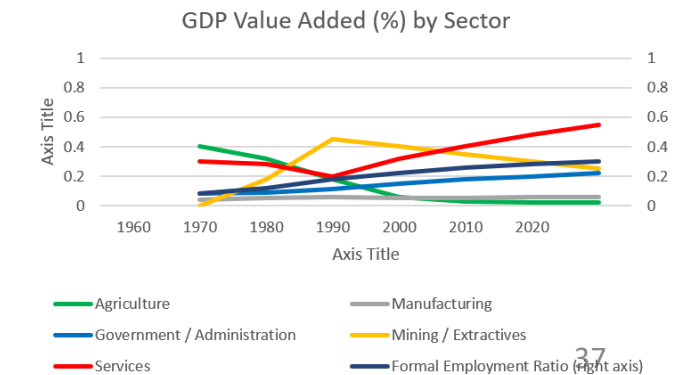
Saudi Arabia – Pop: 35mil, GDP per capita: \$20K



Namibia – Pop: 2.5mil, GDP per capita: \$4.7K



Botswana – Pop: 2.4mil, GDP per capita: \$6.8K



Before We Model the System, Did We First Look at Its Behaviour?

<https://www.linkedin.com/pulse/before-we-model-system-did-first-look-its-behaviour-sheila-damodaran-ycjsf/?trackingId=NBUVjQJ9QY6itDBS9QZg9w%3D%3D>

Distribution of economic sector depending on the stage of economic development

Economic Stage	Primary Sector (%)	Secondary Sector (%)	Tertiary Sector (%)
Fully Developed Economy	3–5%	15–25%	70–80%
Resource-Dependent Emerging Economy	15–25%	30–40%	35–45%
Industrialized, Value-Added Economy	5–10%	30–40%	50–60%

- In fully developed economies, services dominate the economy while manufacturing and raw material extraction have a minimal share.
- In contrast, resource-dependent emerging economies maintain a higher share of the primary sector due to ongoing reliance on raw outputs, balanced by significant manufacturing activity.
- Meanwhile, in economies driven by industrialization and value-added processing, the secondary sector is robust, with a growing service sector complementing a modest primary sector.

What is the change we want?

Economic Stage	Primary Sector (%)	Secondary Sector (%)	Tertiary Sector (%)	
Resource-Dependent Emerging Economy	25 %	40 %	35 %	100%
Botswana 2023 Comparison	23 % (2% Agric)	22 % (7% Mfg)	37 %	? %
Change That Is Needed:	? %	? %	? %	

- What policies in agriculture and manufacturing economic sectors will secure that change for the country?



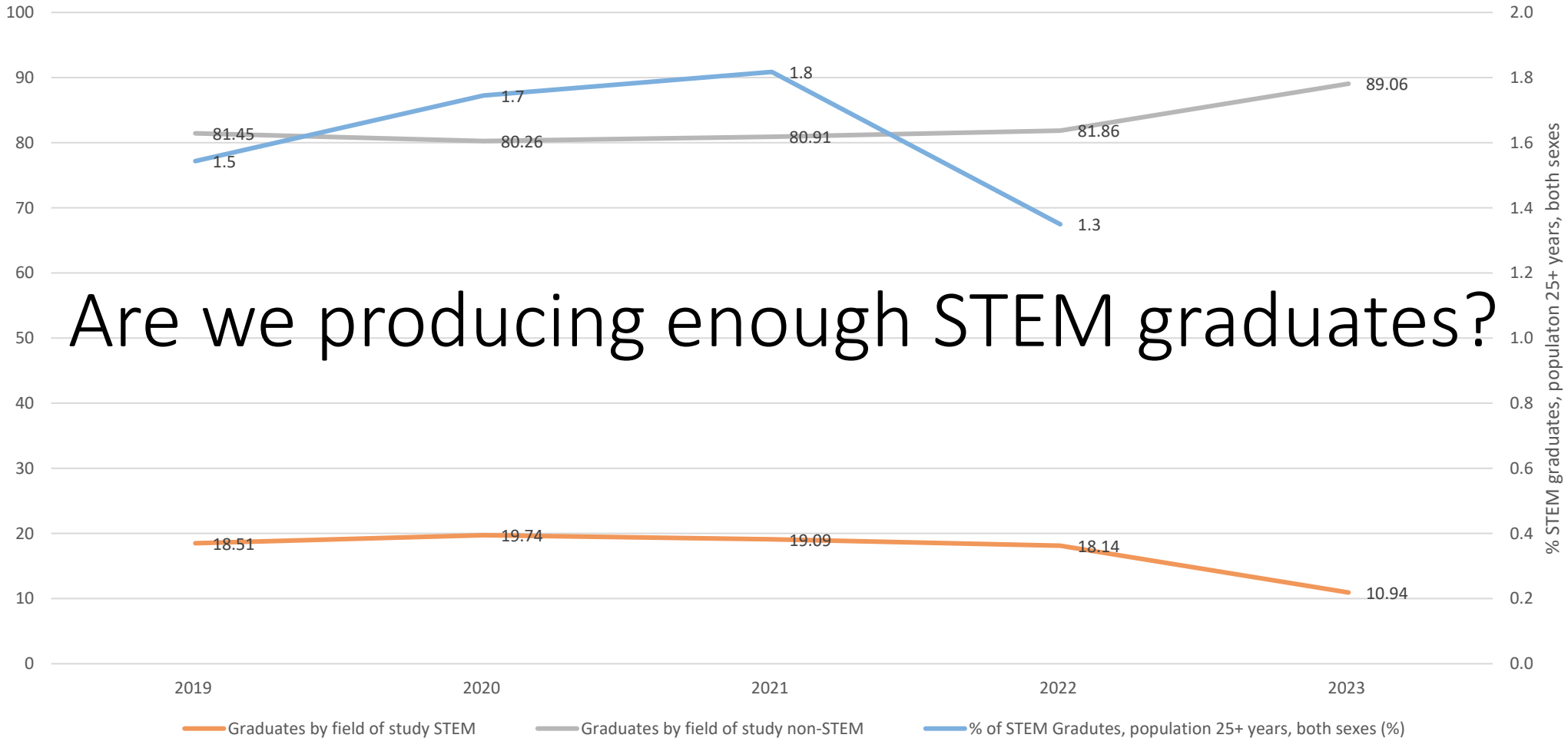
WHY ARE THESE NOT ALREADY HAPPENING?



THE PRODUCTIVE CAPABILITY QUESTION

"What kind of economy is Botswana's education system reproducing?"

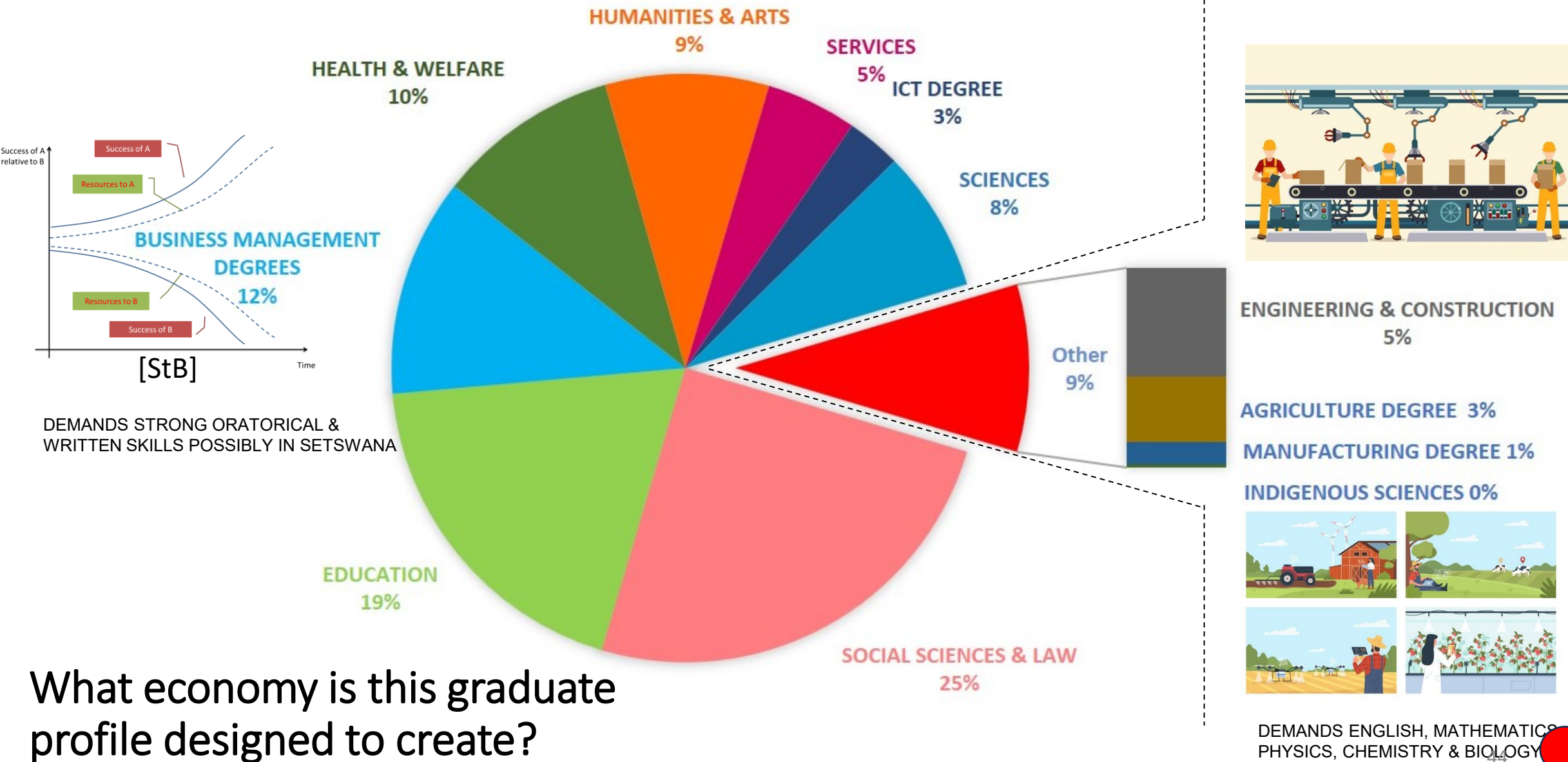
STEM Pipeline Composition Relative to Adult Population, Botswana 2019–2023 Source: UNESCO



Are we producing enough STEM graduates?



Tertiary Graduate Orientation Botswana (2009-2018)

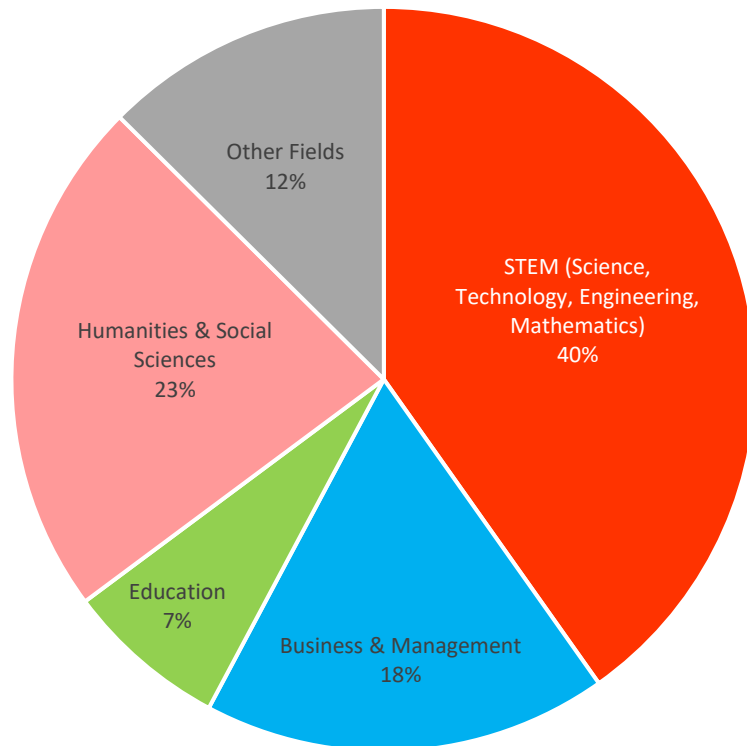


What economy is this graduate profile designed to create?

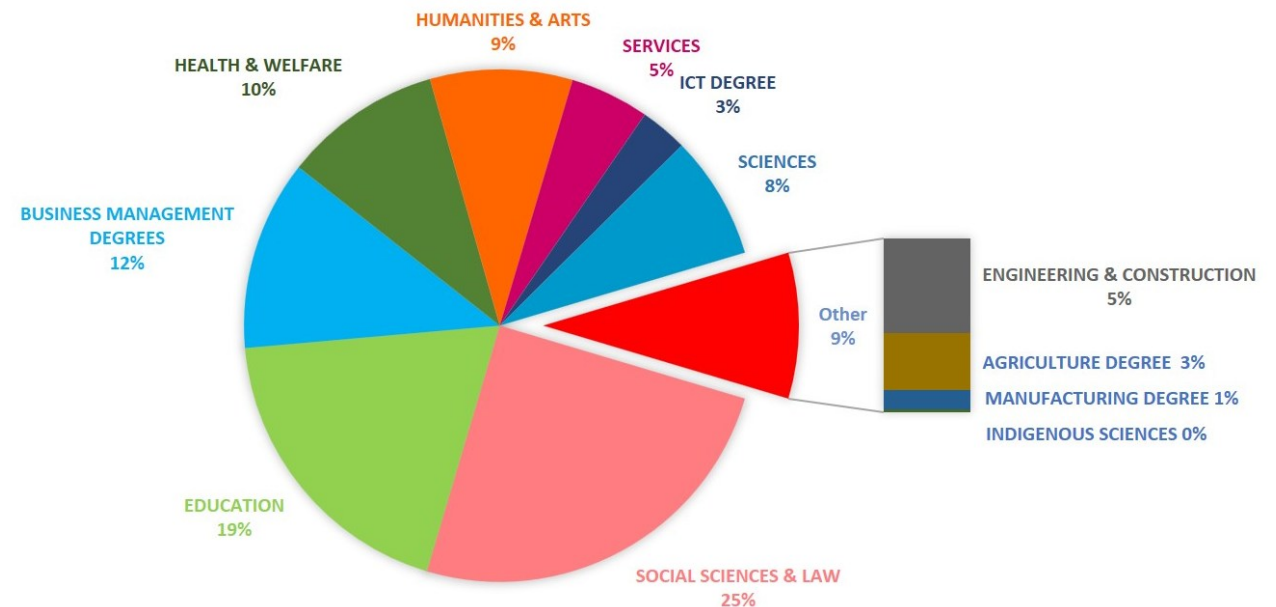


Tertiary Graduate Orientation

CHINA: Approximate Distribution Pattern (2020-2023)



BOTSWANA: Actual (2009-2018)



THE ISSUE IS NOT A LACK OF EDUCATION FUNDING

Education Investment: Botswana Vs China

Government Spending on Education

Indicator	Botswana	China
Education Spending (% GDP)	~8.1% (2020)	~4.0% (2022–2023)
Education Spending (% Government Budget)	~21.5%	~11%
Education Spending Per Capita	~US\$509	~US\$508

Sources: World Bank, CEIC, CountryEconomy.

Trading Econom... +2

Trading Econom... +1



SOMETHING IS NOT ADDING UP

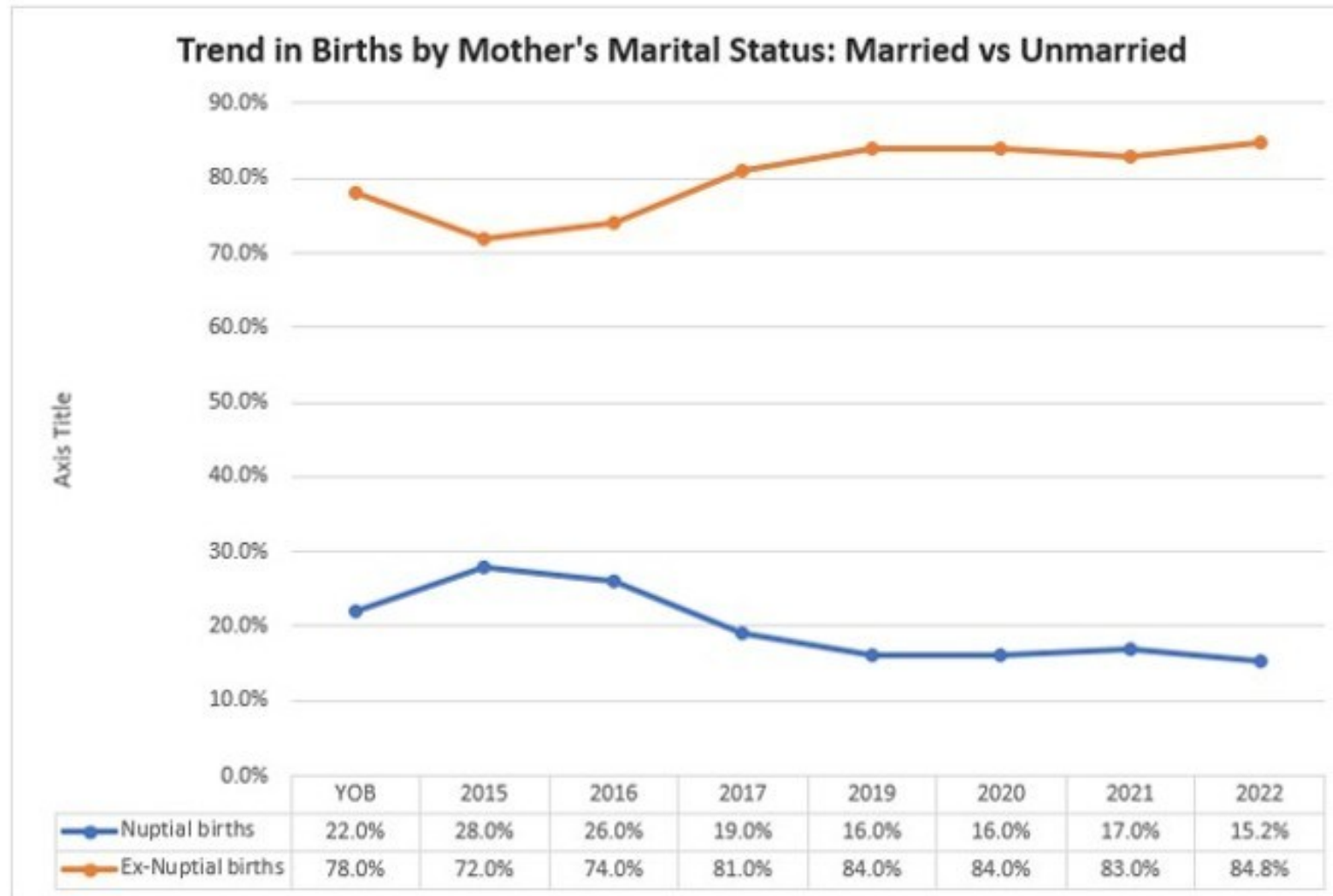
Indicator	Botswana	China
Education Spending (% GDP)	High	Lower
Education Spending Per Person	Similar	Similar
Manufacturing GDP	~5%	~27%
Graduate Unemployment	High	Lower

Question:

- If money is not the explanation, what is?

**WHY ARE THESE NOT ALREADY
HAPPENING?**

Births & Family Structure



BIRTHS & FAMILY STRUCTURE [StS & Esc]

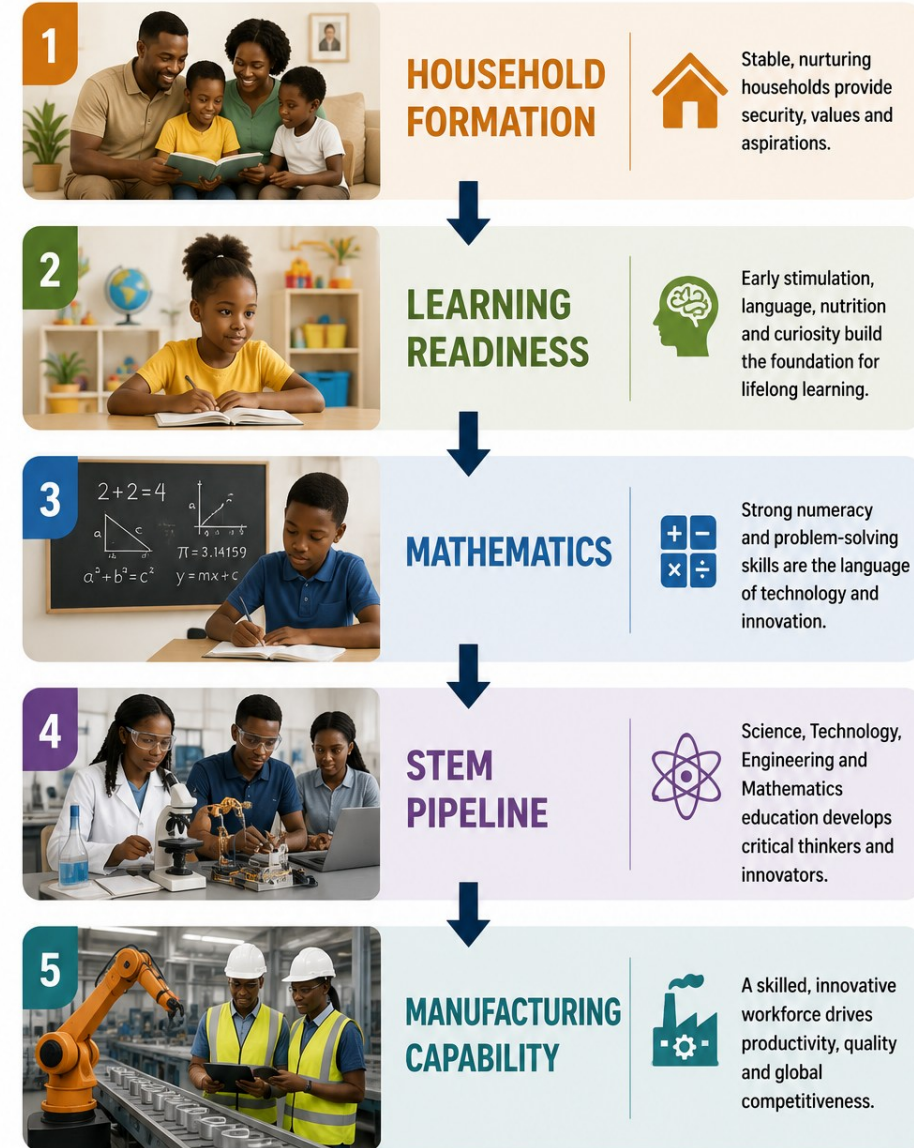
- There is an **80% chance** a child is *born to an unmarried parent or to parents who, although married, do not cohabit in the same household.*
- With the country's marriage rate at only **20%**, it is more likely that unmarried women, sometimes with children from different fathers, will be more successful in having children.
- Further, **six out of ten** times, the women are unemployed and rely on a combination of state support and financial contributions from the fathers of their children to provide for their families. This financial dependency, while helping them fulfil family and community obligations, leads to tensions and conflicts at both familial and community levels.

HOUSEHOLD FORMATION IS A STEM ISSUE

Headline:

- Children do not become engineers at university.
- They begin becoming engineers in childhood.

BUILDING A MANUFACTURING NATION The Human Capability Pipeline



PRODUCTIVE CAPABILITY INDEX (PCI)

Formula

$$PCI = (55\% \times STEM) + (45\% \times Household\ Formation)$$

STEM (55%)

- Mathematics
- Science
- Engineering
- Technical Education
- Industrial Research

Household Formation (45%)

- Stable child development
- Educational support
- Learning readiness
- Workforce preparation

Question:

Can a society reliably reproduce productive capability?

PRODUCTIVE CAPABILITY STAGES

Stage	Developmental Function
Stage A	Resource Extraction System
Stage B	Manufacturing Operator System
Stage C	Manufacturing Design System
Stage D	Manufacturing Leadership System

Question:

- Where are countries positioned?

THE GLOBAL PRODUCTIVE CAPABILITY LADDER

• Stage A

**Resource
Extraction**

Examples:

- Botswana
- Namibia
- Zambia

• Stage B

**Manufacturing
Operator**

Examples:

- Malaysia
- Vietnam
- Thailand
- Mexico

• Stage C

**Manufacturing
Design**

Examples:

- Germany
- Japan
- Taiwan
- South Korea

• Stage D

**Manufacturing
Leadership**

Examples:

- United States
- China
- Germany
- South Korea

Question:

What distinguishes movement between stages?

PRODUCTIVE CAPABILITY VS GDP PER CAPITA

Country	GDP per Capita	Stage
China	~US\$13k	D
South Korea	~US\$35k	D
Malaysia	~US\$13k	B
Botswana	~US\$8k	A

Headline:

- **WEALTH DOES NOT DETERMINE THE STAGE**
- **CAPABILITY DOES**

GLOBAL PRODUCTIVE CAPABILITY RANKING (PCI)

Capability Reproduction Index

TOP 20 COUNTRIES

Rank	Country	PCI Score (0-100)	Manufacturing Status*
1	Switzerland	86.9	Advanced Manufacturing
2	Singapore	83.3	Advanced Manufacturing
3	United States	82.4	Industrial Powerhouse
4	Germany	81.0	Industrial Powerhouse
5	Japan	80.2	Industrial Powerhouse
6	South Korea	79.1	Industrial Powerhouse
7	Taiwan	78.3	Industrial Powerhouse
8	Netherlands	77.3	Advanced Manufacturing
9	Sweden	76.6	Advanced Manufacturing
10	Denmark	75.8	Advanced Manufacturing
11	Finland	75.0	Advanced Manufacturing
12	Austria	74.1	Advanced Manufacturing
13	Belgium	73.4	Advanced Manufacturing
14	United Kingdom	72.5	Advanced Manufacturing
15	France	71.8	Industrial Powerhouse
16	Norway	71.2	Advanced Manufacturing
17	Canada	70.4	Advanced Manufacturing
18	Australia	69.7	Moderate Manufacturing
19	Israel	68.9	High Technology Manufacturing
20	New Zealand	68.1	Moderate Manufacturing

*Manufacturing Status Classification

Derived from: UNIDO Competitive Industrial Performance (CIP) Index, Manufacturing Value Added (MVA), Economic Complexity Index (ECI), and Share of Manufacturing in GDP and Exports.

BOTSWANA TODAY

Approximate PCI Position
~100 / 190
 Countries



Productive capability exists.
 Its reproduction remains inconsistent.

NOTABLE OBSERVATION: CHINA

Manufacturing Rank:
#1 GLOBALLY

PCI Ranking:
OUTSIDE TOP 20

Why?

The PCI measures a nation's ability to reproduce productive capability across generations.

WHY CHINA DOES NOT RANK IN THE TOP 20

EXCEPTIONALLY STRONG IN:

- Mathematics
- Science
- Engineering
- Technical Education
- Industrial Research
- Manufacturing Output

MODERATED BY LONG-TERM HOUSEHOLD & DEMOGRAPHIC FACTORS:

- 1 Fertility Decline**
Decades of one-child policy led to a dramatic reduction in births, shrinking future cohorts of learners and workers.
- 2 Household Compression**
Ageing grandparents, fewer working adults, fewer children and fewer siblings increase pressures on each productive adult and weaken developmental support.
- 3 Educational Pressure vs Support**
High academic achievement does not always reflect strong household developmental support and learning readiness.
- 4 Workforce Reproduction**
The challenge is not how many skilled workers exist today, but whether society can continuously reproduce them over future generations.

WHAT DISTINGUISHES HIGH PCI NATIONS?



PCI MEASURES:

Can a nation continuously reproduce productive capability?

MANUFACTURING RANKINGS MEASURE:

How much productive capability is being expressed today?



*Productive capability drives prosperity.
 Building capability builds nations.*

The PCI looks beyond what nations produce today to what they can reliably reproduce tomorrow.

Manufacturing status validated using:
 UNIDO CIP Index • MVA • ECI

THE GLOBAL PARADOX

Indicator	Botswana
Education Spending	High
GDP Per Capita	Upper Middle Income
Productive Capability Rank	~100
Manufacturing GDP	~5%
Manufacturing Graduates	~1%

Headline:

- **WEALTHY ENOUGH TO EDUCATE**
- **NOT PRODUCTIVE ENOUGH TO INDUSTRIALISE**

WHAT DOES MANUFACTURING REQUIRE?

Requirement	Typical Source
Engineers	Engineering
Automation	Engineering + ICT
Production Systems	Engineering
Industrial Design	Engineering + Science
Machinery	Engineering
Food Manufacturing	Agriculture + Science

Headline:

- **FACTORIES RUN ON STEM**



WHAT ECONOMY IS OUR EDUCATION SYSTEM REPRODUCING?

The direction of graduate output shapes the direction of our economy.



PRODUCTIVE PIPELINE ~20% OF GRADUATES (~1-3% OF POPULATION)

- Agriculture
- Manufacturing
- Engineering
- ICT
- Sciences
- Farms
- Factories
- Industrial Parks
- Exports
- Jobs

ADMINISTRATIVE PIPELINE ~80% OF GRADUATES (~7-8% OF POPULATION)

- Law
- Business
- Education
- Social Sciences
- Offices
- Administration
- Compliance
- Services
- Management



SMALL FOOTPRINT
HIGH IMPACT

LARGE FOOTPRINT
LOW IMPACT

THE SIZE OF THE INDUSTRIAL ECONOMY CANNOT EXCEED THE SIZE OF THE PIPELINE THAT FEEDS IT.

Botswana's future prosperity depends on expanding the productive pipeline, especially in **STEM** and STEM and manufacturing.

MORE RIGHT TALENT. MORE CAPABILITY. MORE PROSPERITY.

THE EDUCATION SYSTEM IS NOT PRODUCING A MANUFACTURING ECONOMY

AFRICA'S UNTAPPED PRODUCTIVE OPPORTUNITY

Moving from Stage A (Resource Extraction) to Stage B/C (Manufacturing)

Indicator	Today	Stage B/C
Population	1.5 Billion	1.5 Billion
Formal Employment	~15%	40–60%
Food Demand	1.2 Billion Tonnes	1.4–1.8 Billion Tonnes
Food Production	0.85 Billion Tonnes	1.4–1.8 Billion Tonnes
Food Gap	350 Million Tonnes	Potential: 1 Million Tonnes
Manufactured Goods Production	Limited	Large-scale Regional Production
Imports Required	High	Significantly Reduced

WHO WILL PRODUCE FOR AFRICA?

Additional Demand Created by Industrialisation

Product Category	Today	Stage B	Stage C
Food	1.2 Bt	1.4 Bt	1.8 Bt
Steel	40 Mt	120 Mt	250 Mt
Cement	250 Mt	500 Mt	800 Mt
Plastics	20 Mt	70 Mt	150 Mt
Vehicles	Baseline	5×	10×
Industrial Machinery	Baseline	5×	15×

The Strategic Question

If Africa industrialises:

- Who will produce an additional 600 million tonnes of food?
- Who will produce an additional 210 million tonnes of steel?
- Who will produce an additional 550 million tonnes of cement?
- Who will build the machinery, vehicles, pumps, tractors and factories?

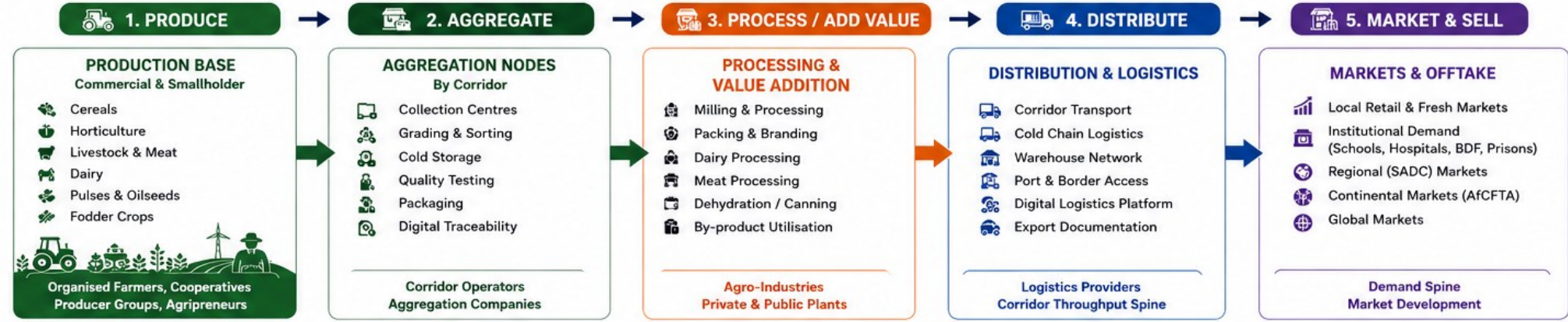
The Opportunity

Africa's future growth challenge is not demand creation. Demand already exists. We meet it as we build productive capability to supply it.

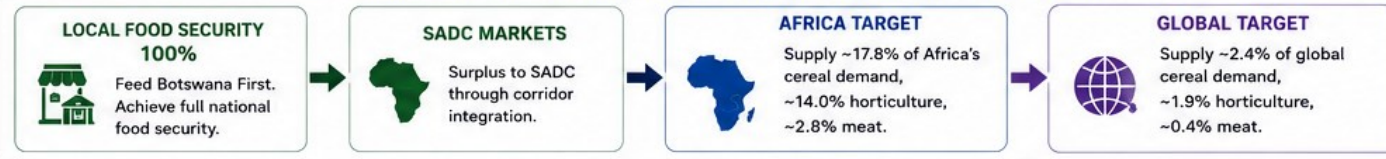
AGRICULTURE CORRIDOR EXECUTION LATTICE 2.0

SCENARIO 1: TRANSITION ECONOMY 2026–2035 (15 MILLION HA)

Feeding Botswana First. Supplying SADC. Powering Africa. Reaching the World.



MARKET HIERARCHY & TARGETS – SCENARIO 1 (TRANSITION 2026–2035)



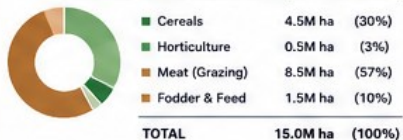
ENABLERS OF THE CORRIDOR EXECUTION LATTICE

- Policy & Governance:** Enabling policies, streamlined regulations
- Infrastructure:** Roads, rail, energy, irrigation, storage
- Finance:** Affordable finance, risk guarantees, working capital
- Technology & Data:** Digital platforms, IoT, AI, market intelligence
- Skills & Extension:** Agri-advisory, business development, STEM
- Quality & Standards:** SPS, certification, traceability, compliance

SCENARIO 1 (TRANSITION 2026–2035) – LAND, PRODUCTION, MARKET SHARES & FARMERS

MARKET LEVEL	SCOPE	CEREALS					HORTICULTURE					MEAT (ALL TYPES)					TOTAL LAND (HA)	FARMERS (TOTAL)	EMPLOYMENT (DIRECT + INDIRECT)
		PRODUCTION (TONNES)	LAND (HA)	AFRICA SHARE	GLOBAL SHARE	FARMERS	PRODUCTION (TONNES)	LAND (HA)	AFRICA SHARE	GLOBAL SHARE	FARMERS	PRODUCTION (TONNES)	LAND (HA)	AFRICA SHARE	GLOBAL SHARE	FARMERS			
1	LOCAL FOOD SECURITY (Botswana)	370,000	37,000	100%	—	740	120,000	3,500	100%	—	350	85,000	425,000	100%	—	430	465,500	1,520	15,200
2	SADC MARKETS (Surplus)	2,030,000	203,000	—	—	4,060	880,000	25,000	—	—	2,500	340,000	1,700,000	—	—	1,700	1,928,000	8,260	49,600
3	AFRICA TARGET (Approx.)	42,600,000	4,260,000	17.8%	—	85,200	16,500,000	471,000	14.0%	—	47,100	1,700,000	8,500,000	2.8%	—	8,500	13,231,000	140,800	845,000
4	GLOBAL TARGET (Approx.)	2,000,000	200,000	—	2.4%	4,000	1,750,000	50,000	—	1.9%	5,000	170,000	850,000	—	0.4%	850	1,100,000	9,850	59,100
TOTAL – SCENARIO 1 (15 MILLION HA)		45,000,000	4,700,000	17.8%	2.4%	94,000	19,250,000	549,500	14.0%	1.9%	54,950	2,295,000	11,475,000	2.8%	0.4%	11,480	15,000,000	160,430	968,900

SCENARIO 1 LAND ALLOCATION (15 MILLION HA)



KEY OUTCOMES

- Full national food security achieved
- Major supplier to SADC markets
- Meaningful contributor to Africa's food security
- Emerging player in global agricultural markets
- Strong foundation for 2045 scale-up to 25M ha

PRODUCTIVITY ASSUMPTIONS (SCENARIO 1)

- Cereals: 10 tonnes/ha
 - Horticulture: 35 tonnes/ha
 - Meat: 1 tonne per 5 ha (grazing + feedlot system)
- Average farm sizes: Cereals 500 ha | Horticulture 10 ha
Meat 1,000 ha

FARMERS & EMPLOYMENT (SCENARIO 1)

- Total Farmers (Direct): 160,430
 - Direct Employment: 322,000
 - Indirect Employment: 646,900
- TOTAL DIRECT + INDIRECT EMPLOYMENT**
968,900

THE VISION

A Botswana-led agricultural transformation that satisfies domestic needs, becomes the food basket of SADC, contributes meaningfully to Africa's food security, and participates in global agricultural markets.



ASSUMPTIONS

- Cereals yield: 10 tonnes/ha
- Cereals farmer size: 500 ha
- Horticulture farmer size: 10 ha
- Horticulture yield: 35 tonnes/ha
- Horticulture farmer size: 10 ha
- Meat output: 1 tonne per 5 ha
- Meat farmer size: 1,000 ha

NOTES

- Land includes production plus associated infrastructure, access, conservation buffers.
- Employment includes on-farm, processing, logistics, input supply, services and retail.
- Figures are indicative, based on 2026 baseline and medium-term productivity gains.

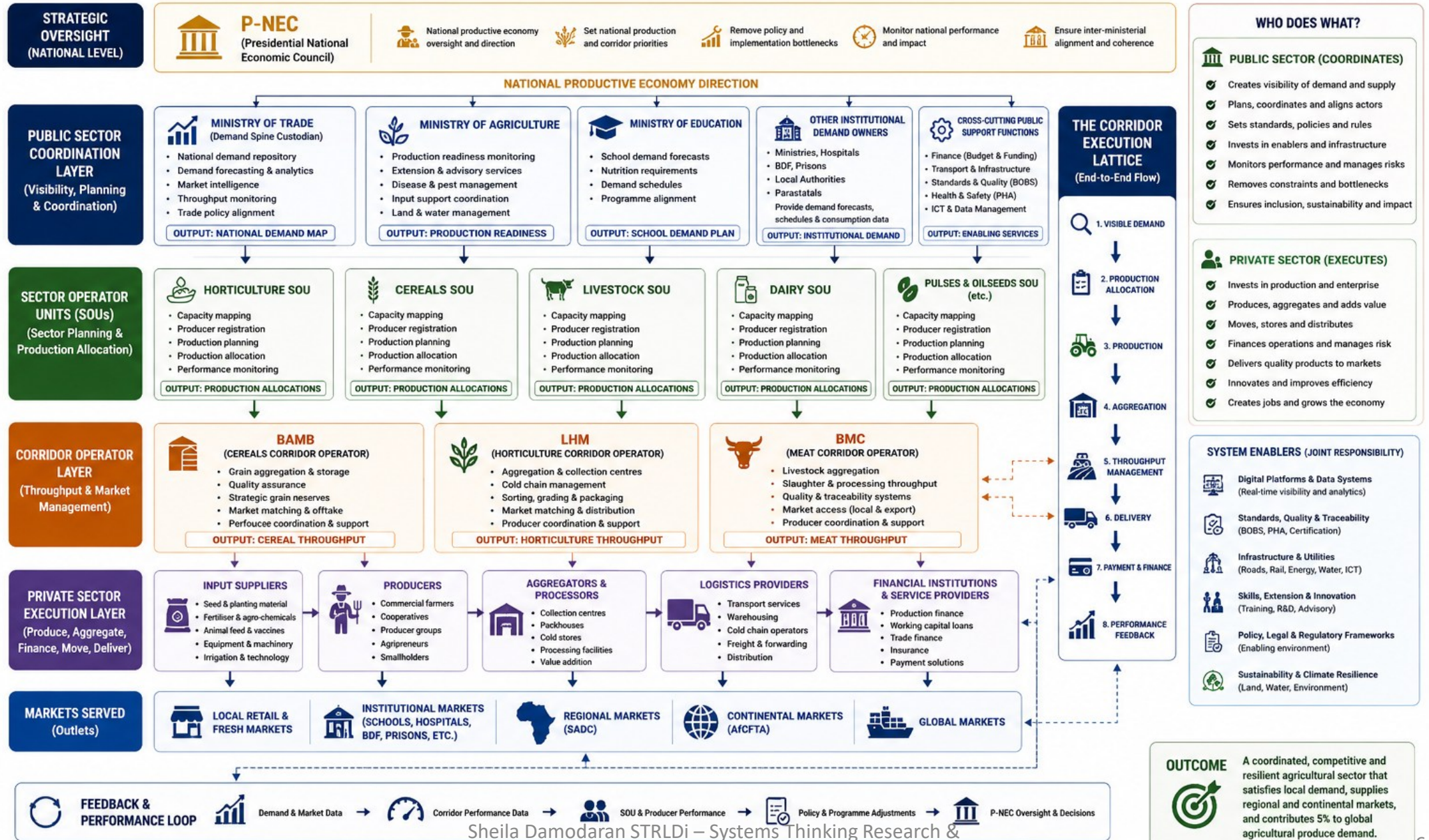
STRLDi

Building Botswana's Agriculture Corridors
From Local to Continental and Global Markets



AGRICULTURE CORRIDOR EXECUTION LATTICE – PUBLIC & PRIVATE ROLES AND RELATIONSHIPS

GOVERNMENT COORDINATES. PRIVATE SECTOR EXECUTES. MARKETS GROW. NATION PROSPERS.



Sheila Damodaran STRLDi – Systems Thinking Research &

Leadership Development Institute

GOVERNMENT PROVIDES DIRECTION, VISIBILITY AND ENABLERS. PRIVATE SECTOR DRIVES PRODUCTION, INNOVATION AND GROWTH. TOGETHER WE BUILD A PRODUCTIVE BOTSWANA THAT FEEDS ITSELF, THE REGION AND THE WORLD.

THE NATIONAL QUESTION

Are we educating people
to administer the economy
or
to build the economy?

THE DECISION THAT CANNOT BE DELEGATED

OPTION A

Continue reproducing:

- Administrators
- Managers
- Lawyers
- General graduates

while importing productive capability

OPTION B

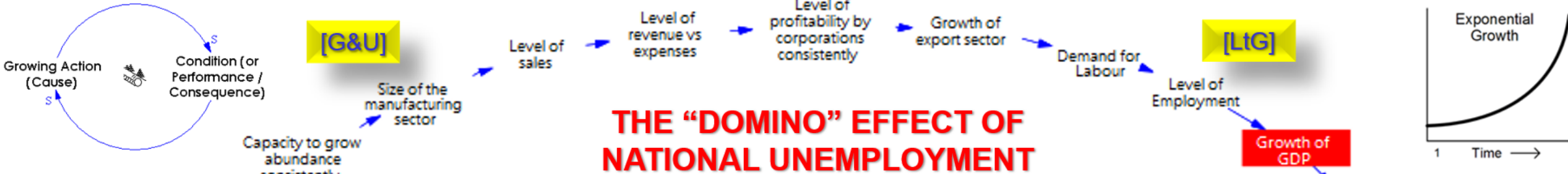
Deliberately reproduce:

- Engineers
- Scientists
- Technicians
- Manufacturing specialists
- and build the productive economy around them.

THE QUESTION IS NOT WHETHER BOTSWANA WILL CHANGE

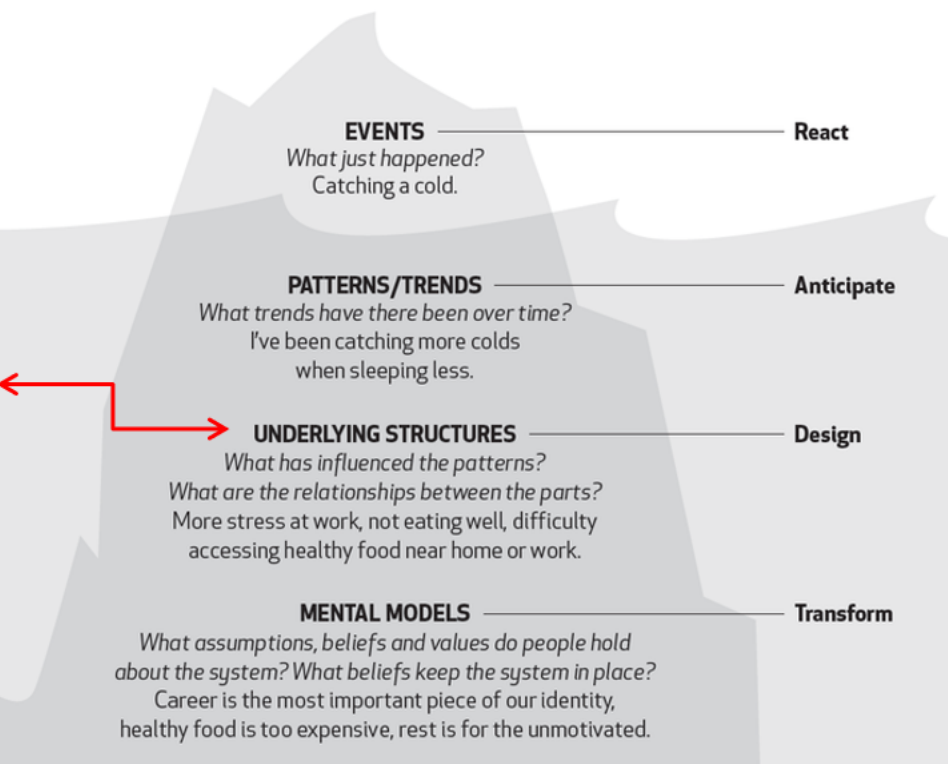
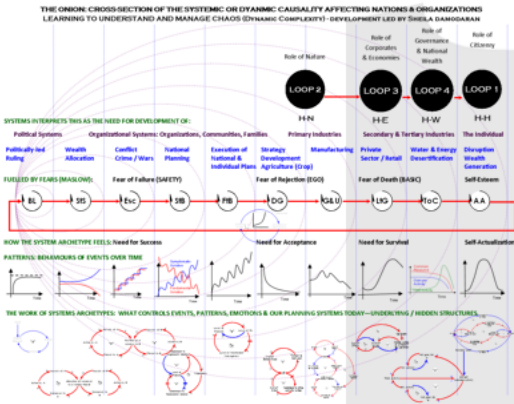
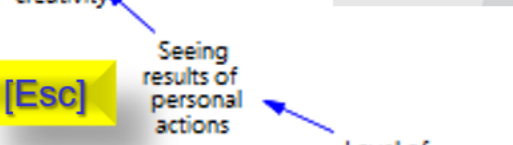
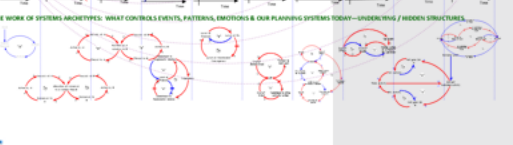
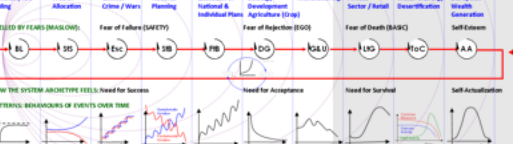
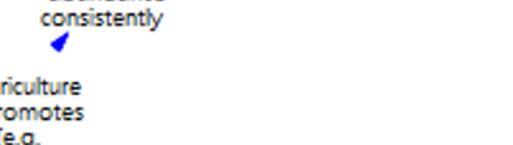
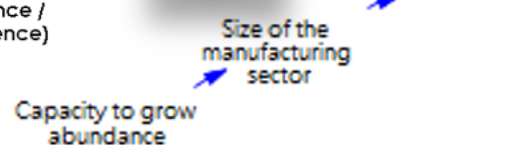
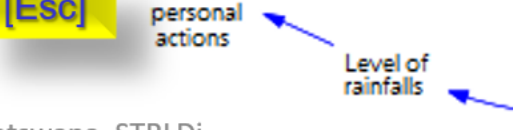
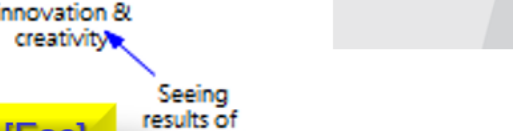
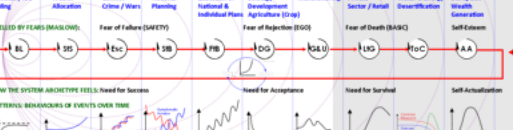
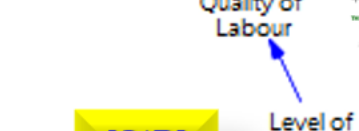
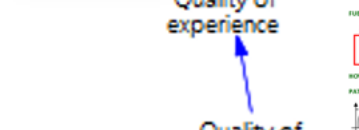
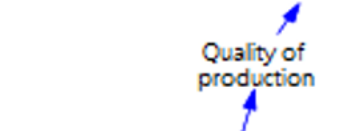
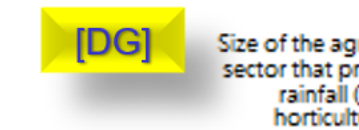
THE QUESTION IS WHETHER BOTSWANA WILL CHANGE BEFORE THE SYSTEM FORCES IT TO

THE DOMINO EFFECT OF NATIONAL UNEMPLOYMENT



THE "DOMINO" EFFECT OF NATIONAL UNEMPLOYMENT

THE ICEBERG
A Tool for Guiding Systemic Thinking



Sheila Damodaran STRLDi – Systems Thinking Research & Leadership Development Institute

WHAT IS NEXT?

IMPLEMENTATION PATHWAY

STEM AS ECONOMIC INFRASTRUCTURE

- Key shift:
 - STEM is no longer primarily an education agenda.
- It becomes:
 - productive infrastructure,
 - industrial capability,
 - corridor intelligence,
 - manufacturing discipline,
 - and throughput coordination capacity.

Core insight:

- Industrial systems move at the speed of human coordination.
- Target: 60% of population STEM adept



PRODUCTIVE ECONOMIES REQUIRE STEM CONFIDENCE

- **Productive sectors operate through technical reasoning.**
- Agriculture, manufacturing, mining, logistics, engineering, construction, and technology all depend upon people who are comfortable working with measurement, quantities, forecasting, causality, and uncertainty.
- The issue extends beyond technical specialists. Productive economies become possible when large numbers of citizens possess sufficient confidence to engage with mathematics, science, systems, and practical problem-solving.
- **Productive capability grows when technical confidence becomes widespread.**
- A nation becomes capable of sustaining complex productive systems when STEM adeptness is distributed throughout society rather than concentrated within small technical communities.

THE SAME CHALLENGE MAY APPEAR IN THE PUBLIC SECTOR

- **Public-sector implementation also depends upon technical confidence.**
- Investment assessment, project evaluation, infrastructure planning, economic modelling, budgeting, industrial coordination, procurement, and programme review all require confidence in working with quantitative information and dynamic complexity.
- When technical confidence is limited, uncertainty often produces caution. Decisions take longer, approvals slow down, implementation becomes fragmented, and coordination becomes increasingly difficult.
- **Public-sector performance and productive-sector performance may therefore share common capability foundations.**
- The same capability constraints influencing productive sectors may also influence the institutions responsible for enabling them.

FROM PRIVATE-SECTOR PERFORMANCE TO PUBLIC-SECTOR PERFORMANCE

The same pattern may be expressing itself through different parts of the system.

PRODUCTIVE SECTOR

- Lower technical confidence
- Lower investment confidence
- Reduced productive expansion
- Reduced labour absorption
- Persistent unemployment

PUBLIC SECTOR

- Lower technical confidence
- Lower implementation confidence
- Slower approvals
- Slower coordination
- Persistent implementation pressures

Persistent issues often emerge across multiple parts of the same system.

What appears as separate challenges may ultimately reflect a common structural condition expressing itself through different institutions and sectors.



Two Sides. One Capability. One Nation.



A NATIONAL CAPABILITY PROPOSITION

- **Botswana may wish to pursue a long-horizon objective of developing STEM adeptness across approximately 60% of the working-age population.**
- The objective is not to produce scientists and engineers exclusively.
- The objective is to develop a population increasingly comfortable with numbers, measurement, technical reasoning, systems thinking, forecasting, experimentation, and practical problem-solving.
- **The emergence of AI creates an opportunity previous generations did not possess.**
- AI-assisted but monitored learning can accelerate access to technical knowledge, reduce barriers to learning, and increase confidence in engaging with mathematics, science, and productive disciplines.
- **Early effects can emerge rapidly.**
- Within months, confidence levels begin changing.
- Within approximately three years, shifts begin appearing in productivity, implementation capability, entrepreneurship, innovation, and productive-sector participation.
- **Capability compounds over time.**
- Once technical confidence begins spreading through a population, the effects reinforce one another through households, schools, workplaces, institutions, and productive sectors.

CAPABILITY COMPOUNDS. NATIONS TRANSFORM.

A 3-YEAR STEM ADEPTNESS ACCELERATION PATHWAY FOR BOTSWANA

OUR NATIONAL TARGET

60%
STEM ADEPTNESS
of working-age population
within 3 years



Comfort with

- Numbers
- Measurement
- Causality



Technical Reasoning

- Systems Thinking
- Problem Solving
- Experimentation

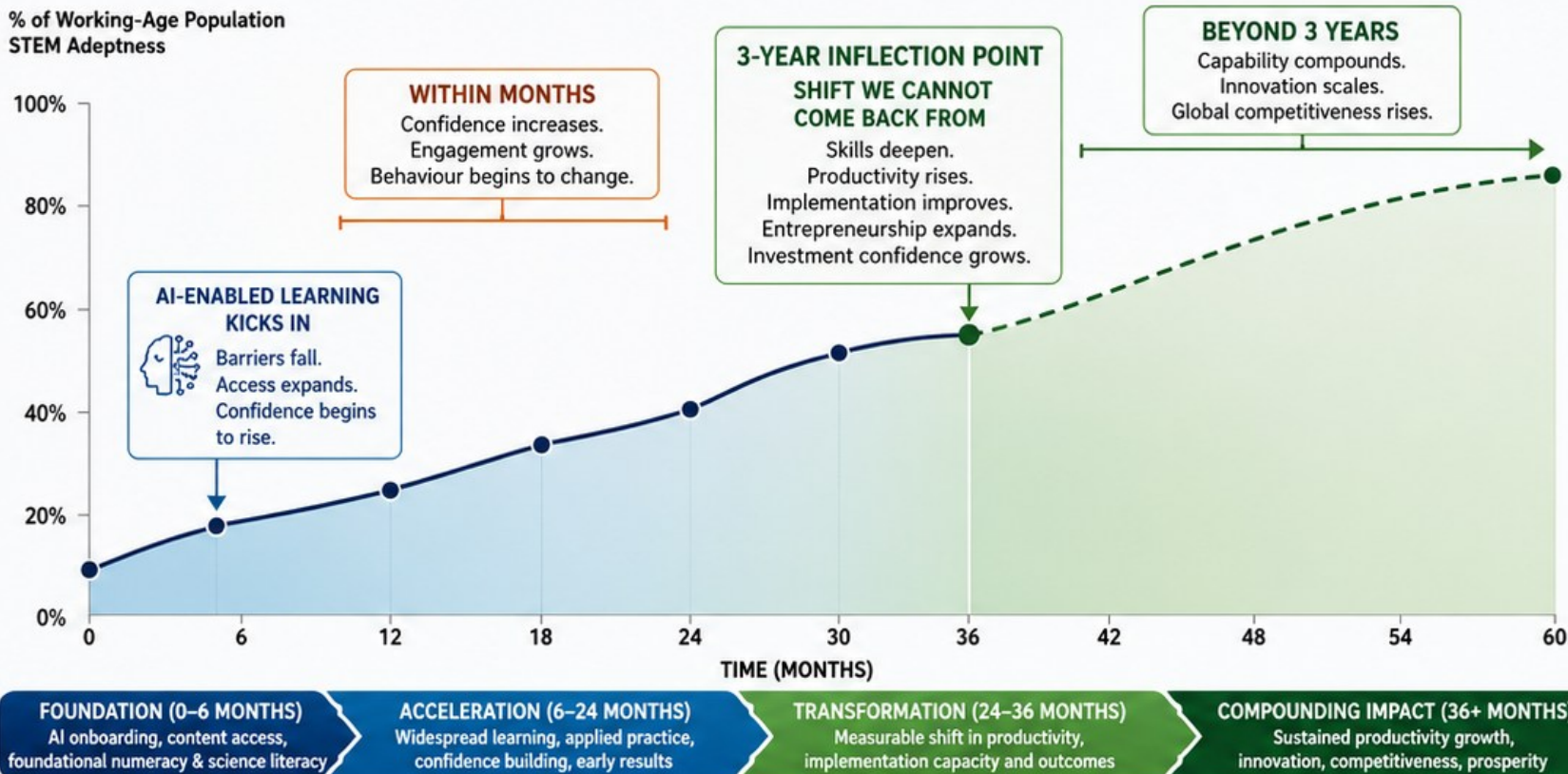


Applied Skills

- Technology Use
- Data Literacy
- Innovation Mindset

NOT TO CREATE SCIENTISTS ALONE,
BUT TO BUILD A NATION COMFORTABLE
WITH COMPLEXITY AND CAPABLE OF
SUSTAINING PRODUCTIVE SYSTEMS.

BEHAVIOUR OVER TIME: STEM ADEPTNESS & NATIONAL IMPACT



WHAT BEGINS TO CHANGE



LABOUR PRODUCTIVITY
More output.
Higher value.
Better quality.



IMPLEMENTATION CONFIDENCE
Faster decisions.
Better planning.
Stronger execution.



ENTREPRENEURSHIP & INNOVATION
More start-ups.
More solutions.
More jobs.



PRODUCTIVE SECTOR PARTICIPATION
More firms.
More production.
More exports.



LABOUR ABSORPTION
More people in
meaningful, productive
work.

THE SYSTEM CONNECTION: FROM STEM ADEPTNESS TO NATIONAL OUTCOMES



STEM ADEPTNESS
Population comfortable
with numbers, science,
technology & systems



NATIONAL CAPABILITY
Stronger skills base,
better problem solving,
greater technical depth



HIGHER PRODUCTIVITY & INVESTMENT CONFIDENCE
Firms expand. Institutions perform
better. Economy becomes dynamic.



LABOUR ABSORPTION
More opportunities.
More jobs. Higher incomes.
Inclusive participation.



**REDUCED UNEMPLOYMENT
FULL PRODUCTIVE
PARTICIPATION**
P10,344
Potential Per-Capita Monthly Income
Working-age population fully
productively engaged

OUR ASPIRATION: A NATION OF CONFIDENT, CAPABLE PEOPLE BUILDING A DIVERSE, PRODUCTIVE, PROSPEROUS BOTSWANA.

"Once capability begins to grow across a population, the trajectory becomes difficult to reverse — because capability compounds."

THE HUMAN OPERATING SYSTEM

- Different labour layers required:
- **Production Layer**
 - growers,
 - irrigation operators,
 - livestock technicians.
- **Industrial Layer**
 - machinists,
 - packhouse operators,
 - maintenance teams,
 - cold-chain technicians.

THE HUMAN OPERATING SYSTEM

- Different labour layers required:
- **Coordination Layer**
 - throughput planners,
 - logistics coordinators,
 - standards managers,
 - export schedulers.
- **Intelligence Layer**
 - data systems,
 - forecasting,
 - demand analytics,
 - systems modelling.

Bottom reflection:

- The future shortage may not be jobs.
- It may be coordinated capability.

FROM UNEMPLOYMENT TO PRODUCTIVE ABSORPTION

- This is directly your unemployment work.
- Botswana's issue increasingly becomes:
 - not simply:
 - unemployment,
- but:
 - insufficient productive absorption systems.

Key insight:

- Economies absorb labour through coordinated productive structures — not through intention alone.
- Then show:
Demand → Production → Manufacturing → Logistics → Exports → Labour Absorption

WHAT SETS THIS IMPLEMENTATION PATHWAY APART?

TRADITIONAL APPROACH

Policies → Programmes → Budgets → Projects → Jobs

STRLDI IMPLEMENTATION PATHWAY

Understanding → Alignment → Behaviour Change → Structural Change → Labour Absorption

FROM SYMPTOM MANAGEMENT

- Unemployment Programmes
- Grants & Subsidies
- Incentives
- Public Sector Expansion
- Project-Based Interventions

TO STRUCTURAL TRANSFORMATION

- Productive-Sector Deepening
- Labour Absorption Design
- Diversification Capability
- STEM Capability Formation
- Long-Term Economic Coordination



PHASE 1: STRUCTURAL RECOGNITION

Objective

- Build a shared understanding that persistent unemployment is not behaving as a labour-market issue alone, but as a structural national issue.
- **Focus Areas**
 - Behaviour Over Time (BOT) patterns
 - Labour absorption dynamics
 - Productive-sector performance
 - Diversification behaviour
 - Household and STEM linkages
 - Systems archetypes and structural causes
- **Key Outcome**
 - The national conversation shifts from:
 - **“What programme should we fund next?”**
 - to
 - **“What structures are reproducing unemployment?”**



PHASE 1: STRUCTURAL RECOGNITION

PURPOSE

- Build a shared understanding of the structural drivers underlying persistent unemployment and diversification challenges.
- **INITIAL REACH-OUTS**
 - **Presidencies**
 - **National Planning Commission (NPC)**
 - **Botswana Economic Transformation Programme (BETP)**
 - **Ministry of Finance**
 - **Productive Sector Leadership**
 - **Agriculture**
 - **Manufacturing**
 - **Trade**
 - **Education & Skills Development**
- **EVENUAL REACH-OUTS**
 - Southern Africa
 - Eastern Africa
 - Western Africa

OUTPUT

- **Shared National Understanding**
- **Leadership Alignment**
- **Recognition of Structural Drivers**
- **Readiness for Coordinated Action**



PHASE 2: POLITICS SPEAKS BACK TO ITS PEOPLE

- **Objective**
 - Create a new national dialogue around productive development and shared responsibility.
- **Focus Areas**
 - Productive economies
 - Labour absorption
 - Agriculture and manufacturing
 - STEM readiness
 - Long-term national competitiveness
- **Key Message**
 - **Government cannot solve unemployment alone.**
 - **Government and citizens must solve unemployment together.**
- **Key Outcome**
 - Citizens begin seeing themselves as participants in the solution rather than recipients of programmes.

PHASE 3: HOUSEHOLD ONBOARDING

Objective

- Strengthen the household's role in capability formation and long-term economic development.
- **Focus Areas**
 - Educational continuity
 - STEM readiness
 - Family stability
 - Learning environments
 - Intergenerational capability development
- **Key Insight**
 - **The household is not only a social institution.**
 - **The household is also an economic institution.**
- **Key Outcome**
 - Greater national alignment between family life, education, and productive-sector needs.

PHASE 4: PRODUCTIVE-SECTOR REORIENTATION

Objective

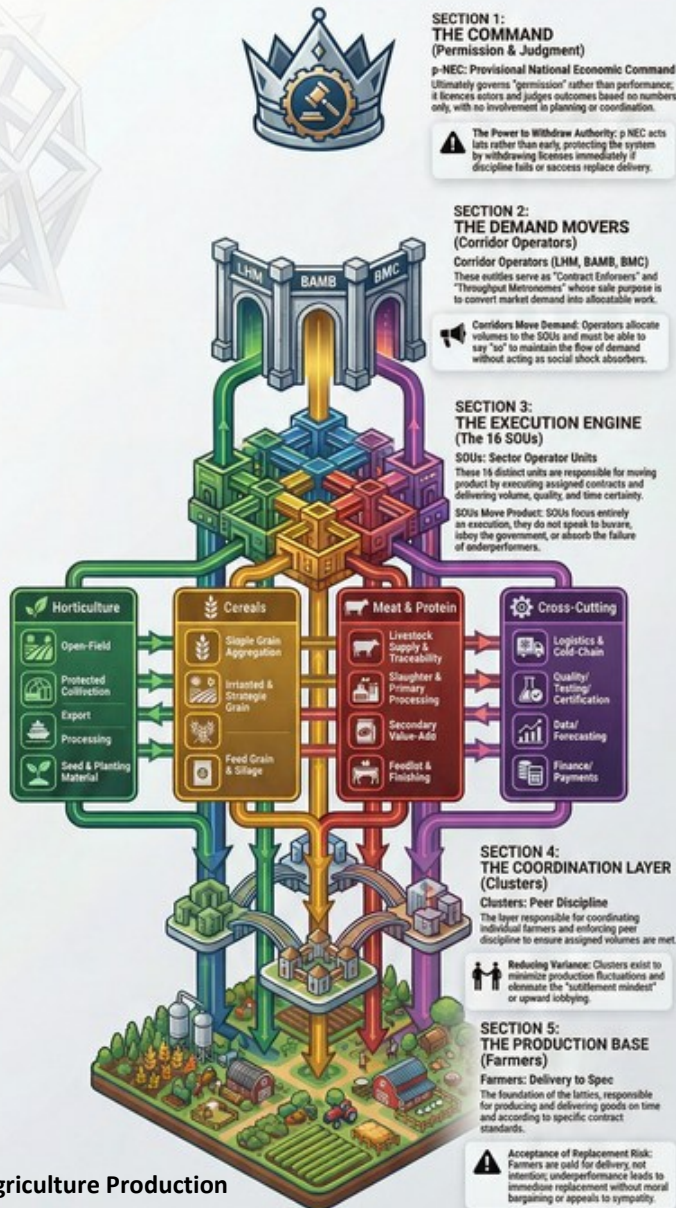
- Refocus national growth toward sectors capable of absorbing labour at scale.
- **Priority Sectors**
 - Agriculture
 - Manufacturing
 - Agro-processing
 - Logistics
 - Technical services
- **Key Questions**
 - Which sectors absorb labour?
 - Which sectors reproduce capability?
 - Which sectors create multiplier effects?
- **Key Outcome**
 - Labour absorption becomes a deliberate design objective.



PHASE 5: DEMAND-SPINE & SUPPLY-SPINE COORDINATION

- **Objective**
 - Align production systems with regional and global demand opportunities.
- **Focus Areas**
 - Trade
 - Agriculture
 - Manufacturing
 - Education
 - Finance
 - Investment
- **Key Questions**
 - What does the market require?
 - What can Botswana competitively produce?
 - How should production systems be organised?
- **Key Outcome**
 - National coordination around productive growth and export competitiveness.

The STRLDi Minimum Viable Execution Lattice: A Hierarchy of Discipline



ROLE DOCTRINE — WHO DOES WHAT

1. p-NEC (Provisional National Economic Command)

Composition: OP delegate, Finance, Trade, Private Sector (BB-nominated), Financiers, MoA (regulatory), Systems role.

p-NEC exists to govern permission, not performance. It does not operate the corridor. It licenses it, protects it, and withdraws authority when discipline erodes. Its mandate is narrow by design:

- License corridor actors
- Protect execution from interference
- Judge outcomes
- Withdraw authority if discipline fails.

2. Corridor Operators (LHM, BAMB, BMC)

Their mandate is execution discipline in motion.
 Convert demand into allocatable work
 Allocate volumes into SOUs
 Enforce quality, time, and exclusion
 Report numbers, not stories

3. MoA (Post-Split Doctrine)

Two faces — permanently separated.

A. Sovereign Regulator (unchanged)▪ Law, standards, enforcement
 International credibility
 Sanctions authority

B. Corridor Service Units (CSUs)▪ Embedded execution support
 SLA-driven
 Time-bound
 Contract-prioritised

4. SOUs (Sector Operator Units)

SOUs exist to execute contracts — not to expand mandates.
 Execute assigned contracts
 Allocate work to clusters
 Replace underperformers
 Maintain delivery discipline.

5. Clusters

Clusters exist to reduce variance, not amplify complaints.
 Coordinate farmers
 Enforce peer discipline
 Deliver assigned volumes

6. Farmers

Farmers are paid for delivery — not intention.
 Deliver to spec
 Deliver on time
 Accept replacement risk

7. BOHOCO & Farmer Associations

Representation remains necessary — but it is structurally separate.
 Representation
 Readiness preparation
 Absorbing social pressure
 Learning & advocacy

8. Financiers

Capital is disciplined, or it destabilises the spine.
 Finance contracts
 Price risk explicitly
 Withdraw when discipline erodes

9. Donors

Donors support the ecosystem — not the engine.
 Fund readiness
 Fund learning
 Fund exit pathways

10. Media, Political Parties, Public Forums

They are not part of the execution spine.
 Not engaged during pilots
 Not briefed on execution detail
 Not answered reactively
 Corridors die in public before they fail in reality.
 Silence, at times, is policy.



THE MISSING LAYER: THE NEXUS OPERATOR

- Not a new ministry.
Not another committee.
Not a regulator.
- But a neutral operating layer responsible for:
 - sequencing,
 - throughput,
 - corridor cadence,
 - infrastructure utilisation,
 - demand coordination,
 - manufacturing integration,
 - logistics timing,
 - production balancing,
 - and system learning.

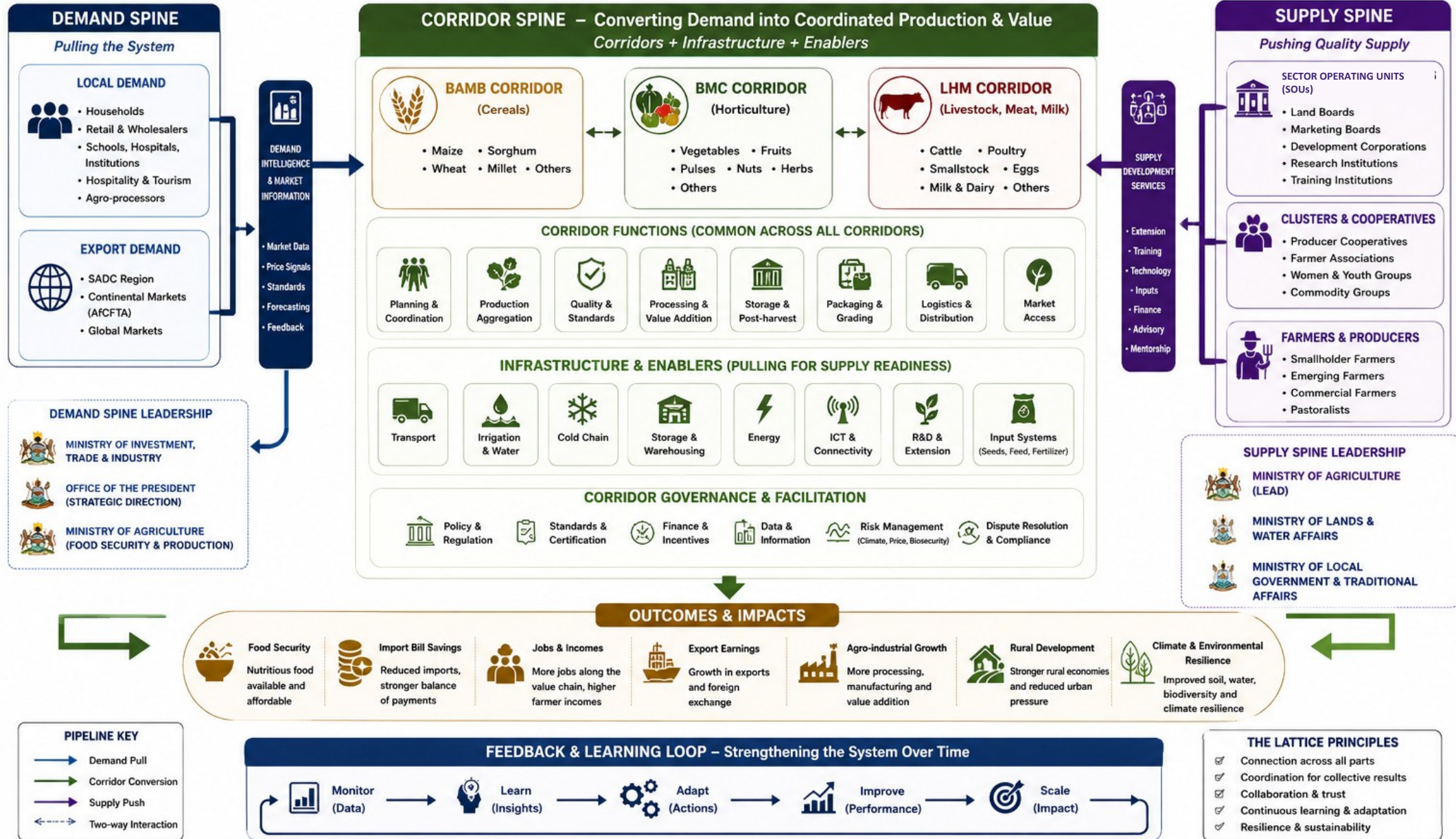
THE MISSING LAYER

- **The Nexus Operator Holds:**
- Demand before production
- Contracts before planting
- Throughput before scaling
- Corridor utilisation before isolated projects
- Bottom reflection:
- Today, much of this work is happening informally through individuals.
- Industrial-scale systems cannot depend on informal coordination.

BOTSWANA AGRICULTURE LATTICE

Demand Spine → Corridors (including Infrastructure) → Supply Spine

A coordinated system that turns demand into income, jobs and food security



THE REGIONAL ECONOMIC BELTS

- **Botswana does not scale alone.**
- **Economic Belt Logic**
- Botswana → SADC → Ports → Global Markets
- **Strategic Port & Corridor Integration**
 - Walvis Bay
 - Durban
 - Maputo
 - Beira
 - Lobito
 - AfCFTA trade corridors

THE REGIONAL ECONOMIC BELTS

What Belts Stabilise

- logistics continuity,
- export throughput,
- manufacturing scale,
- labour absorption,
- infrastructure utilisation,
- and regional trade rhythm.

Bottom reflection:

- Corridors move products.
- Economic belts sustain industrial civilisation scale.

WHAT THE SYSTEM IS ACTUALLY BUILDING

- **Not farms.**
- **Not projects.**
- **Not isolated interventions.**
- The system is increasingly building:
 - productive throughput,
 - labour absorption,
 - industrial coordination,
 - export capability,
 - manufacturing depth,
 - regional competitiveness,
 - institutional learning capacity,
 - and productive GDP.

Reflection:

- Agriculture increasingly behaves less like a social support activity and more like productive infrastructure.

WHAT CHANGES IF THE SYSTEM STRENGTHENS?

- **Possible Structural Effects**

- **Economy**

- Reduced import leakage
- Higher productive GDP
- Increased exports
- Stronger forex position
- Expanded industrial activity

- **Employment**

- Higher labour absorption
- Youth participation
- More stable income systems
- Technical capability growth



WHAT CHANGES IF THE SYSTEM STRENGTHENS?

- **Institutions**

- Higher infrastructure utilisation
- Better corridor visibility
- Faster learning loops
- Stronger throughput discipline

- **Agriculture**

- Predictable demand visibility
- Reduced waste & gluts
- Improved planning
- More stable supply systems

Bottom reflection:

- The issue may increasingly no longer be agricultural productivity alone.
- The issue may be national productive coordination capacity.



THE REGIONAL ECONOMIC BELTS

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THE REGIONAL ECONOMIC BELTS

What Belts Stabilise

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- and regional trade rhythm.

Bottom reflection:

- Corridors move products.
- Economic belts sustain industrial civilisation scale.

THESE IMPLY:

WHAT SCALE MUST THE SYSTEM COORDINATE?

- **Indicative National Scaling Requirements**

- Key reflection:
- The issue may no longer simply be increasing production.
- The issue may increasingly be coordinating industrial-scale throughput across the entire production pipeline.

SYSTEM REQUIREMENT	INDICATIVE SCALE
Farmers participating	230,000–390,000
Labour throughput	850,000–1.5 million
Productive hectares	12–17 million ha
Irrigated hectares	300,000–500,000 ha
Cluster aggregation systems	Thousands
Packhouses & storage nodes	Hundreds
Cold-chain throughput	National scale
Logistics coordination	Continuous
Feed coordination	Multi-corridor dependent
Processing throughput	Industrial scale
Demand visibility	Daily/seasonal
Agriculture GDP Contribution	~6–10%+



PHASE 6: STEM DEEPENING

Objective

- Build world-class technical and productive capability.
- **Focus Areas**
 - Science
 - Technology
 - Engineering
 - Mathematics
 - Agricultural sciences
 - Industrial skills
- **Key Insight**
 - Long-term diversification depends on sustained technical capability.
- **Key Outcome**
 - A growing pipeline of globally competitive STEM talent.

PHASE 7: LABOUR ABSORPTION ACCELERATION

Objective

- Enable employment growth through productive-sector expansion.
- **What Happens**
 - Firms expand
 - Suppliers emerge
 - Value chains deepen
 - Technical services grow
 - Export activity increases
- **Key Insight**
 - Employment becomes an outcome of productive growth rather than a target pursued independently.
- **Key Outcome**
 - Sustained increases in labour absorption across the economy.

PHASE 8 (PARALLEL): NATIONAL LEARNING SYSTEM

Objective

- Build the capability to identify and address future systemic challenges before they become crises.
- **Foundation**
 - The Five Disciplines
 - Systems Thinking
 - Personal Mastery
 - Mental Models
 - Shared Vision
 - Team Learning
- **Key Insight**
 - Nations that learn continuously adapt more effectively to change.
- **Key Outcome**
 - A learning society capable of sustaining productive development across generations.

PHASE 9: NATIONAL SYSTEMIC INTEGRATION

- **Objective**

- Integrate insights from multiple persistent national issues into a coherent national development architecture.

- **INPUT STUDIES**

- Persistent Unemployment
- Economic Diversification
- STEM Capability Development
- Gendered Violence
- Household Stability
- Educational Outcomes
- Agricultural Productivity
- Public Sector Performance
- Health Outcomes
- Other Persistent National Challenges

<https://sheilasingapore.blog/2026/05/16/a-showcase-of-viewing-persistent-issues-through/>

- **PROCESS**

- Cross-study analysis
- Shared systemic structures
- Common causal patterns
- Interacting system archetypes
- National priority alignment
- Strategic integration

- **KEY QUESTION**

- **What structures are simultaneously influencing multiple national outcomes?**

- **OUTPUT**

- Integrated National Systems Strategy
- Cross-Ministry Coordination Framework
- National Learning Priorities
- Long-Term Structural Interventions
- Evidence-Based National Development Planning



The Persistent Structural Issues Atlas: Mapping the Global Loop

Societal problems like unemployment and health crises are not isolated failures but "persistent structural pressures" generated by underlying systems. By mapping these into four interacting layers (KSLs), we can move from managing downstream symptoms to reshaping the structural generator that produce them.

KSL 4: Institutional Allocation & Execution

Governance systems must prioritize long-term productive investment over short-term political distribution or "treating" symptoms.

KSL 4: Stb, StS
(Shifting the Burden, Success to the Successful)

KSL 3: Productive Economic Capacity

The "real" economy transforms resources and labor into goods through manufacturing depth rather than just consumption.

KSL 3: G&U, Esc, AA
(Growth & Underinvestment, Escalation, Accidental Adversaries)

KSL 1: Human Formation

Societies must form disciplined, capable individuals whose technical competency—not just years of schooling—drives economic participation.

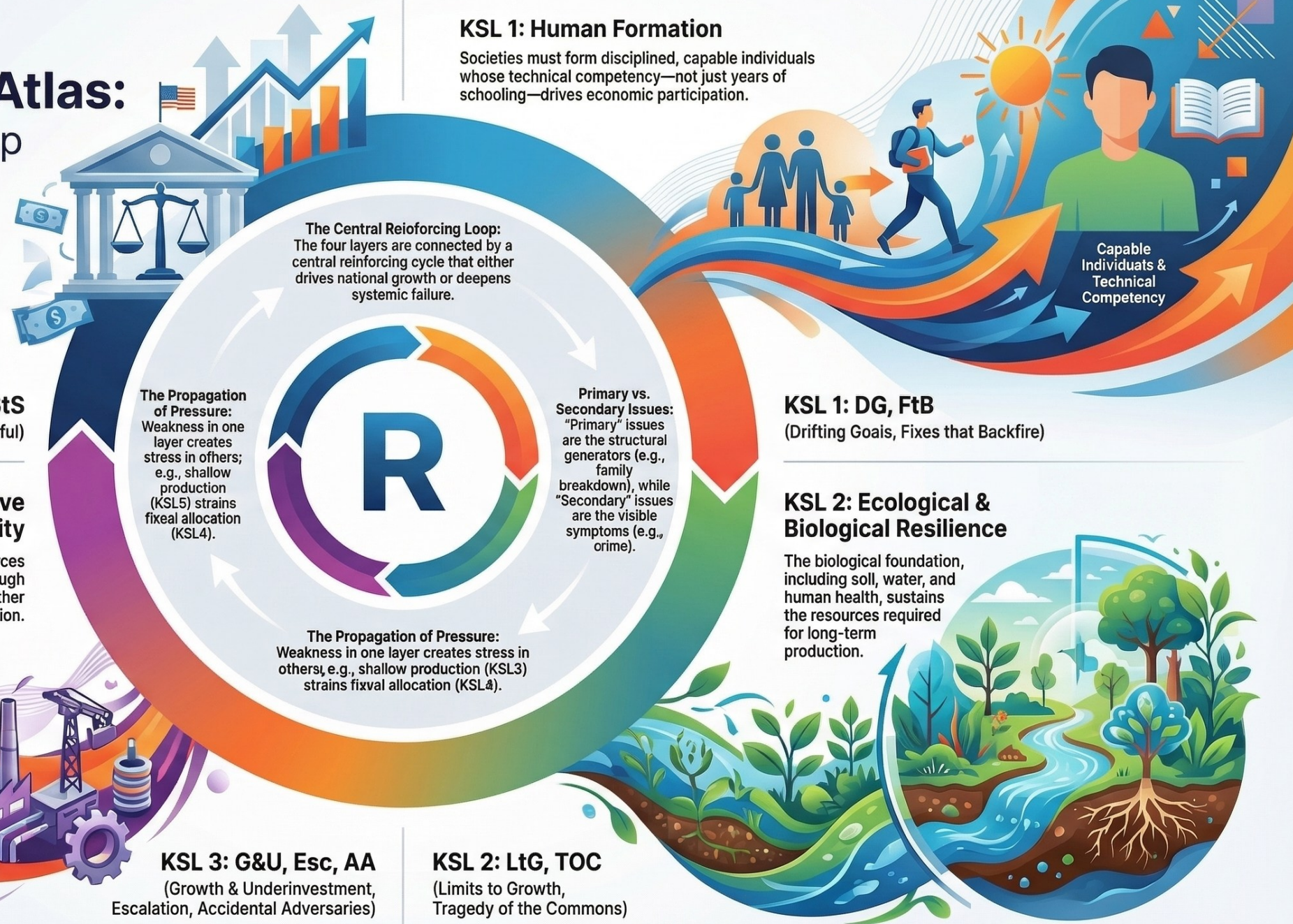
Capable Individuals & Technical Competency

KSL 1: DG, FtB
(Drifting Goals, Fixes that Backfire)

KSL 2: Ecological & Biological Resilience

The biological foundation, including soil, water, and human health, sustains the resources required for long-term production.

KSL 2: LtG, TOC
(Limits to Growth, Tragedy of the Commons)



ROLE OF NATIONAL DEVELOPMENT PLANS (NDPs)

- National Development Plans become:
 - **Less focused on isolated sector strategies**
 - and
 - **More focused on addressing the structural conditions influencing multiple national outcomes simultaneously.**
- **END STATE**
 - **A National Learning System capable of continuously studying, integrating, and responding to persistent issues through coherent long-term development strategies.**



CLOSING SLIDE : THE STRLDI TRANSITION PATHWAY

- **Phase 1** – Structural Recognition
- **Phase 2** – Politics Speaks Back to Its People
- **Phase 3** – Household Onboarding
- **Phase 4** – Productive-Sector Reorientation
- **Phase 5** – Demand-Spine & Supply-Spine Coordination
- **Phase 6** – STEM Deepening
- **Phase 7** – Labour Absorption Acceleration
- **Phase 8** – National Learning System
- **Phase 9** – National Systemic Integration & NDP Alignment

End Goal

A productive, labour-absorbing economy supported by capable households, strong institutions, and a continuously learning society.



WHAT IS DIFFERENT?

- **Addresses the structures producing unemployment, not only the symptoms.**
- **Recognises households as part of the economic system.**
- **Positions citizens alongside government as co-creators of solutions.**
- **Places labour absorption at the centre of economic design.**
- **Builds productive sectors before chasing employment numbers.**
- **Develops national learning capacity to prevent future crises.**

END GOAL

A PRODUCTIVE, LABOUR-ABSORBING ECONOMY

- Supported by:
 - **Capable Households**
 - **Strong Productive Sectors**
 - **Coordinated Institutions**
 - **STEM Capability**
 - **Continuous National Learning**

HOW THE WORK WITH STRLDI UNFOLDS

Stage 1:

LEADERSHIP DEVELOPMENT

Learning to Work with Structure

- Systems Thinking Capability Building
- Five Disciplines Practice
- Assumption Testing
- Feedback Loop Analysis
- Leverage Point Discovery

Output: Leaders capable of seeing and working with systemic causes rather than symptom

RESULT

Persistent Issue → Structural Understanding → Leadership Capability → Coordinated Action → Behaviour Change Over Time

Stage 2:

SYSTEMIC RESEARCH

Seeing the System Whole

- Behaviour Over Time Analysis
- Persistent Issue Mapping
- System Archetype Identification
- Structural Diagnosis
- Shared Understanding of the Issue

Output: A visible picture of the structures generating the persistent outcome.

Stage 3:

SYSTEMS STEWARDSHIP & STRATEGY RENEWAL LABS

Translating Insight into Action

- Cross-Sector Learning
- Strategy Testing
- Intervention Sequencing
- Implementation Alignment
- Continuous Learning

Output: Coordinated action capable of shifting Behaviour Over Time patterns.



HOW THE WORK UNFOLDS

Three interconnected modes of practice.
All three are engaged, depending on the system and the stage of readiness.



“ We do not just provide answers. We build the capability to ask better questions, see deeper, learn together, and steward what matters. ”

DISTINCTIONS TO “SYSTEMS”

SYSTEM MANAGEMENT / ANALYSIS

DETAILED COMPLEXITY

- Exists because of a defined purpose, mandate, target, or objective.
- Boundaries are known, visible, and often formally defined.
- The parts are generally visible and can be mapped directly.
- Management focuses on improving performance within the system.
- Most organisational "systems" discussions fall into this category.
- Problems are often solved through process improvements, resource allocation, compliance, and management intervention.

SYSTEMIC STRUCTURES

DYNAMIC COMPLEXITY

- Exists whether or not anyone recognises it.
- Boundaries are not predefined and must be discovered.
- The causal relationships are often hidden and revealed through inquiry.
- Learning focuses on revealing and changing the structure producing behaviour.
- Most persistent national and societal issues fall into this category.
- Problems require understanding feedback loops, delays, system archetypes, and underlying structures.

DISTINCTIONS TO “SYSTEMS”

EXAMPLES OF SYSTEM MANAGEMENT / ANALYSIS

- Organisation and its divisions
- Industry and its organisations
- A vehicle and its components
- The human body and its organs
- Supervisor–supervisee relationships
- Employer–employee relationships
- Government ministries and departments
- Corporate operating systems

KEY DISTINCTION

SYSTEM MANAGEMENT ASKS:

"How do we improve the performance of the system we can already see?"

SYSTEMIC STRUCTURE INQUIRY ASKS:

"What hidden structure is producing the behaviour we keep observing over time?"

EXAMPLES OF SYSTEMIC STRUCTURES

- Persistent unemployment
- Economic diversification challenges
- Low labour absorption
- Weak manufacturing growth
- Declining STEM capability
- Educational performance patterns
- Poverty traps
- Wildlife–human conflict
- Gendered violence
- Organisational decline and attrition
- Public sector performance patterns
- Climate change

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LEAD CONSULTANT

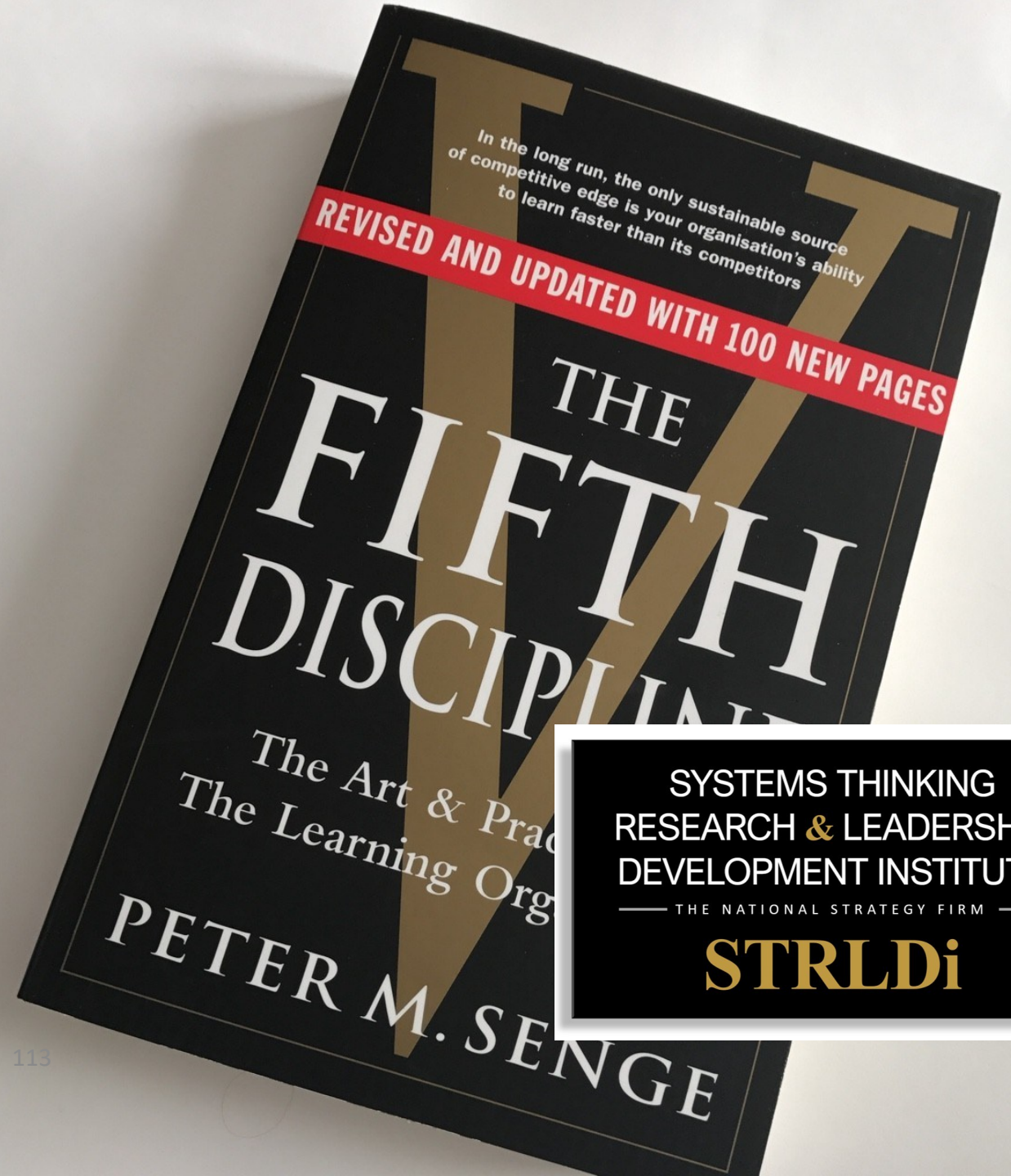
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— THE NATIONAL STRATEGY FIRM —

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