

SYSTEMS THINKING
RESEARCH & LEADERSHIP
DEVELOPMENT INSTITUTE

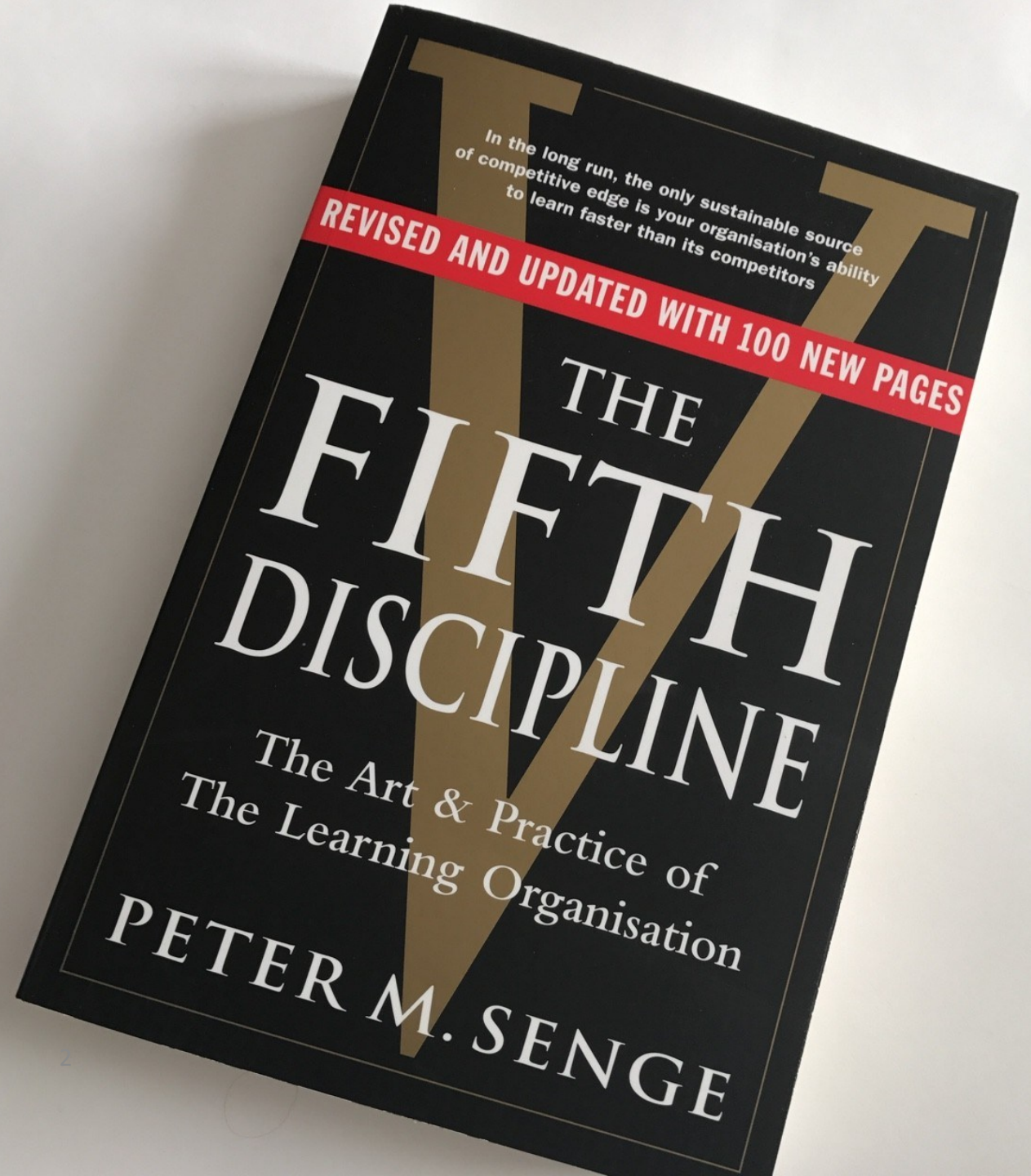
— THE NATIONAL STRATEGY FIRM —

STRLDi

**SHEILA
DAMODARAN**
LEAD CONSULTANT

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

Sheila Damodaran STRLDi – Systems Thinking
Research & Leadership Development Institute



Our Profile

STRLDi

- **Systems Thinking Research Institute**
- **Leadership Development Institute**
- **2008–2012:** Contracted by the **Office of the President** to conduct the teach of *The Fifth Discipline*, and to support **research and strategy formulation** for NDP input across the public-service leadership in the country.
- Registered in Botswana in 2013. Reach Africa and Europe
- Lead Consultant and Founder's practice began in Singapore in 1996 (30 years in 2026). Reach Asia.

PINNACLE FOODS

- **Food manufacturing & franchising** — Registered in 2013
- **My Farmhouse Kitchens (MFK):** Brand conception and development as a precursor to manufacturing
- **Commercial horticulture & seedling production** — 2020–2023
- **MFK Gardens – Farmers' Learning Centre:** Short-term regenerative framing learning programmes for horticultural farmers — 2022–present

Objectives for the Engagement

- **Acknowledge the moment** — We are grateful for the opportunity to have the Institute's work heard by a former President and whose family founded the nation.
- **Open the presidential conversation** — Explore whether the study can provide a basis for **past and present Presidencies to jointly examine the systemic structures that keep reproducing persistent national challenges and draining resources without commensurate change.**
- **Move the needle** — Determine what it would take for Botswana and Southern Africa to **build productive capability, diversify their economies and expand formal employment fast enough to eliminate persistent unemployment**, while strengthening the region's position in the global economy.

STRLDi Unemployment Study

Presentation Roadmap

1. Botswana's Historical Response to Unemployment
2. Opening Question: Why Does 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 Strategies

Adopted Over the past 50 years

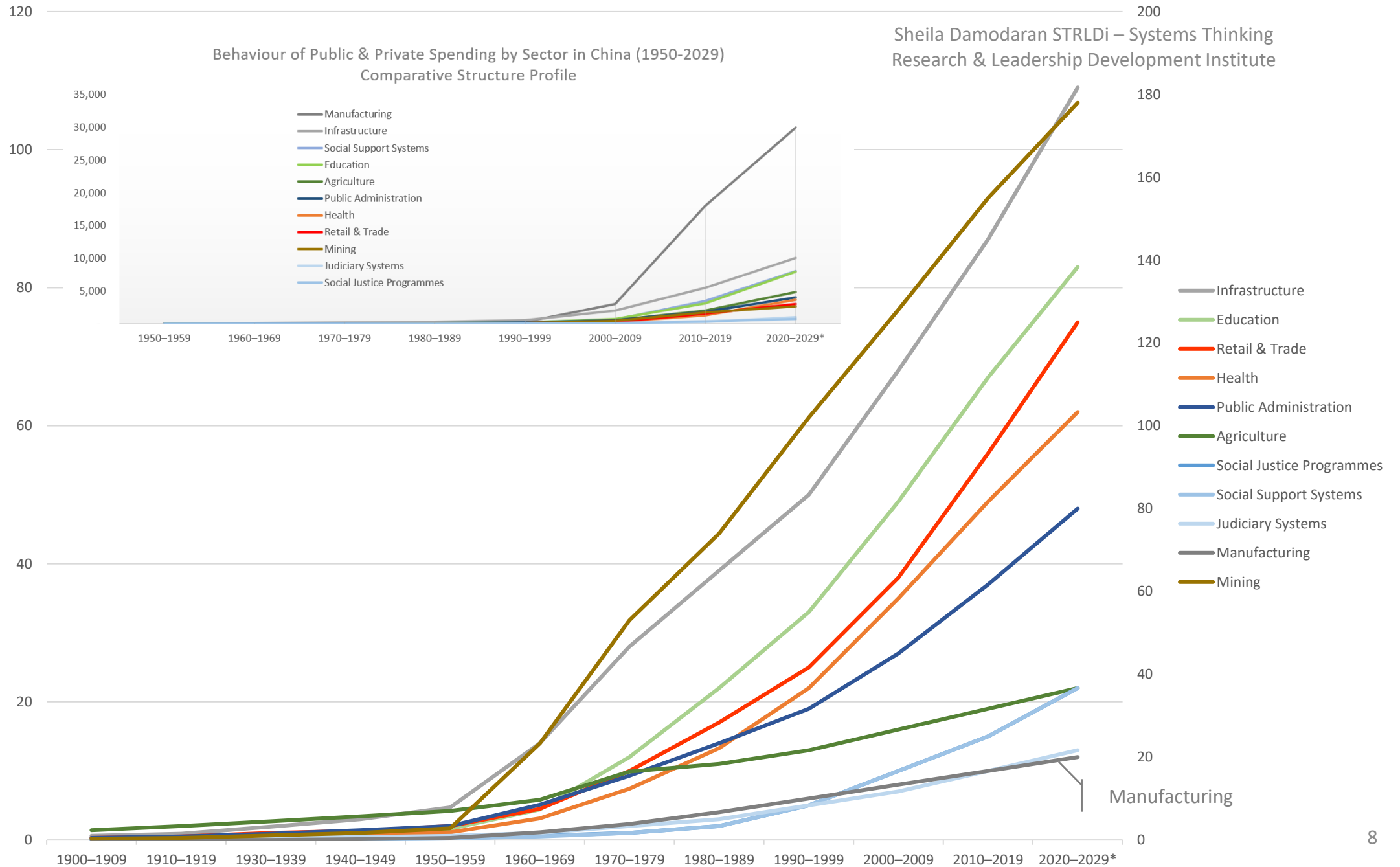
- Public Sector Expansion
- Education Expansion Strategy
- Youth & Labour-Based Public Works Programmes
- Citizen Economic Empowerment Schemes
- Economic Stimulus & Diversification Strategies
- Foreign Direct Investment (FDI) Attraction
- Agricultural Support Programmes
- Infrastructure-Led Development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



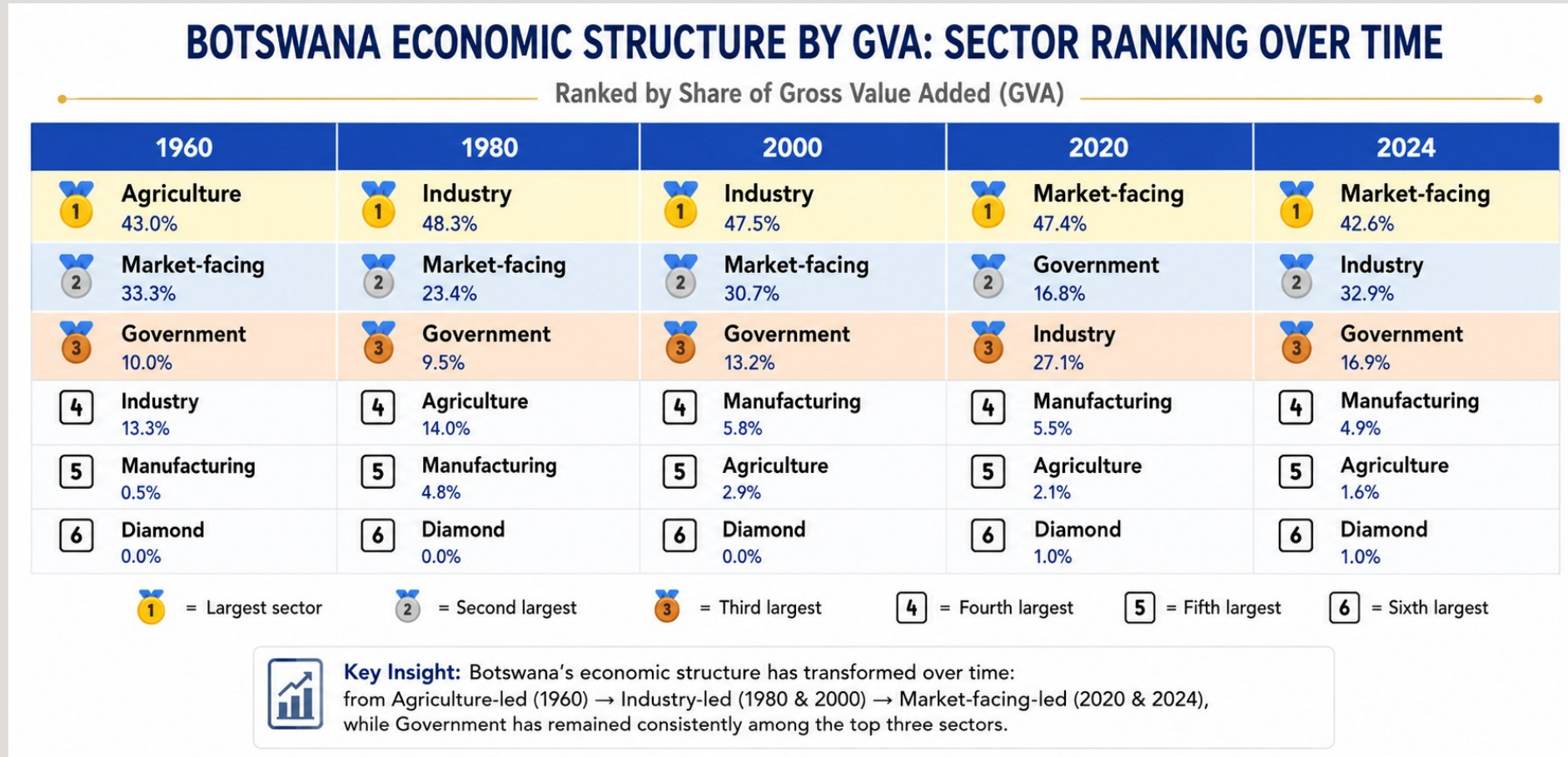
Behavior of Public & Private Spending By Sector in Botswana 1900 -2029

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

Behaviour of Public & Private Spending by Sector in Botswana (1900-2029)



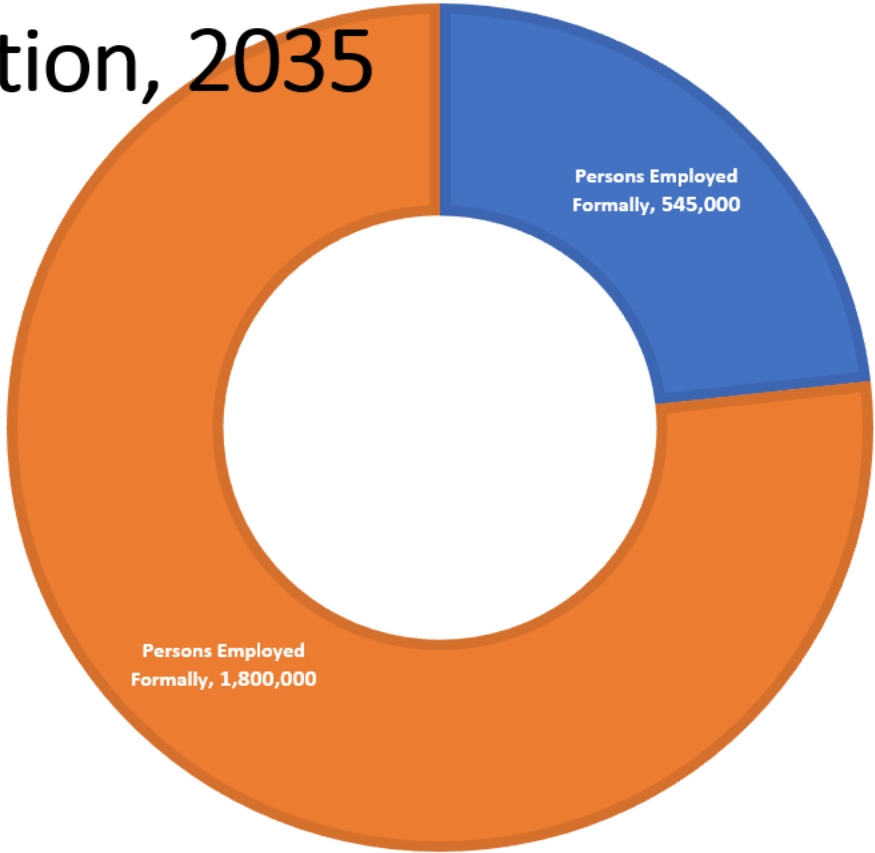
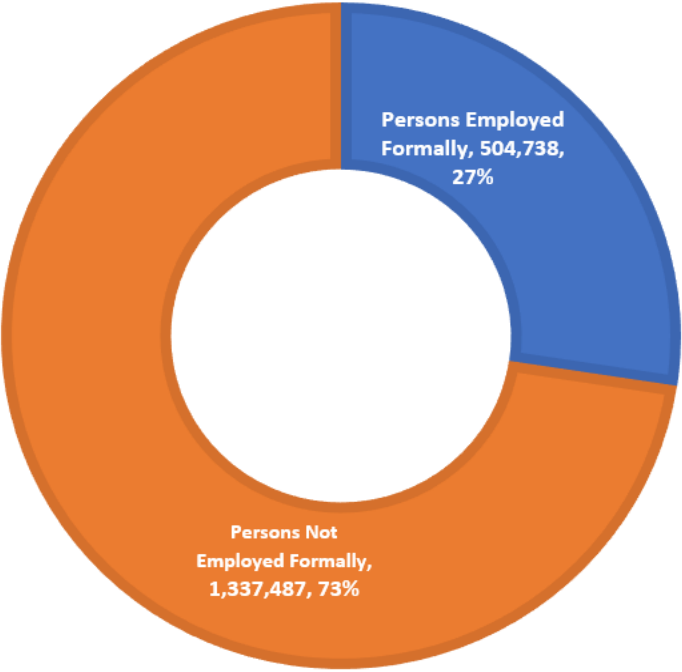
Botswana's Economic Structure – Shift in Dominance



**But economic dominance does not tell us employment capacity.
That is the next question.**

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%

Formal vs Informal Economy

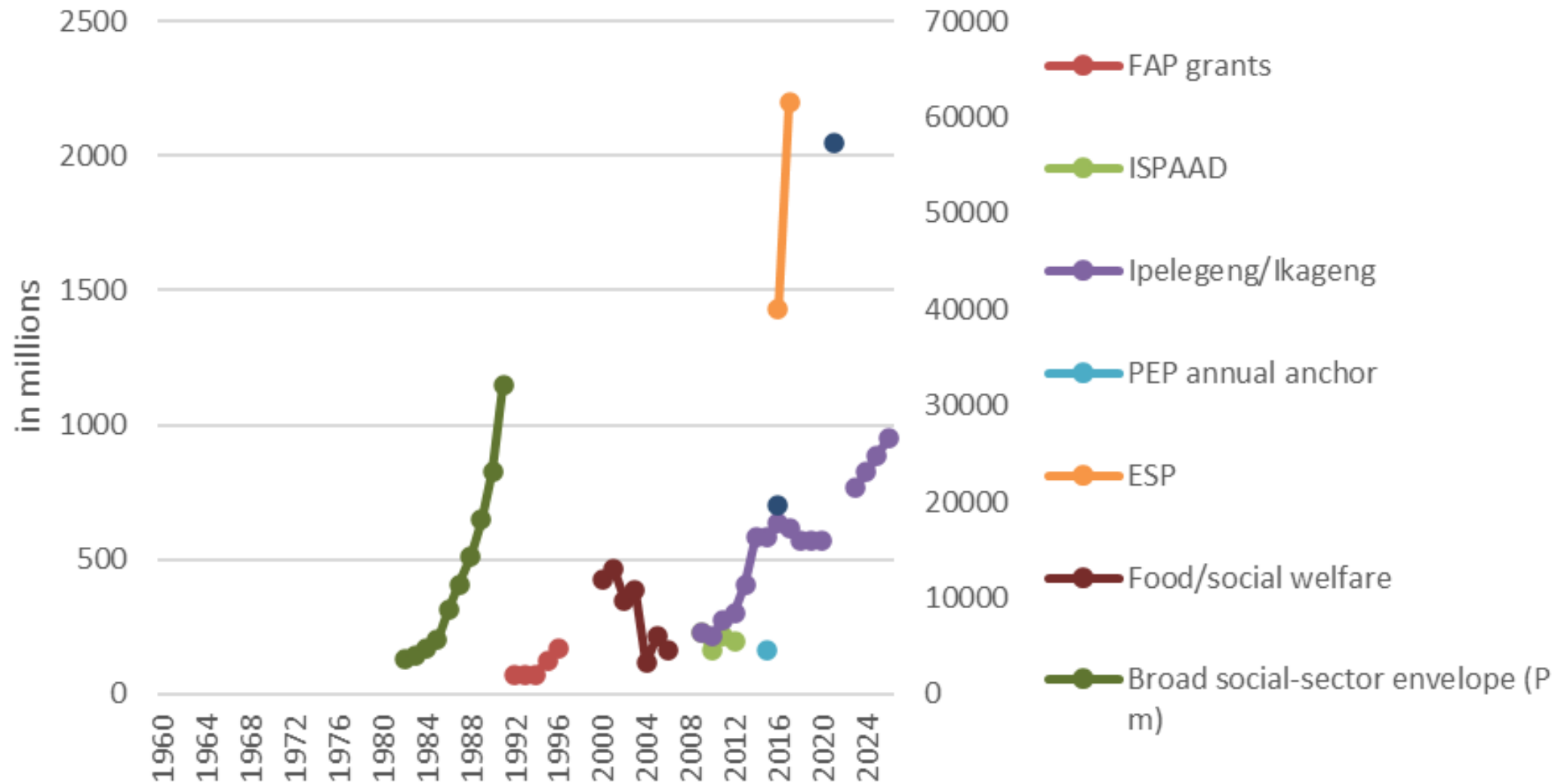
The issue is not whether informal activity has value. It does. The issue is whether it creates a pathway into the future economy.

	SURVIVAL ECONOMY	PRODUCTIVE ECONOMY
Purpose	Immediate income	Sustainable enterprise
Scale	Small & fragmented	Economies of scale
Productivity	Distributes work	Increases output per worker
Capability	Immediate skills	Technical, managerial & productive capability
Market	Local / irregular	Reliable supply chains & wider markets
Investment	Limited	Capital, technology & reinvestment
Employment	Absorbs people	Creates sustainable jobs
Price Distortion & Inflation	Lower informal prices can mask higher system-wide costs	Efficient purchasing, regular supply, managed transport costs and margins.

THE NATIONAL QUESTION

At what stage of development should the formal productive economy become larger than the informal economy—and what capabilities and systems make that transition possible?

The Growing Financial Response to Unemployment: Productive Intervention, Employment Relief and Social Support, 1980–2026



GDP:

Three Ways of Measuring the Same Economy

PRODUCTION

- **GDP = GVA + Taxes on Products – Subsidies on Products**
- *What is produced?*

EXPENDITURE

- **GDP = Consumption + Investment + Government Spending + (Exports – Imports)**
- *What is spent on the economy's output?*

INCOME

- **GDP = Labour Income + Operating Surplus + Mixed Income + Taxes on Products – Subsidies on Production**
- *How is the value created distributed as income?*

Gross Value Added (GVA)

Three Ways to understand the value an economy creates

1. OUTPUT-INPUTS

GVA = Value of Output – Intermediate Consumption

Value of Output

Total sales or market value of goods and services produced

Intermediate Consumption

Inputs, raw materials and services bought and used in production

2. GDP RELATIONSHIP

GVA = GDP – Taxes on Product + Subsidies on Products

Conversely:

GDP = GVA + Taxes on Product + Subsidies on Products

3. INCOME APPROACH

GVA = Compensation of Employees + Gross Operating Surplus + Gross Mixed Income + Other Taxes – Other Subsidies on Production

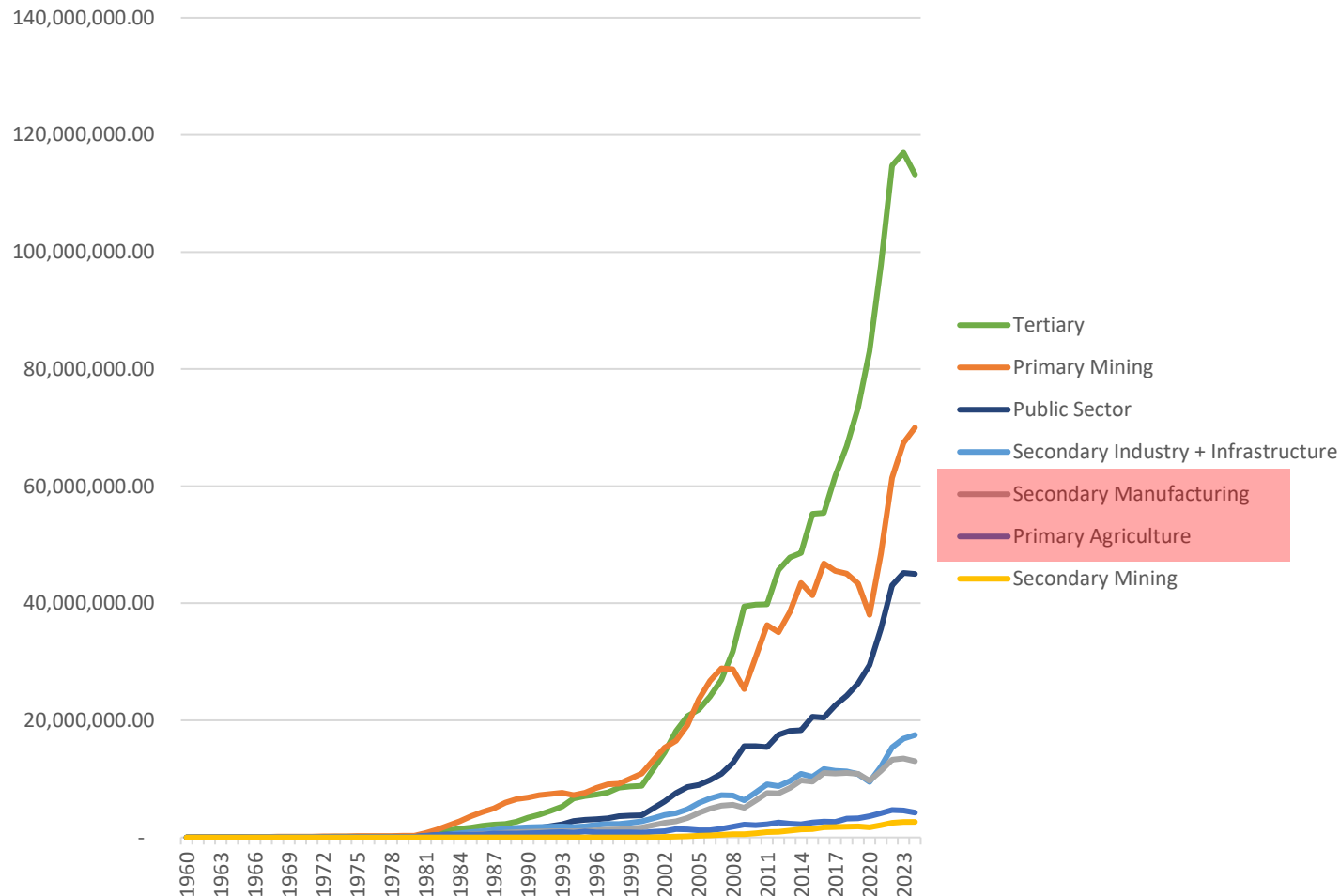
KEY TAKEAWAYS

- Gross value added (GVA) measures economic productivity by industry, sector, or region.
- GVA adjusts GDP by accounting for subsidies and taxes on products.
- It helps evaluate the economic contribution of specific companies or sectors.
- GVA is preferred over GDP for assessing national economic output and growth.
- GVA subtracts costs and adds subsidies to calculate the value added to an economy.

STRLDi learning question: Where, within the production system, is value actually being created?

Gross Value Added by Sector

Botswana Private Sector GVA 1960-2024



Key Structural Insights

1. Total GVA has grown **from P21.7 Million in 1960 to nearly P250 Billion by 2024**, demonstrating massive nominal expansion.
2. The **'Productive Spine'** (Agriculture and Manufacturing) **has thinned significantly** relative to overall GVA, exemplifying the Shifting the Burden archetype.
3. **Market-Facing services and Government sectors have expanded dramatically**, absorbing the bulk of economic value.
4. Diamond Manufacturing has been supported as a key strategic value chain since 2005, contributing to mineral beneficiation.

Economic Healing Starts with National Attitude

THE POISON

Conduit Economy

TYPE: KEY FINDING: Earnings pass through the economy like a pipe, immediately leaking out via imports.

IMPORTS

ESTABLISHED ROUTES



THE "SYMPTOMATIC" RELIEF TRAP

Quick-relief solutions provide temporary stability but cause the core productive capability to wither



ALLOCATION BY DEFAULT

Economic flows are shaped by intermediaries and established routes rather than coordinated local planning

60–80%
of National Income
Exits the System

Container Economy

TYPE: KEY FINDING:
The Interlocking Gears of Local Multiplication: Wealth compounds when STEM, manufacturing, and agricultural science work in a coordinated loop.

SHIFT FROM
CONDUIT TO
CONTAINER



FAMILY STABILITY AS THE "FIRST ECONOMY"

Intact households provide the cognitive discipline and long-horizon mindset required for technical mastery



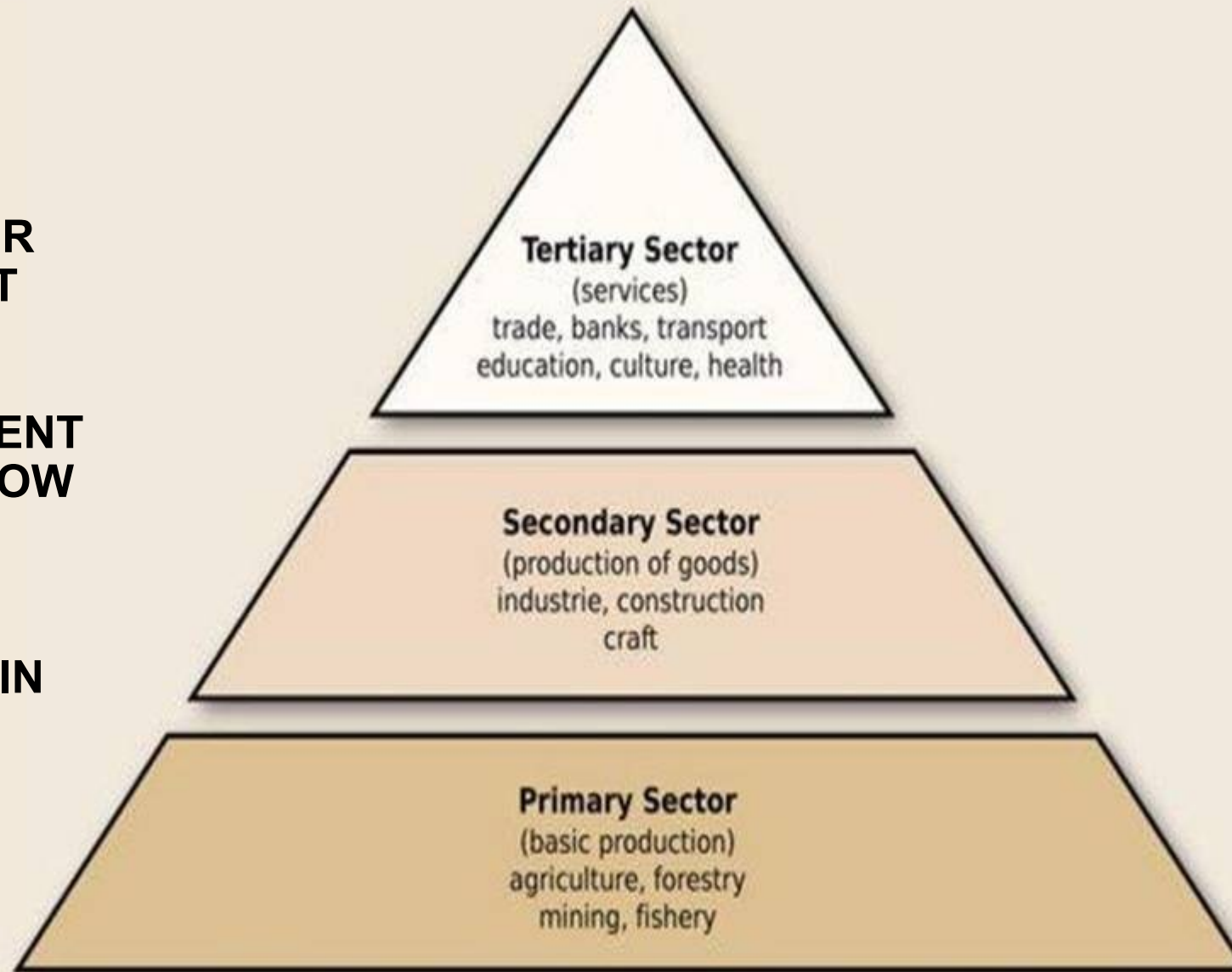
REBUILDING THE PRODUCTIVE SPINE

Shifting from consuming imports to producing with a clear view of market absorption

THE HERBS



**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

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.

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.



What the Disciplines Do

- 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

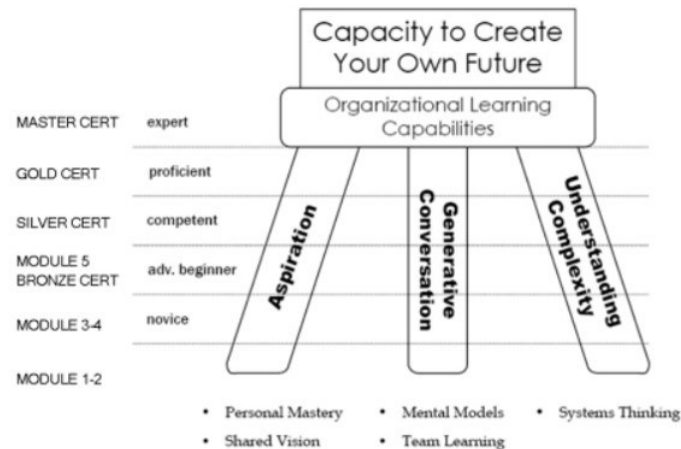
- Systems Thinking begins by learning to see patterns before events.
- The Five Disciplines exist to help human beings develop that capacity together.

Tools of The Fifth Discipline

Intent: Manage change seamlessly

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

THREE-LEGGED STOOL



THE CAPABILITIES OF A LEARNING ORGANIZATION

TOOLS OF THE LEARNING ORGANISATION!

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

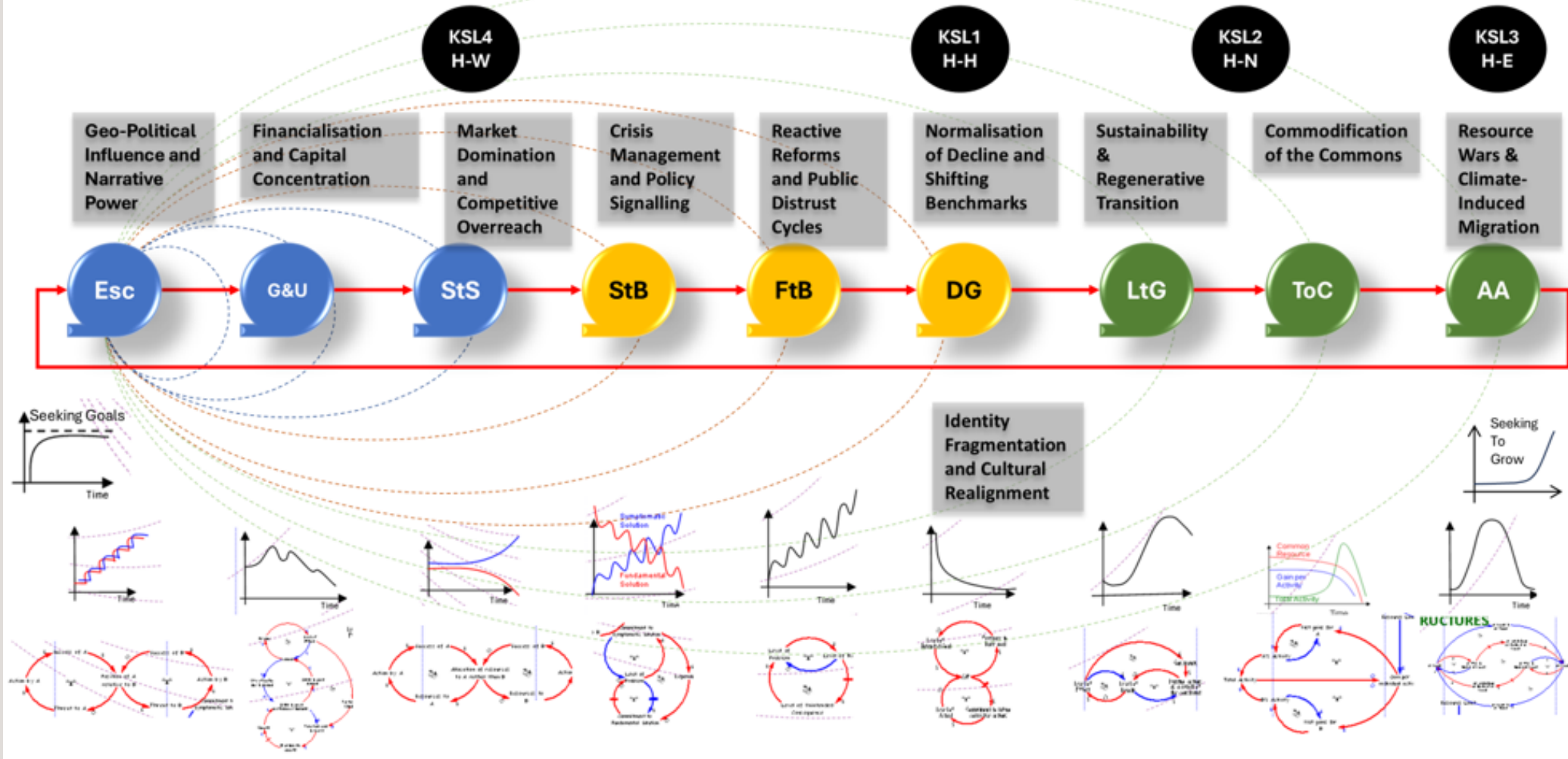
Personal Mastery	Shared Vision	Mental Models	Team Learning	Systems Thinking
PRACTICES AND PRINCIPLES:				
- CLARIFYING PERSONAL VISION - HOLDING CREATIVE TENSION (FOCUS ON RESULTS AND SEEK CURRENT REALITY) - MAKING CHOICES	- VISIONING PROCESS - ACKNOWLEDGING CURRENT REALITY	- DISTINGUISHING "DATA" FROM ABSTRACTION BASED ON DATA - TESTING ASSUMPTIONS "LEFT-HAND COLUMN"	- SUSPENDING ASSUMPTIONS - ACTING AS COLLEAGUES - SURFACING OWN DEFENSIVENESS "PRACTICING"	- SYSTEM ARCHETYPES - SIMULATION
PRACTICE TOOLS:				
☐ Personal Mastery goes beyond proficiency ☐ Creative Tension Model ☐ Personal Vision ☐ Holding Creative Tension ☐ Structural Conflict ☐ Commitment to the Truth ☐ Using the subconscious ☐ Integrating Reason and Intuition ☐ Seeing our connectedness to the world ☐ Compassion ☐ Commitment to the Whole ☐ Centering long enough to focus on what we want ☐ Crafting the Purpose Statement – 1 st Choice	☐ Encouraging Personal Vision ☐ From Personal to Shared Visions ☐ Spreading Visions ☐ Enrolment ☐ Commitment ☐ Compliance ☐ Guidelines for enrolment and commitment ☐ Anchoring Vision to Purpose and Values ☐ Positive versus Negative Vision ☐ Creative tension and commitment to the truth ☐ Why visions die prematurely	☐ Planning as learning ☐ Managing mental models at personal and interpersonal levels ☐ Reflection Skills ☐ Leaps of Abstraction or Ladder of Inference ☐ Left Hand Column ☐ Inquiry Skills ☐ Balancing Inquiry and Advocacy ☐ Espoused Theory versus Theory-in-Use ☐ Double Loop Learning	☐ Dialogue and Discussion ☐ Participants suspend their assumptions ☐ Seeing each other as colleagues ☐ There must be a facilitator who "holds" the context ☐ Dealing with Current Reality: Conflict and defensive ☐ The Missing Link: Practice ☐ Learning how "to practice"	☐ 11 laws of complexity ☐ Seeing circles of causality ☐ Balancing Loop ☐ Reinforcing Loop ☐ Delays ☐ Archetypes ☐ Accidental Adversaries ☐ Balancing Loop with Delays ☐ Drifting Goals ☐ Escalation ☐ Fixes that Backfire ☐ Growth and Underinvestment ☐ Limits to Success ☐ Shifting the Burden ☐ Success to the Successful ☐ Tragedy of the Commons ☐ Behavior Time Graphs ☐ 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)

THE SYSTEMIC ONION FRAMEWORK

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

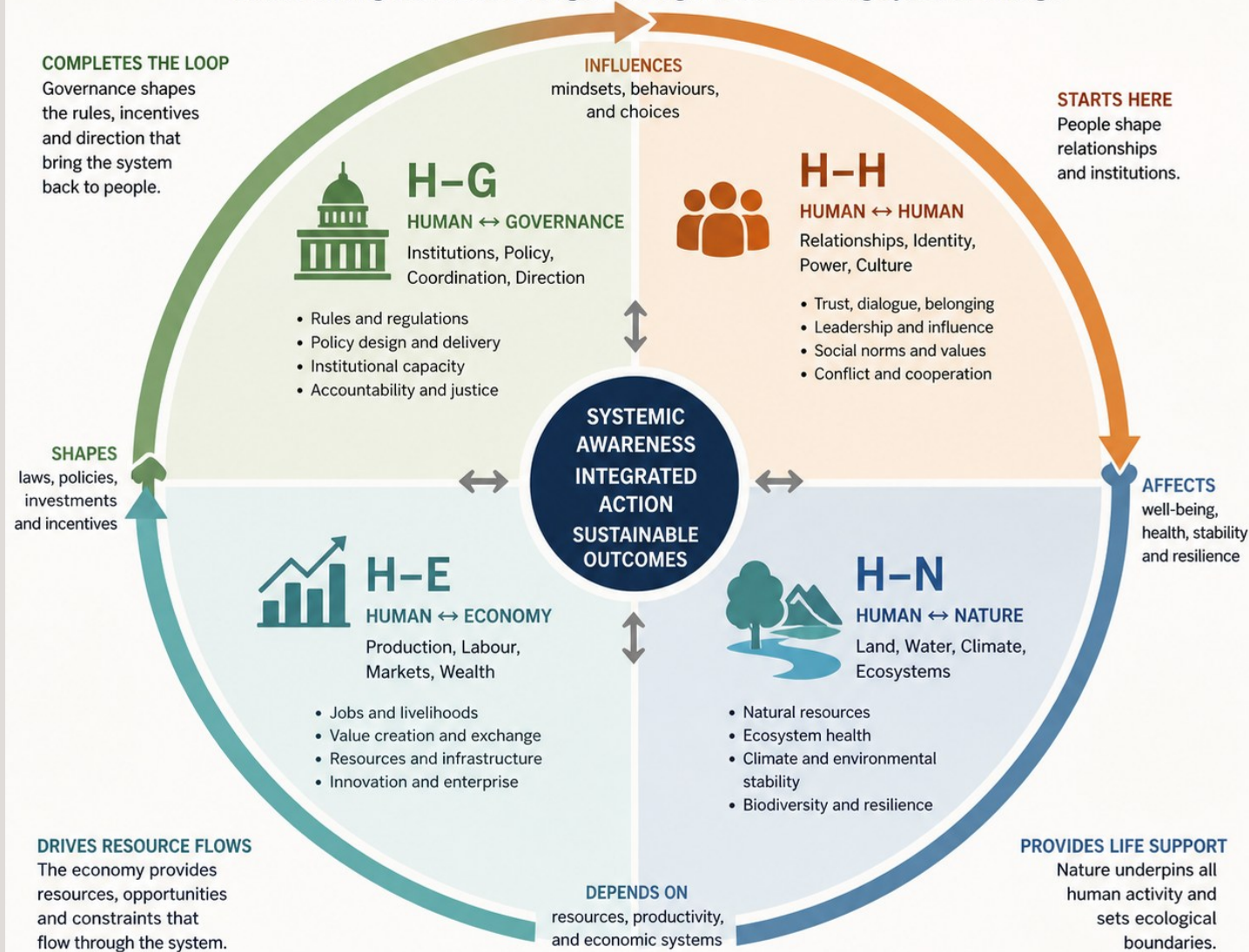
Developed by Ms Sheila Damodaran, STRLDi, integrating and extending the seminal systems archetype work of Peter Senge and his MIT team



THE FOUR-QUADRANT SYSTEMS FRAMEWORK

Created by STRLDi

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



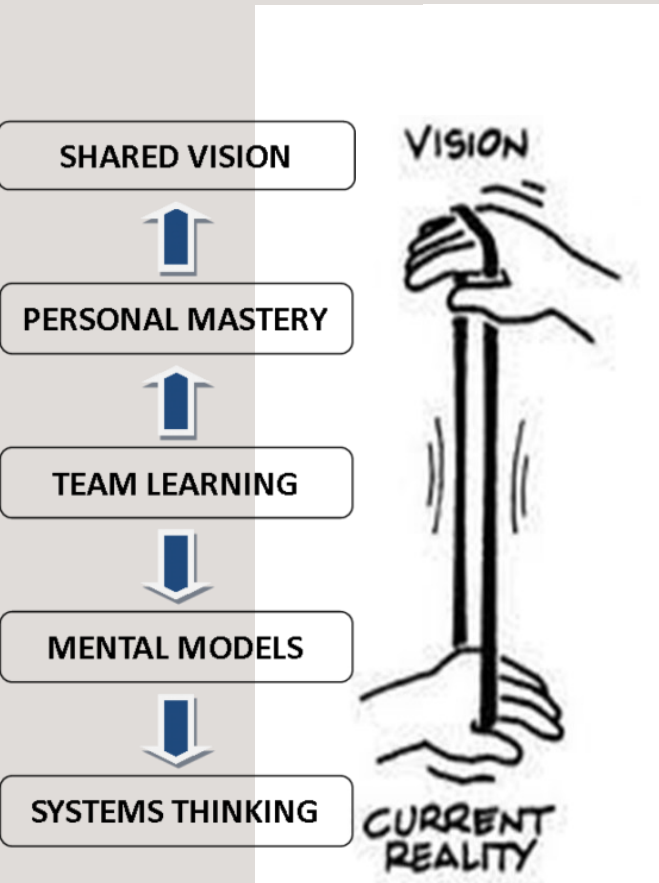
FEEDBACK LOOP: Every action in one quadrant creates effects in the others.
The system grows or declines based on the quality of our choices.

**NOT WISELY.
CHOOSE SYSTEMICALLY.**

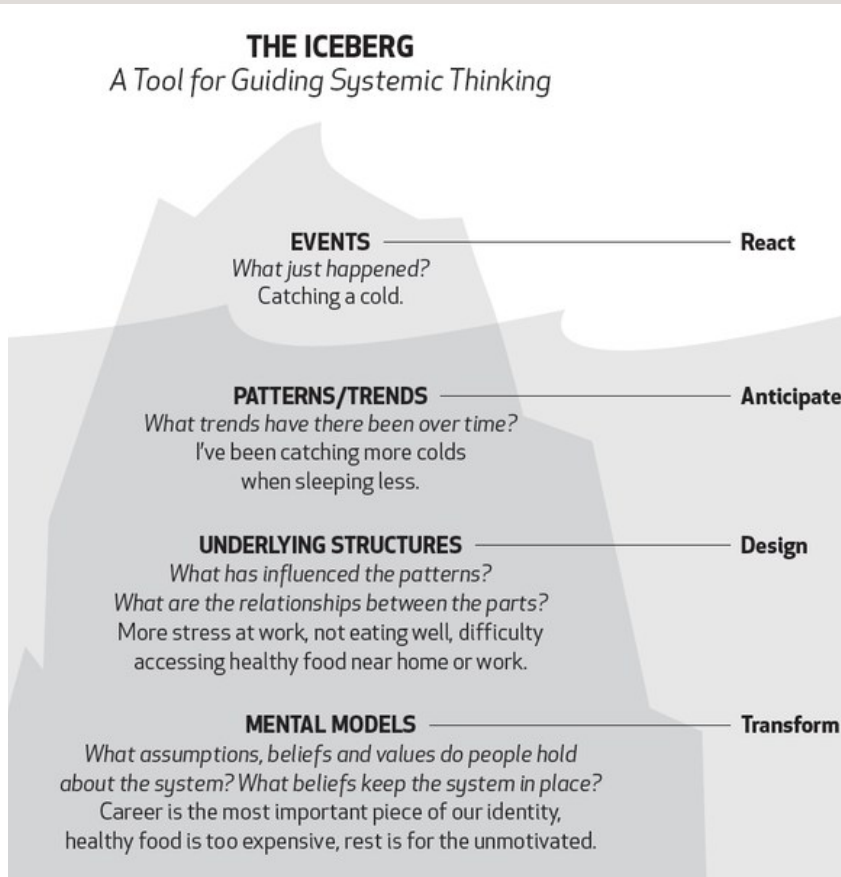


KEY POINTS OF PRACTICE

CREATIVE TENSION MODEL



THE ICEBERG



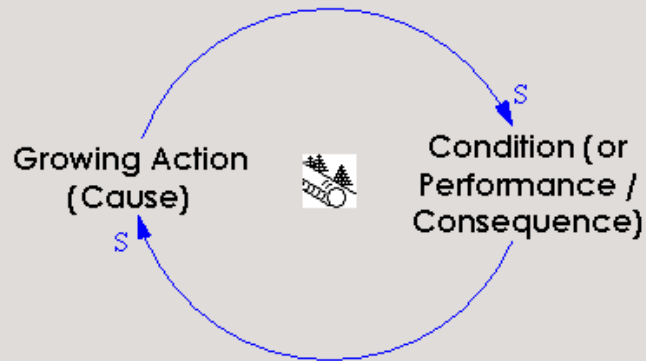
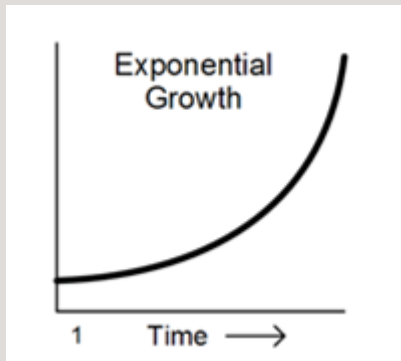
DEFINITION OF SYSTEMS THINKING

- 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 of behaviour of events over time in Systems Thinking

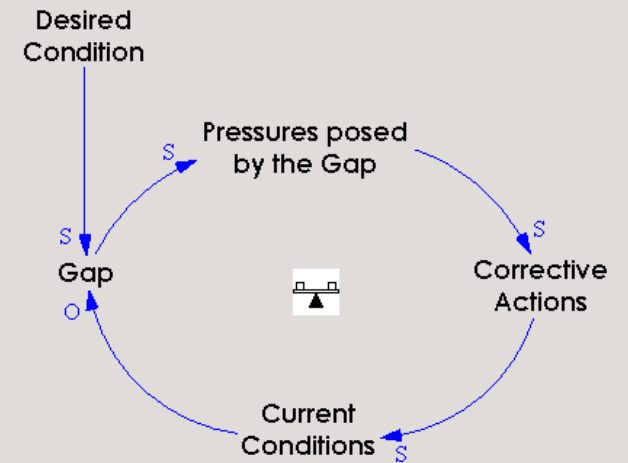
REINFORCING LOOP

SEEKS TO GROW (NOT STABILISE)



BALANCING LOOP

SEEKS TO STABILISE (NOT GROW)



TIMELINE OF STUDY & RESULTS

- APR 2008 **STUDY FIRST MOOTED** (Mogae Presidency)
- MAR 2012 **FIRST FORMATION OF RESEARCH GROUP** (Khama Presidency)
- 2012-2018 RESEARCH ON HOLD PENDING FORMATION OF STATISTICS BOTSWANA
- 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 (Masisi Presidency)
- 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 (Boko Presidency)
- MAY 2026 PRESENTATION TO NPC & UDC 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.

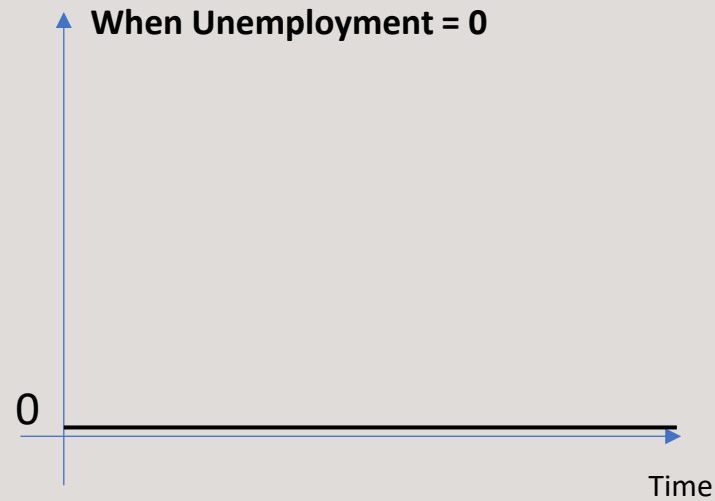
WHAT CAUSES PERSISTENT UNEMPLOYMENT

SELF WORK. QUESTIONS:

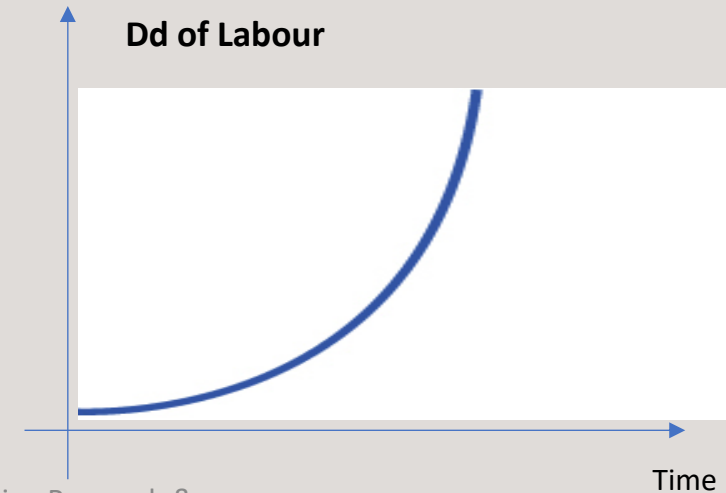
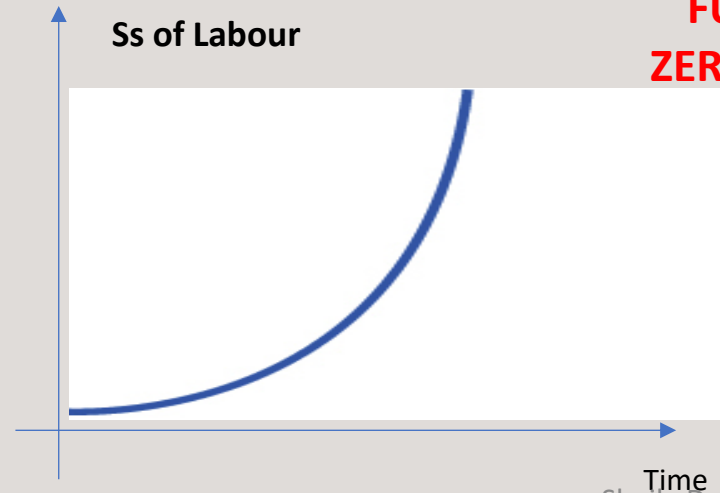
- IDENTIFY ORGANISATIONAL (GOVT, PTE, COMMUNITY, PROFESSIONALS) STAKEHOLDERS
- WHAT FILTERS TODAY MAY HAVE STOPPED THEM FROM LEARNING ABOUT THESE ALREADY?
- IDENTIFY IMPACT OF CAUSES THAT IMPACT YOUR ORGANISATION.



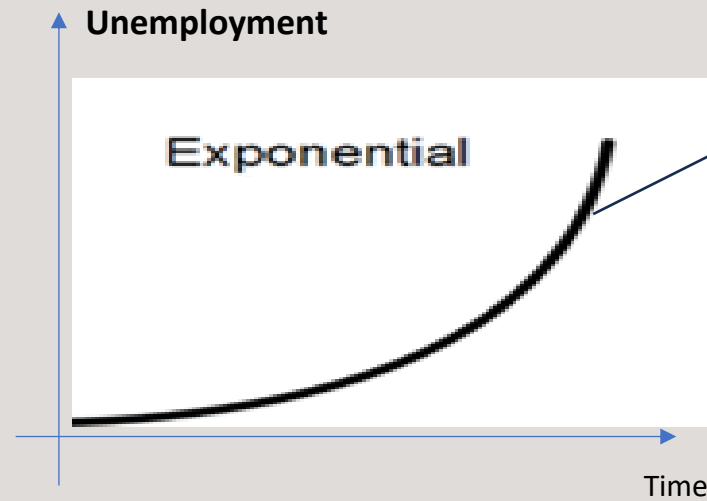
Drilling Down on Persistent National Unemployment



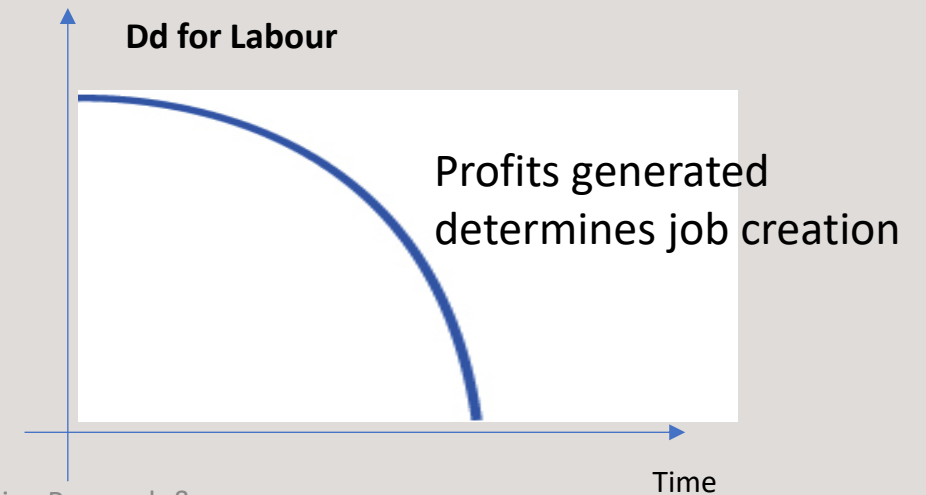
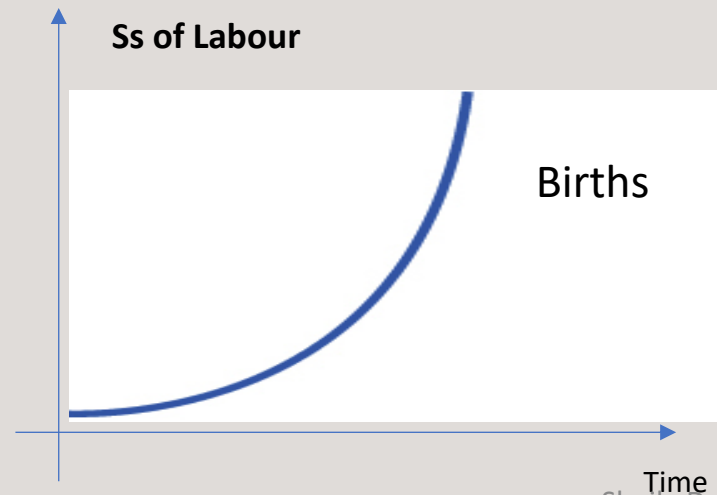
**SS = DD MEANS
FULL EMPLOYMENT
ZERO UNEMPLOYMENT**



Drilling Down on Persistent National Unemployment

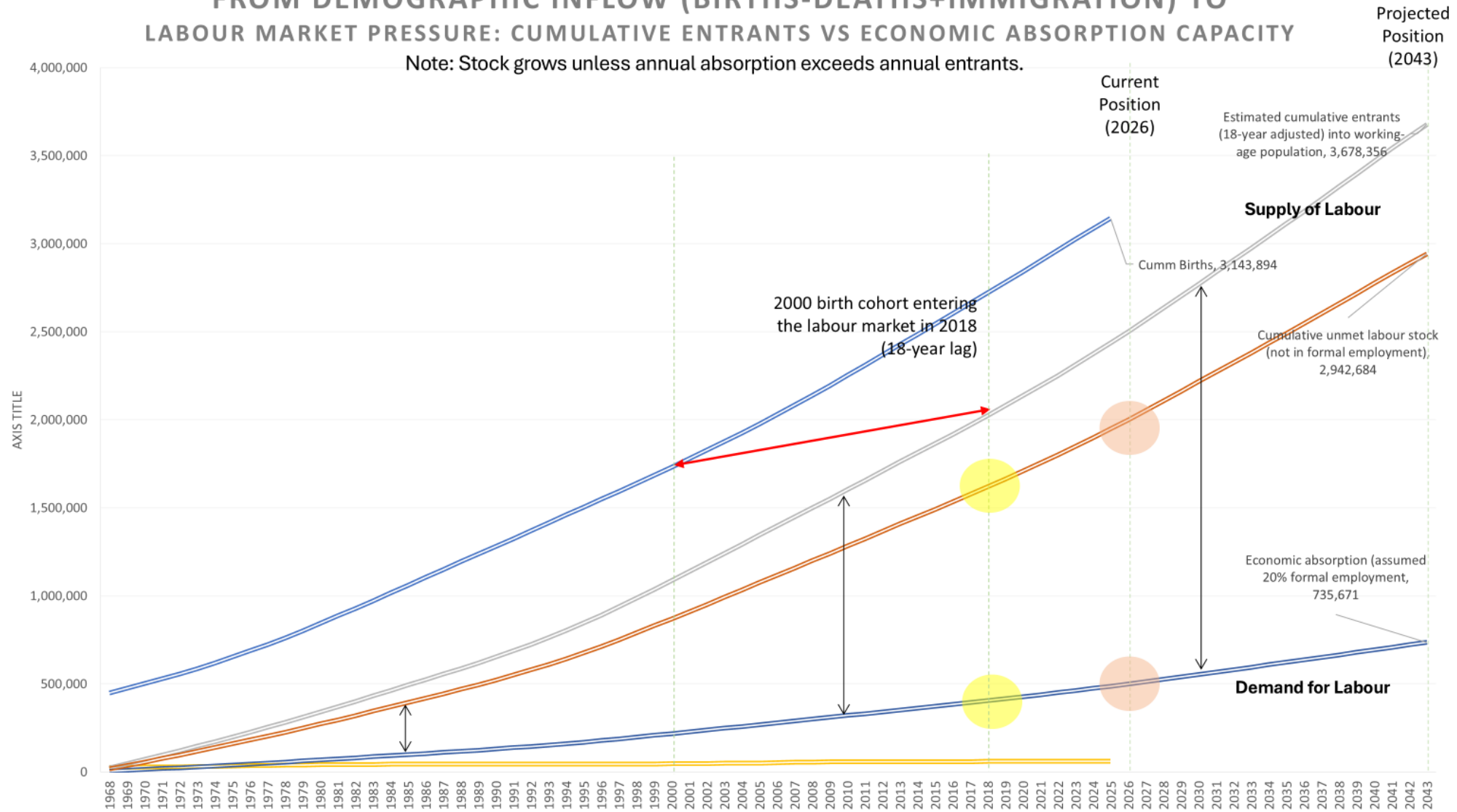


These graphs are indicating that a reinforcing causal loop structures are at play that are seeking to grow.



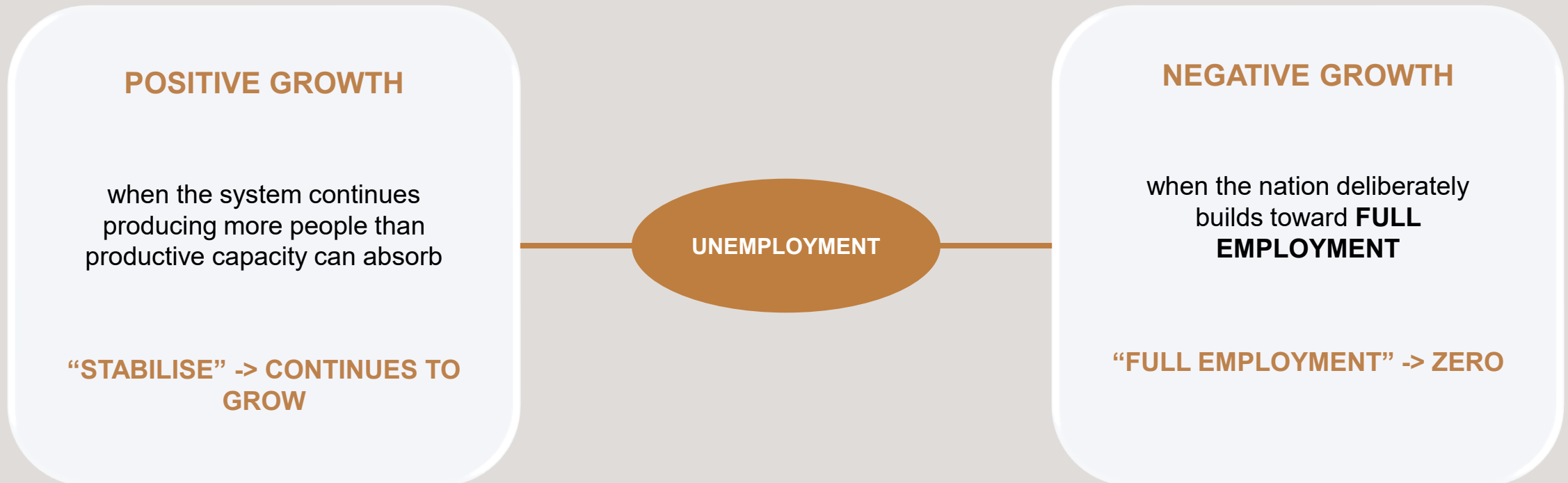
FROM DEMOGRAPHIC INFLOW (BIRTHS-DEATHS+IMMIGRATION) TO LABOUR MARKET PRESSURE: CUMULATIVE ENTRANTS VS ECONOMIC ABSORPTION CAPACITY

Note: Stock grows unless annual absorption exceeds annual entrants.



Unemployment Does Not Stabilise – It Moves

Its direction depends on the signals the economic system is sending



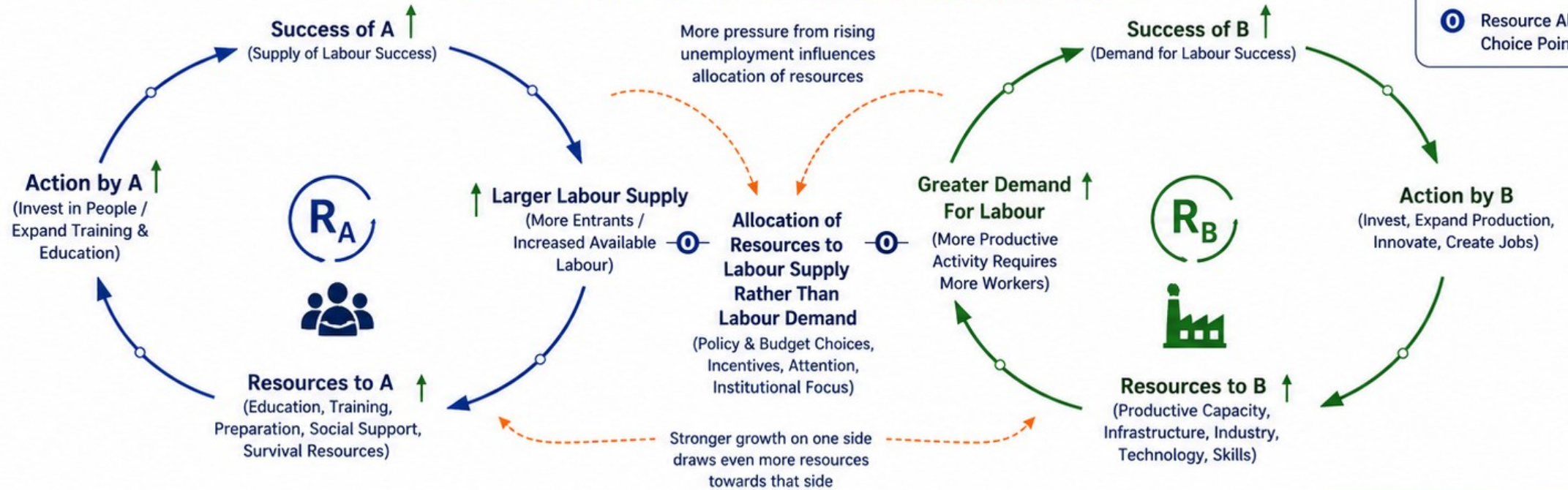
THE OBJECTIVE CANNOT BE TO STABILISE UNEMPLOYMENT
THE OBJECTIVE MUST BE TO CHANGE THE SYSTEM THAT IS PRODUCING IT

SUCCESS TO THE SUCCESSFUL (StS) ARCHETYPE

SUPPLY OF LABOUR vs DEMAND FOR LABOUR

LEGEND

- R** Reinforcing Loop
- O** Resource Allocation Choice Point



BEHAVIOUR OVER TIME (BOTS)



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

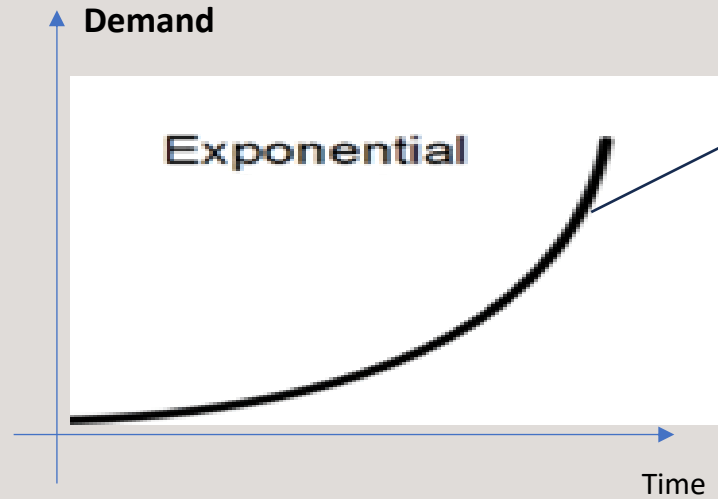
STRLDi Unemployment Study Presentation Roadmap

WE ARE
HERE NOW

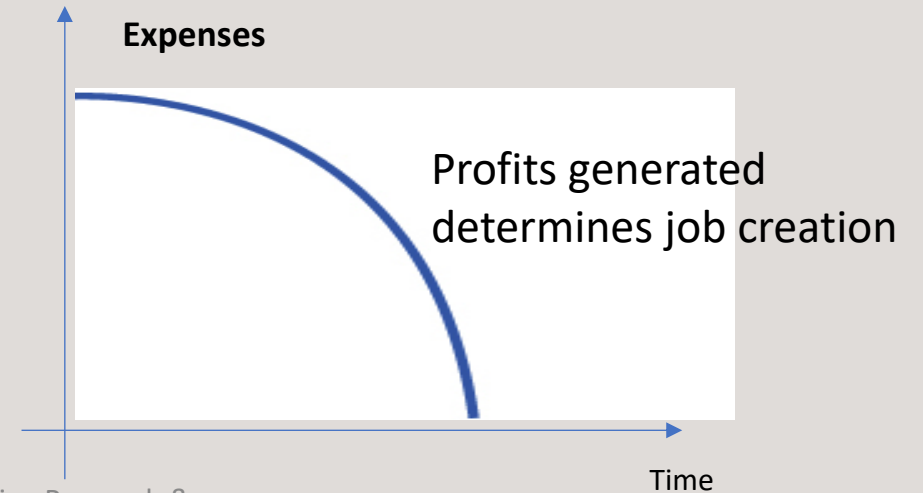
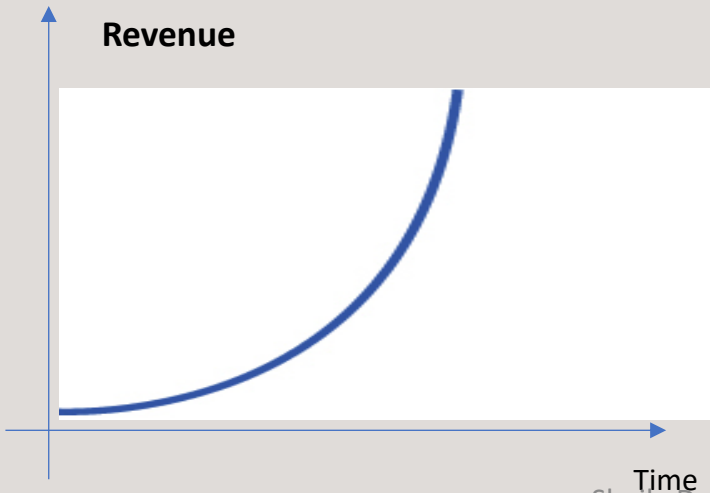
1. Botswana's Historical Response to Unemployment
2. Question opening: Why Does the Problem Persists Despite 50 Years of Intervention
3. Systems Thinking and the Study Methodology
4. Behaviour Over Time: What the Data Reveals
- 5. Structural Drivers of Persistent Unemployment**
- 6. Productive Sector Analysis – Demand for Labour:**
 - 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



Drilling Down on Demand for Labour



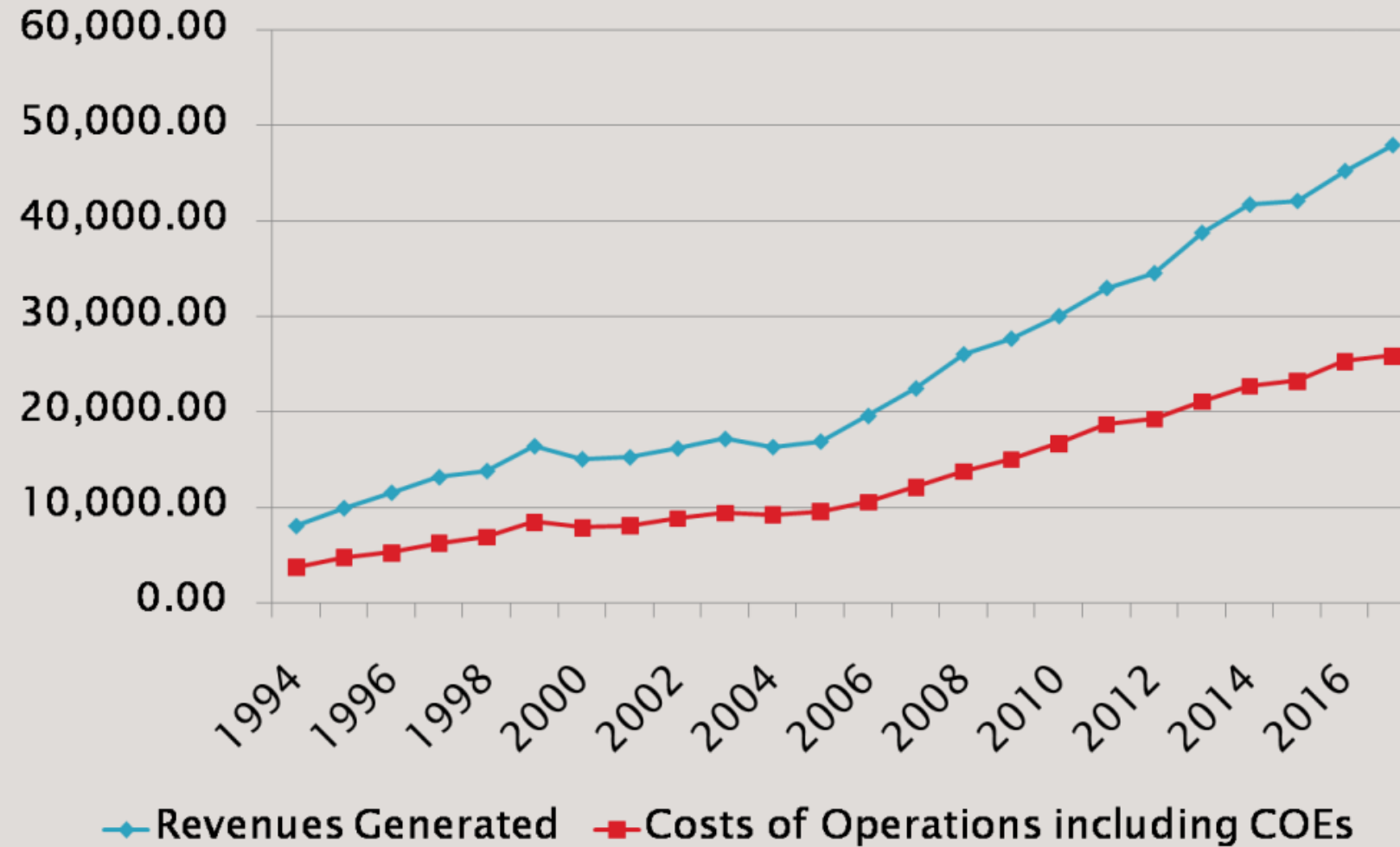
These graphs are indicating that a reinforcing causal loop structures are at play that are seeking to grow.



BEHAVIOUR OF COSTS OF PRODUCTION VS REVENUE: TERTIARY ECONOMIC SECTOR

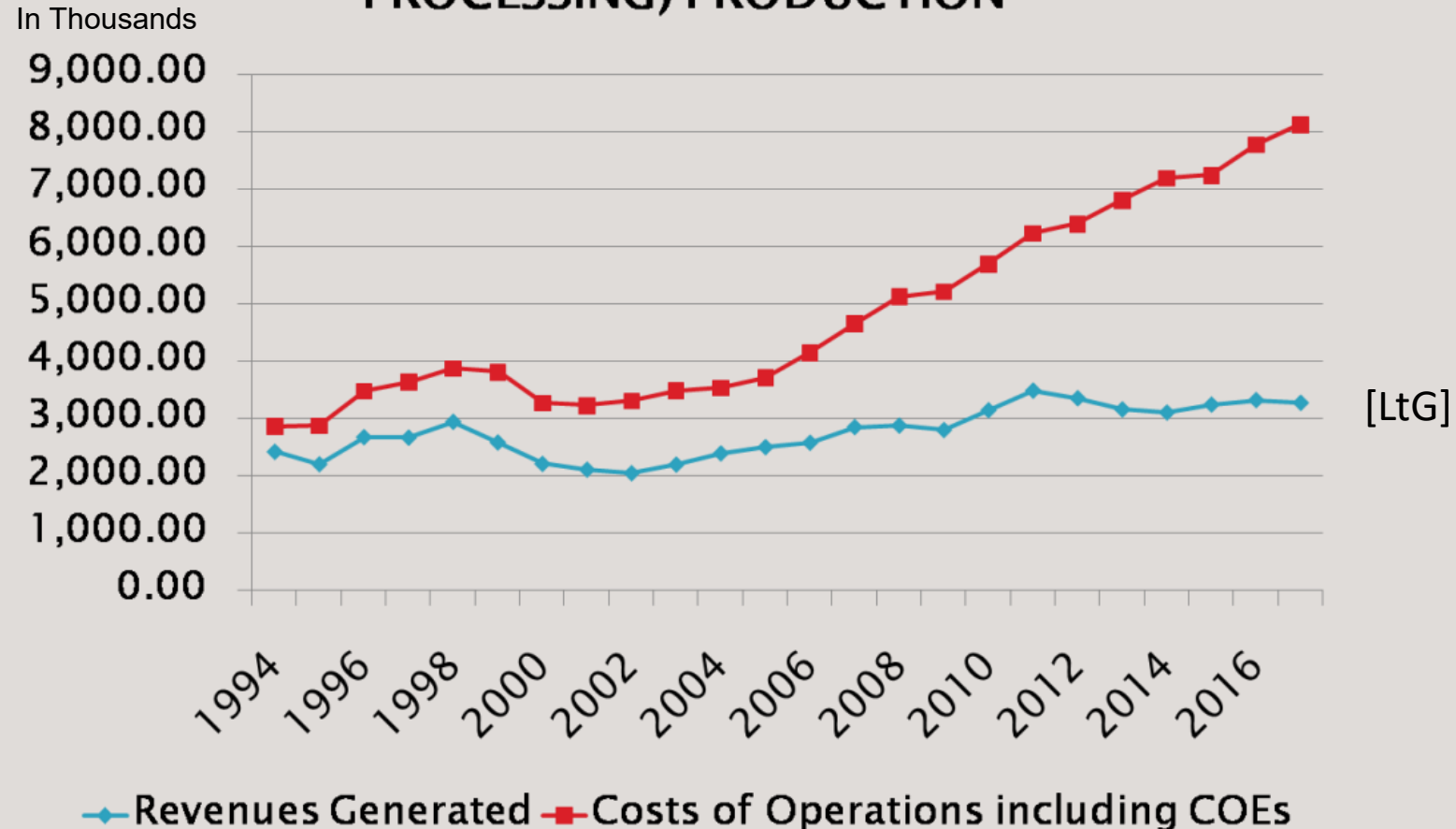
In Thousands

Tertiary Sector: 60B



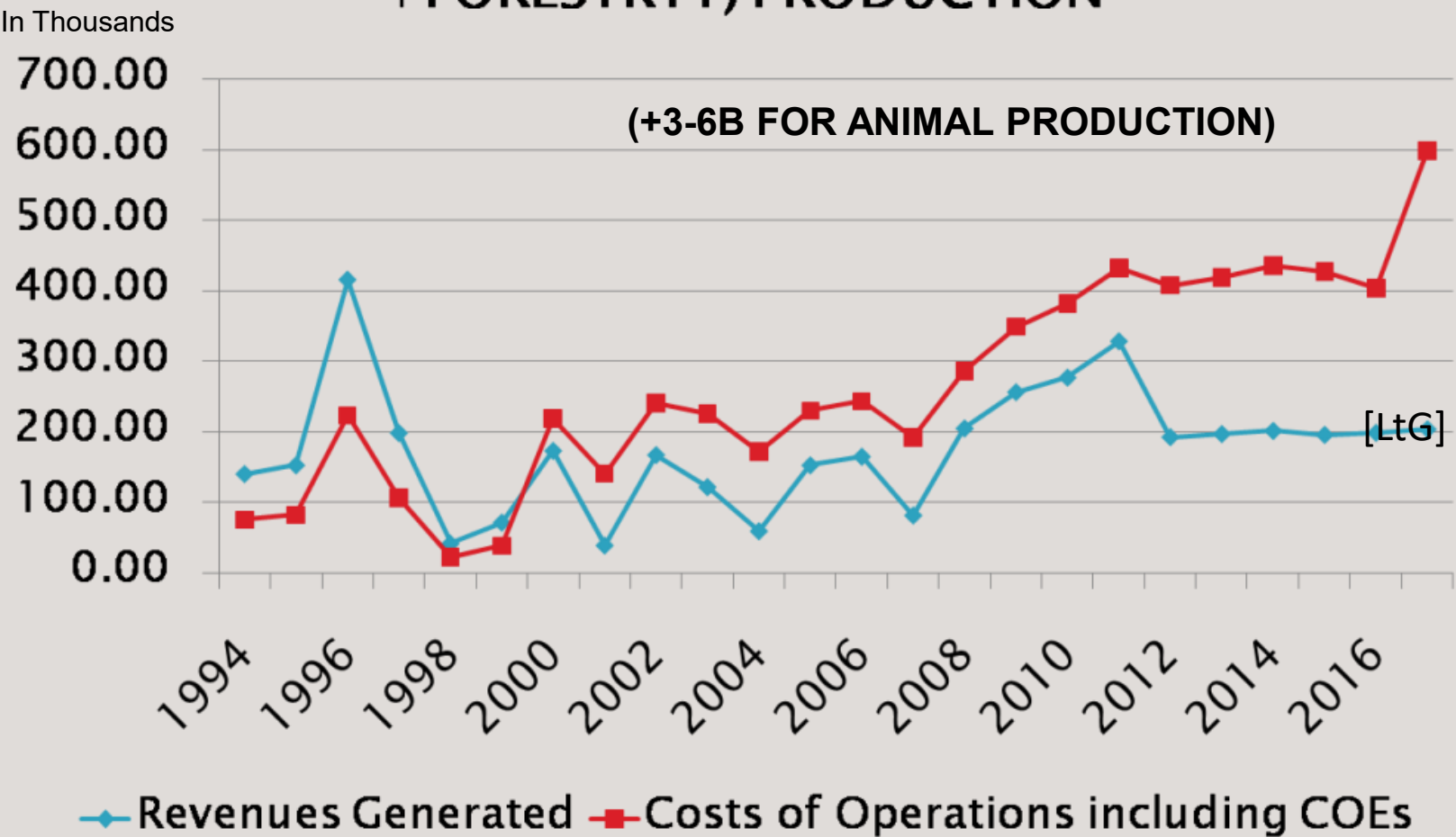
BEHAVIOUR OF COSTS OF PRODUCTION VS REVENUE: MANUFACTURING (NOT INCLUDING OTHERS / DIAMOND PROCESSING) PRODUCTION

Tertiary Sector: 60B
Manufacturing: 4B

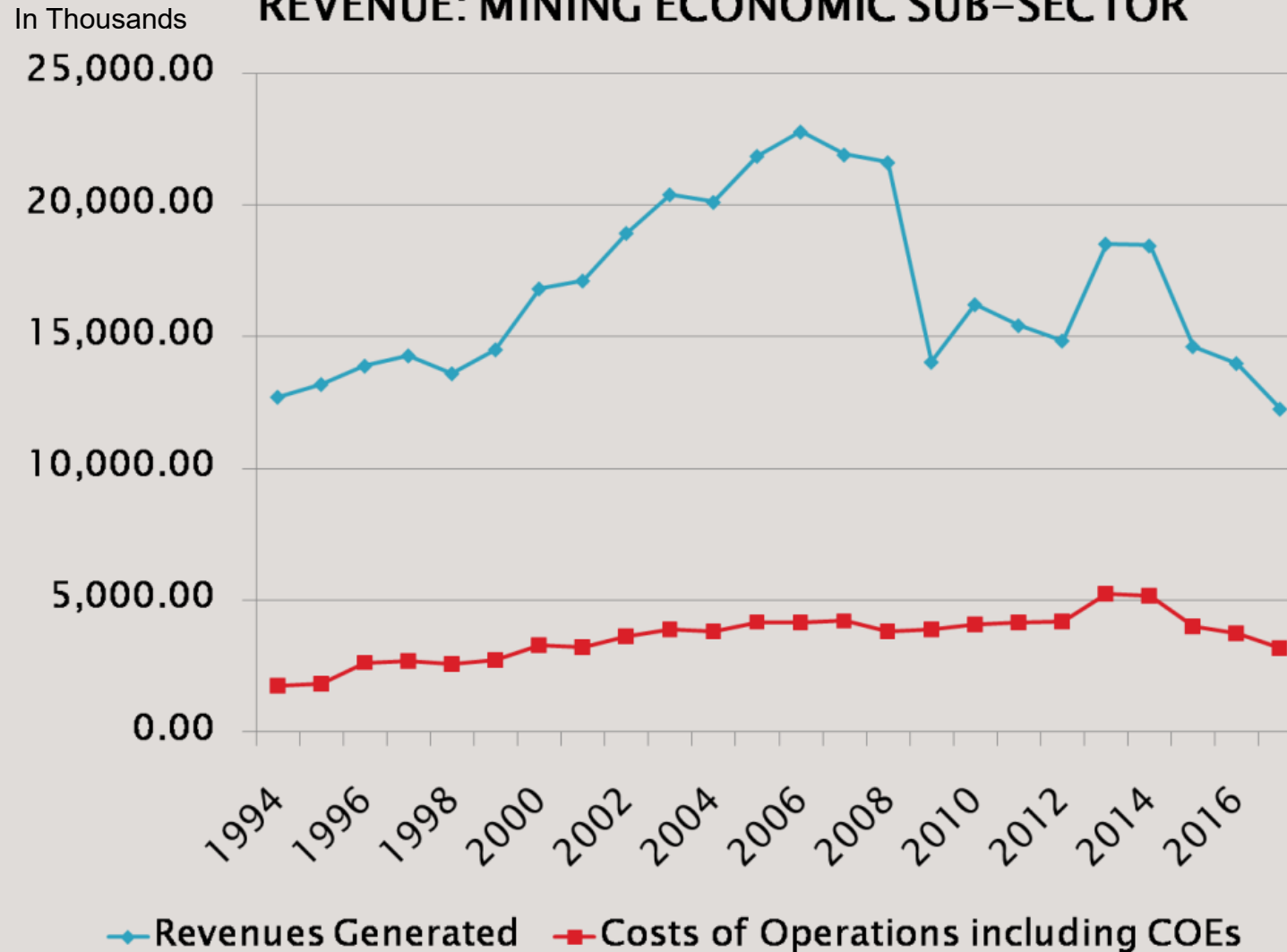


BEHAVIOUR OF COSTS OF PRODUCTION VS REVENUE: PLANT (CROP+HORTICULTURE +FORESTRY) PRODUCTION

Tertiary Sector: 60B
Manufacturing: 4B
Agriculture: 0.2-3B



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



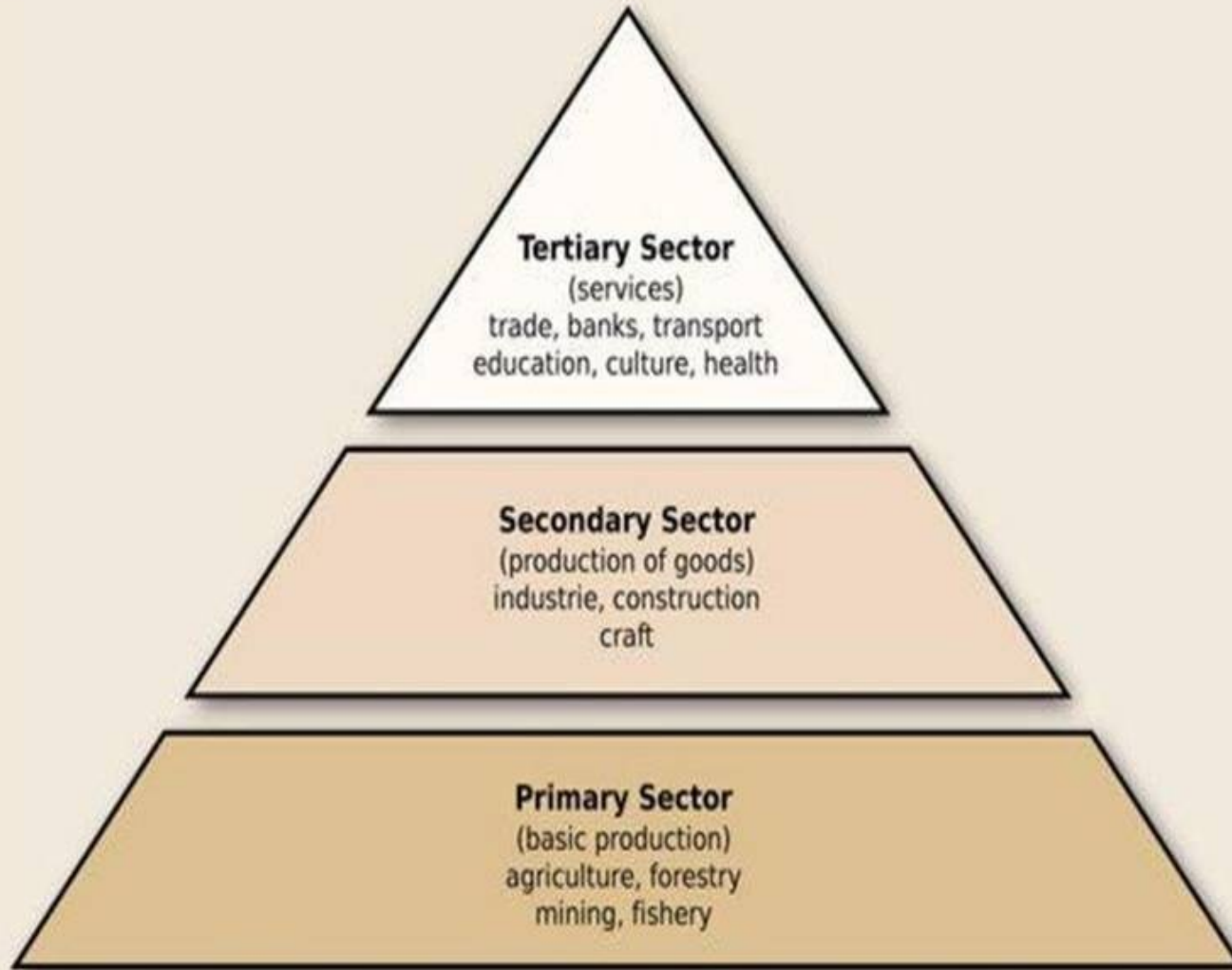
Botswana Formal Employment

By Economic Level — Q1 2024

Economic level	Economic activities included	Formal employees	Share
QUATERNARY	Information & Communication; Professional/Scientific/Technical; Public Administration & Defence; Education; Human Health & Social Work; Extraterritorial Organisations	179,493	46.70%
TERTIARY	Wholesale/Retail; Transport & Storage; Accommodation & Food; Finance & Insurance; Real Estate; Administrative & Support; Arts/Entertainment; Other Services; Households as Employers	140,303	36.50%
SECONDARY	Mining & Quarrying; Manufacturing; Electricity/Gas; Water & Waste; Construction	50,881	13.20%
PRIMARY	Agriculture, Forestry & Fishing	13,838	3.60%
TOTAL	Employed Formally	384,515	100.00%
	Employable Population	1,842,225	~ 20%

Botswana Formal Employment

By Economic Level — Q1 2024

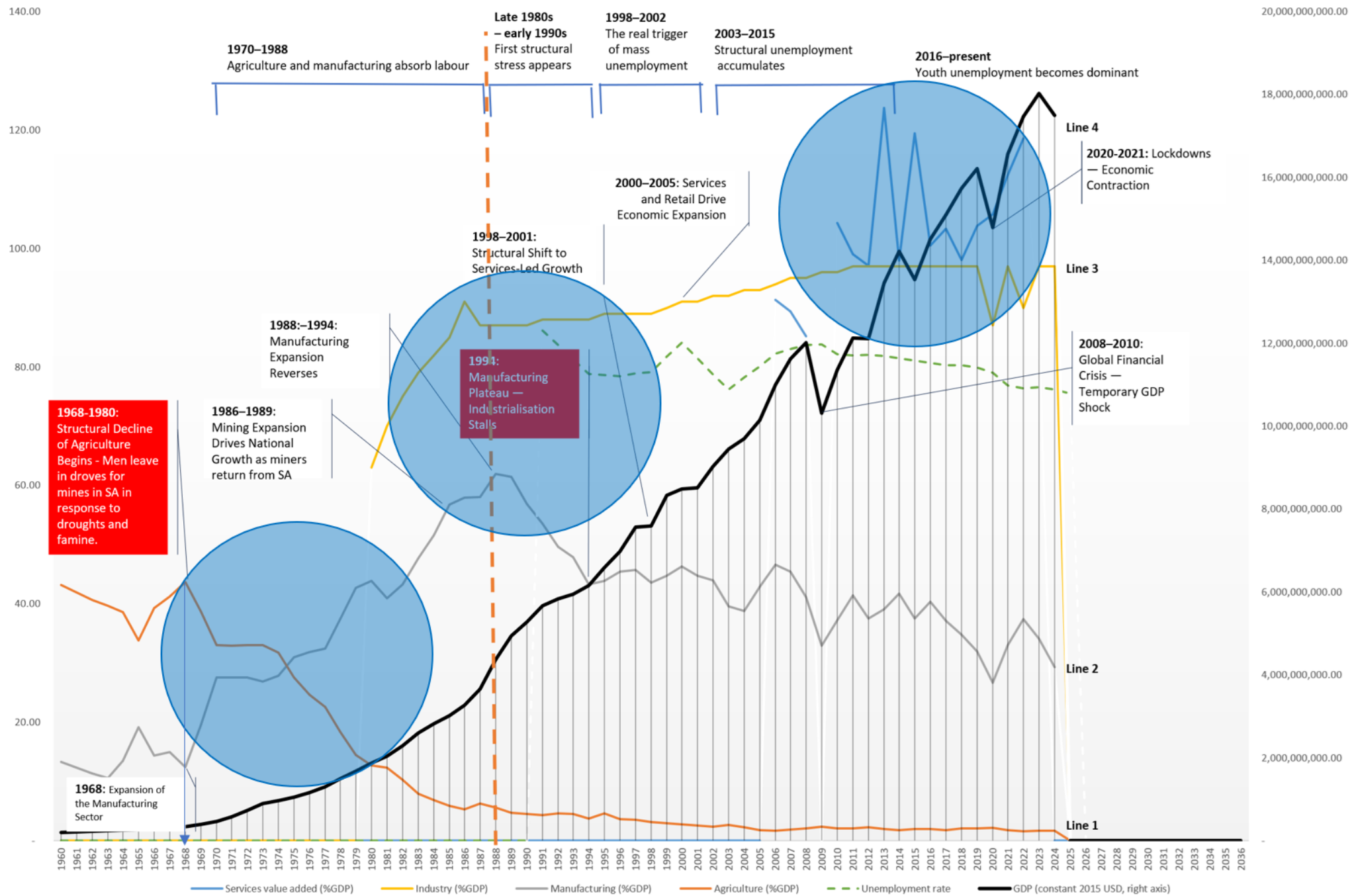


Sectoral structure of an economy

www.regionales-wirtschaften.de



SECTION 3: PRODUCTIVE SECTORS

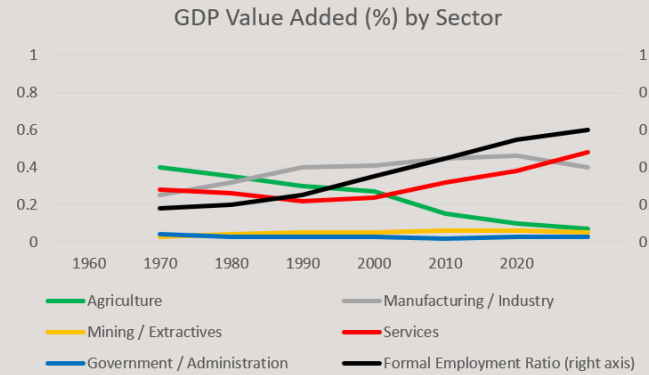


**Do not focus
on how far
ahead
someone else
may be.**

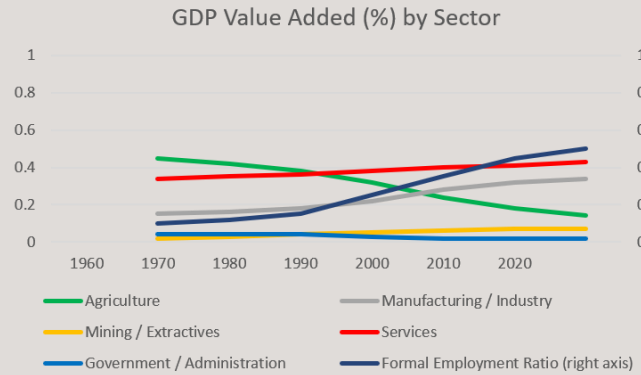
**Focus on
strengthening
our skills,
processes for
consistency
so that
we
continually
improve,
move ahead
and ultimately
lead.**



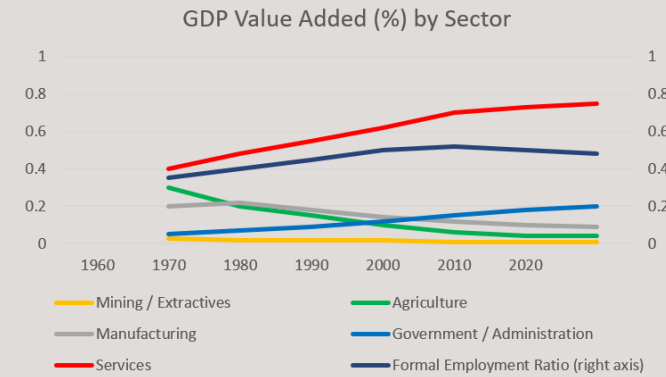
China – Pop: 1,41bil, GDP per capita: \$10.5K



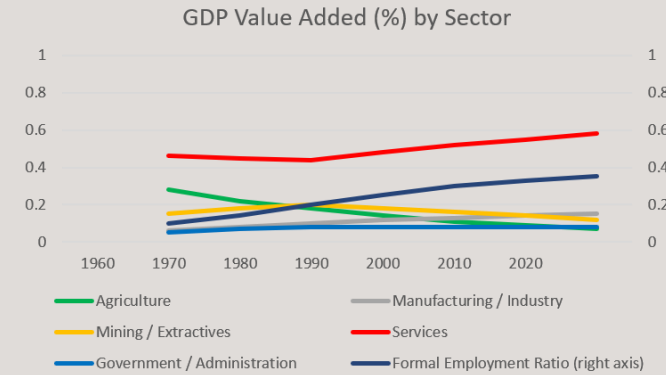
Vietnam – Pop: 97mil, GDP per capita: \$2.8K



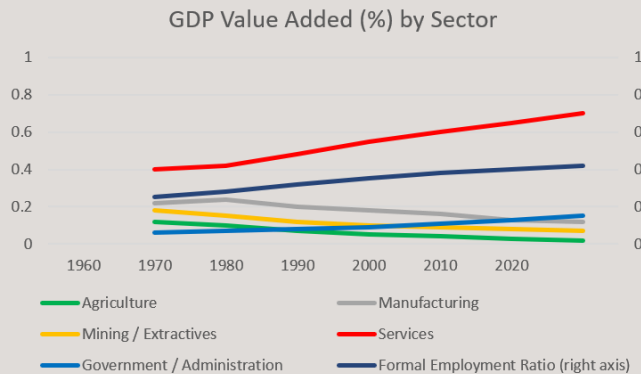
Greece – Pop: 10.7mil, GDP per capita: \$19K



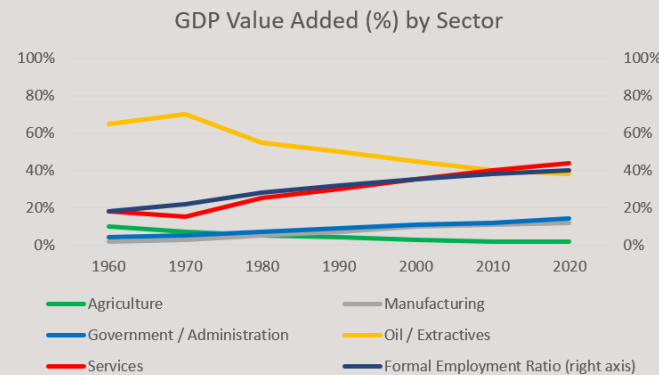
Namibia – Pop: 2.5mil, GDP per capita: \$4.7K



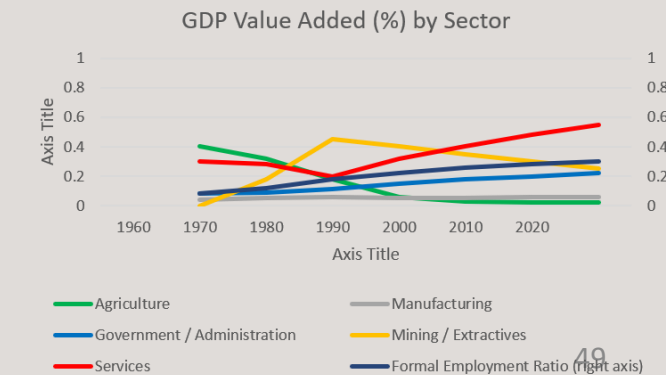
South Africa – Pop: 59mil, GDP per capita: \$6K



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



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?



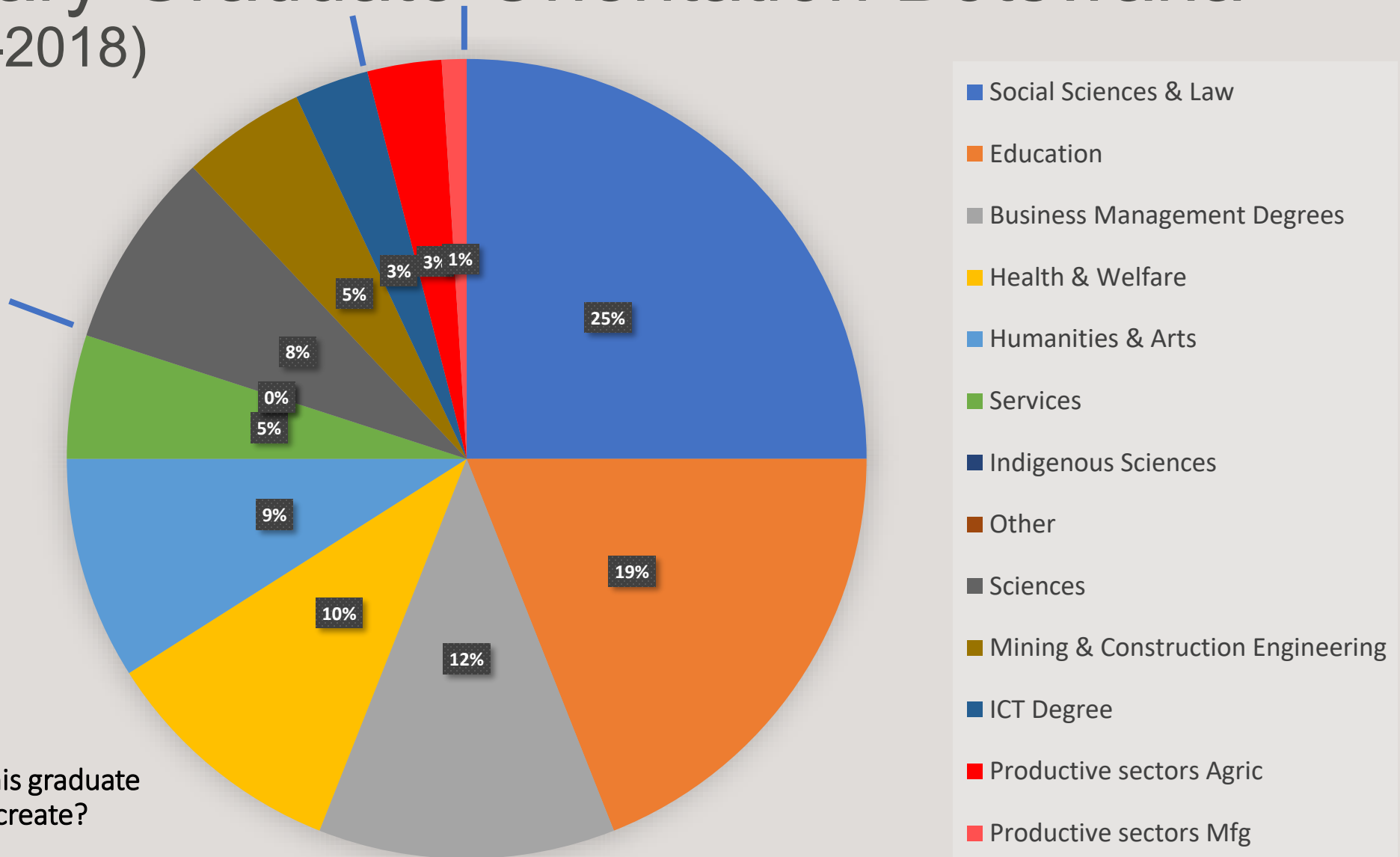
WHY ARE THESE NOT ALREADY HAPPENING?



THE PRODUCTIVE CAPABILITY QUESTION

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

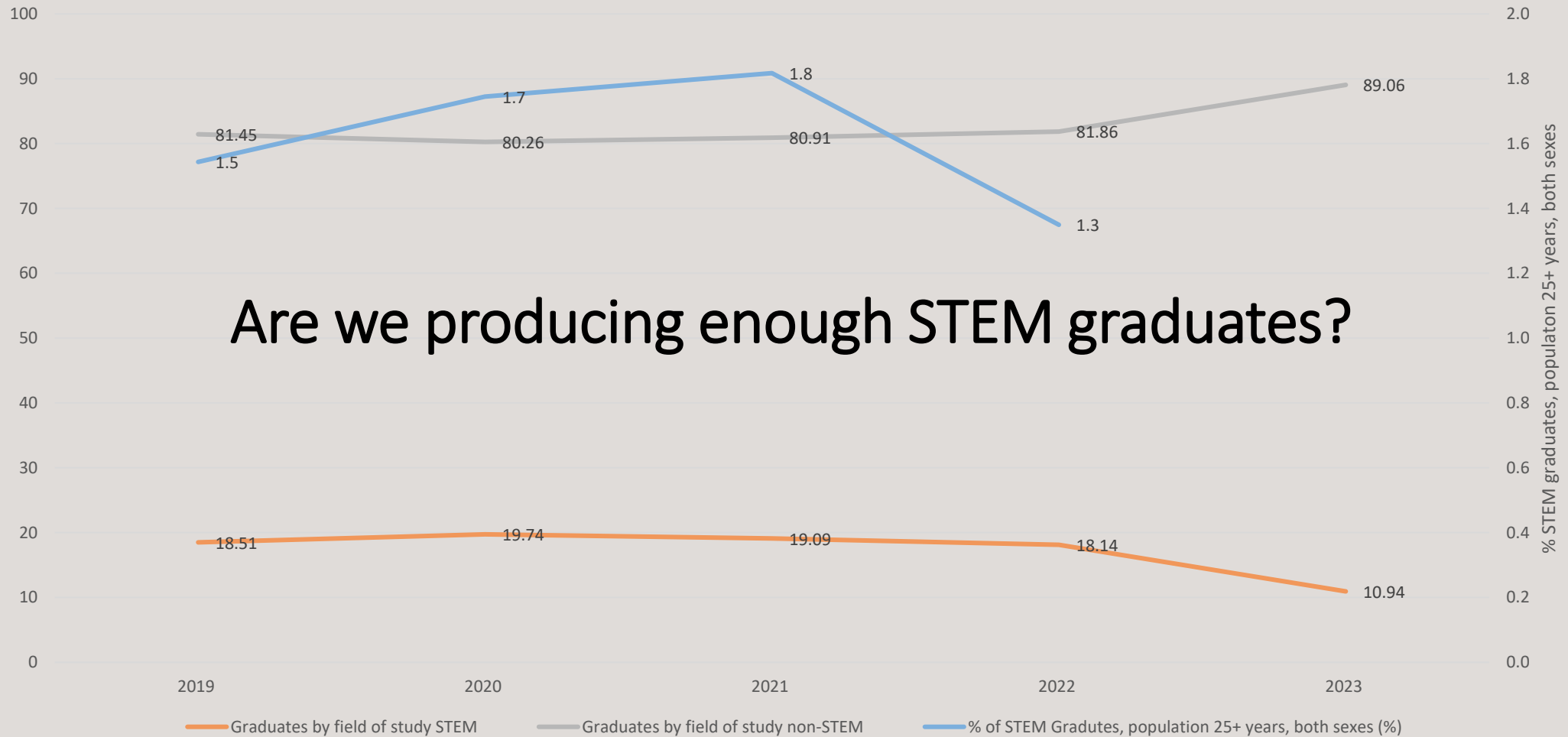
Tertiary Graduate Orientation Botswana (2009-2018)



What economy is this graduate profile designed to create?

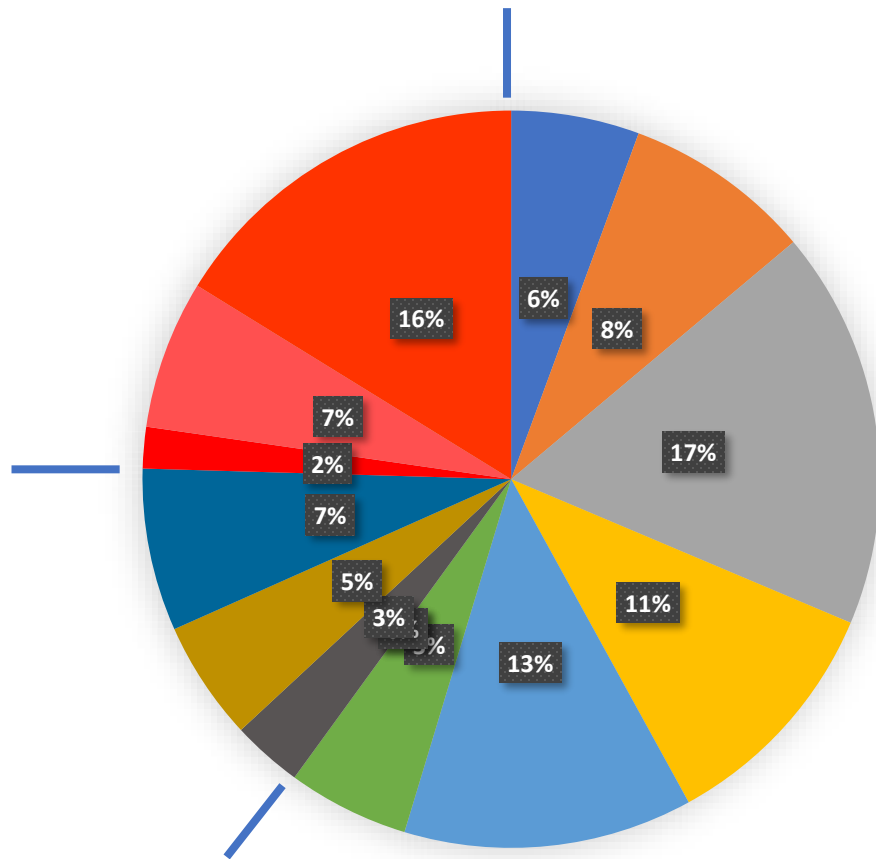


STEM Pipeline Composition Relative to Adult Population, Botswana 2019–2023 Source: UNESCO

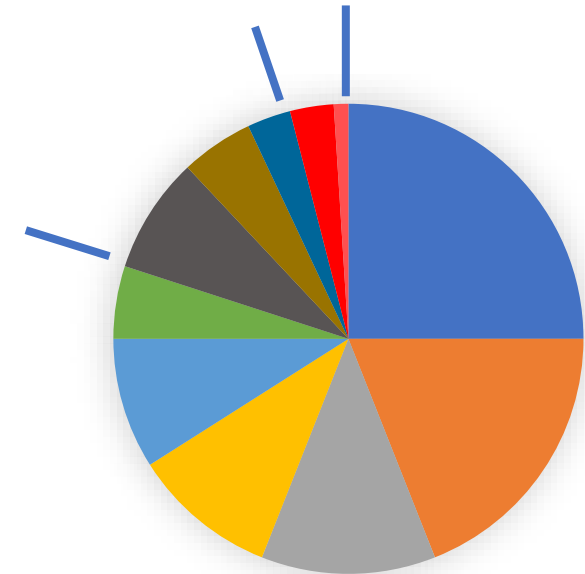


Tertiary Graduate Orientation

CHINA: Distribution Pattern (2022)



BOTSWANA: Actual (2009-2018)



The issue is not a lack of 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

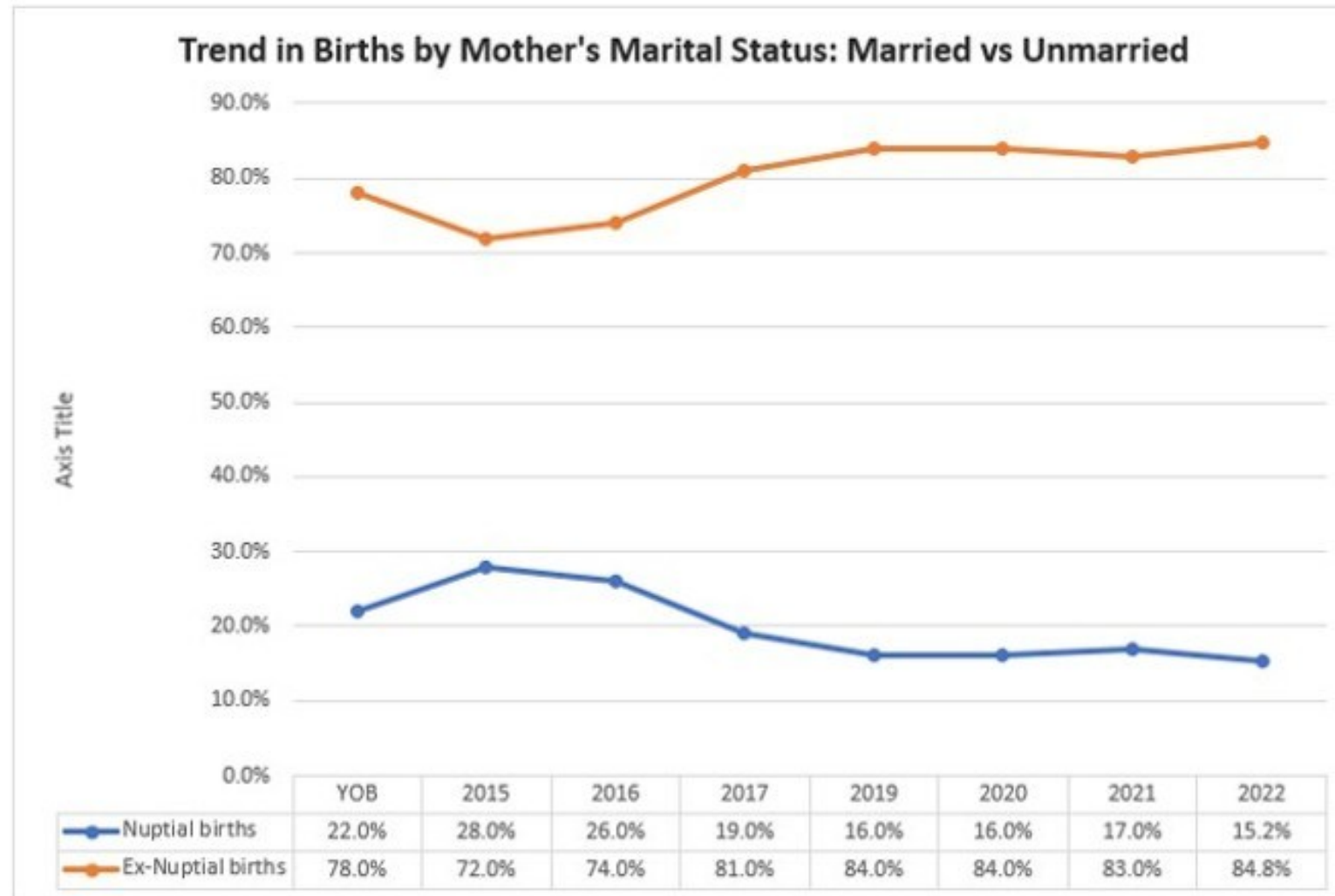
Indicator	Botswana	China
Education Spending (% GDP)	High	Lower
Education Spending Per Person	Similar	Similar
Manufacturing GDP	~5%	~27%
Graduate Unemployment	High	Lower

Question:

- If money is not the explanation, what is?

WHY ARE THESE NOT ALREADY HAPPENING?

Births & Family Structure



Births & Family Structure

Female-Led Households

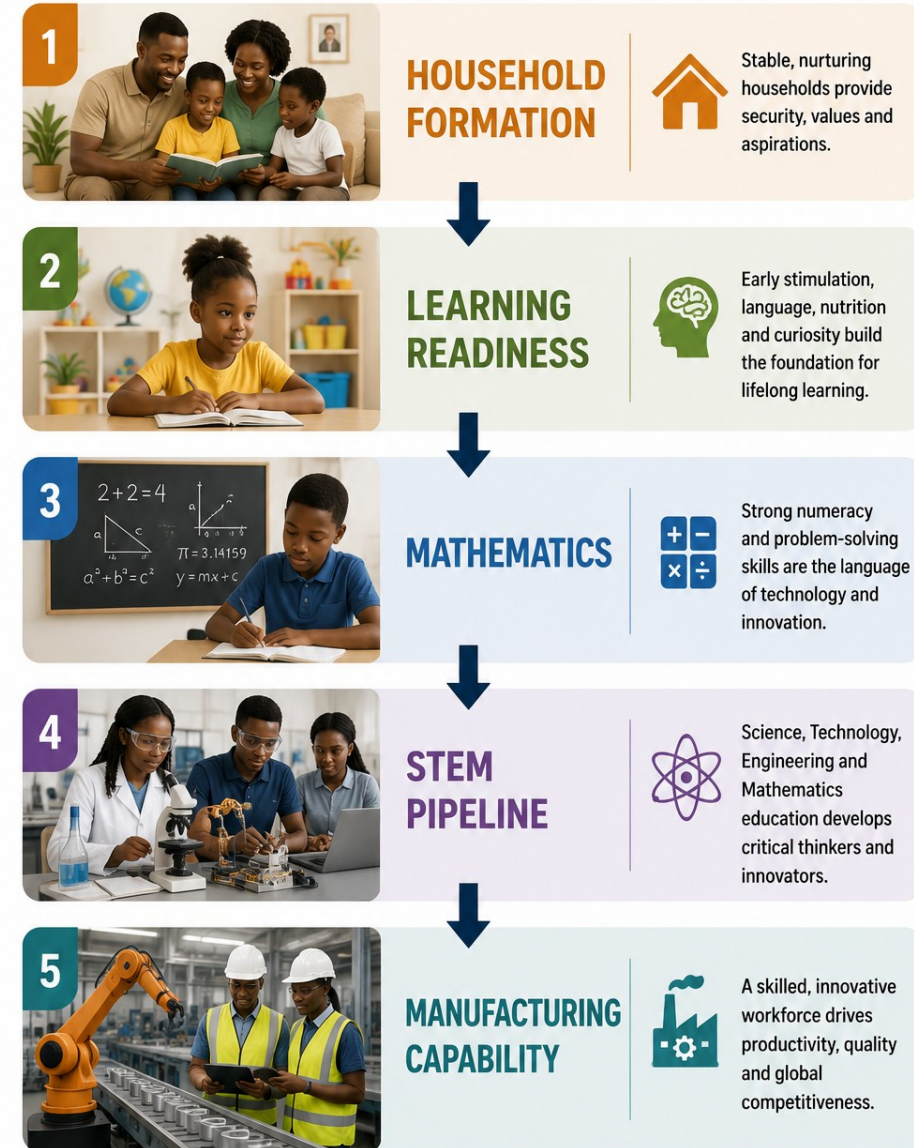
- There is an **80% probability** that a child is born either to an **unmarried parent** or to parents who, although married, do not **cohabit in the same household**.
- With the country's **marriage rate at only 20%**, marriage is therefore not the dominant household-forming arrangement.
- This means that **unmarried women are more likely to have children**, including, in some cases, children with different fathers, than women in cohabiting marriages.
- **Seven out of ten men and women are not employed formally**, leaving many female-led households dependent on a combination of **state support and financial contributions from the fathers of their children**.
- These financial contributions may enable women to **meet family and community obligations**, but they can also create **economic dependency and relational tensions**.
- The resulting dependencies and obligations can generate **tensions and conflicts within families (SS & Esc) more broadly, within the communities in which these households are embedded**.

Household Formation Is A STEM Issue

Headline:

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

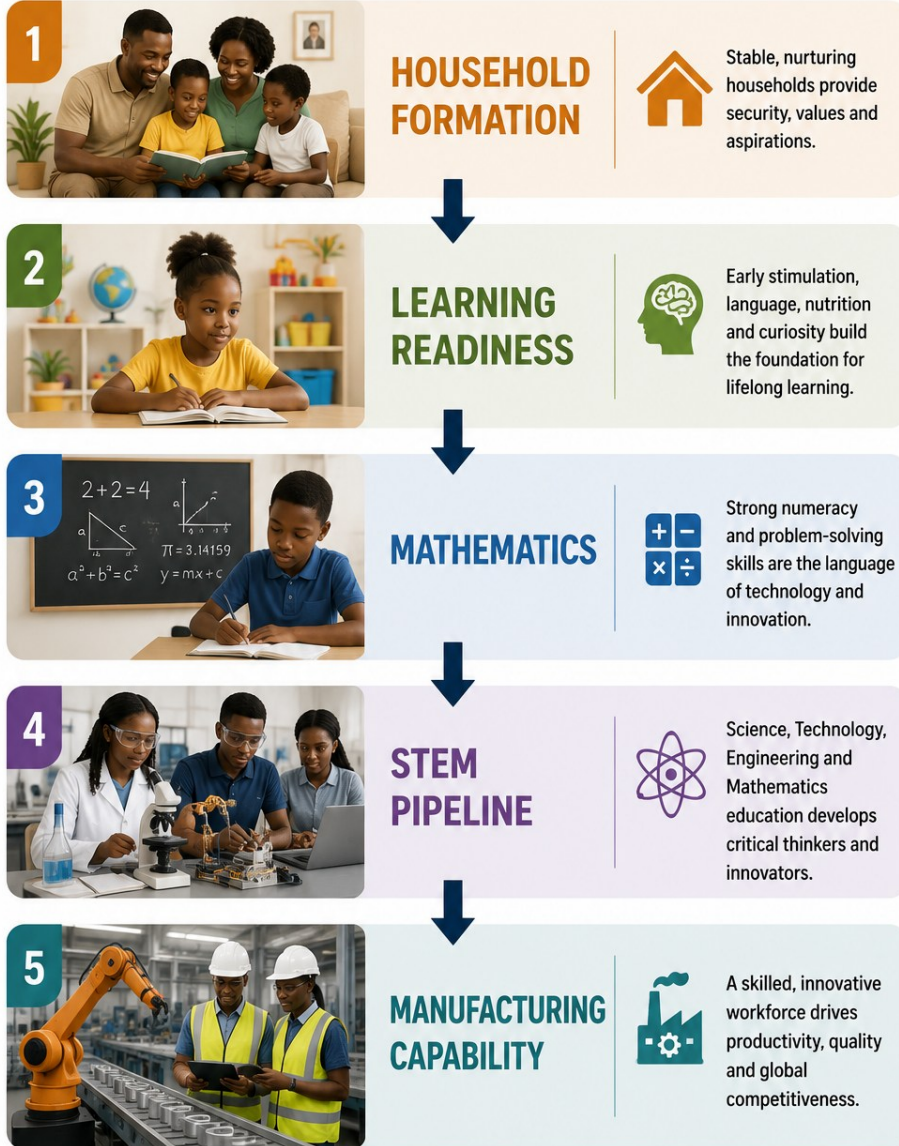
BUILDING A MANUFACTURING NATION The Human Capability Pipeline



STRONG FOUNDATIONS. SKILLED PEOPLE. COMPETITIVE NATION.
Invest early. Build the pipeline. Create prosperity for generations.

BUILDING A MANUFACTURING NATION

The Human Capability Pipeline

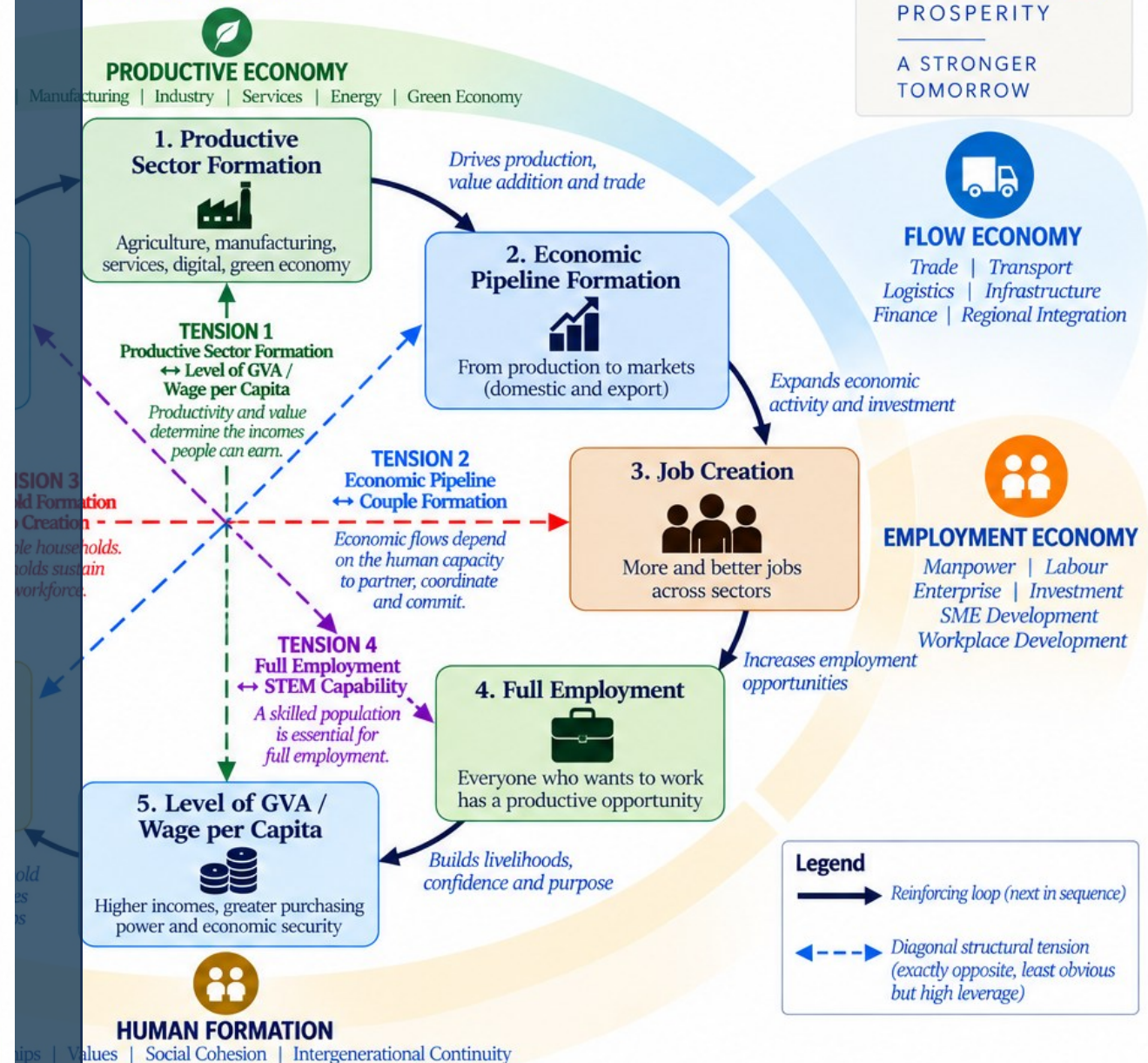


STRONG FOUNDATIONS. SKILLED PEOPLE. COMPETITIVE NATION.

Invest early. Build the pipeline. Create prosperity for generations.

Reinforcing Loop

Structural Tensions.



SEE THE SYSTEM. BUILD A BRIGHTER TOMORROW.

The Leverage is There – But It Is Buried

A strong society and a fully employed nation are built on strong relationships.

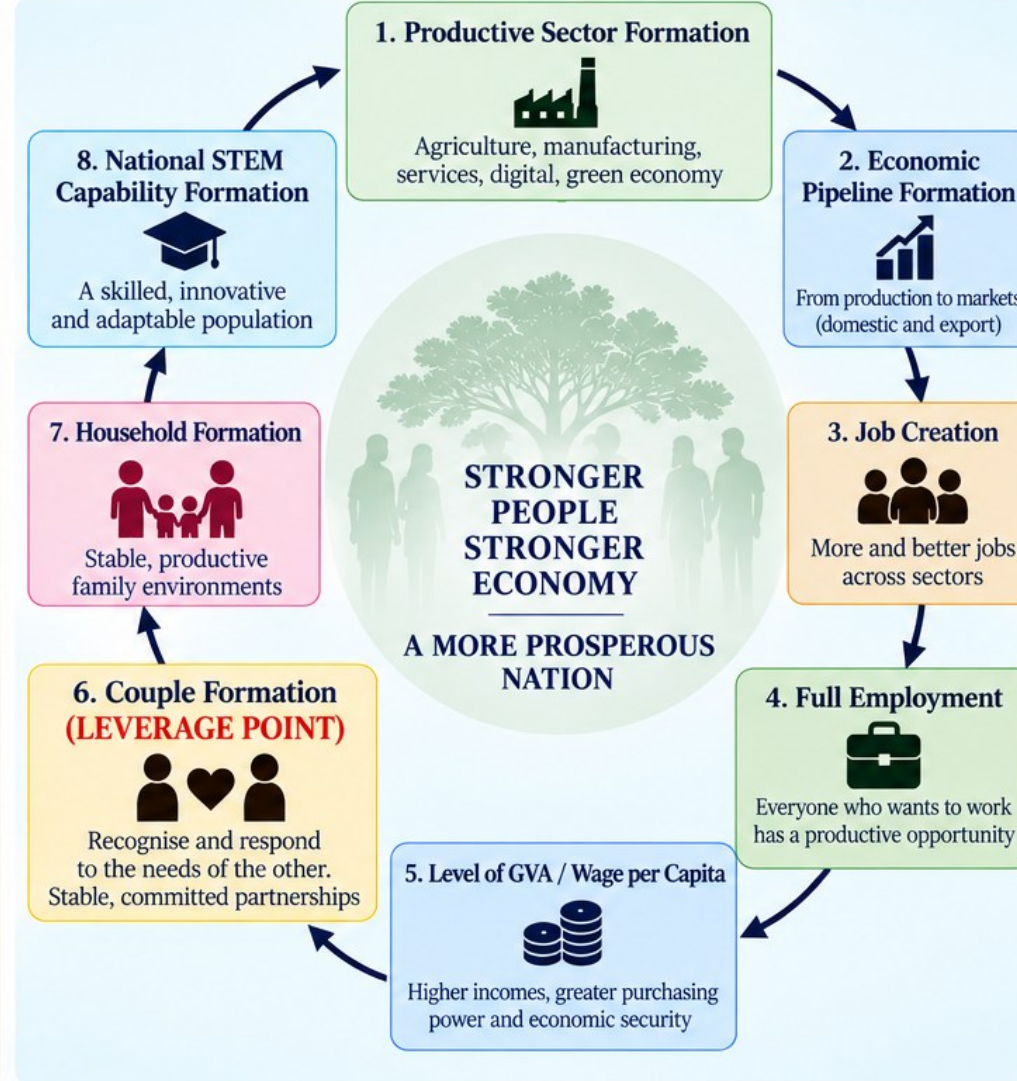
THE KEY INSIGHT

There is a **leverage point** in **couple formation**, and when this capacity is not fully developed, it reinforces a negative system structure that makes it difficult for a country to achieve full employment.

A weakly formed couple relationship does not remain a private issue.

It travels through the entire system — affecting families, households, human capability, productive sectors and the economy.

When individuals can recognise and respond to the needs of the other, its positive effects traverse and strengthen the whole system.



WHY THIS LEVERAGE IS HARD TO SEE

It is buried within social issues that often appear separate from the economy:



Gender-Based Violence (GBV)

Undermines trust, safety and stable partnerships



Single-Led Households

Often the result of relationship breakdown, abandonment or violence



Family Instability

Affects the nurturing environment for children



Perceived as a Social Issue

Not recognised as a driver of economic outcomes

Because it is seen in fragments, the connection to unemployment is not immediately obvious.

THE ROLE OF NATIONAL LEADERSHIP

The more national leadership understands these hidden leverages and their systemic relationships, the better they are able to lead the nation out of this trap.



Deeper seeing leads to better decisions, and better decisions create a stronger, more inclusive and prosperous nation.

When relationships are stronger, nations are stronger.

Investing in the foundations of people is not separate from economic policy — it is economic policy.

STRLDi

Systems Thinking Research &
Leadership Development Institute

PEOPLE
SYSTEMS
OPPORTUNITIES
PROSPERITY

PEOPLE
SYSTEMS
OPPORTUNITIES
PROSPERITY

SEE THE SYSTEM.
STRENGTHEN LEADERSHIP.
BUILD A BRIGHTER TOMORROW.
STRLDi

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	• Stage B	• Stage C	• Stage D
Resource Extraction	Manufacturing Operator	Manufacturing Design	Manufacturing Leadership
Examples:	Examples:	Examples:	Examples:
• Botswana • Namibia • Zambia	• Malaysia • Vietnam • Thailand • Mexico	• Germany • Japan • Taiwan • South Korea	• 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 / INVESTMENTS / SPENDING / GOVERNMENT SUPPORT DO NOT DETERMINE THE STAGE**
- **CITIZEN 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:

- Fertility Decline**
Decades of one-child policy led to a dramatic reduction in births, shrinking future cohorts of learners and workers.
- Household Compression**
Ageing grandparents, fewer working adults, fewer children and fewer siblings increase pressures on each productive adult and weaken developmental support.
- Educational Pressure vs Support**
High academic achievement does not always reflect strong household developmental support and learning readiness.
- 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?

Households remain developmentally stable

Educational support is strong

Learning readiness is consistently reproduced

STEM pathways are well developed

Institutions reinforce rather than compensate for household formation

Productive capability is transmitted across generations

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.

1. POPULATION



2.8
MILLION

2. TERTIARY GRADUATES



~250,000
(7-10% OF POPULATION)

3. PRODUCTIVE PIPELINE



~50,000
(~20% OF GRADUATES)
(~1-3% OF POPULATION)

4. ADMINISTRATIVE PIPELINE



~200,000
(~80% OF GRADUATES)
(~7-8% OF POPULATION)

Only ~1-3% of
the population
is in the productive
STEM pipeline.

PRODUCTIVE PIPELINE

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



Agriculture



Manufacturing



Engineering



ICT



Sciences



Farms



Factories



Industrial Parks



Exports



Jobs



UNIVERSITY

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 **STE** and STEM and manufacturing.

MORE RIGHT TALENT. MORE CAPABILITY. MORE PROSPERITY.

CONCLUSION: 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.

IF THIS IS THE PROBLEM— WHAT SIZE ECONOMY WOULD BE REQUIRED TO BREAK IT?

Botswana has now seen:

- Persistent unemployment
- The Behaviour Over Time
- Structural drivers
- Reinforcing conditions
- Sectoral constraints
- Productive capability limitations

THE QUESTION NOW CHANGES

- **WHAT WOULD BOTSWANA HAVE TO BUILD INSTEAD?**

OUR PEOPLE
OUR RESOURCES
OUR POTENTIAL
OUR FUTURE

DON'T CHASE THE WAVE. GET AHEAD OF IT.

LEARN FROM YESTERDAY. BUILD FOR TOMORROW. A PROSPEROUS BOTSWANA.

A BOLDER
MORE PRODUCTIVE
MORE INCLUSIVE
BOTSWANA

YESTERDAY

GAPS WE DID NOT
CLOSE FULLY

INDUSTRIAL CAPACITY

STEM CAPABILITY

TECHNICAL SKILLS

MANUFACTURING

TECHNOLOGY
ADOPTION

PRODUCTIVE
EMPLOYMENT

These gaps are real.
They must be addressed.

TODAY

TRYING TO CATCH UP

BOTSWANA

STRENGTHEN
EDUCATION

BUILD SKILLS

DEVELOP INDUSTRIES

EXPAND OPPORTUNITIES

WE CANNOT SPEND TOMORROW
CATCHING UP WITH YESTERDAY.

THE WORLD HAS MOVED AHEAD

INTO TOMORROW

ARTIFICIAL
INTELLIGENCE

ADVANCED
MANUFACTURING

AUTOMATION
& ROBOTICS

BIOTECHNOLOGY
& LIFE SCIENCES

CLEAN ENERGY
& GREEN INDUSTRIES

DIGITAL ECONOMY
& INTELLIGENT SYSTEMS

NEW INDUSTRIES.
NEW OPPORTUNITIES.
A DIFFERENT WORLD.

TOMORROW

OPPORTUNITIES FOR THOSE
WHO PREPARE TODAY

BOTSWANA

AHEAD OF
THE WAVE

CLOSE THE
CRITICAL GAPS.
THE FUTURE.
MOVE AHEAD.



1. REPAIR BELOW

Close the critical gaps
from the past.



2. BUILD AHEAD

Invest in the capabilities
for the future.



3. MOVE TOGETHER

Government, private sector,
education, communities.



A STRONGER, MORE PROSPEROUS BOTSWANA

People. Productivity. Possibility.

SAME PEOPLE. A BIGGER TOMORROW.

BOTSWANA MUST WORK BACKWARDS FROM THE FUTURE

FUTURE ECONOMIC PERFORMANCE



PRODUCTIVE SECTORS



ENTERPRISES & PRODUCTION



OCCUPATIONS



CAPABILITIES



EDUCATION & TRAINING

KEY MESSAGE:

- **UNEMPLOYMENT CANNOT BE SOLVED BY PRODUCING PEOPLE FIRST AND LOOKING FOR WORK FOR THEM LATER**

COUNT THE FUTURE

WHAT DOES THE ECONOMY ACTUALLY REQUIRE?

Botswana must begin to count:

- The people required to plan the economy
 - The people required to carry out the plans
 - The people required to produce
 - The capabilities required to carry the productive system
-
- **THE NUMBERS ARE NOT THE FINAL ANSWER.**
 - **THEY ARE THE BEGINNING OF THE QUESTION.**

THE CORE NATIONAL CAPABILITY REQUIREMENT

HOW MANY PEOPLE MUST THE ECONOMY CARRY

Core Economic Capacity	Today	5 Years	10 Years	20 Years
National Planning & Direction	6,000	7,500	9,000	12,000
Public Pipeline Execution	24,000	32,000	42,000	60,000
Direct Productive Workforce	384,515	2,502,000	2,685,000	3,080,000
TOTAL CORE CAPACITY	414,515	2,541,500	2,736,000	3,152,000

WHERE WILL THESE PEOPLE COME FROM?

THE UNEMPLOYMENT QUESTION LOOKS DIFFERENT WHEN THE FUTURE IS COUNTED

- **TODAY**
 - **384,515**
Direct Productive Personnel
- **IN 5 YEARS**
 - **2,502,000**
- **IN 10 YEARS**
 - **2,685,000**
- **IN 20 YEARS**
 - **3,080,000**

KEY MESSAGE:

- The problem is not simply that Botswana has unemployed people.
- **THE PROBLEM IS WHETHER BOTSWANA IS BUILDING AN ECONOMY LARGE ENOUGH TO CARRY THE PEOPLE WHO ARE COMING.**
- The critical shift is from asking **how many people are unemployed today** to asking **how much productive capacity the economy must build to absorb the workforce over the next 20 years.**

WHERE MUST THE PEOPLE WORK?

THE FUTURE PRODUCTIVE ECONOMY BY SECTOR

Productive Sector	20-Year Requirement
Agriculture & Primary Production	830,000
Agro-Processing	276,000
Manufacturing	608,000
Construction & Industrial Infrastructure	276,000
Energy, Water & Utilities	124,000
Transport & Logistics	276,000
ICT & Industrial Services	276,000
Other Productive Services	414,000
TOTAL	3,080,000

UNEMPLOYMENT WILL NOT DISAPPEAR UNTIL PRODUCTION HAS SOMEWHERE FOR PEOPLE TO GO.

WHO IS SUPPOSED TO BUILD THIS ECONOMY?

THE STEM-CAPABLE WORKFORCE

STEM-CAPABLE WORKFORCE	Today	5 Years	10 Years	20 Years
STEM-CAPABLE WORKFORCE	146,000	975,000	1,074,000	1,263,000

**BOTSWANA IS NOT TALKING ABOUT A FEW MORE SCIENTISTS.
IT IS BUILDING TOWARDS NEARLY HALF A MILLION STEM-CAPABLE
PEOPLE.**

THE DOMINO EFFECT OF NATIONAL UNEMPLOYMENT

The "Domino" Effect of National Unemployment

A Tool for Guiding Systemic Thinking

One reinforcing loop. Four engines.
Many connections. A more prosperous nation.

See the System.
Build a Brighter Tomorrow.

PEOPLE
SYSTEMS
OPPORTUNITIES
PROSPERITY

STRLDi

ENGINE 1 PRODUCTIVE CAPACITY *What we produce*

Agriculture | Manufacturing |
Industry | Services | Energy |
Green Economy

Capacity to grow
abundance
consistently

Size of the agriculture
sector that promotes
rainfall (e.g.
horticulture)

Quality of
production

Level of
skills

Quality of
experience

Quality of
Labour

Level of
academic
excellence

Level of
innovation &
creativity

Seeing results of
personal actions

Level of
rainfalls

Attention on
personal actions
that impact nature

Quality of academic
achievements in
mathematics and
sciences

Capacity to
assimilate
mathematics and
science subjects

Extent child grows up with
both maternal and paternal
influences with particularly
strong influence by the father
in the field of sciences.

EVENTS

What just happened?
Catching a cold.

React

PATTERNS/TRENDS

What trends have there been over time?
I've been catching more colds
when sleeping less.

Anticipate

UNDERLYING STRUCTURES

What has influenced the patterns?
What are the relationships between the parts?
More stress at work, not eating well, difficulty
accessing healthy food near home or work.

Design

MENTAL MODELS

What assumptions, beliefs and values do people hold
about the system? What beliefs keep the system in place?
Career is the most important piece of our identity,
healthy food is too expensive, rest is for the unmotivated.

Transform



ENGINE 2 ECONOMIC FLOW *How we bring value to markets*

Trade | Markets | Transport |
Logistics | Infrastructure |
Finance | Regional Integration

Growth of
GDP

Level of per capita
income / personal
income

Attention on need
for corrupt practices
/ crime

Level of personal
sense of
self-actualization

Attention on
meeting the needs
of the self

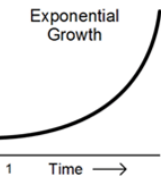
Attention on
meeting the needs
of another

Quality of
marital
relations

Level of
births

ENGINE 3 HUMAN FORMATION *Who we become*

Individuals | Couples |
Families | Values |
Social Cohesion |
Culture | Health |
Demography

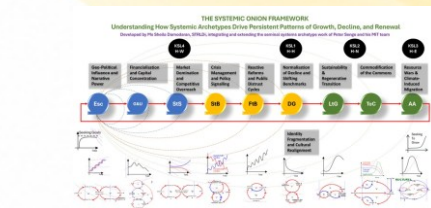


Legend

→ Causal link (reinforcing loop)

XX

System archetype (as labelled)



CAN BATSWANA GET THEIR STEM RIGHT?

YES.

But not simply by:

Adding more subjects

Buying more computers

Building more laboratories

Announcing another education reform

<https://sheilasingapore.blog/2026/09/13/can-we-get-our-stem-right/>

BOTSWANA MUST FIRST DECIDE:

What must the economy produce?



What sectors must produce it?



What people are required?



What capabilities are required?



THEN BUILD THE EDUCATION PIPELINE.

THE ECONOMY AND EDUCATION MUST BECOME ONE PIPELINE

THE NATIONAL ECONOMIC PIPELINE

PUBLIC SECTOR

DEFINE DEMAND



P-NEC



SECTOR OPERATING UNITS



CORRIDOR OPERATORS



CLUSTERS & PRODUCTION
SYSTEMS

PRODUCTIVE SECTOR

FARMERS



MANUFACTURERS &
PRODUCERS



LOGISTICS OPERATORS



DOMESTIC & EXTERNAL
MARKETS

RUNNING ALONGSIDE THE ENTIRE PIPELINE

EDUCATION → SKILLS →
EXPERIENCE → LICENSING →
PRODUCTIVE ENTRY

THIS IS WHERE
UNEMPLOYMENT AND STEM
FINALLY MEET.

INTEGRATED
PEOPLE.
PRODUCTIVE SECTORS.
REGIONAL MARKETS.
A STRONGER BOTSWANA.

A Productive Botswana: People, Capability and Opportunity in Motion

FROM POTENTIAL TO PROSPERITY — THROUGH A CONNECTED ECONOMY

PRODUCE
PROCESS
INNOVATE
TRADE
EMPLOY
PROSPER

A STRONGER
BOTSWANA
A BRIGHTER
SOUTHERN AFRICA

SUSTAINABLE
AGRICULTURE

AGRO-PROCESSING
& FOOD MANUFACTURING

MANUFACTURING
& VALUE ADDITION

CLEAN ENERGY
& INFRASTRUCTURE

LOGISTICS &
REGIONAL TRADE

DIGITAL ECONOMY
& INNOVATION

SKILLED PEOPLE
& THRIVING COMMUNITIES



HEALTHY SOILS
HEALTHY FOOD
HEALTHY PEOPLE
A RESILIENT
BOTSWANA

LOCAL
PRODUCTION
REGIONAL MARKETS
GLOBAL STANDARDS

CONNECTING
BOTSWANA
TO SADC
AND BEYOND



FOOD
SECURITY



INDUSTRIAL
DIVERSIFICATION



QUALITY
EMPLOYMENT



CLEAN
ENERGY



REGIONAL
CONNECTIVITY



INNOVATION
& TECHNOLOGY



SUSTAINABLE
COMMUNITIES

PEOPLE.
CAPABILITY.
PRODUCTION.
A STRONGER BOTSWANA.



STRLDi
SYSTEMS THINKING
RESEARCH & LEADERSHIP
DEVELOPMENT INSTITUTE

A PRODUCTIVE ECONOMY TURNS POTENTIAL INTO PROSPERITY FOR GENERATIONS.

THE COUNTRY ALREADY HAS A STARTING POINT USE THE PEOPLE BOTSWANA HAS ALREADY PRODUCED

1. EXISTING EXPERTISE

- Experienced Batswana locally and overseas.

2. EXISTING WORKFORCE

- People who can be upgraded and repositioned.

3. FUTURE WORKFORCE

- Students moving through the education system.

4. CAPABILITY BUILDERS

- Teachers, trainers, curriculum architects and assessors.

BUILD ALL FOUR AT THE SAME TIME.

THE ECONOMY AND EDUCATION MUST BECOME ONE PIPELINE

THE NATIONAL ECONOMIC PIPELINE

YEARS 1–5

CAPABILITY BEGINS

- Existing expertise mobilised
- National architecture established
- Teachers strengthened
- Public institutions upgraded
- Education pathways redesigned
- Productive pipelines strengthened

YEARS 6–10

CAPABILITY BECOMES VISIBLE

- Stronger cohorts enter productive sectors
- STEM workforce expands
- Manufacturing capability deepens
- Technical agricultural capability expands
- Public institutions become more capable
- Economic pipelines become stronger

YEARS 11–20

CAPABILITY REPRODUCES ITSELF

- Domestic expertise deepens
- Botswana increasingly produces its own specialists
- Technical institutions become stronger
- Productive sectors become more sophisticated
- Research and production become increasingly integrated
- External dependency progressively reduces

THE NUMBERS DO NOT NEED TO ALARM BOTSWANA THEY NEED TO GUIDE BOTSWANA.

The alarm should come if Botswana reaches the future and discovers that it needs:

- **12,000**
 - People capable of seeing and planning the economy.
- **60,000**
 - People capable of carrying the public pipeline.
- **1,115,000**
 - People capable of carrying productive work.
- **457,250**
 - People with the STEM capability required to build and sustain the system.
- **AND DISCOVERS THIS TWENTY YEARS TOO LATE.**
- **TRANSITION BACK INTO THE EXISTING STUDY**
- **THE QUESTION HAS NOW BEEN ESTABLISHED:**
- **WHAT MUST BOTSWANA BUILD TO CARRY ITS FUTURE POPULATION?**

THE PIPELINE CANNOT BE LEFT TO CHANCE.

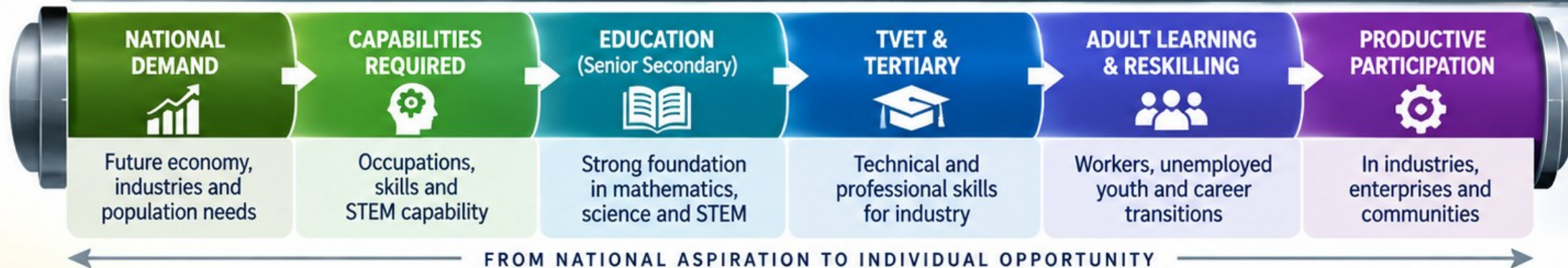
DESIGN TODAY. DEVELOP TOMORROW. A PROSPEROUS BOTSWANA.

FROM
POTENTIAL
TO PRODUCTIVE
PARTICIPATION

A nation does not accidentally produce the capability required to carry a larger and more complex economy. If the pipeline is not deliberately designed, we may produce people — but not the people required, in the numbers required, at the time they are required.

A DELIBERATELY DESIGNED STEM PIPELINE

EVERY STAGE CONNECTS.
EVERY STAGE MATTERS.



IF THE PIPELINE IS LEFT TO CHANCE...

- Skills shortages and unemployment
- Reliance on imported expertise
- Lost investment and delayed development
- Frustrated households and social pressures
- Speculative pathways to wealth
- A productive economy unable to absorb its own population



IF THE PIPELINE IS DELIBERATELY DESIGNED...

- The right people, with the right skills, at the right time
- Stronger industries and value creation
- Local innovation and technological capability
- Inclusive opportunities across the population
- Resilient communities and a more stable society
- A self-reliant and prosperous Botswana

"We do not leave our water, energy or transport systems to chance. We should not leave our people pipeline to chance."



**DESIGN THE PIPELINE.
BUILD THE NATION.**

SKILLED PEOPLE
STRONGER INDUSTRIES
BRIGHTER COMMUNITIES
A PROSPEROUS BOTSWANA

THE NEXT QUESTION IS:

HOW DOES THE COUNTRY ORGANISE THE ECONOMY TO BUILD IT?

*A connected economy.
A capable people.
A stronger Botswana.*

*Every sector has a role.
Every Motswana has a place.*

**FROM POTENTIAL TO PROSPERITY
TOGETHER WE BUILD BOTSWANA**

*A productive today.
A brighter tomorrow.*

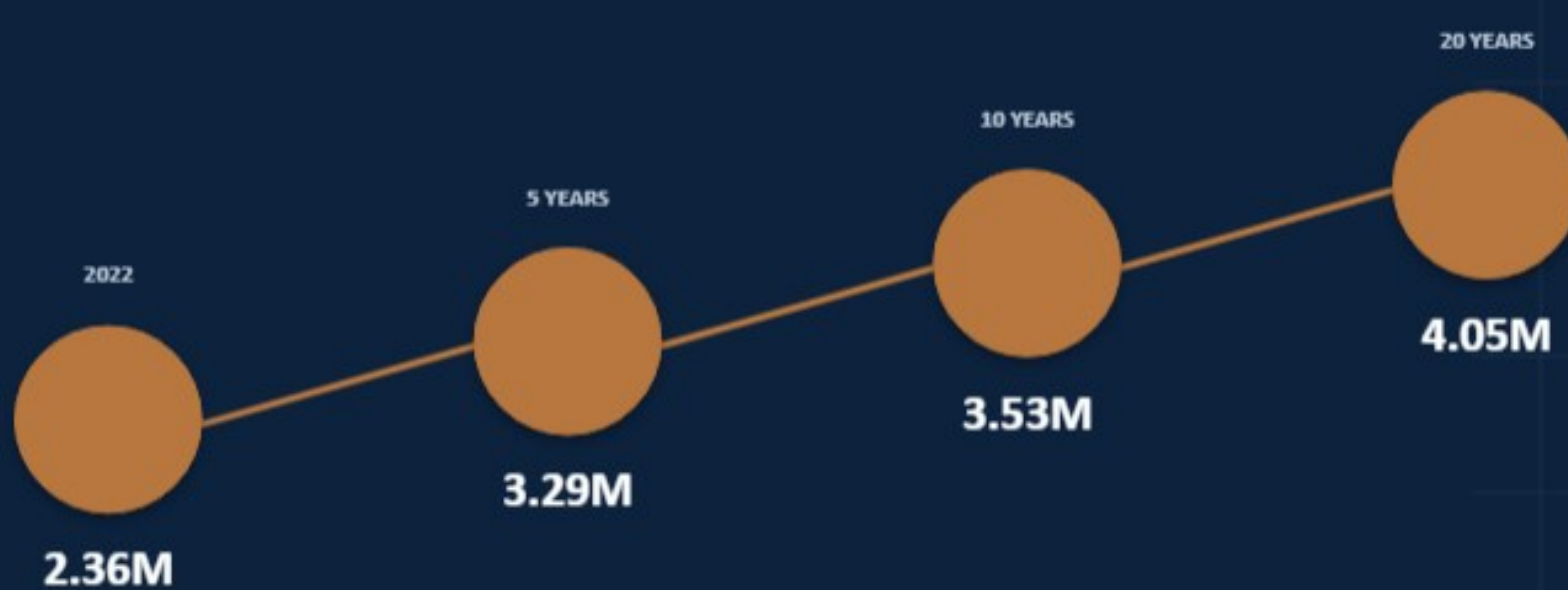


BUILDING THE NATIONAL ECONOMIC PIPELINE

**FOR BOTSWANA AND SOUTHERN AFRICA
AS THE GROUND IS MOVING**

THE GROUND IS MOVING

Botswana is not planning for a static population.



The question is not simply how many people Botswana will have.

The question is what productive system will be ready to receive them.

STRLDi Article
Published: 1 September 2026

THE GROUND IS MOVING

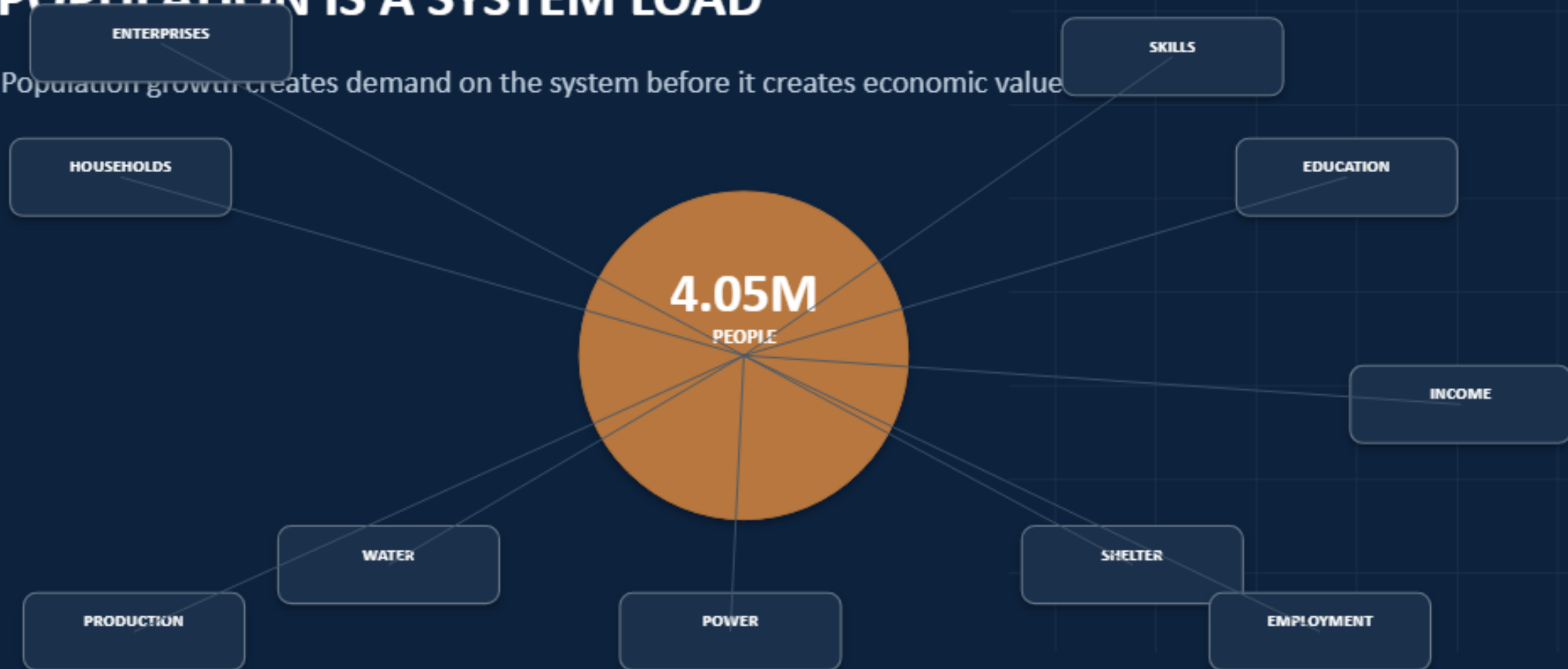
Intent of the article:

To make visible the economic choice facing Botswana as its population and economic load continue to grow—and to show, through a 5-, 10-, and 20-year trajectory, that the issue is not simply whether GDP grows, but whether the country builds the productive capacity, physical infrastructure and organisational system capable of converting its growing population into productive value.

The article is deliberately a gateway into the STRLDi National Economic Operating System. It does not attempt to present the entire operating system; rather, it establishes the question that makes the operating system necessary: as the ground moves beneath the country, what economic system will be ready to receive the population coming next?

POPULATION IS A SYSTEM LOAD

Population growth creates demand on the system before it creates economic value



The population increment must be received by physical, human and productive capacity.

TWO TRAJECTORIES — SAME POPULATION

Scenario B measures Botswana as if it develops the productive characteristics of the four-country composite — with a 90:10 private–public employment

SCENARIO A

Botswana's existing structural trajectory continues.

GVA / WORKER

P251K

YEAR-20 TOTAL GVA

P1.018T

SCENARIO B

Botswana's trajectory is modelled against a four-country composite of Germany, Switzerland, Japan and Korea, using a 90:10 private/productive–public workforce structure as the reference architecture.

GVA / WORKER

P776K

YEAR-20 TOTAL GVA

P3.143T

The population is held constant. What changes is the productive architecture through which that population passes.

PEOPLE DO NOT ENTER AN ECONOMY WITHOUT PHYSICAL CAPACITY

The population trajectory requires a corresponding build-out of the institutions that form, equip and absorb people.

TODAY
~ 822
~ 295
~ 47 Public instituions / 128 accredited TVET providers
62
No national system count
No national system count

SCENARIO B CAPACITY NODES	5 YEARS	10 YEARS	20 YEARS
Basic Schools	≈1,750	≈1,900	≈2,200
Secondary Schools	≈700	≈760	≈880
TVET / Technical	≈100	≈125	≈160
STEM Institutions	20	25	30
Agricultural Learning Centres	100	150	200
Enterprise Apprenticeship Centres	150	250	350

Scenario B makes the required institutional scale visible: capacity must be built ahead of the population load.

THE ENTERPRISE MACHINE

The organisations required to turn population into productive employment

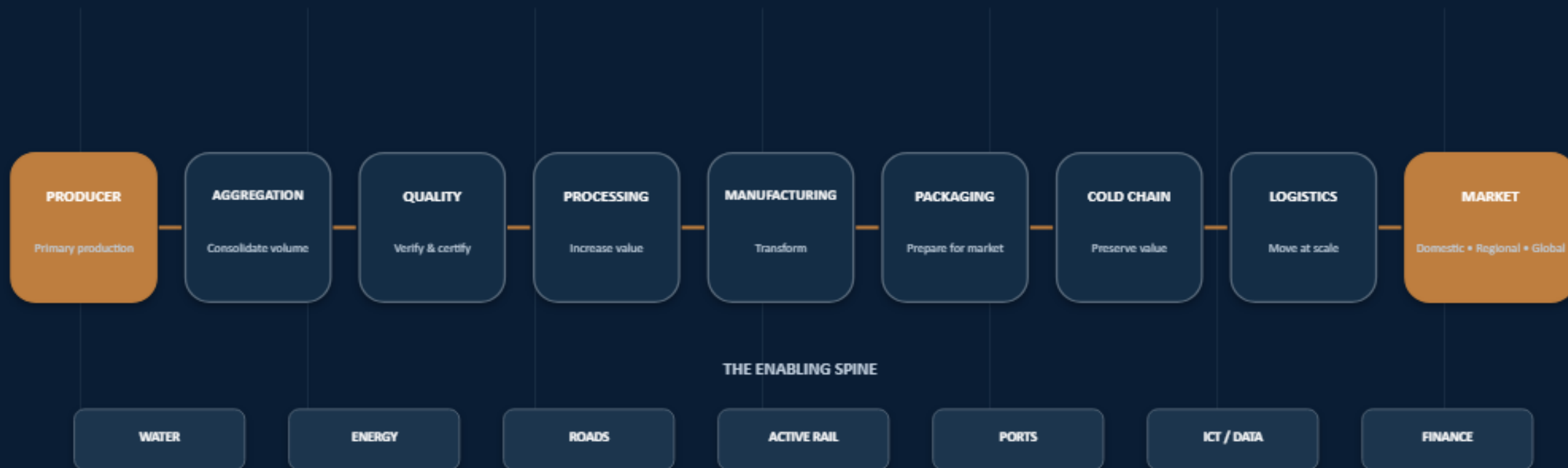
	PRODUCTION	PROCESSING	MANUFACTURING	LOGISTICS	EXPORT
Enterprise system	TODAY	5 YEARS	10 YEARS	20 YEARS	
Agricultural enterprises	408	11,120	14,920	20,540	
Employees	13,838	556,000	746,000	1,027,000	
Manufacturing enterprises	2,366	5,560	7,460	8,560	
Employees	22,754	556,000	746,000	856,000	
Heavy industry / utilities enterprises	3,035	5,560	5,960	6,840	
Employees	28,127	417,000	447,000	513,000	
Service / logistics enterprises	18,706	38,920	29,840	27,360	
Employees	319,796	973,000	746,000	684,000	
TOTAL ENTERPRISES	24,515	61,160	58,180	63,300	
TOTAL EMPLOYMENT	384,515 formal	2,502,000	2,685,000	3,080,000	

Planning assumption: these enterprise targets operate within a functioning corridor system — road + active rail where appropriate + ports + energy + water + ICT.

Source note: CIPA registrations ≠ operating enterprises. CIPA records registered companies/business names (reported 129,015); Statistics Botswana's SBR records active formal establishments.

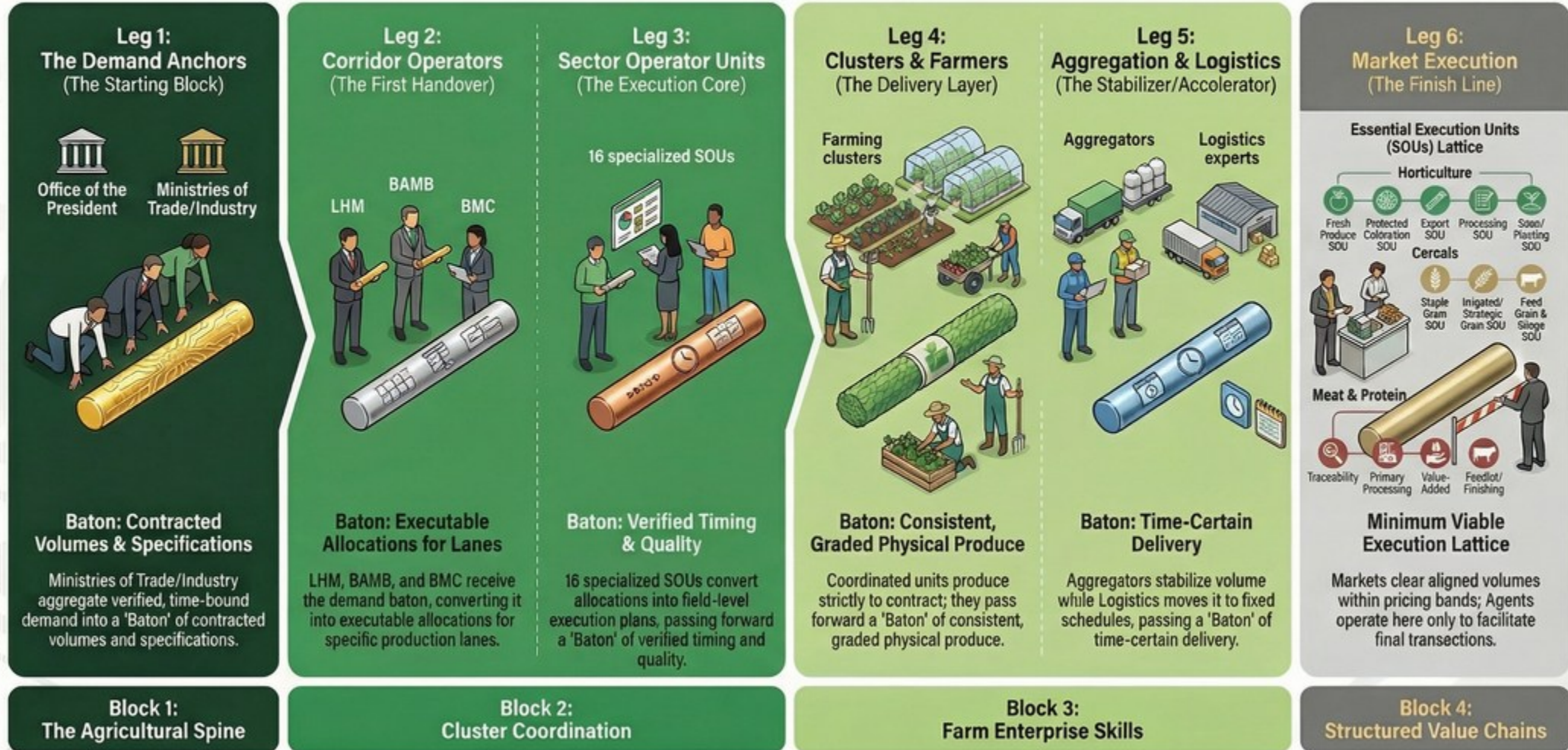
THE PRODUCTION SPINE

Everything before this point is preparation for one thing: making value move.



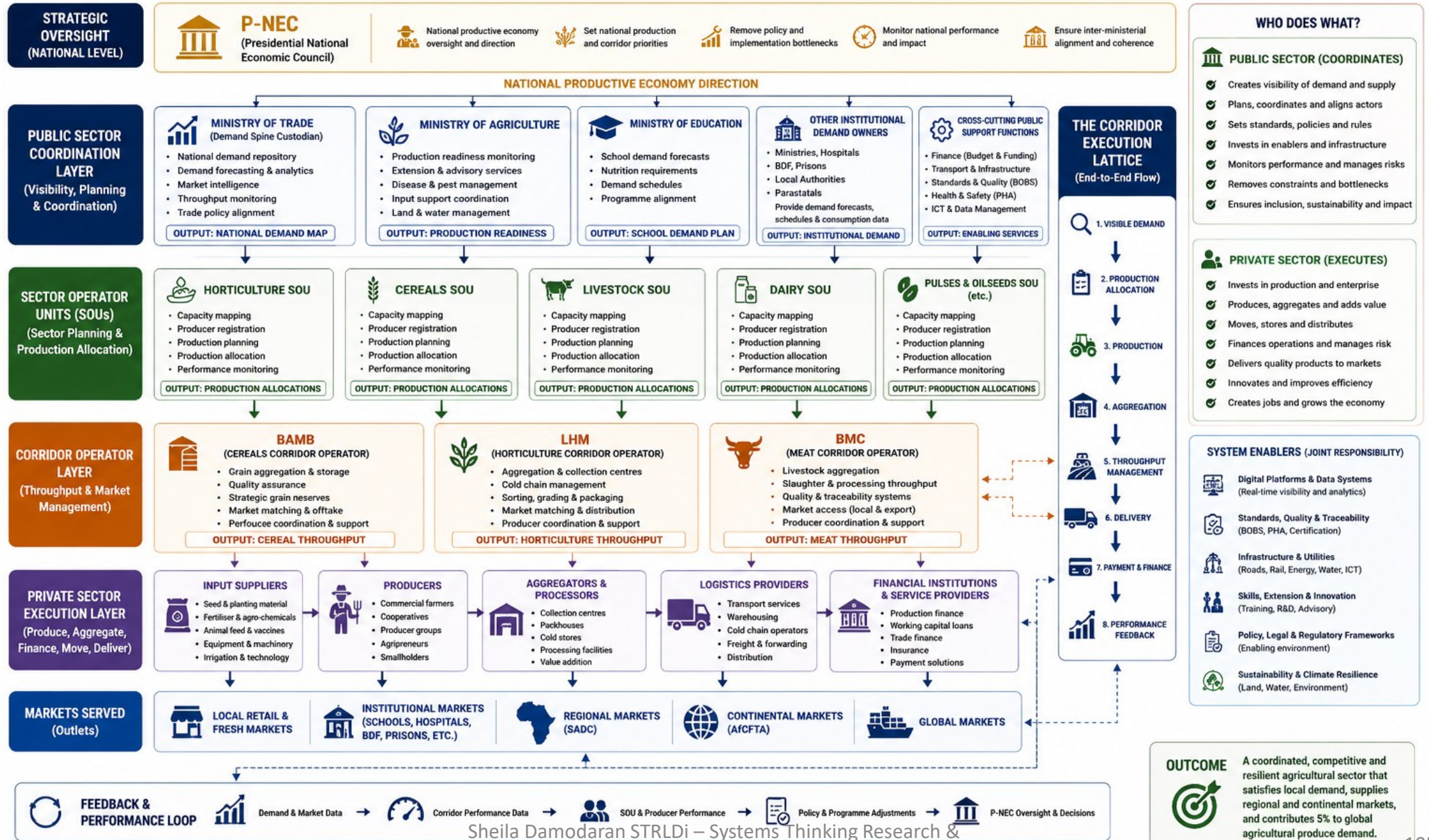
PRODUCTION IS NOT THE END OF THE PIPELINE. VALUE EXISTS ONLY WHEN IT CAN MOVE.

The Agricultural Relay: Passing the Baton for National Throughput



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.

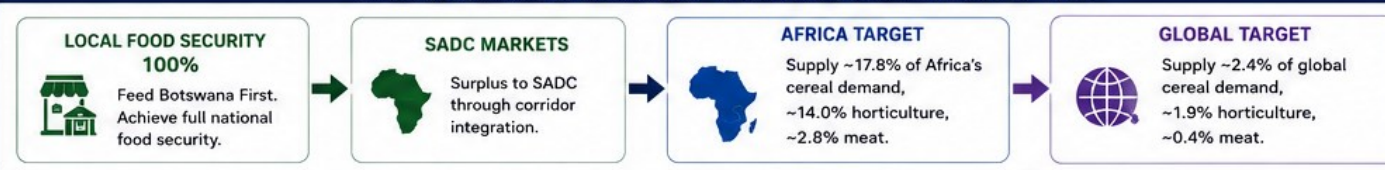
AGRICULTURE CORRIDOR EXECUTION LATTICE 2.0

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





ROOTED IN
BOTSWANA
GROWING FOR
TOMORROW

From Our Farms to the World

A Productive Pipeline for Botswana's People, Economy and Future

Growing farmers. Building enterprises. Creating jobs. Supplying local, regional, continental and global markets.

BIGGER MARKETS
HIGHER PRODUCTIVITY
BETTER LIVELIHOODS
A STRONGER BOTSWANA

LOCAL

Botswana's own communities, enterprises, industries and productive economy.



*Strong farmers
Strong communities
A productive Botswana*



FARMERS NEEDED
20,000

Commercial and emerging farmers supplying local markets



AVERAGE MONTHLY INCOME
PER FARMER (TARGET)
P8,000 – P12,000

From productive, market-linked farming

REGIONAL

Southern African production systems, markets and value chains.



FARMERS NEEDED
100,000

Supplying regional markets and value chains (SADC)



AVERAGE MONTHLY INCOME
PER FARMER (TARGET)
P12,000 – P18,000

From larger volumes and contracted markets

CONTINENTAL

Africa's wider markets, productive systems and opportunities.



FARMERS NEEDED
500,000

Supplying continental markets and agro-processing hubs



AVERAGE MONTHLY INCOME
PER FARMER (TARGET)
P18,000 – P30,000

From higher value production, processing and exports

GLOBAL

Global knowledge, technology, scientific and economic systems.



FARMERS NEEDED
1,000,000

Supplying global markets and specialised value chains



AVERAGE MONTHLY INCOME
PER FARMER (TARGET)
P30,000 – P50,000+

From high-value, technology-enabled, export-oriented production



Develop Farmers
Training, land access, finance, extension



Build Enterprises
Aggregation, processing, logistics, storage



Create Jobs
On-farm and off-farm across the value chain



Increase Earnings
From survival income to competitive wages



Plug into Markets
Local → Regional → Continental → Global

A PEOPLE-CENTRED
PRODUCTIVE BOTSWANA
THAT COMPETES GLOBALLY



BITC
BOTSWANA INSTITUTE
FOR TECHNOLOGY AND CAPABILITY

FARMERS | ENTERPRISES | SKILLS | VALUE CHAINS | MARKETS | A PROSPEROUS BOTSWANA

*From Botswana
To The World*

THE THREE STRUCTURAL HURDLES

Why strengthening individual parts does not automatically move the system.

1

RELATIONAL GLUE

The system requires people and institutions capable of working across boundaries, rather than operating as isolated functions.

2

THE ARTISAN FALLACY

Training people to perform individual tasks does not automatically create the organisational architecture capable of absorbing their capability.

3

THE SILENT THERMOSTAT

The system can continuously regulate itself back toward its existing structure unless the underlying control architecture changes.

WHAT HAPPENS WHEN WE KEEP STRENGTHENING INDIVIDUAL PARTS WITHOUT CHANGING THE SYSTEM THAT CONNECTS THEM?

Parts can improve while the system continues to reproduce the same outcome.

THE CHOICE

The ground is moving. The question is whether the economic system moves with it.

SCENARIO A | CONTINUE THE TRAJECTORY

Move roughly the same population through an economy whose productive structure remains largely unchanged.

More people → more pressure → existing capacity

SCENARIO B | BUILD THE SYSTEM

Use the same demographic period to deliberately construct the productive system capable of receiving the next population increment.

People → Capability → Organisations → Production → Value

INCOME → REINVESTMENT → EXPANDED PRODUCTIVE CAPACITY → NEXT POPULATION INCREMENT

THE CHOICE IS NOT WHETHER THE POPULATION WILL COME. IT IS WHAT SYSTEM WILL BE READY FOR IT.

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 without STEM capability
- Legal practitioners
- General graduates
- While importing productive / STEM 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

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.



A STRONGER
ECONOMY
A MORE INCLUSIVE
BOTSWANA

Two Sides. One Capability. One Nation.

PEOPLE • KNOWLEDGE • OPPORTUNITY • A BRIGHTER BOTSWANA

FROM
POTENTIAL
TO PROSPERITY
TOGETHER

PRODUCTIVE ECONOMY

JOBS • INDUSTRIES • OPPORTUNITIES



AGRICULTURE
& AGRO-PROCESSING



MANUFACTURING
& VALUE ADDITION



MINING
& MINERALS



LOGISTICS
& TRADE



ENGINEERING
& CONSTRUCTION



TECHNOLOGY
& INNOVATION



THINK



ANALYSE



SOLVE

STEM CONFIDENCE

Mathematics
Science
Technology
Engineering
Problem Solving
Systems Thinking

PUBLIC SECTOR CAPABILITY

POLICY • PLANNING • INVESTMENT • DELIVERY



PLANNING &
STRATEGY



INVESTMENT
ASSESSMENT



BUDGETING &
RESOURCE ALLOCATION



INFRASTRUCTURE
PLANNING



PROCUREMENT &
COORDINATION



PROGRAMME
EVALUATION

NATURAL
RESOURCES
PEOPLE
ENTERPRISE
VALUE CREATION

EFFECTIVE
INSTITUTIONS
QUALITY SERVICES
ACCOUNTABILITY
A RESILIENT
BOTSWANA



When STEM Confidence is widespread,
Productive Economies expand and Public Institutions perform.



Economic
Diversification



Higher
Productivity



Jobs &
Inclusion



Sustainable
Growth



Better
Decisions



Greater
Coordination



Efficient
Implementation



Improved
Outcomes

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



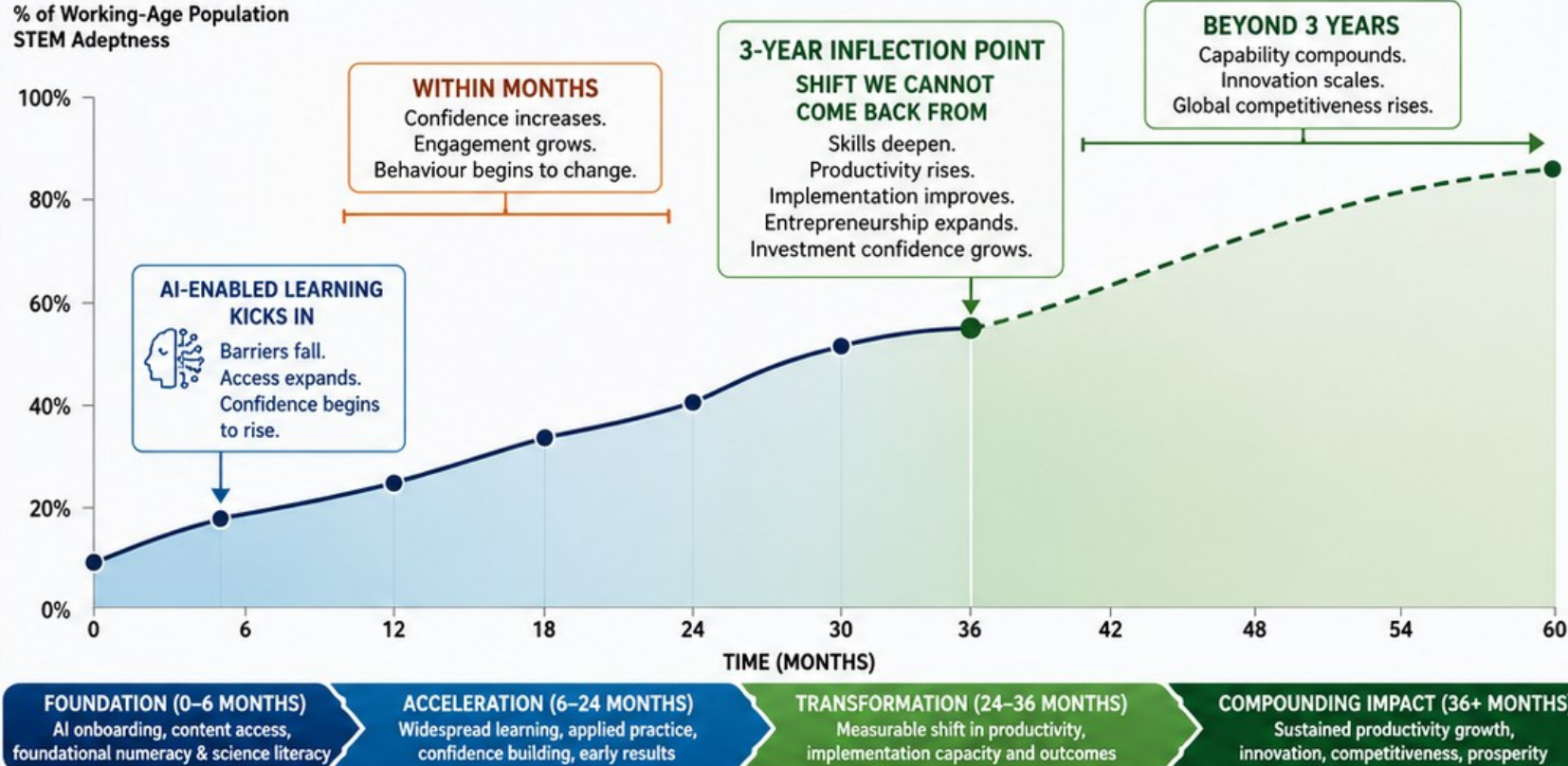
Technical Reasoning
• Systems Thinking
• Problem Solving
• Experimentation



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



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."

STEM CANNOT STEER ITSELF

Botswana cannot expect individual institutes, institution and education providers to independently determine what STEM capability the nation requires. The country requires one national architecture capable of connecting the future economy, education, skills development, technology and the existing population.

A MORE
PROSPEROUS
BOTSWANA
THROUGH
PEOPLE, SKILLS
AND INNOVATION

THE NATIONAL STEERING ARCHITECTURE



THE PRESIDENCY

National Direction and Political Stewardship

VISION
COMMITMENT
COORDINATION
ACCOUNTABILITY



NATIONAL STEM STEERING GROUP

15–20 National and International Experts

EXPERTISE
GUIDANCE
CHALLENGE
KNOWLEDGE TRANSFER

FOUR NATIONAL CAPABILITY COUNCILS



1 Productive Economy & STEM

Determine the capability required by the future economy.



2 Education & Future Learning

Prepare the next generation for the future.



3 Skills, TVET & Adult Transition

Upgrade and convert the existing population.



4 Science, Technology & Innovation

Build advanced scientific and technological capability.



ALIGNED NATIONAL INSTITUTIONS

Policies | Funding | Regulation | Implementation | Monitoring



SCHOOLS



TVET



UNIVERSITIES



INDUSTRY



ADULT POPULATION

ONE NATIONAL DIRECTION. MULTIPLE DELIVERY SYSTEMS.

PEOPLE
CAPABILITY
OPPORTUNITY
PROSPERITY

A
PRODUCTIVE
PEOPLE
A PROSPEROUS
BOTSWANA



SKILLED
PEOPLE
STRONGER
INDUSTRIES
A BRIGHTER
BOTSWANA

FROM THE FUTURE ECONOMY TO THE BATSWANA POPULATION

THE ECONOMY MUST DEFINE THE CAPABILITY REQUIRED

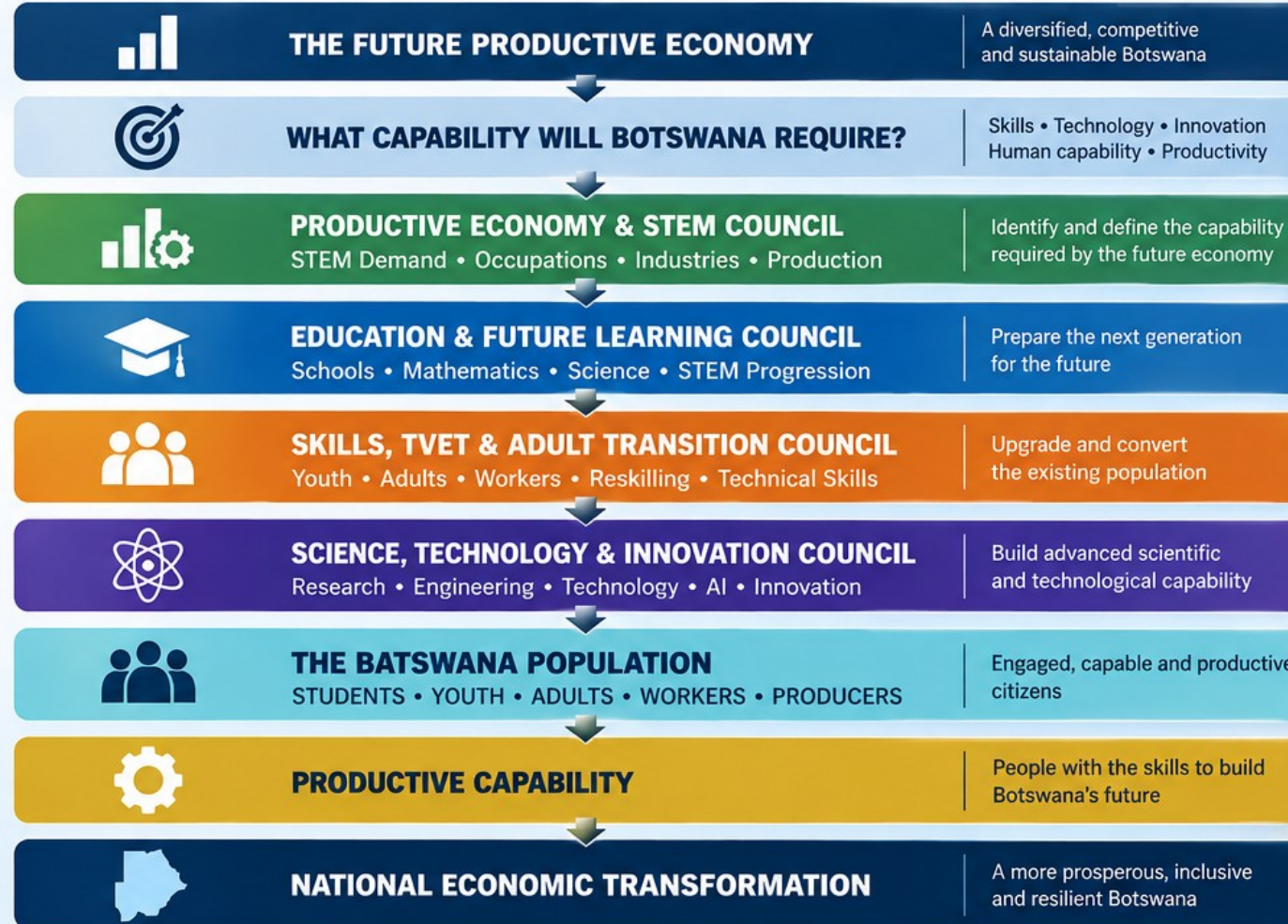
STEM cannot begin with the question: What subjects should students study? Botswana must first determine what kind of productive economy it intends to build and then work backwards to establish the scientific, technical and human capability required to build it.

PEOPLE
CAPABILITY
PRODUCTIVITY
A BRIGHTER
BOTSWANA

A
PRODUCTIVE
PEOPLE
A PROSPEROUS
BOTSWANA



SKILLS
INNOVATION
INDUSTRIES
OPPORTUNITY
FOR ALL



CAPABILITY
TODAY
TOMORROW
TOGETHER



ONE PEOPLE
ONE DIRECTION
A BRIGHTER
BOTSWANA



THE FUNDAMENTAL SHIFT

**THE ECONOMY DEFINES
THE CAPABILITY REQUIRED.**

**THE NATIONAL SYSTEM
DEVELOPS IT.**

**THE POPULATION
CONNECTS TO IT.**

BOTSWANA DOES NOT HAVE TO LEARN THIS ALONE

BUILD NATIONAL CAPABILITY BY LEARNING FROM THOSE WHO HAVE ALREADY STEERED TRANSFORMATION

Botswana should not spend twenty years discovering alone what other nations have already learned through decades of economic, scientific, educational and technological transformation. A small group of internationally recognised experts can help Botswana accelerate its learning while deliberately transferring the knowledge required for Botswana to eventually steer their own systems with confidence.

PEOPLE
CAPABILITY
INNOVATION
A STRONGER
BOTSWANA



THE NATIONAL STEM STEERING GROUP 15 – 20 PEOPLE BOTSWANA'S NATIONAL LEADERSHIP AND EXPERTS

Working alongside carefully selected international capability:

AREA OF EXPERIENCE		INDICATIVE NUMBER
	National Economic Transformation	3 – 4
	Education Transformation	3 – 4
	STEM & Science Development	2 – 3
	AI & Future Learning	2 – 3
	TVET & Skills Systems	2 – 3
	Industrial & Productive Development	2 – 3
	Systems Integration	1 – 2



GLOBAL EXPERIENCE

Proven strategies and lessons learned



LOCAL OWNERSHIP

Working with Botswana to build national capability



KNOWLEDGE TRANSFER

Building skills and institutional strength



ACCELERATED PROGRESS

Avoiding a 20-year learning curve

GLOBAL
KNOWLEDGE.
NATIONAL
PROGRESS.

A BRIGHTER
BOTSWANA
BUILT BY
BOTSWANA

LEARN
CONNECT
ADAPT
BUILD
TOGETHER



THE PRINCIPLE

BRINGING THE WORLD'S EXPERIENCE TO BOTSWANA— TO BUILD BOTSWANA'S CAPACITY TO STEER.

They are not here to do Botswana's work. Botswana must learn from them, work with them and progressively acquire the knowledge and discipline required to stand on their own two feet—rather than continue following blindly or depending permanently on others.



INTERNATIONAL EXPERIENCE



BOTSWANA LEADERSHIP



NATIONAL CAPABILITY



A BRIGHTER BOTSWANA

PEOPLE
SKILLS
INNOVATION
OPPORTUNITY
A STRONGER
BOTSWANA

*Today's
learning
for tomorrow's
economy*

BOTSWANA'S SECRET KEY: COMPRESSING TIME

WHAT IF BOTSWANA DOES NOT HAVE TO WAIT FOR MORE STEM TEACHERS?

Botswana does not currently have enough STEM teachers to rapidly develop the scale of capability required by the future economy. The conventional response would be to wait for more teachers to be trained, more students to graduate and new generations to enter the economy. Botswana may not have that time.

A MORE
PROSPEROUS
BOTSWANA
THROUGH
PEOPLE, SKILLS
AND INNOVATION

THE CONVENTIONAL PATH



TRAIN MORE STEM TEACHERS



Teach Students



Wait for Graduates



Train Adults Separately



Upgrade Workers Separately



SEQUENTIAL TRANSFORMATION

SLOWER • MORE DEPENDENCIES • HIGHER COSTS

BOTSWANA'S CAPABILITY ACCELERATOR

AI-GOVERNED LEARNING FROM SENIOR SECONDARY ONWARDS

ANYTIME • ANYWHERE • PERSONALISED • BOTSWANA-RELEVANT

SENIOR SECONDARY



- Advanced STEM Learning
- Mathematics & Science
- Career Exploration

TERTIARY & TVET



- Technical & Professional Learning
- Engineering & Technology
- Industry Pathways

ADULT POPULATION



- Reskilling & Capability Upgrading
- Workers & Unemployed Youth
- Producers & Entrepreneurs

MULTIPLE POPULATIONS DEVELOP SIMULTANEOUSLY

FASTER CAPABILITY DEVELOPMENT • GREATER REACH • A STRONGER ECONOMY



AI DOES NOT REPLACE THE TEACHER.

IT REMOVES THE LIMITATION OF THE TEACHER AS THE SOLE CARRIER OF KNOWLEDGE.

BOTSWANA CAN THEN DELIBERATELY DEVELOP FEWER, DEEPER AND MORE EXCEPTIONAL STEM EDUCATORS.

INVEST
IN PEOPLE
BUILD
CAPABILITY
CREATE
OPPORTUNITY

PEOPLE
NATURAL RESOURCES
KNOWLEDGE
INNOVATION
A BRIGHTER
BOTSWANA



LEARN TODAY
LEAD TOMORROW



SKILLS FOR A PRODUCTIVE NATION



INCLUSIVE OPPORTUNITY



SUSTAINABLE GROWTH

INVEST ONCE. MULTIPLY CAPABILITY FOR GENERATIONS.

A DIFFERENT NATIONAL CAPABILITY EQUATION

Botswana does not need to choose between developing more teachers and developing better teachers. It can use AI to multiply the reach of exceptional expertise while investing deliberately in developing STEM educators of the highest calibre for this generation and those that follow.

SKILLED PEOPLE
INNOVATIVE
INDUSTRIES
INCLUSIVE
OPPORTUNITIES
A STRONGER
BOTSWANA

PEOPLE
CAPABILITY
PROSPERITY
TOGETHER

CONVENTIONAL MODEL MORE OF THE SAME	BOTSWANA'S CAPABILITY MODEL A SMARTER, FASTER FUTURE
 More teachers required for more learners	 Exceptional expertise multiplied through AI
 Learning progresses sequentially	 Multiple populations learn simultaneously
 Adults return to separate programmes	 Adults learn continuously
 TVET operates separately	 AI + TVET + Industry connected
 Expert knowledge limited by classroom reach	 Expert knowledge reaches the population at scale
 Teacher delivers most knowledge	 Teacher develops thinking and application
 Generational transformation	 Population + Generational transformation

THE MAIN PRIZE IS NOT ONLY COST. THE MAIN PRIZE IS TIME.



SENIOR SECONDARY STUDENTS
ADVANCE NOW.



TVET STUDENTS
DEVELOP NOW.



UNEMPLOYED YOUTH
RESKILL NOW.



WORKERS
UPGRADE NOW.



ADULTS
RETURN TO LEARNING NOW.



STEM EDUCATORS
DEVELOP TO A HIGHER STANDARD NOW.

AI
PEOPLE
POSSIBILITIES
A BRIGHTER
BOTSWANA



THE PRESIDENTIAL QUESTION

Could Botswana use Artificial Intelligence not merely to digitise education—but to accelerate the capability development of every Batswana from Senior Secondary onwards, while building the highest-calibre STEM educators for generations to come?

TODAY'S
INVESTMENT.
GENERATIONS
OF OPPORTUNITY.



PEOPLE
WITH SKILLS



PRODUCTIVE
INDUSTRIES



INCLUSIVE
OPPORTUNITIES



A STRONGER
BOTSWANA



OUR PEOPLE
OUR POTENTIAL
OUR TOMORROW

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 our 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?

FROM SYMPTOM MANAGEMENT

TRADITIONAL APPROACH

Policies → Programmes → Budgets →
Projects → Jobs

STRLDI IMPLEMENTATION PATHWAY

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

- 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.



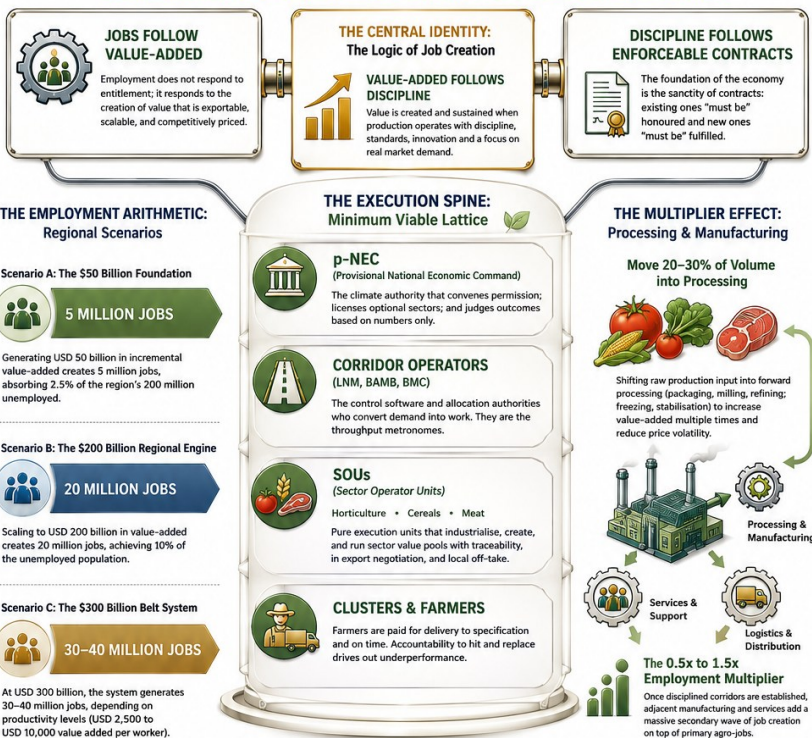
PHASE 5: DEMAND- SPINE & SUPPLY- SPINE COORDINATION

- **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

THE DISCIPLINE-TO-EMPLOYMENT ENGINE: SOLVING UNEMPLOYMENT IN SOUTHERN AFRICA

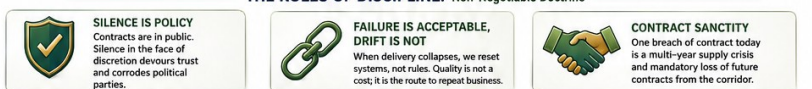
DISCIPLINE CREATES VALUE. VALUE CREATES JOBS. JOBS CREATE DIGNITY.



REGIONAL PLUG-IN SEQUENCE: Phased Integration



THE RULES OF DISCIPLINE: Non-Negotiable Doctrine



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.

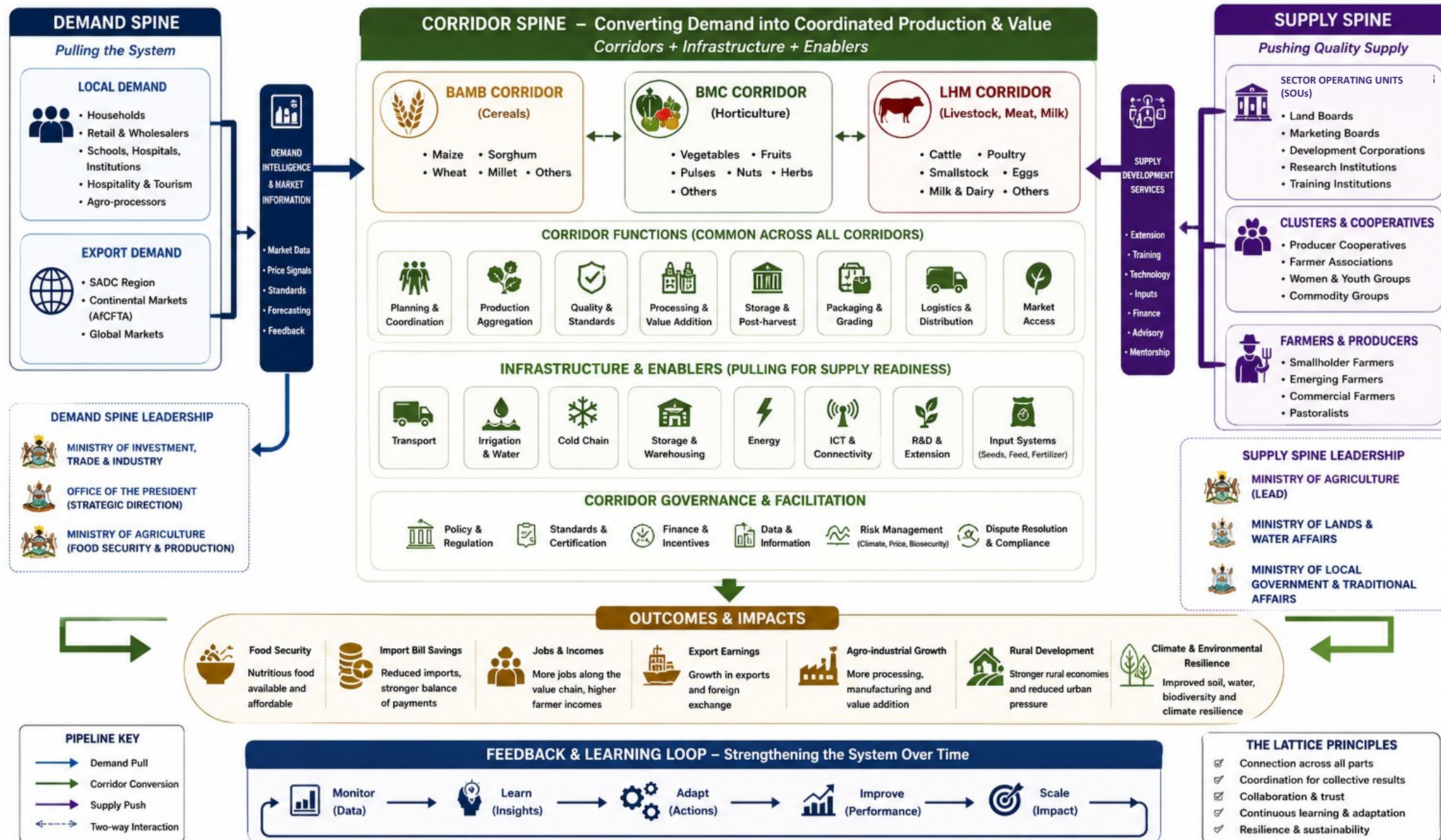
THE MISSING LAYER

- **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

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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

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

- **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/>



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

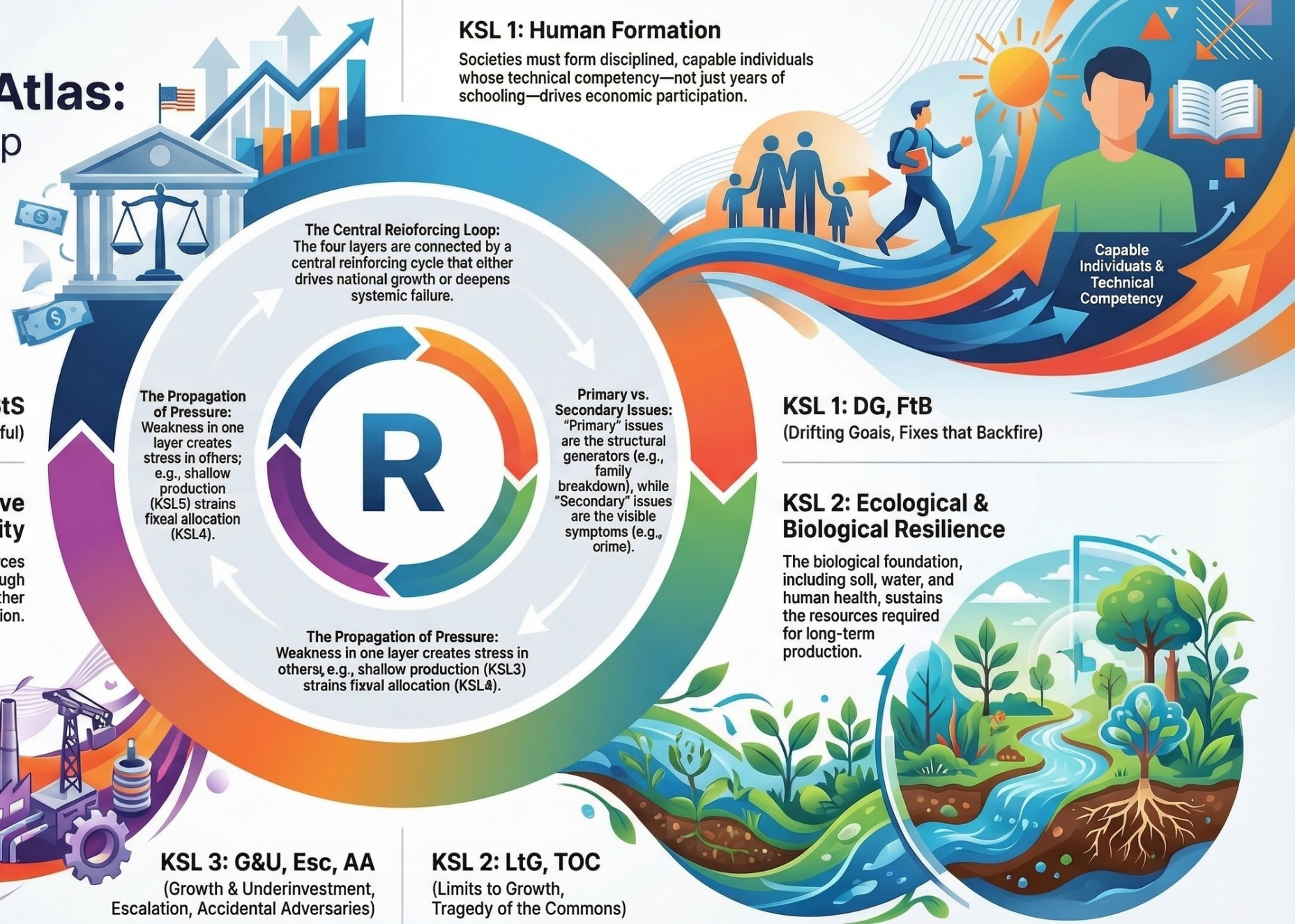
KSL 1: DG, FtB

(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**

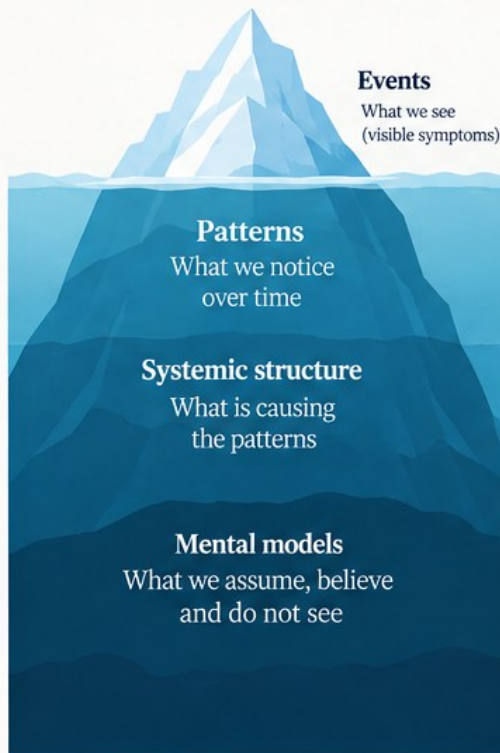
Why the Seeing Does Not Happen Without Training

And why the training must itself be a system

1. The Nature of the Problem

Persistent national problems are systemic, not single-cause.

Unemployment, for example, is not produced by one factor or one sector. It is the outcome of multiple, interdependent factors that reinforce each other over time. These relationships are not obvious when we look at the system from inside it, because we tend to see only our part, our mandate, or the most visible symptoms.



2. Why the Seeing Does Not Happen Naturally

We are inside the system.

Ministers and Permanent Secretaries, like everyone else, operate from their own experience, sectoral data, institutional mandates and existing mental models. This creates natural blind spots:



Without structured training, these blind spots remain. As a result, well-intentioned efforts tend to focus on symptoms, repeat past approaches, or shift problems elsewhere in the system.

3. Why Training Changes This

Training develops the capacity to see and work with systems.

Systems thinking training helps leaders to:



Through repeated practice, leaders begin to see the system differently, and can make decisions that work with the structure rather than against it.

4. Why the Training Must Be a System

A one-off workshop is not enough.

Developing this capacity requires a structured, progressive and reinforcing programme, because:



From Seeing to Systemic Shifts

The goal is not simply to provide information. It is to develop the capacity of those who own the system — Ministers and Permanent Secretaries — to see it, work with it, and contribute to the evidence base for the National Development Plan.

The 10 Goals of STRLDi

FROM UNDERSTANDING TODAY TO A THRIVING TOMORROW
Research. Learning. Leadership. Lasting Change.

*Turning
Persistent Issues
into a More Productive,
Regenerative and
Peaceful World.*

1 Complete the Unemployment Study



Produce and present a rigorous, systems-based study on unemployment as a national milestone, demonstrating a different way of understanding persistent issues.

2 Build Understanding of the Theoretical Foundations



Invite those who have completed the study to a 3-day workshop masterclass on the theoretical underpinnings of the work (Executive Systems Programme).

3 Expand the Work to Other Persistent Issues



As National Planning Commissions and other institutions engage, unpack additional persistent issues and their causality.

4 Identify Leverage Action Areas



Use the sets of persistent issues and their causal analysis to isolate leverage action areas that can create wider and lasting impact across the national system.

5 Calibrate and Observe National Needs



Develop instruments to measure key performance needles, track progress over time and use the insights to recalibrate national action as needed.

6 Integrate into National Development Planning



Ensure the findings and leverage action areas inform national strategies and are embedded into the country's national development planning processes.

7 Showcase the Journey



Make the sequence of studies, learning and national application a showcase for other countries and global platforms.

8 Develop a Post-Graduate Programme



Create a two-year post-graduate programme in leadership for persistent issues for national and global organisations.

9 Build a Cadre of Lecturers and Institute the Work



Develop a cadre of lecturers and embed the work in tertiary institutions to ensure sustainability, research continuity and wider capability development.

10 Develop a Cadre of Global Leaders



Contribute to a growing cadre of global leaders better able to understand, work with and turn around the persistent issues of the planet.

Our Ultimate End-State

A more productive, regenerative and peaceful global system

Thriving People. Regenerated Planet. Shared Prosperity.

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

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.

RESULT

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



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

The Ultimate End-Goal of the Work

From persistent issues to a productive and regenerative global system

*Systems Thinking
for People,
Nations and
a Thriving Planet*

TODAY: PERSISTENT GLOBAL ISSUES

Interconnected challenges that continue to reproduce despite repeated efforts to solve them.



Mass & Severe Unemployment
Underutilised human potential



Severe Poverty
Persistent inequality and exclusion



Land Degradation
Declining productive and natural systems



Climate Change Escalation
Increasing environmental stress and risk



Demographic Pressures
Uneven population distribution and urban strain



Social Instability
Erosion of social cohesion and trust



Geopolitical Conflict
Rising tensions and instability

INTERCONNECTED • MUTUALLY REINFORCING • PERSISTENT OVER TIME

OUR DEVELOPMENT PATHWAY

From understanding to action, learning and scaling.



BUILDING A REPEATABLE CAPABILITY TO TURN PERSISTENT ISSUES AROUND

Knowledge → Action → Lasting Change

THE END-GOAL STATE

A productive and regenerative global system



PEOPLE
Healthy, educated and skilled populations with meaningful opportunities to contribute



ECONOMIES
Diverse, resilient and productive economies generating sufficient opportunities for all



LAND & PLANET
Regenerated ecosystems, healthy natural systems and responsible stewardship of the earth's resources



NATIONS
Capable institutions that anticipate, understand and turn around persistent issues before they escalate



GLOBAL SYSTEMS
Greater stability, cooperation and shared prosperity, with reduced inequality, instability and conflict

*Thriving People.
Regenerative Planet.
A More Peaceful World.*

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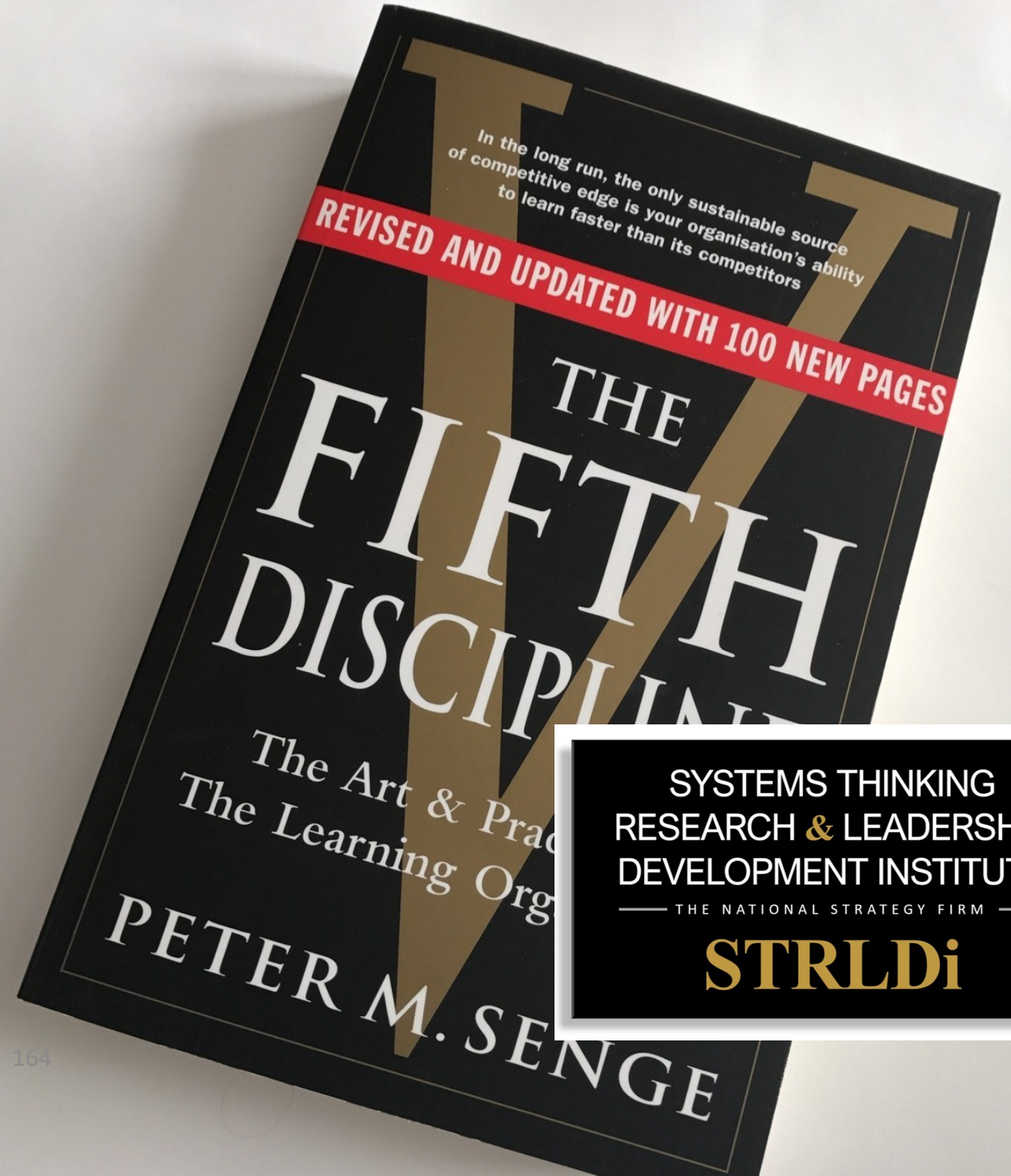
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— THE NATIONAL STRATEGY FIRM —

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Thank you.