



**Tshwane University
of Technology**

We empower people

South Africa's National System of Innovation & Development

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**The BRICS Project: National Systems of Innovation
and Development**

Ten years of Local Innovative and Productive Systems
Rio de Janeiro, 27th November 2007





Outline

- Introduction
 - Development Challenges of Post-Apartheid South Africa
- Continued Evolution of the NSI
- Conclusions

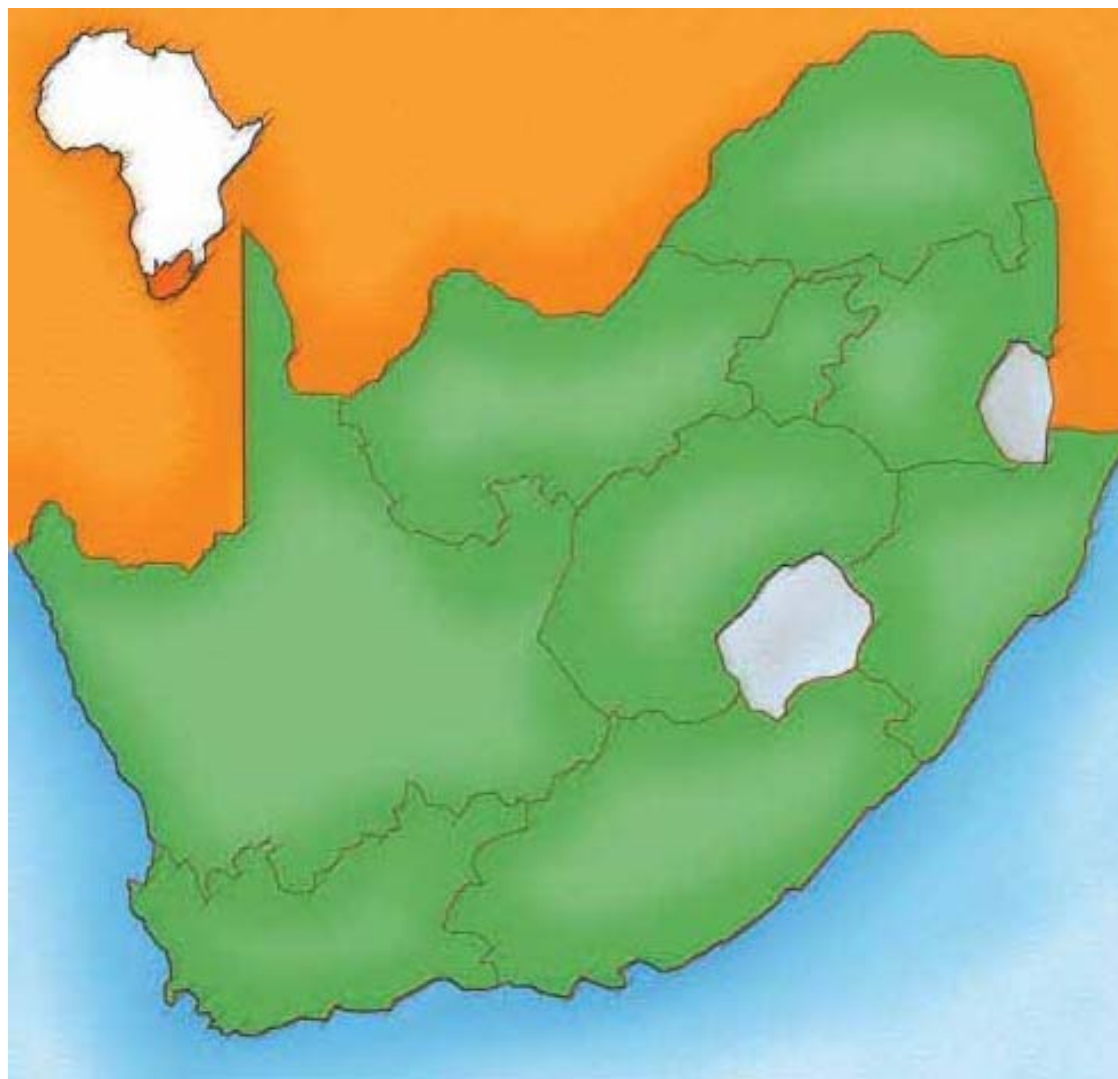


Introduction

Republic of South Africa
(1994)

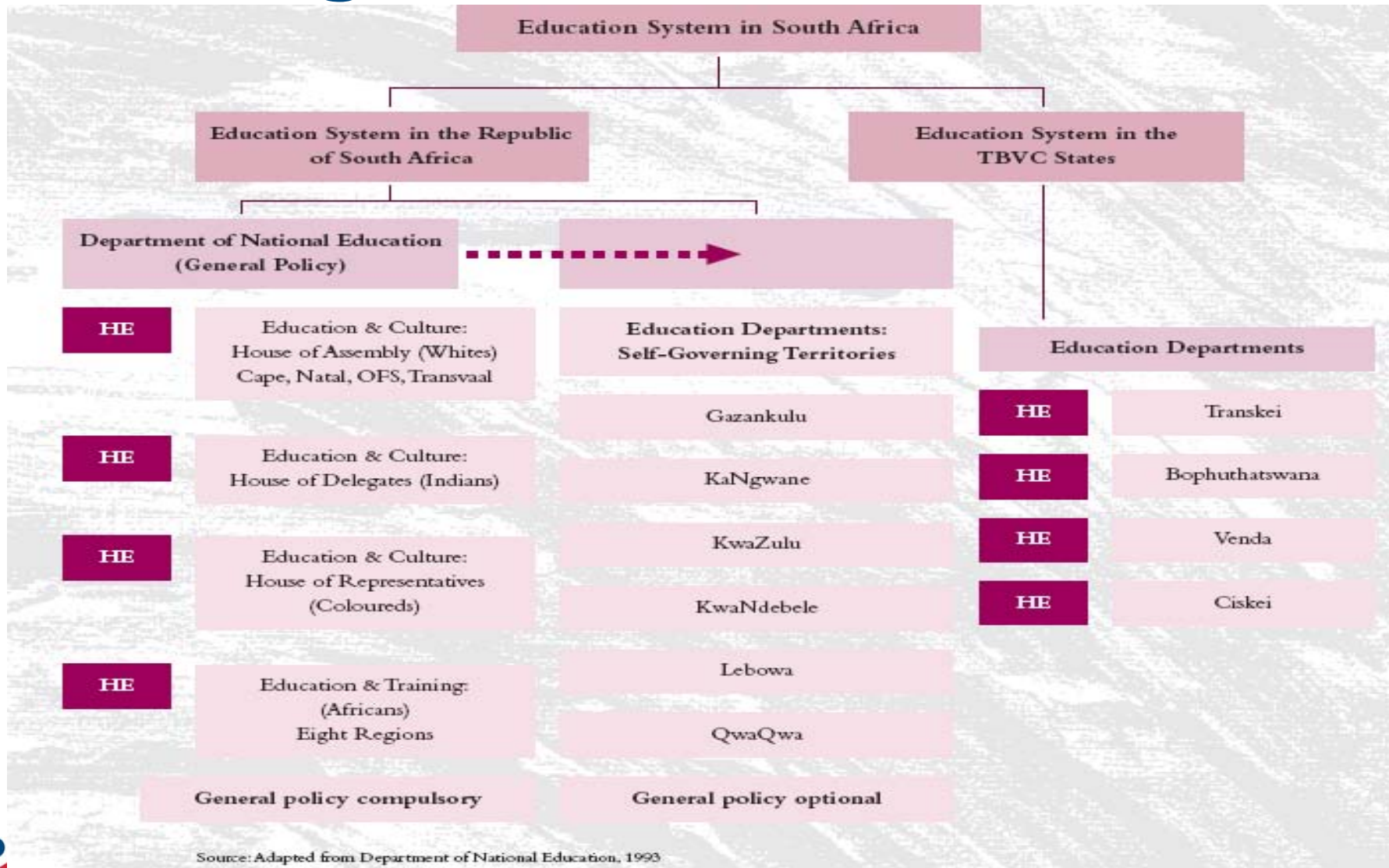
Population: 46.5 million

GDP Growth Rate: 5%





Background

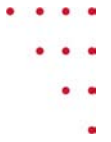




Policy Definitions

- Narrow STI:
 - Innovations in products, services, processes, & institutional strategies
- Systems of Innovation:
 - Totality of know-how in a firm, industry, sector, cluster, region or nation
 - Functional & dysfunctional arrangements
 - Coordination challenge

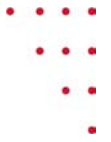




Explicit STI

- ANC Discussion Document on Science & Technology for a Democratic South Africa
- Eminent Persons Review (IDRC, Commonwealth & OECD)
- Science & Technology Initiative
 - National Science & Technology Forum
 - Mass Democratic Movement + Statutory Forces
- Green Paper on Science & Technology
 - Audit of Science, Engineering & Technology in the Public Sector
 - Foresight: Preparing for the 21st Century
 - Review of Science Budget Vote
- White Paper on Science and Technology
 - Review of Science, Engineering & Technology Institutions
 - National Advisory Council on Innovation
 - National Research Foundation
- National Research and Development Strategy





Implicit STI

- Fiscal
 - Growth, Employment & Redistribution
- Monetary
 - Inflation Targeting
- Competition
 - Commission & Tribunal
- Industrial
 - National Industrial Policy Framework
- Geo-spatial Planning
 - Priority Nodes & Spatial Development Corridors
- Sustainability & Environment
 - Biodiversity Protection (including IKS)
 - Strategic Environmental Impact Assessments
 - National Sustainable Development Strategy





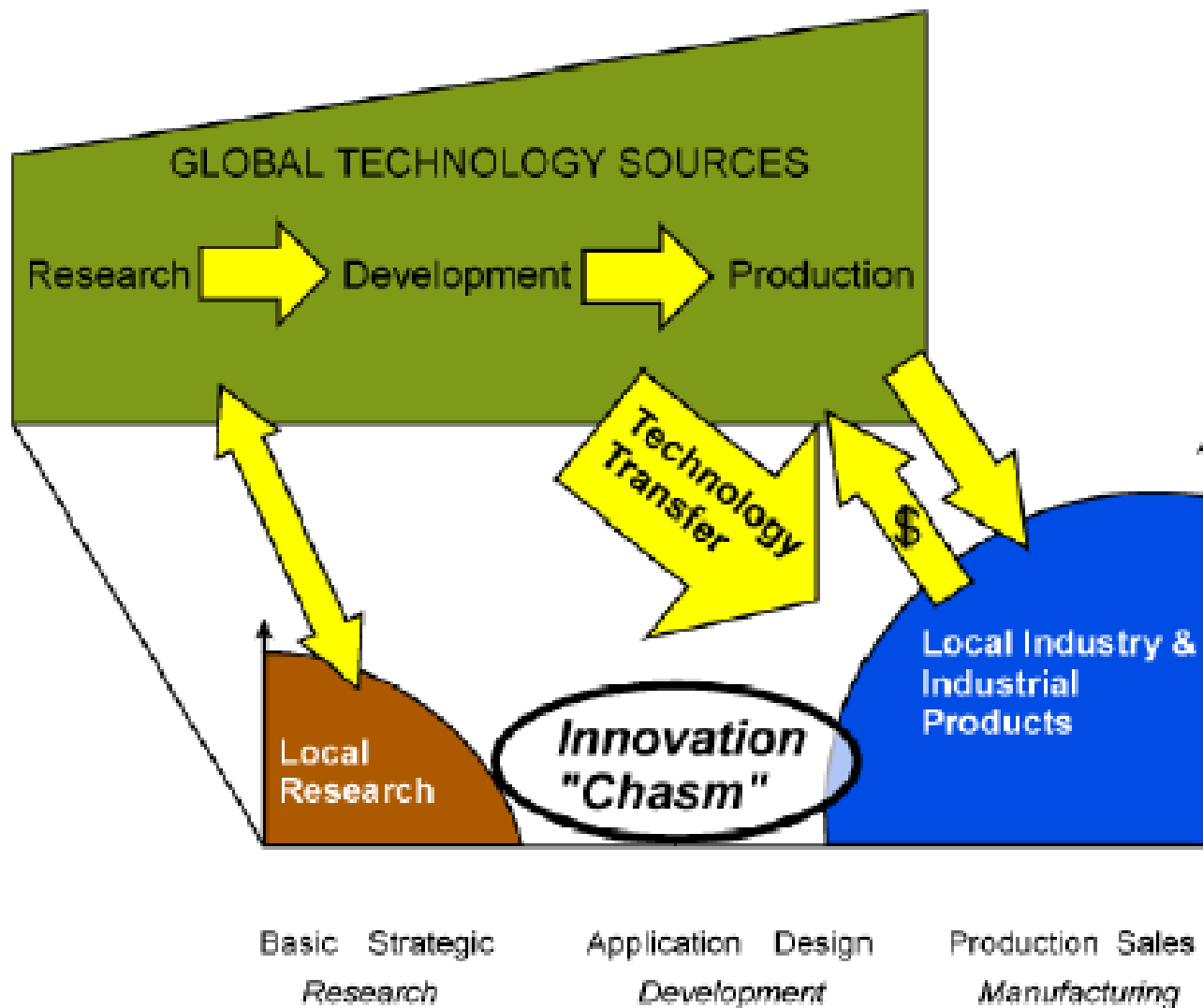
NR&DS Intro

- The termination of key technology missions
 - *“military dominance in the subcontinent and energy self-sufficiency”*
- Strategic security considerations: human, economic & defence
- Human Resources: *“frozen demographics”*
- Globalisation: investment and performance reductions of private sector
- Inadequate intellectual property legislation and infrastructure
- Fragmented governance structures



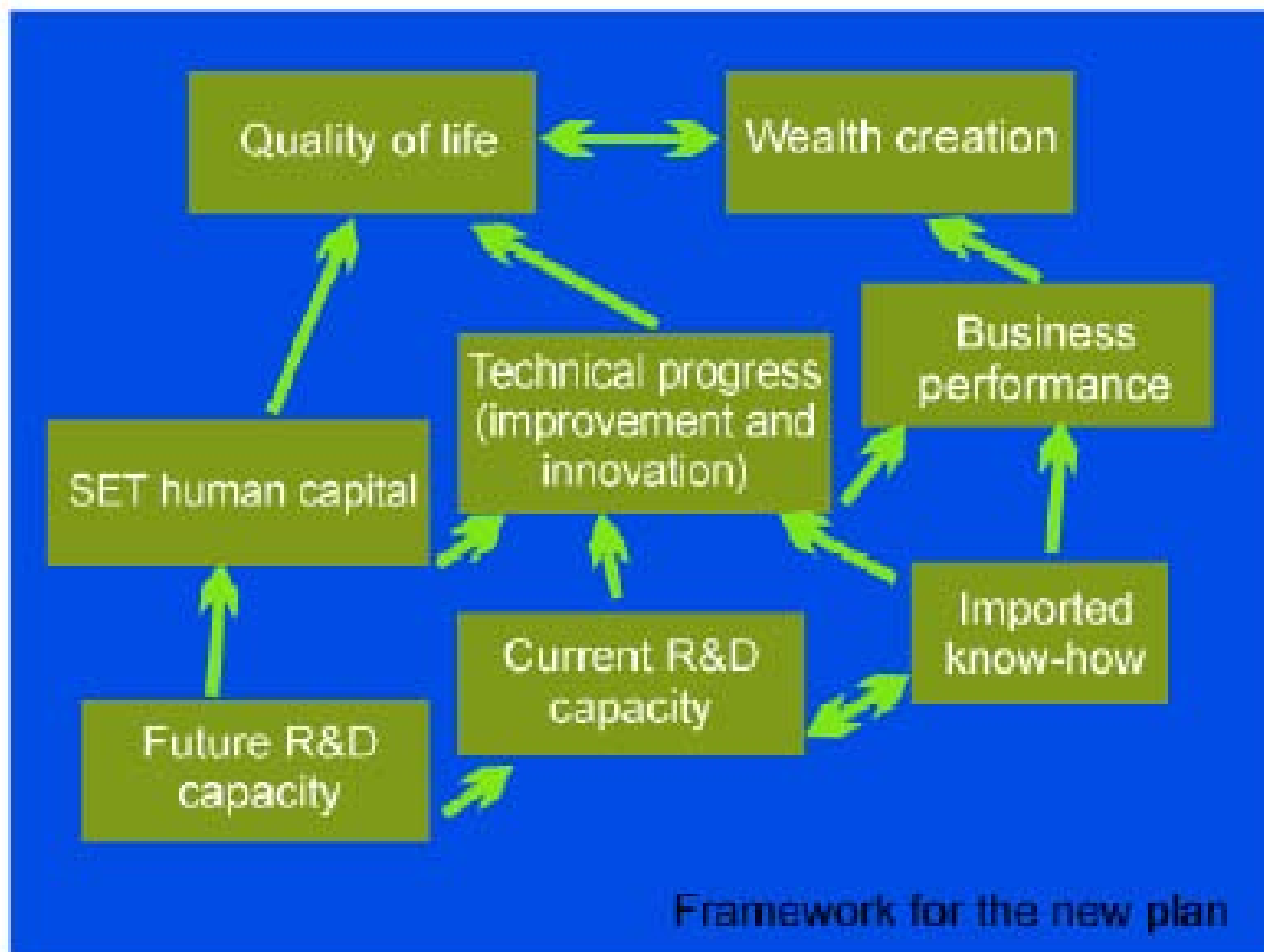


Innovation Chasm





NR&DS Framework





NR&DS Indicators

Quality of life

- Technology Achievement Index

Wealth Creation

- Technology-based growth

Science, engineering and technology human capital

- Researchers per thousand of workforce
- SET demography

Technical progress (improvement and innovation)

- Patents
- High-tech start-ups
- Business innovation investment
- Key technology missions

Business performance and key industrial sectors

- Technology / trade mix
- Proportion of high-tech firms
- Sectoral performance

Future R&D capacity

- University enrolments (SET proportion)
- S&T post-graduate degrees
- Matriculants with Maths and Science

Current R&D capacity

- Publications
- Global share of publications
- R&D intensity (investment)

Imported know-how

- Technology balance of payments
- Imported high-tech equipment
- Imported ICT



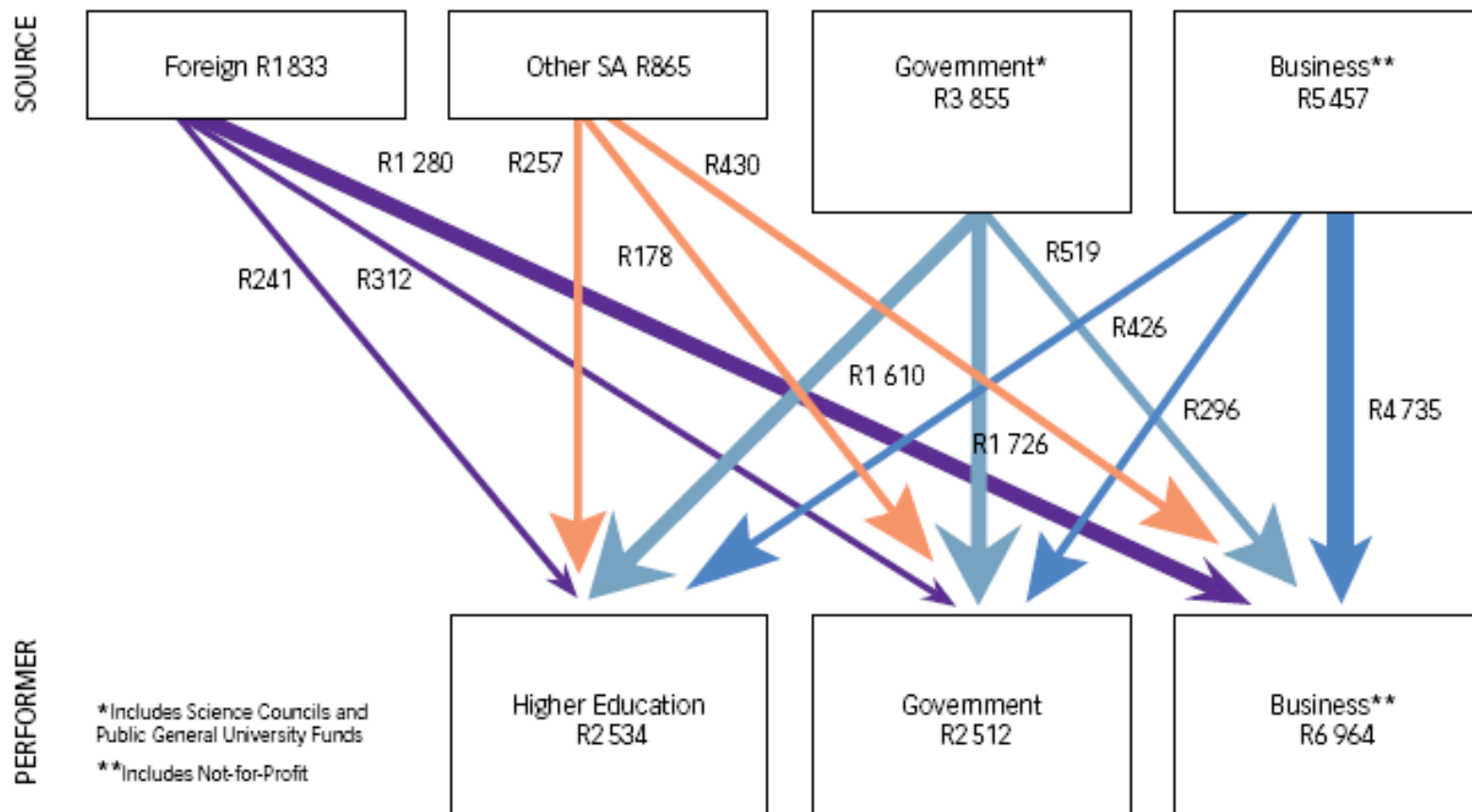
2005 Main Results

INDICATOR	VALUE	
	2003/04	2004/05
Gross domestic expenditure on R&D – GERD (Rand millions)	10 082.6	12 010.0
GERD as a percentage of GDP	0.81	0.87
Total R&D personnel (FTE) ^a	25 185	29 692
Total researchers ^b (FTE)	14 129	17 910
Total researchers per 1000 total employment ^c (FTE)	1.2	1.6
Total R&D personnel per 1000 total employment (FTE)	2.2	2.6
Civil GERD as a percentage of GDP	0.72	0.80
Total researchers (headcount)	30 703	36 979
Women researchers as a percentage of total researchers	38.0	38.3
<p>^a FTE = Full Time Equivalent ^b Following OECD practice, doctoral students are included as researchers ^c Following OECD practice, total employment is now provided by the International Labour Organisation based on the Labour Force Surveys of Statistics South Africa and is not restricted to the formal non-agricultural sectors as previously reported.</p>		



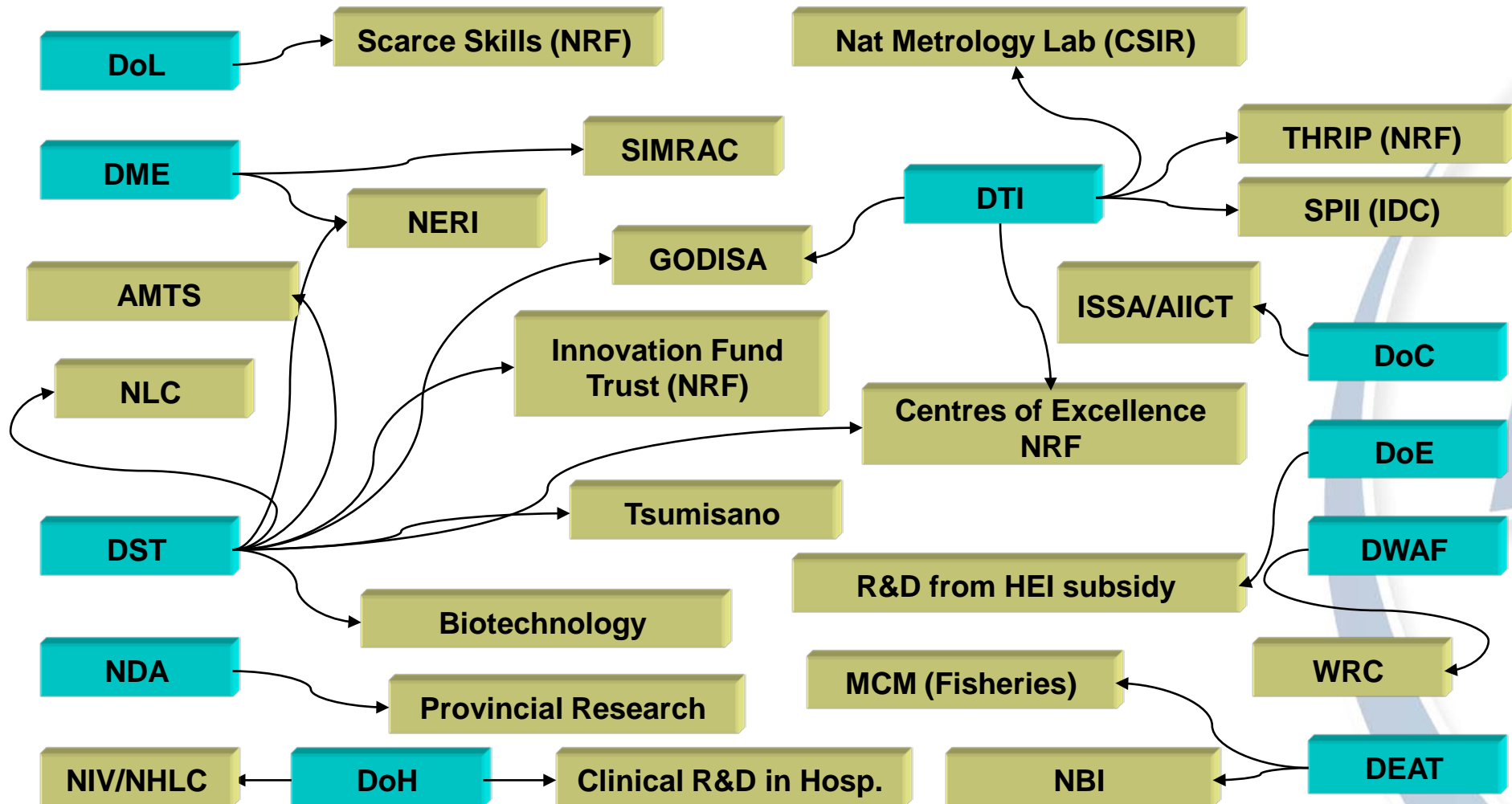


2005 Flows





- Alignment & Steering





Conclusion

- Globalisation
- Regionalisation
- National Systems
- Provincial Roles
- Local Dynamics





Thank You

- For more information, contact:
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