

Observations from South Africa's National System of Innovation with a focus on climate change

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Tunisia

by

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SA CTCN NDE
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Making *sure* *it's possible*

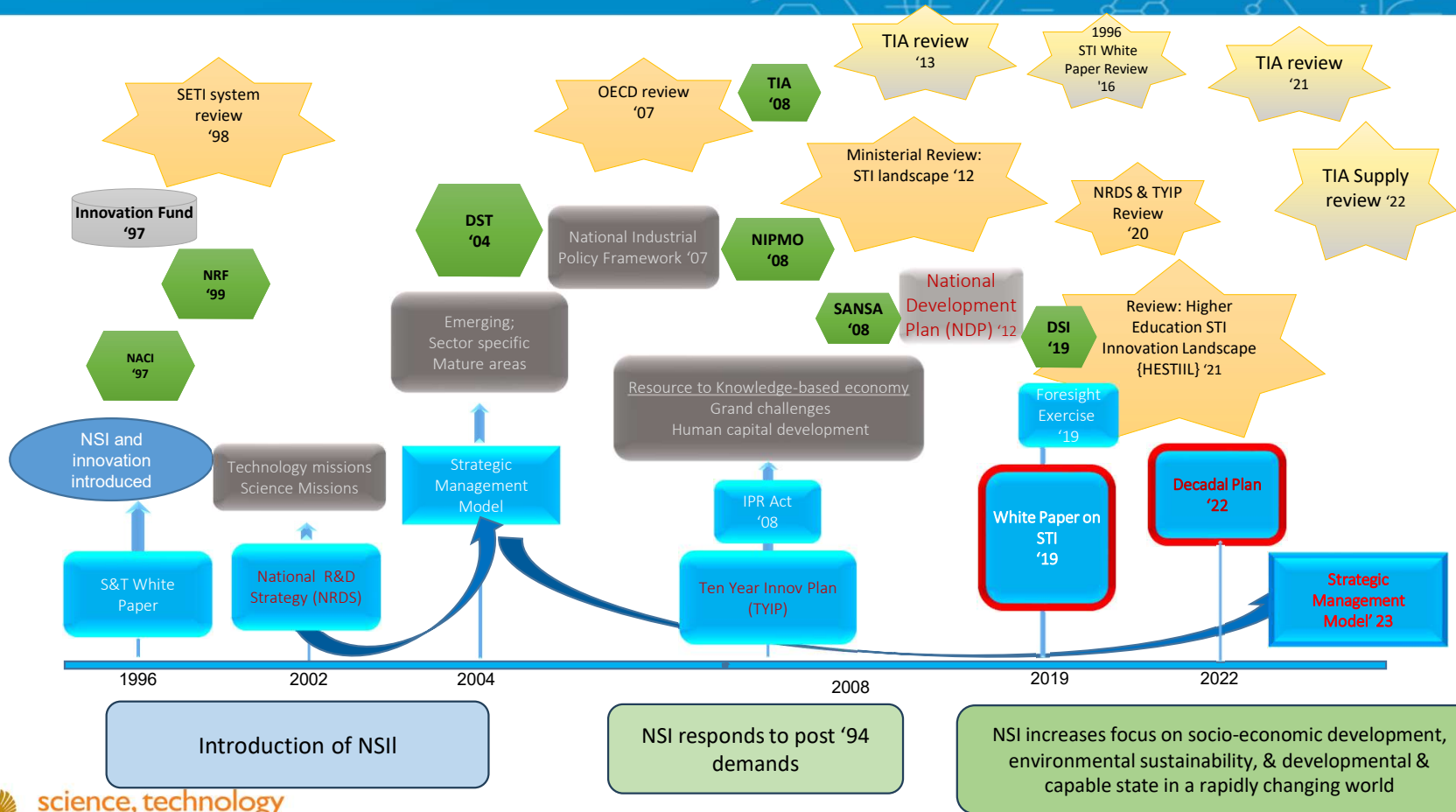


science, technology
& innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA



South Africa's STI Policy Landscape



Department of Science Technology and Innovation '24

Observations and learnings

Policy continuity matters more than policy change

South Africa has maintained a relatively stable innovation policy trajectory—from early post-apartheid strategies to the STI White Paper. This consistency enabled institutional maturation and long-term programmes.

Lesson:

System benefit more from **iterative refinement than constant redesign.**

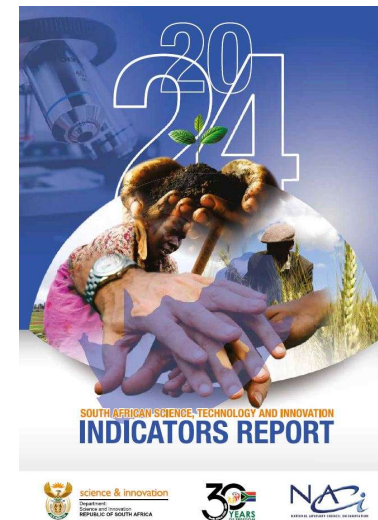
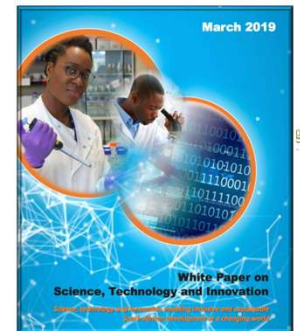
Monitoring and indicators are critical for system learning

Through NACI STI Indicator Reports, South Africa has built a strong culture of:

- Measurement
- Benchmarking
- Evidence-based policy

Lesson:

Without robust indicators, innovation systems **cannot self-correct or improve strategically.**



Strong public sector leadership is essential—but may not sufficient

The Department of Science, Technology and Innovation has played a central coordinating role, supported by entities. Private sector participation remains comparatively weak.

Lesson:

Government can **build the system**, but **industry partners important to drive scale and impact**.

DSTI Mantra “placing science, technology and innovation at the centre of government, education, industry and society”

Hon. Dr Blade Nzimande, Minister DSTI

Academy of Science of South Africa



Council of Scientific and Industrial Research



Human Sciences Research Council



National Advisory Council on Innovation



National Research Foundation



South African Council for Natural Scientific Professions



South African National Space Agency



Technology Innovation Agency



- **Mission-oriented programmes can align the system**
- Mobilize funding
- Link science to societal challenges
- **Lesson:**
“Grand challenges” are effective tools for system-wide coherence and impact

The global change research plan



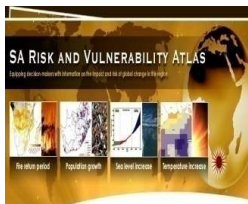
| A | B | C | D |
|--|--|---|---|
| Understanding a changing planet <ol style="list-style-type: none"> 1. Observation, monitoring and adaptive management 2. Dynamics of the oceans around southern Africa 3. Dynamics of the complex internal earth system 4. Linking the land, the air, and the sea 5. Improving model predictions at different scales | Reducing the Human Footprint <ol style="list-style-type: none"> 1. Waste minimization methods and technologies 2. Conserving biodiversity and ecosystems services 3. Institutional integration to manage ecosystems and the services they offer 4. Doing more with less | Adapting the way we live <ol style="list-style-type: none"> 1. Preparing for rapid change and extreme events 2. Planning for sustainable urban development in a South African context 3. Water security for South Africa 4. Food and fibre security for South Africa | Innovation for Sustainability <ol style="list-style-type: none"> 1. Dynamics of transition at different scales – mechanisms of innovation and learning 2. Resilience and capability 3. Options for greening the developmental state 4. Technological innovation for sustainable socio-ecological systems 5. Social Learning for sustainability, adaptation, innovation and resilience |



- **Global integration strengthens national systems**
- South Africa benefits from:
- International research collaboration
- Participation in global science programmes
- **Lesson:**
Integration into global knowledge networks enhances capability and visibility, especially for emerging economies.



Environmental Sustainability & climate change (STI indicator report)



Patents per Million Population: Solar Thermal Energy Technology (Measures innovation in harnessing the sun's heat for energy)

| Year | China (Leader) | South Africa | Brazil | India |
|------|----------------|--------------|--------|-------|
| 2011 | 5.345 | 1.026 | 0.790 | 0.001 |
| 2020 | 18.170 | 0.199 | 0.028 | 0.000 |

Source: Computed from International Renewable Energy Agency data (2024 South African STI Indicators Report)

Patents per Million Population: Wind Energy Technology (Measures innovation in harnessing wind power)

| Year | China (Leader) | South Africa | Brazil | India |
|------|----------------|--------------|--------|-------|
| 2011 | 2.979 | 0.725 | 1.292 | 0.002 |
| 2020 | 7.603 | 0.204 | 0.070 | 0.000 |

Strong research programmes
Embedded in programmes are
platforms for education and training
Research Chairs
Centres of Excellence
Biannual Global change conferences

SASSCAL

Southern African
 Science Service Centre for
 Climate Change and
 Adaptive Land Management

Persistent Challenges, STI indicator report (Latest to be released 26/03/26)

- **Gini Coefficient** : remain one of the world's most unequal societies
- **Economic Spillovers**: The NSI's contribution to addressing the "triple challenge" of poverty, unemployment, and inequality remained a key focus area
- **Innovation Chasm**: While knowledge production (publications) grew from **3,693 (2000) to 27,208 (2022)**, patent applications declined by **40% over the last decade (from 371 in 2013 to 223 in 2022)**
- **R&D Investment Stagnation**: Gross Expenditure on R&D (GERD) stood at just **0.62% of GDP (2023/2024)** , far below the 1.5% target, emphasising the need for more business sector investment.
- **Private Sector Hesitancy**: Despite tax incentives under **Section 11D** of the Income Tax Act, business R&D investment remained insufficient.
- **Global Competitiveness**: An overall drop in patent applications was observed, although foreign IP payments **decreased** and South African IP sales **increased**.

Dankie
Enkosi
Ha khensa
Re a leboga
Ro livhuwa
Siyabonga
Siyathokoza
Thank you



Photo credit: Govender K 2024

Making sure it's possible

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Specialist



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