

THE MINISTER OF HIGHER EDUCATION, SCIENCE AND INNOVATION ADDRESS ON THE OCCASION OF THE LAUNCH OF THE 2022 SOUTH AFRICAN SCIENCE, TECHNOLOGY AND INNOVATION INDICATORS REPORT

29 July 2022

Chairperson of the Portfolio Committee on Higher Education, Science and Technology, Ms Nompandolo Mkhathshwa;

The Director-General of the Department of Science and Innovation; Dr Phil Mjwara;

The Chairperson of NACI, Dr Shadrack Moephuli;

All NACI Council Members;

The Acting CEO of NACI, Dr Mlungisi Cele;

Invited guests;

Members of the media;

Ladies and gentlemen

I greet you all this morning

Let me take this opportunity to thank the National Advisory Council on Innovation (NACI) for organising this important webinar to publish the South African Science, Technology and Innovation (STI) Indicators Report.

As you may be aware, NACI publishes the South African Science, Technology and Innovation (STI) Indicators Report annually as part of its monitoring of the national system of innovation's performance.

This commitment by NACI illustrates the importance of Science, Technology and Innovation for economic development and social progress.

Therefore, our 2022 STI Indicators Report should be seen in the context of deepening global economic, ecological and social reproduction crises, particularly the following:

(a) COVID-19 pandemic

The COVID-19 pandemic has had a disastrous impact on public health systems and economic progress across the globe. Millions of people have died, and economies have declined sharply. Unemployment has increased significantly. Poverty is on the rise. Inequality is deepening. The gains related to the Sustainable Development Goals (SDGs) are at risk, and vulnerabilities and inequalities within and between nations have been exposed.

The national system of innovation (NSI) responded to the COVID-19 pandemic by demonstrating the goodwill and competence of South Africa's NSI actors, which collaborated in joining up funding from various sources, constructing hospitals at speed and producing medical devices and protective gear at competitive prices.

The World Health Organization permitted South Africa to establish a world-class consortium to create the first technology transfer hub for COVID-19 vaccines in Africa.

The hub will play a leading role in the preclinical research phase of Africa's first messenger RNA technology. It will also be responsible for the inbound technology transfer and production of the first vaccines against COVID-19 and other diseases.

(b) Climate change

Reports from the Intergovernmental Panel on Climate Change (IPCC) between August 2021 and April 2022 noted the adverse effects of climate change in all assessed regions.

Extreme impacts have caused irreversible changes to some human and natural systems. Extreme weather events such as those recorded in KwaZulu-Natal in 2022 are expected to become more frequent and will have increasingly severe impacts.

This has enormous implications for South Africa's development aspirations, such as creating employment and reducing poverty and inequality.

The Co-chair of Intergovernmental Panel on Climate Change (IPCC) Working Group II, Prof. Dr Hans-Otto Pörtner, has noted that "The scientific evidence is unequivocal: climate change is a threat to human wellbeing and the health of the planet. Any further delay in concerted global action will miss a brief and rapidly closing window to secure a liveable future."

There is an urgent need to build a climate-resilient society to respond to the current and projected impacts of climate change while transitioning to a just climate future. Investment in innovative instruments for mitigation and adaptation is critical for building a just society and meeting the SDGs.

(c) Economic challenges

According to Statistics South Africa, our country's gross domestic product (GDP) expanded by 1,9% in the first quarter of 2022, representing a second consecutive quarter of upward growth.

The size of the economy is now at pre-COVID-19 pandemic levels. The real GDP was slightly higher than before the COVID-19 pandemic. However, unemployment was at 34,5% during the first quarter of 2022, with black women and the youth bearing most of the brunt.

Now, let me turn my attention to the highlights of the report which will be presented to you shortly:

1.1 On Human resources for STI

The proportion of female academic staff at South African public universities has increased from 46,40% in 2010 to 50,44% in 2019.

The number of researchers employed in research and development (R&D) has been declining since 2018.

The number of technicians employed in R&D has also been on the decline since 2015. The proportion of technicians to researchers employed in R&D decreased from 32,8% in 2014/15 to 24,3% in 2019/20.

Employment in R&D in the business sector declined by slightly more than one-fifth.

3.2 On Science, technology and innovation investments

The 2021 UNESCO Science Report raised a concern that four out of five countries devoted less than 1% of their GDP to R&D. Among BRICS countries, South Africa and India are struggling to exceed the 1% benchmark. In 2019/20, South Africa's R&D intensity stood at 0,62%.

COVID-19 constrained the already tight NSI fiscal environment further. My Department of Science and Innovation and our entities experienced budget cuts.

As a result, all NSI actors had to work together and contribute toward the realisation of gross expenditure on R&D (GERD) equal to 1,5% of GDP.

Government expenditure on R&D has more than doubled in the past decade, increasing from R9 billion in 2010/11 to R19 billion in 2019/20. A minor dip in 2018/19 was followed by a large increase of 11,1% in 2019/20.

In 2019/20, R&D expenditure by the business sector (BERD) decreased 29% from the previous year. This decrease was far larger than the decline in aggregate private sector investment, which was 16%.

The business sector has been the main reason for the stagnation in R&D intensity over the last decade. The R&D expenditure by the business sector (BERD) as a percentage of gross expenditure on R&D declined from 53,2% in 2009/10 to 39,3% in 2018/19.

3.3 On attractive research systems

South Africa's publications per million population increased from 248 in 2011 to 505 in 2020. Overall, South Africa's scientific publications per million population are above the average of the upper-middle-income countries (452 in 2020).

As a result of the pandemic, there was a rapid upsurge in coronavirus-related research. In South Africa, COVID-19-related scientific publications increased from 400 in 2020 to almost 700 in 2021.

3.4 On innovation activities

During the period 2016-2019, the University of Cape Town had the most co-publications with industry (5,2% of its co-publications), followed by the University of the Witwatersrand (5,1%) and the University of Pretoria (4,9%).

Universities experienced a decline in their share of scientific co-publications with industry.

In 2020, South Africa had 25 patent applications per million population. This is lower than the average for other upper-middle-income countries (641 in 2020).

The United Nations Conference on Trade and Development's Technology Readiness Index measures the level at which countries adopt and diffuse frontier technologies. The index looks at five aspects: ICT deployment, skills, R&D activity, industry activity and access to finance.

As South Africa's our main weakness are in skills. We are at 84th of 158 countries, industry (71st) and ICT (69th). Its area of strength is the availability of finance (13th). We also have the lowest technology readiness index of the BRICS countries.

3.5 On social and economic impacts of STI

(a) Social effects

The socio-economic indicators presented in the report show a significant rise in deprivation, which reflect the impacts of the COVID-19 pandemic.

The number of households living in poverty increased in terms of all poverty indicators (the food, lower-bound and upper-bound poverty lines). Over the past decade, other forms of deprivation such as a lack of access to clean water and sanitation have remained unchanged.

The Social Progress Index (SPI) and the Human Development Index (HDI) indicate a decline in South Africa standards of living since 2015.

The country's relatively low ranking on the HDI is mainly a consequence of low life expectancy at birth (64,1 years in 2019).

The proportion of people living in extreme poverty was about 24% in 2020. About 33% lived below the lower-bound poverty line, and 45% lived below the upper-bound poverty line.

A global deterioration in social progress seems to have affected mainly the SPI indicators under "basic human needs" and "foundations of well-being". The provision of shelter is generally deteriorating in upper-middle-income, while South Africa's ranking improved in this regard, from 104th in 2019 to 96th in 2021.

Since the start of the COVID-19 pandemic, there have been various efforts by the government and civil society to provide shelter and take care of homeless people.

Our ranking in health and wellness improved from 109th to 102nd, environmental quality from 85th to 78th and personal rights from 51st to 46th.

(b) Economic effects

South Africa's medium and high technology manufacturing output decreased by almost 20% in 2020. Its high-technology manufacturing exports as a percentage of total exports was 5,6%. This is very low in comparison to other middle-income countries average which stood at 23,4%. Brazil is at (11,4%), Malaysia (53,8%), China (31,3%) and Russia (9,2%).

South Africa's digital competitiveness ranking improved from 51st in 2016 to 44th in 2019, before falling steeply to 60th in 2020.

About 71% of firms in manufacturing and services use email for conducting business and only 36% of firms have websites. Inadequate digital skills is one of the causes.

The country's Total Entrepreneurship Activity (TEA) rose steadily from 7% in 2014 to 11% in 2017, and then declined slightly to 10,8% in 2019.

This decline is an indication that the motivation for entrepreneurs to start new businesses is low.

The Total Entrepreneurship Activity measures the percentage of individuals between 18 and 64 years who are in the process of starting a business and those who have been running businesses for less than three and a half years.

South Africa scored marginally higher than other BRICS member countries in respect of shifting to more progressive taxation, rethinking how corporations, wealth and labour are taxed, nationally and in an international cooperative framework.

The country scored lowest among the BRICS countries with regard to incentivising and expanding investment in research, innovation and inventions that could create the "markets of tomorrow".

South Africa experiences challenges in creating "markets of tomorrow", owing not only to weaknesses in its research and technological systems, but also weak public-private partnerships.

3.6. On Provincial systems of innovation

The distribution of provincial R&D expenditure in South Africa is concentrated mainly in Gauteng, the Western Cape and KwaZulu-Natal.

Furthermore, innovation support organisations such as incubators and technology stations, which are intended to improve the capacity of innovators and entrepreneurs, are also unevenly distributed, with most located in the same three provinces.

2. CONCLUSION

Ladies and gentlemen

Let me indicate that the National System of Innovation (NSI) has laid a solid foundation for the future. However, it remains fragmented across government and between business, academia and civil society. It continues to be significantly underfunded, and the participation of black people and women at senior level (e.g. professors) remains too low.

The COVID-19 pandemic has stretched the NSI to its limits, revealing areas that need strengthening to improve the country's resilience and preparedness for future crises.

South Africa's innovation performance is falling behind other middle-income countries with regard to outputs such as patents and high technology exports.

South Africa performs better in innovation inputs than innovation outputs. Considering its level of innovation investment, the country produces few innovation outputs.

In responding to these challenges, guided by the 2019 White Paper on Science, Technology and Innovation (STI), as the Department of Science and Innovation and all our agencies, we will be furthering the role of the STI in economic and social development, emphasising inclusivity, transformation and partnerships.

We will implement the White Paper on the STI through the Decadal Plan which was approved for implementation by Cabinet in March 2021 to serve as a government-wide Master Plan.

The Plan emphasises four societal grand challenges of climate change, future-proofing education and skills; re-industrialising our modern economy, as well as two STI priorities on health innovation and energy innovation.

One of our critical interventions in our DHESI landscape is the Higher Education, Science, Technology and Innovation Institutional Landscape (HESTIIL) Review, which is part of strengthening our institutions and agencies supporting higher education, science and innovation.

As part of ensuring that we consolidate our Science, Technology and Innovation (STI) programmes and our budget processes, I will be chairing a standing ministerial-level STI Structure and the President of the Republic will host an annual STI Plenary which will include business, government, academia and civil society.

Let me end by let thanking you all for participating in this webinar and it remains my wish that all agencies in the NSI uses this report for planning, and budgeting in order to building more inclusive economy and socially integrated societies.

Thank you very much.