

FACT SHEET: 2024 SOUTH AFRICAN SCIENCE, TECHNOLOGY, AND INNOVATION (STI) INDICATORS REPORT



Making sure it's possible



science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA



WHAT

The 2024 Science, Technology, and Innovation (STI) Report offers a comprehensive analysis of South Africa's national system of innovation (NSI), assessing its performance in research and development (R&D) and technological advancement.

WHY

It highlights critical trends, challenges and opportunities within the NSI, focusing on how innovation contributes to socio-economic growth and global competitiveness. The report also discusses the NSI's resilience in the face of global challenges and emphasises the importance of fostering a robust, inclusive innovation system for sustainable development.

KEY FINDINGS

Economic growth and R&D investment: South Africa's real GDP per capita growth has lagged behind other upper-middle-income countries, leading to high unemployment and limited socio-economic progress. The country's R&D intensity is lower than other African nations like Kenya (0,61% vs. 0,98%) and far below global leaders such as South Korea.

University entrants: Notable progress in education has been made, with university enrolments increasing by 12% and graduates by 41% between 2012 and 2021. Enrolments in public universities increased by 12% between 2012 and 2021, from 950 000 to 1,01 million. Over the same period, the number of graduates grew by 41%, from 165 986 to 233 257, and the throughput rate improved from 17,4% to 21,8%.

Academic staff: The representation of female academic staff members in higher education institutions increased from 46% in 2010 to 52% in 2021, showing progress in gender transformation efforts. Over the same period, the share of black African academic staff increased from 27% to 43%, indicating significant racial transformation in the academic sector.

Learners doing maths and science: The percentage of learners who achieved 50% and above in Mathematics and Physical Science remains very low, especially in the Eastern Cape, Mpumalanga and Limpopo. The Western Cape is the best-performing province with 47% of learners achieving 50% and above in Maths and Physical Science, followed by Gauteng at 33,5%.

Scientific output and innovation:

South Africa's scientific publications have shown a positive trend in citation impact, with a mean normalised citation score consistently above the world average over the past decade. A significant percentage of papers have featured in the top 1% of frequently cited papers, ranging from 14,1% in natural sciences to 2,4% in agricultural sciences.

Technological infrastructure: South Africa has made good progress in leveraging information and communication technologies to enhance public services, promote digital inclusion, and drive sustainable development. The country's E-Government Development Index rose from 0,49 in 2012 to 0,74 in 2022, and its global ranking jumped from 101st to 65th out of 193 countries. The country went from 63rd on the Inclusive Internet Index in 2018 to 54th in 2022, indicating progress in making the internet more accessible to and affordable for citizens.

Technological exports: In 2022, manufacturing exports amounting to R555,8 billion were 9,1% higher than the R509,4 billion in exports in 2013. Similarly, medium and high technology (MHT) exports amounting to R263,2 billion in 2022 were 12,2% higher than the R234,6 billion in 2013, and MHT excluding motor vehicles of R194,8 billion in 2022 were 11,4% higher than the R174,8 billion in exports in 2013.

Patents: South Africa's patenting activity has declined significantly over the past few years. Domestic patents granted decreased from 694 in 2019 to 513 in 2022, while patent applications abroad dropped from 1 457 in 2020 to 968 in 2022. Additionally, patents granted by the European Patent Office decreased from 80 in 2020 to 38 in 2022. However, there was a slight increase in patents granted by the US Patent and Trademark Office, from 125 in 2021 to 150 in 2022.

Regional disparities: Gauteng, the Western Cape, and KwaZulu-Natal are the leading provinces in innovation, education and economic output. However, significant regional disparities persist, with provinces like the Eastern Cape and Limpopo lagging in educational attainment and technological development.

In 2022, 33% of the national GDP was attributed to Gauteng, 16% to the Western Cape and 14% to KwaZulu-Natal. Between 2012/13 and 2021/22, Gauteng spent more than the other provinces on R&D, followed by the Western Cape and

KwaZulu-Natal. In Gauteng 39,9% of the population has attained a Grade 12 or National Senior Certificate level of education, followed by KwaZulu-Natal (38,2%) and the Western Cape (34%). The Eastern Cape, Limpopo and Northern Cape have the lowest numbers of individuals who have reached this level.

Socio-economic challenges: The country faces a severe socio-economic crisis, marked by high poverty and youth unemployment rates. South Africa has a 62,6% poverty rate, a 61,5% youth unemployment rate, and a Gini coefficient of 66,92. With less money available for investment, the potential of STI to make a socio-economic contribution to the country is constrained. Addressing these challenges requires collaborative efforts and sustainable solutions.

The 2024 STI Report highlights both achievements and areas for concern within South Africa's STI ecosystem. While the country has made strides in sectors like biotechnology and renewable energy, it faces significant challenges in R&D investment, science, technology, engineering and maths education, and equitable access to technology. The report calls for stronger public-private collaboration and improved policy frameworks to ensure that STI effectively contributes to South Africa's economic growth and social development. Continued strategic interventions are necessary to fully leverage STI as a driver of national progress.