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Innovation for inclusive growth in South Africa: The role of R&D policy in addressing inequality

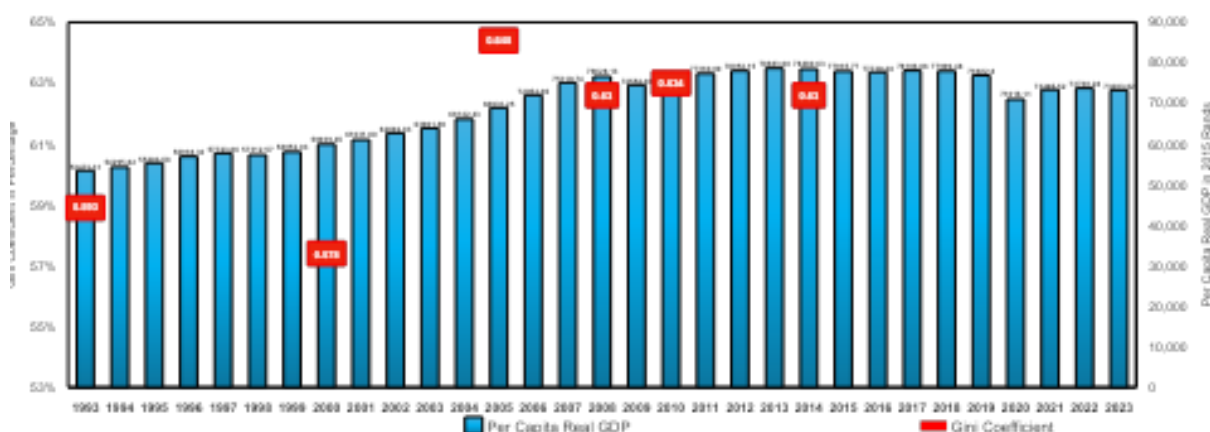
Nyemwerera Matshaka and Mphatso Elias Ackim

Innovation has the potential to drive inclusive economic growth and reduce income inequality, yet, in South Africa, persistent gaps in R&D funding, patent accessibility, and unequal skills development limit its benefits. It is imperative for the government to review policy guidelines and make clear funding commitments to promote the equitable uptake of innovative technologies for wealth creation.

Inequality in South Africa

South Africa's inequality is persistent and the worst in the world despite modest gains in real income per person. The country's Gini coefficient, which measures the inequality of income, marginally increased from .63 in 2008 to .643 in 2010 before falling back to .63 in 2014. Even though per-capita real GDP steadily rose until 2014, inequality has worsened since the end of the apartheid era when the Gini coefficient was .593. The country still ranks globally as the most unequal society, surpassing Sub-Saharan Africa's Gini coefficient average of .416. Its real income per person has subsequently dwindled in recent years from R78 107 in 2017 to R73 284 in 2023 (in 2015 prices), alongside a modest decline in inequality. ^[3]

Figure 1: The Evolution of Income Inequality in South Africa (1993 - 2023)



Data Source: The World Bank Development Indicators Database

Inequality remains the most salient feature of South Africa's post-apartheid era, notwithstanding efforts to address its multidimensional manifestations. As of 2015, the top 10% of the population spent 7.6 times more than the bottom 40% based on the Palma ratio, a modest drop from 8 times registered in 2006. The wealthiest 10% also held a striking 75.9% of total wealth in 2015. The bottom 60% of households rely more on the social grant program introduced in 2006 than on income from the labour market, which is the primary source of livelihood for the top 10% wealthiest households. ^[10] ^[1]

The labour market in South Africa is the main source of inequality. It contributes about 74.2% to overall income disparities, with female employees earning, on average, around 30% less than their male counterparts. Black Africans face the worst employment inequalities, with average real earnings registered at R6,899 per month as compared to Coloureds at R9,339, Indians/Asians at R14,235, and Whites at R24,646 between 2011 and 2015 (in December 2016 prices). They also suffered from the worst unemployment outcome of 31.0% in 2017 out of all population groups. Other disadvantaged groupings included women and people from rural areas with the highest unemployment rates of 29.6% and 30.5%, respectively, in these categories. ^[2]

How innovation could address inequality

This article explores the potential of innovation to drive inclusive growth and reduce inequality in South Africa. In the context of rapid progress in technology and innovation globally, South Africa cannot overlook its potential to foster and drive growth and so address the country's persistent disparities.

Innovation, which arises from research, generates economic development through enhanced productivity, efficient processes, and new or improved products on the market. However, there are concerns about whether this process translates to improved benefits for marginalized groups and the narrowing of the gap between the rich and poor. If not designed to broaden participation and promote inclusivity, innovation may not only fail to address inequality; it may even exacerbate existing inequalities. ^[5] It is, therefore, imperative to examine the extent to which policy interventions have promoted innovations that aid equitable redistribution of wealth in South Africa.

South Africa has published two White Papers serving as policy guidelines on research and innovation. In 1996, a White Paper by the South African Department of Science and Technology acknowledged the potential for innovation to support growth through policies that combat inequality and marginalisation. A 2019 White Paper builds on its predecessor, with an emphasis on inclusivity and broader stakeholder coordination in its core themes. The guideline also stipulates the need for substantial financing efforts. ^[9]

The country has since developed several related strategies and interventions to promote innovation. These include the R&D Strategy (2002), the National Development Plan (2012), and the Decadal Plan on Science, Technology and Innovation (2021-2031), supported by coordinating institutions and departments. The government designed these institutions to facilitate funding and R&D investment, including the R&D tax incentive.

The 2019 white paper outlines a goal to foster inclusivity through community and civil society support and engagement, while embracing and enhancing diverse and indigenous knowledge, and reviewing and improving the patent system. The Decadal Plan proposes

more specific interventions focused on enabling the livelihoods of youth entrepreneurs, women, and people with disabilities, including improved access to markets and income opportunities for grassroots innovators.

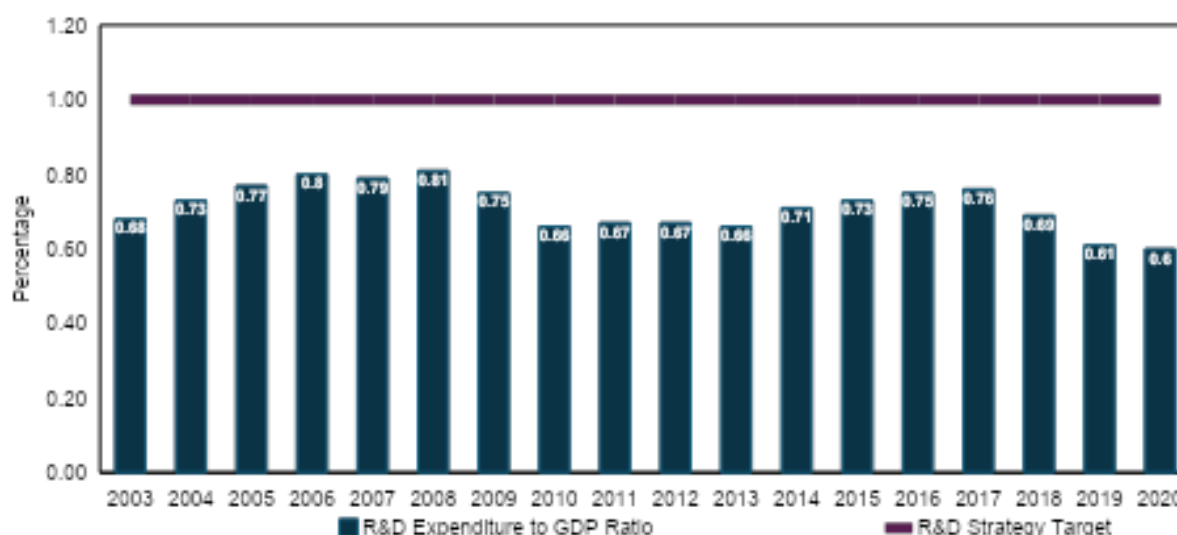
The policy focus over the years has shifted toward fostering inclusive innovation, with initiatives such as the Innovation for Inclusive Development (IID) programme and the Decadal Plan promoting technological solutions through community driven research tailored to underserved areas. These interventions include the Living Lab and Grassroots Innovation Programme, which are set up in townships and rural areas. The Buffelsdraai Landfill Site Community Reforestation Project, initiated in 2008 near Durban, aimed at planting trees for environmental rehabilitation while the MomConnect mHealth Initiative channelled mobile technology to address healthcare inequalities. The projects exemplify the potential of targeted R&D efforts in addressing disparities.

However, it is unclear whether these efforts have yielded the intended benefits. This article evaluates the extent to which some of the key goals on innovation outlined in the policy guidelines have been implemented.

Progress and Barriers to Inclusive Growth through Innovation

In the context of slow economic growth and the constrained fiscal position, South Africa has not been able to meet its R&D funding plans, constraining efforts to achieve equitable growth through innovations. The 2002 R&D strategy outlines a R&D spending to GDP ratio target of 1%, which the subsequent National Development Plan (2012) projects to reach 1.5% by 2030. However, the pinnacle so far has been 0.81% in 2008 ^[2], which translates to failure to meet any of the set goals. Following this peak, the R&D investment-GDP ratio has dwindled to about 0.60% in 2020 ^[8], approximately 20 years after the initial set target. This is indicative of the failure to maintain the momentum. However, the 2025 National Budget, which proposes interventions in the health, energy, and bio-economy sectors, offers some hope.

Figure 2: Research and Development Expenditure Trends (2003 - 2020)



Data Source: The World Bank Development Indicators Database

Human capital development in science and engineering has not favoured some disadvantaged groups, even though South Africa has improved in this field. Women

constitute only 13% of Science, Technology, Engineering, and Mathematics (STEM) graduates, which is significantly below the global average of (35%) ^[6]. The Engineering Council has very low registrations of females, indicative of persistent systematic bias, lack of support, and societal expectations. Despite the country implementing gender-responsive policies, these challenges persist. From a racial perspective, before 1994, only 7.3% of skilled and registered professionals in science were from discriminated groups ^[4]. By 2001/2, this improved to 36.5% of R&D personnel and 45.9% of those registered with Science Councils. This improvement, however, falls short of the demographic composition of the country.

Since the dawn of democracy the Government has made significant strides in broadening access to higher education and increasing financial support for R&D. This has been achieved through National Research Foundation (NRF) and programmes like Thuthuka and SARChI. These flagship programmes have significantly advanced South Africa's research and innovation landscape over the last two decades. Thuthuka focuses on empowering early-career researchers from historically disadvantaged groups, by fostering their professional development and enhancing their capacity to contribute to knowledge. SARChI strengthens institutional research capacity by establishing Research Chairs at public universities.

The Research Chairs focus on producing high-quality research addressing national development challenges such as health, economic growth, and environmental sustainability. The program also aids in attracting and retaining top-tier researchers. However, challenges remain which limit their transformative impact on inequality and innovation in South African higher education. These are linked to institutional capacity, barriers of bureaucracy, monitoring and evaluation and funding disparities and limitations.

Funding disparities and limitations are partly driven by broader budgetary constraints, with the share of university allocations in the national education budget declining from 11.3% in 2020/21 to 9.51% in 2025/26. Although nominal funding rose slightly, real allocations remained stagnant at around R39 billion (in December 2020 prices). Similarly, innovation funding as a share of the economic development budget dropped from 7.8% in 2020/21 to 7% in 2025/26, reflecting fiscal shifts that have disconnected national innovation ambitions from prior set resource commitments. This trend further entrenches inequalities, particularly for historically disadvantaged institutions.

Figure 3: Trends in University Budget Allocations

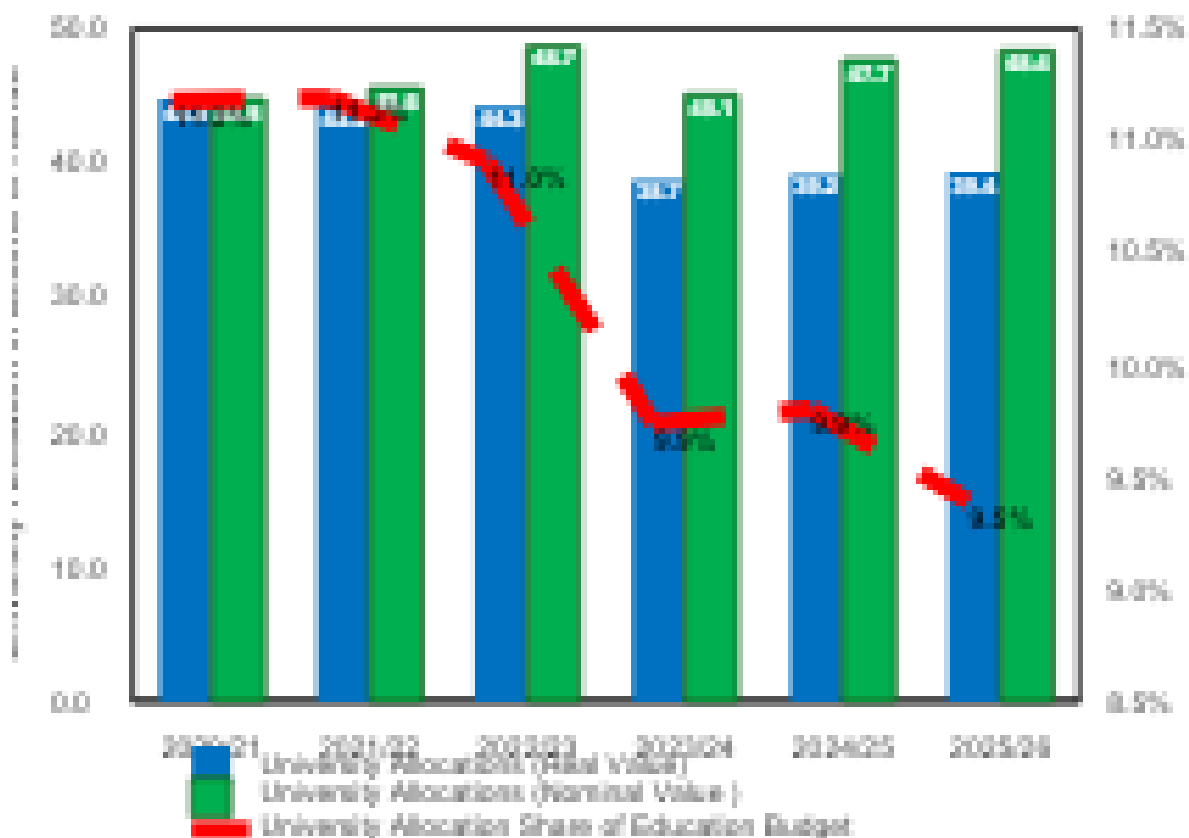
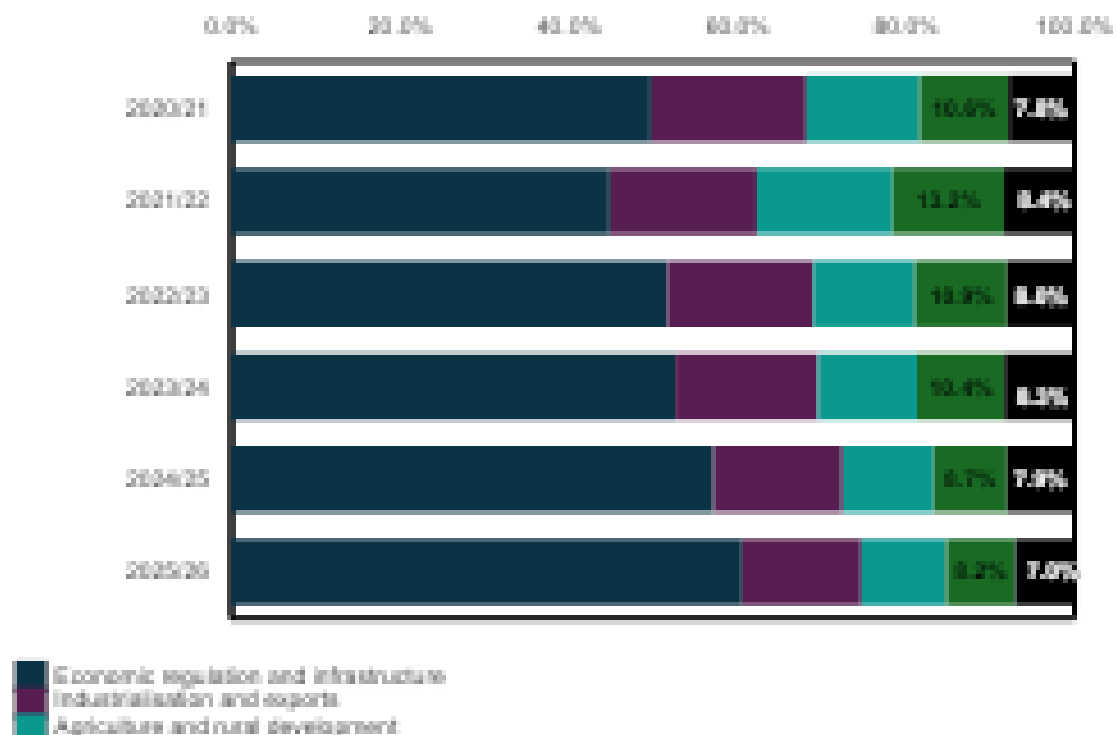


Figure 4: Innovation share of Economic Development Budget



Data Source: National Budget Highlights by the Treasury, Republic of South Africa

Conclusion and Policy Implications

South Africa has put in place several policy frameworks to advance innovation and technology for inclusive growth. The policies acknowledge the potential of innovation to address inequality through the benefits of expanded growth and opportunities. The policy frameworks also stipulate that denting inequality is one of the goals of innovation by specifically encouraging the participation of individuals from different backgrounds. This can potentially reduce gaps in income, wealth, and gender. Over the last few decades of democracy, many programmes and interventions have been established based on the set policy goals. These have achieved improvements with regard to improved accessibility and exposure to innovation and have enhanced equity and livelihoods.

However, despite these interventions, innovation remains a significant, uncharted potential to address inequality. Challenges such as the narrow implementation scope of the programs, limited capacity, and inadequate funding continue to disadvantage the underserved. These and other limitations constrain the successful implementation of policy. Some sections of society still face grassroots challenges such as access to resources and infrastructure. Although the possible role of innovation in addressing inequality is outlined in the policies, innovation continues to be associated with the elite.

This policy brief, therefore, recommends a revised, specific, and tailored policy strategy that clearly stipulates mechanisms for reducing disparities through innovation and technology. The loss of momentum, among other limitations over the years, also highlights the need to revive innovation as a priority to move the nation ahead while addressing its unique context of extreme inequality.

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