

2022/23

Annual Review Report



2001/02



2003/04



2004/05



2005/06



2006/07



2007/08



2008/09



2009/10



2010/11



2011/12

Celebrating
20 years of
collecting and
analysing
R&D data for
South Africa



2012/13



2013/14



2014/15



2015/16



2016/17



2017/18



2018/19



2019/20



2020/21



2021/22

* Forthcoming



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HSRC-CeSTII 2023. *Centre for Science, Technology and Innovation Indicators: 2022/23 Annual Review Report.*

Human Sciences Research Council: Cape Town.

Date of publication: September 2023

Concept and production: Gerard Ralphs, Glenda Kruss, Katharine McKenzie

Editing: Katharine McKenzie

Design and layout: Tracey Watson

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ABBREVIATIONS

ACTS	African Centre for Technology Studies
AOSTI	African Observatory for Science, Technology and Innovation
AUDA	African Union Development Agency
CeSTII	Centre for Science, Technology and Innovation Indicators
DSI	Department of Science and Innovation
ECOWAS	Economic Community of West Africa States
Evi-Pol	Strengthening the Capacity of Africa's Science Granting Councils in the Use of Evidence in Policy and Decision Making
GEAR	Growth, Employment and Redistribution
GERD	Gross domestic expenditure on R&D
HSRC	Human Sciences Research Council
IDRC	International Development Research Centre
IERI	Institute for Economic Research on Innovation at Tswane University of Technology
ISESCO	Islamic World Education, Scientific and Cultural Organization
NACETEM	National Centre for Technology Management (Nigeria)
NCRST	National Commission on Research, Science and Technology (Namibia)
NACI	National Advisory Council on Innovation
NEPAD	New Partnership for Africa's Development
NRF	National Research Foundation
NSI	National system of innovation
OECD	Organisation for Economic Co-operation and Development
R&D	Research and development
RDP	Reconstruction and Development Programme
R&DSMS	R&D Survey Management System
RedeSist	Research Network on Local Productive and Innovation Systems
SASQAF	South African Statistical Quality Assessment Framework
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
STATS SA	Statistics South Africa
STI	Science, technology and innovation
STISA	Strategy for Technology, Innovation and Science in Africa
TIPC	Transformative Innovation Policy Consortium
UIS	UNESCO Institute for Statistics
UJ-TRCTI	University of Johannesburg – Trilateral Research Chair in Transformative Innovation, the 4th Industrial Revolution and Sustainable Development



Prof. Sarah Mosoetsa

Chief Executive Officer: Human Sciences Research Council

The ‘so what’ of South African science and innovation indicators

Addressing the crucial “so what?” question, which resonates with both South African citizens and decision-makers across various sectors who benefit from our research, the HSRC stands apart in two significant dimensions. Firstly, its wealth of multidisciplinary expertise and the creation of vital longitudinal datasets spanning social, economic, political, and health-related subjects empower the effective utilisation of shared knowledge to shape the nation’s policies and drive strategic actions. This research-driven policy approach sets the HSRC apart as a leader in translating data into meaningful change.

Secondly, the HSRC’s remarkable ability to convene stakeholders from diverse domains and guide them in assessing research from an implementation standpoint establishes the organisation as a pivotal influencer in the decision-making process. In a world where global challenges intertwine with local issues, including but not limited to climate change, inequality, and health crises, the HSRC’s role in translating research into actionable insights becomes paramount. This demands that the HSRC not just generate knowledge but also chart a course toward tangible impact.

It is with this in mind, that the HSRC’s Centre for Science, Technology, and Innovation Indicators (CeSTII), mandated by the Department of Science and Innovation (DSI), plays a fundamental role in producing datasets that underpin South Africa’s science and innovation policies. Beyond this foundational role, CeSTII bears the responsibility of interpreting evidence and disseminating its insights and expertise through extensive networks and collaborations across Africa. The dedicated members of the CeSTII team have over many years meticulously built a reputation as credible leaders in the field of science, technology, and innovation (STI) indicators, a recognition that extends across the continent. This, in synergy with the contributions of other HSRC teams, significantly reinforces South Africa’s

development objectives, positioning it as a player to be reckoned with on the global stage.

As we look forward, guided by our shared commitment to making a real impact, the importance of CeSTII’s data for policymaking cannot be overstressed. It serves as the bedrock upon which informed decisions are built. In a world characterised by rapid change and complex challenges, data-driven policymaking is not a luxury but a necessity. CeSTII’s contributions play a key role in ensuring that South Africa remains agile and responsive in the face of evolving global and local dynamics.

In my journey with the HSRC since early 2023, I have witnessed the HSRC’s resolute dedication to effecting change through its various research divisions including CeSTII. As we continue to implement our carefully crafted business and strategic plans, in close partnership with stakeholders and collaborators, I am filled with anticipation for the indispensable role that CeSTII will continue to play in advancing this transformative agenda. Together, we remain committed to not merely asking “so what?” but actively answering it with actions that drive positive change and progress, both within South Africa and far beyond its borders.

ABOUT CESTII

The Centre for Science, Technology and Innovation Indicators is a statistical and policy research unit located within the Human Sciences Research Council.



OUR VISION

The Centre for Science, Technology and Innovation Indicators seeks to be a leading Centre for the measurement of science, technology and innovation, with a growing national, continental and global footprint, impact and reputation rooted in high-quality research evidence, strong networks of researchers, policy makers and practitioners, and the deployment of cutting-edge research technologies that improve the quality and quantity of output. The work of CeSTII is supported by an ethos of teamwork and inclusive diversity, shared learning, creativity, and a commitment to sustainability.



OUR MISSION

To become the leader in the field of national surveys that underpin benchmarking, planning and reporting on R&D and innovation in South Africa. We adapt best practice international methodologies for measurement of science, technology and innovation (STI) indicators, within a framework of innovation for inclusive and sustainable socio-economic development.



OBJECTIVES

- 1 Build the institutional capabilities of CeSTII researchers to achieve its mandate.
- 2 Undertake statistical surveys that support measurement and analysis of STI indicators in South Africa to national and international quality standards.
- 3 Contribute to and deepen analysis of STI indicators in relation to challenges of economic growth and inclusive development, through scientific publications, data sharing, technical briefs and international benchmarking studies.
- 4 Contribute to data sharing, knowledge sharing and exchange with national, regional and global STI measurement and policy communities and other actors in the national system of innovation.
- 5 Lead a new research agenda to inform the design of measures and indicators that can support and promote a strategy of innovation for inclusive development, in line with the HSRC organisational research focus, Department of Science and Innovation's White Paper, and towards national development goals.



Dr Glenda Kruss

Executive Head: CeSTII, Human Sciences Research Council

Mapping change pathways for the decades ahead

In November 2022, the CeSTII team gathered for their lekgotla at the historic Mont Fleur conference centre near Stellenbosch. An annual strategic meeting to spark opportunities for collective reflection and learning, we used the lekgotla to work on a shared understanding of the change pathways we need to pursue to achieve our vision.

Given the local and global challenges that confront us, the CeSTII vision is increasingly relevant and of value: thought leadership in science, technology and innovation measurement, as evidence for policy learning, in South Africa, Africa and the global south.

This vision is reinforced by our organisational objectives that inform the substantive focus of CeSTII research projects.

In this context, a welcome addition to our lekgotla conversation was a team process introduced to articulate the CeSTII theory of change: a mapping of the trajectories propelling our individual and organisational activities toward the desired outcomes and impacts we seek.

To start the process, we imagined a future where STI policy making was grounded in the realities of, and would benefit, all who live in South Africa. To shape policy in this way, we recognised the need for CeSTII researchers to become thought leaders; yet, to become thought leaders, we also identified the need to build our organisation's reputation for providing ironclad quality data, and relevant, incisive analysis.

Through our day-to-day work, it would be important to demonstrate the implementation of new and improved methodologies, expand our relationship building and enhance capacity building through organisational learning. Excellence in execution serves to reinforce our reputation

as part of the HSRC, as CeSTII as a team, and as researchers and intellectuals contributing to the field.

Finally, we set out to explore change pathways between the activities we need to enact, to bring about our desired outcomes and impact.

In enacting this evolving theory of change, a key opportunity is working with our counterparts on the African continent, through formal mechanisms such as those established through AUDA-NEPAD and AOSTII, as well as through our project-based work with science granting councils, and MOU-based work with national authorities from Namibia and Nigeria.

The reflection to design change pathways is particularly significant as we mark 20 years since the HSRC became the national base for R&D and innovation surveys, in partnership with the Department of Science and Innovation and Statistics South Africa. Adding to the solid foundation built over the past two decades, there is now a strategy for sustainable STI measurement practice going forward.

20 years of the R&D Survey

This edition of the CeSTII Annual Review Report celebrates 20 years of the R&D Survey. We thank Prof. Michael Kahn for his reflection on the inception of the Survey two decades ago and its important contribution to STI policy in SA.

INTERVIEW WITH ○ PROF. MICHAEL KAHN ○

We must do more to grow innovation and R&D in South Africa

In 2003, the HSRC's Executive Director for Knowledge Management, Dr Michael Kahn, proposed the formation of CeSTII, as a centre of excellence for science, technology and innovation indicators. He tabled an ambitious business plan that envisaged the creation of an important institution for the new South Africa. One that would foster sound policy development through the collection and dissemination of data on South African innovation, while supporting the evolution and evaluation of the country's national system of innovation. In a wide-ranging interview, CeSTII's founding director reflects on the work of the centre and the challenges that confront innovation scholars today.

In 2002, when SA was mid-way through President Mbeki's first term of office, what was taking place in the broader national context in which the measurement of science, technology and innovation indicators emerged through the formation of CeSTII?

That's a very interesting question because what it immediately addresses, is the relationship between what happens in the narrow world of STI (science, technology, innovation) and the bigger world of the real economy. In the real economy and the national politics, what you have is the forced transition from the RDP to GEAR in 2000, that's one strand. The second, is the maturing of what had started out as DACST (Department of Arts, Culture, Science and Technology) and by 2002 its separation into the Department of Science and Technology and the Department of Arts and Culture under one minister.

Naturally, the new Department of Science and Technology wanted to define itself as something to be taken seriously. Up to that point, you had

the 1996 White Paper on Science and Technology, which set the agenda in broad terms, but was also quite operational. One of the themes in the White Paper was the need for performance management and performance measurement, and DST took that seriously, and in 2002 it commissioned a national R&D survey.

So, there was an environment of performance measurement in the background. You have government, with its emphasis on new public management and evidence-based policy, and in 1999 a new Director-General, Dr Rob Adam, with whom I'd worked very closely in the past, and he had to shape the new department going forward.

On my first day at work, 1 March 2002 down in Cape Town, Mark Orkin (HSRC CEO 2000-2005) walks in. I'm facing a totally empty office, there's nothing; not a desk, not a phone, there's been no prep for the start of this new division. He says, 'Oh, hi, Michael. How are you doing today?' and that he's been talking to Rob Adam who's asked

the HSRC to re-establish the official R&D survey. Can I do that? It was as simple as that, and that's where it began. I asked about budget and staff, he said, 'Well, it's up to you. That's why I hired you.' So that was how the first R&D survey took off, with the HSRC contracted to the new Department of Science and Technology.

I was able to recruit two people who had worked on the 1991 survey and their memory and expertise was essential in getting going in the ridiculous timeline that we had. So, it was a learning process. Also, very early I visited the OECD in June 2002 and struck up a relationship with Fred Gault, who was then committee chair of what is still known as NESTI (the OECD's Party of National Experts on Science and Technology Indicators). Fred was very supportive, right through to today.

Internationally, the OECD leads in establishing and updating methodological guidelines for the measurement of R&D and innovation. What were the challenges associated with 'domesticating' the use of these in SA?

A hugely complicated question! The OECD began work on defining the measurement of R&D in 1962 with Chris Freeman, and he basically wrote what became the first Frascati Manual, adopted in 1963. As early as 1968, South Africa, through the CSIR, was running its first Frascati Manual-compliant R&D survey. So, the OECD took the lead and still takes the lead for R&D surveys.

The question about domestication, arose most strongly not for us, but for the Latin Americans around innovation. They had done some of their own innovation surveys and when the Oslo Manual appeared, they said, 'no, this is not suited

to our socio-economic environment,' and went ahead and developed the Bogota Manual.

The domestication question takes you to, 'How do you define R&D in emerging and developing country contexts?' Through conversations with the UNESCO Institute for Statistics, they set in place a process and commissioned papers on the challenges around measuring R&D in developing countries. This eventually appeared as Technical Guide 5, later incorporated into the revised Frascati Manual of 2015. A lot of history here and 'yours truly' was the author of Technical Guide 5!

To go back to the basic question, we want to benchmark – but we want to acknowledge the character of our environment. It's an unresolved issue. I am currently working on public sector innovation and the same thing comes up. You deal with it by having a core set of questions which are shared, for benchmarking, and you might have

others which are for local use. But if you're going to say, 'We want to have completely unique definitions,' you're going to be on your own.

It's all very well for OECD to say the idealised survey methodology is, 'do a census' or 'achieve such a return rate'. There are practical realities on the ground. If you go to the business sector for innovation data, there is no comprehensive national business register in SA, and we're not alone in that. The same is true in Germany, which is a federal system and each of the Länder (states) has its own story. The way they get around that is by using the company data held by credit rating bureaus, because you can't do business in Germany if you don't have a credit rating. So, you have to find creative ways to get around obstacles.



Michael Kahn with Prof. Rasigan Maharaj (Institute for Economic Research on Innovation, Tshwane University of Technology) at the NACI STI Policy Colloquium, September 2022 [Image credit: Gerard Ralphs]

Our return rate for the first Innovation Survey was 34%, that was the 2002-2004 survey, published as Business Innovation Survey 2006. It was fantastic, in our context. The late William Blankley brought it in, and I raise a salute to him. The way we worked together – he was my adviser on the R&D Survey, and I was his adviser on the Innovation Survey – we each had our domain and drove it, and there was trust. That was terribly important in the way that the organisation worked.

You mentioned the emergence of ‘new public management’ as a framework for how institutions are managed and governed. The preoccupation with developing science systems and innovation systems and then later new public management became an approach to institutionalise these ideas. The national ‘system of innovation’ idea was also fairly new, is that consistent with what you were seeing at the time?

Thank you for bringing in the concept of the national system of innovation. New public management (NPM) was a very strong influence on the first administration and in fact, right through the Mbeki era, which for me begins in 1994. It permeated everything.

The extent to which it was part of the debates in the science policy arena? Virtually nothing. I don’t think anybody knew the acronym. We were concerned with measurement, and measurement was important. The concept of the national system innovation was introduced in the White Paper (on Science and Technology) by the international consultant, Jeff Mullin of Canada. This came in as an idea, a touchstone, because it’s not prescriptive. It tries to simply change the way of thinking about what’s involved in innovation – it’s not just simply you measure R&D, you do R&D,

and hey presto, everything changes. That’s where Frascati was important, (acknowledging) the productivity gain comes from *investing* in R&D, so we’d better measure it.

That was in the 1960s, and it goes like that for two decades and the global situation changed dramatically – the oil shocks – and then the rise of the emerging China, and Japan is dominant. What are they doing that we’re not doing? It’s got to be R&D. And then the next thing is, no, it’s the way their *systems* work.

And that takes you toward the concept of the national system innovation, which basically says take a 360° look around. Innovation is not just in the lab, it’s happening all over the place. That

nuance is generally misunderstood. I like to say to people, here’s a letter to deliver to the NSI. Where are you going to take it? What is the address?

Looking back to the first R&D and innovation surveys CeSTII administered, what were the building blocks that were important then?

So, survey one (R&D

Survey 2001/02), we were really flying by the seat of our pants. We bring it in, the department’s happy and they say, ‘OK, do another’. We were then working at two-year intervals. We were completely under capacitated, so, we hired staff and some are still at the centre; that was a turning point. Working with Statistics Canada, I met some people in the international “economics of innovation” field and when we got the go ahead and recruited newcomers, I contacted Al Teich in Washington, former head of policy at the American Academy for Advancement of Science, and we brought him out, and between him and myself, ran a weeklong workshop to induct the new staff.

“In many ways there are two science systems. There’s one that just tries to keep going and then you’ve got the stars, the brilliant people.”

At the time we were cash flush, and the executive directors had complete financial autonomy (the message from the CEO was, 'I believe you and know what you're gonna do, go ahead and do it, don't mess up'). So, I said to the department, let's open the workshop to SADC and identify someone in each SADC country and invite them to Cape Town. The deal will be you get here and after that it's on us, the hotel and everything else. We did that for a week in our Plein Street office. We shared everything we had learnt.

The principle was, what we have developed, we learned from others.

So, we gave all the participants our protocols, instruments, guidebooks, whatever we had learnt on the way and that was tremendously important because it empowered NEPAD S&T. It led to the creation of the African STI indicators initiative and supported the founding of the African Union Observatory on STI. That's something that the HSRC can be very proud of.

In 2005, in the eyes of DST we gained the cachet of being part of official statistics. We were the first agency outside Statistics SA to get that designation. We also were, I think the first to be allowed to exploit the taxpayer database. That came through an MOU between the department and Stats SA, and it still holds. However, there is still the problem of access to data. I believe we fail to fully exploit what we've got. So, the building blocks were political support, communication and achieving a balance between research and what you actually have to deliver and are going to be held accountable for.

What are the key contributions CeSTII has made over the past 20 years?

In 2005/06, DST set out to open the conversation between the state and business. So, for example, we did a presentation on the R&D survey results at the Johannesburg Stock Exchange. We did a presentation to the Portfolio Committee in Parliament. There we saw traction being gained. The Minister was Mosibudi Mangena, he liked it, and we started seeing new people in the room in, in meetings taking place in the department. Maybe that's because of our work and maybe not. We were actively pushing that R&D is taken seriously.

“Knowledge is a non-rival good. It leaks and the bigger your system is, the more able you are able to exploit it. There's a non-linear effect here, a scale effect, the bigger you are, the more you can do.”

The second thing was empowering the National Council on Innovation (NACI) in its first phase, from 1997 to 2004. One of its responsibilities was to cut up the science vote, as it then was, among the science councils and that needed independent data. So, CeSTII was involved in what was then the committee of science heads, for the CEOs of the science councils and NACI, in speaking about indicators, accuracy and data and getting the conversation going.

I should say a couple of words about challenges. South Africa has somewhat slavishly followed big trends from abroad. We looked at what everybody was saying about tax incentives and said, yes, we've got to do that too, and we did it our way. There's now enough evidence that a consequence of the tax incentive was to make the work of CeSTII almost impossible. That environment it's very, very complex. So, we've got incentives as part of the NSI framework. Are they working and is the voice of CeSTII heard? Because it sits on large data. That data should be deployed to inform those policy decisions. I don't think it has been.

The context now is dramatically different from the early 2000s, with global warming, geopolitical uncertainty, questions around data and artificial intelligence plus South Africa's significant national challenges. We've got a complex world, so why is measurement important now?

It's always been important. Is it more important now than ever? In a way, yes, and I'm not quoting anybody's best-selling book but we're in the business of telling truth to power – this is what's happening, people, sorry. To the best of our ability to measure, this is what's happening. However, when we say this, there's a number giving you the value of BERD as a percentage of GERD. Then you get into the space where you start commenting on why the decline of BERD.

Now you come to the present. Where BERD as a percentage of GERD is looking even worse. We are in a desperate position. In many ways there

are two science systems. There's one that just tries to keep going and then you've got the stars, the brilliant people, the Tulio de Oliveira's, Salim Karim's, the fellows of the Royal Society, the Zebulon Vilakazi's. They're fantastic and we salute them. But underneath, the system as a whole is in deep trouble – it's creaking, it's small, it's not growing.

“So, when you ask about measurement, we've got to keep measuring as accurately as we can. We have to bring it to the attention of the people who should be making clever decisions.”

So, when you ask about measurement, we've got to keep measuring as accurately as we can. We have to bring it to the attention of the people who should be making clever decisions. Knowledge is a non-rival good – it leaks and the bigger your system is, the more able you are able to exploit it. There's a non-linear effect here, a scale effect, the bigger you are, the more you can do. It doesn't matter that 90%

of China's patents are junk. The 10% that are not will be exploitable, because they are so big. South Africa is a tiny player with a rather inflated ego. That's a big problem. That's CeSTII's job – to point out stagnation and where it is.

Interview: Gerard Ralphs, Katharine McKenzie

About Prof. Michael Kahn

Michael Kahn is Research Fellow at the Centre for Research on Evaluation, Science and Technology at Stellenbosch University, Extraordinary Professor at the University of the Western Cape and Professor of Practice of the University of Johannesburg.

In her own words

CeSTII's longest-serving staff member, Natalie Vlotman, joined the Centre in 2003. Looking back on the R&D Survey's formation, she had this to say.



“CeSTII is a place where I could develop expertise in a very specialised field. We worked in an environment that encouraged working independently and within a team structure. I loved working on a project like the R&D Survey which follows sound methodological principles and continuously strive towards attaining statistics of high quality. The high standards set, allowed us to gain recognition from many stakeholders, both local and international experts and this makes me very proud to be part of this project.

Data is impartial, not politically influenced and simply tells the story of the moment... and it has been a pleasure for me to be able to add to this story.”

INTERNATIONAL ADVISORY COMMITTEE

Dr Susan Cozzens
Advisory Committee Chair

Measurement needed to support policy development, monitoring and evaluation

An independent advisory committee, including experts from South Africa, India, Spain, Costa Rica, UK and the USA provides CeSTII with advice on the conceptualisation and implementation of its research agenda.

CHAIR'S REFLECTIONS

The CeSTII Advisory Committee consists of eight appointed members from six countries and the HSRC Executive Head responsible for CeSTII, Dr Glenda Kruss. The Committee was formed in 2017 and has met regularly to review topics of importance to CeSTII and to provide independent advice. The minutes of the committee provide a record of the advice of the committee available to the CeSTII staff. The Committee last met in October 2022.

Over its six-year history, the Committee has devoted attention to a variety of CeSTII projects:

- The CeSTII Business/Strategic Plan
- The Business Innovation Survey, including operational issues
- The R&D Survey
 - Alignment with the 7th edition of the Frascati Manual while insuring South African relevance
 - In 2020, plans to deal with the impact of COVID-19
 - Quality improvements
- Institutionalisation of the South African Agricultural Business Innovation Survey
- Measuring innovation in the informal economy – framework, research agenda, pilot results, policy relevance
- The role of R&D in state-owned enterprises

Longer term topics have included:

- Changing policy interests in STI as the Department of Science and Technology transitioned into the Department of Science and Innovation
- Implications for STI measurement of the 2019 White Paper and the Decadal Plan for Science, Technology and Innovation
- CeSTII's work with the Department of Science and Innovation and with the National Advisory Council for Innovation
- CeSTII involvement with the Southern African Development Community
- The establishment of a CeSTII Data Committee in 2019

In addition to the members of the committee, CeSTII staff participate actively in the meetings, making presentations, providing information, and responding to questions. The DSI is present as an observer, and one of the members of the committee represents the secretariat of the National Advisory Council on Innovation. The presence of DSI and NACI ensures that matters relevant to CeSTII are shared with other agencies engaged in supporting science, technology, and innovation in South Africa.

The committee meets electronically. Each year, two or three members rotate off, allowing renewal of a third of its membership annually.

In summary, since 2017, the committee has focused on the measurement needed to support policy development, monitoring, and evaluation. Its advice

supports both established and emerging areas of measurement in science, technology, and innovation.

INTERNATIONAL ADVISORY COMMITTEE MEMBERS



Dr Susan Cozzens (Chair)

Dr Cozzens is Professor Emerita in the School of Public Policy at the Georgia Institute of Technology, USA and recently served as the Vice Provost for Graduate Education and Faculty Development for the campus. Her research interests are in science, technology and innovation policies in developing countries, including issues of equity, equality and development. Dr Cozzens is active internationally in developing methods for research assessment, and science and technology indicators. She served as Chair of Public Policy and was Associate Dean for Research in the Ivan Allen College of Liberal Arts. From 1995 through 1997, she was Director of the Office of Policy Support at the National Science Foundation, and spent 11 years on the faculty of Rensselaer Polytechnic Institute. Her PhD is in sociology from Columbia University (1985) and her bachelor's degree is in sociology from Michigan State University (1972, summa cum laude).



Prof. Sunil Mani (Vice Chair)

Prof. Mani is Director and Professor at the Centre for Development Studies (Trivandrum, Kerala, India) and visiting professor at the National Graduate Institute for Policy Studies (Tokyo, Japan). He has been a visiting professor at Bocconi University (Italy), the University of Toulouse-Jean Jaurès (France) and the Indian Institute of Management (Calcutta). Prof. Mani also worked at the United Nations University – Merit (Maastricht) as a researcher and head of graduate studies. He specialises in the economics and policy study of innovation, and his recent publications include a book with Franco Malerba and Pamela Adams, *The Rise to Market Leadership: New Leading Firms From Emerging Countries* (2017). Prof. Mani holds a PhD in Economics from Jawaharlal Nehru University (New Delhi) and completed post-doctoral research at the University of Oxford.



Prof. Fred Gault

Prof. Gault is Professor Extraordinaire at the Tshwane University of Technology and a member of the TUT Institute for Economic Research on Innovation. He served on the Council of Canadian Academies (CCA) Panel on the State of Science and Technology in Canada, the CCA Panel on the Socio-Economic Impacts of Innovation Investments, and the U.S. National Academy of Sciences Panel on Developing Science, Technology and Innovation Indicators for the Future. He is a Visiting Professor at the University of Johannesburg and DST/NRF/Newton Fund Trilateral Research Chair in Transformative Innovation, the 4th Industrial Revolution and Sustainable Development.



Dr Almamy Konté

Dr Konte has over 16 years of experience in science policy and innovation, and expertise in higher education and scientific research. He worked for eight years as senior expert in innovation policy at the African Observatory for Science, Technology and Innovation at the African Union Commission. There he led the AOSTI programme to build the capacity of African Union member states to collect STI indicators and develop evidence-based policies. In this period, he worked with 42 of the 55 member countries of the African Union. He has offered his services to several international organisations including UNESCO, NEPAD, ECOWAS, and ISESCO. He also provided his expertise to Mali and the Democratic Republic

of Congo in designing their science policies. From 2006 to 2012, Dr Konte was Director of Technological Research at the Ministry in charge of scientific research in Senegal. Dr Konte holds a PhD in physics and currently works at Cheikh Anta Diop University in Dakar, Senegal.



Prof. Erika Kraemer-Mbula

Prof. Kraemer-Mbula is Professor of Economics at the University of Johannesburg and holds the DST/ NRF/Newton Fund Trilateral Research Chair in Transformative Innovation, the 4th Industrial Revolution and Sustainable Development. Initially trained as an economist, she holds a master's in Science and Technology Policy from the Science and Policy Research Unit (University of Sussex), and a doctorate in Development Studies from the University of Oxford. She specialises in science, technology and innovation policy analysis and innovation systems in connection with equitable and sustainable development. In the United Kingdom Prof. Kraemer-Mbula has held various research positions at the Centre for Research in Innovation Management (CENTRIM) and at the Science and Policy Research Unit (SPRU) at the University of Sussex. In South Africa, she has been senior lecturer at the Institute for Economic Research on Innovation (IERI) at Tshwane University of Technology. She co-authored *The Informal Economy in Developing Nations: Hidden Engine of Innovation?* published in 2016 by Cambridge University Press.



Dr Petrus Letaba

Dr Petrus Letaba joined the Department of Engineering and Technology Management at the University of Pretoria, in 2020. Prior to that, he was a Senior Specialist: Science, Technology and Innovation (STI) Measurements and Evaluation at the National Advisory Council on Innovation (NACI). He has extensive experience in data and information management, policy analysis and technology management. He participates in several local and international expert committees on a wide range of issues including science, technology and innovation policy analysis, and standards development. He holds an MBA from the University of the Witwatersrand in strategic management of innovation and a PhD in technology management.



Dr Pedro Mendi

Dr Mendi is associate professor in the Department of Business, Universidad de Navarra, Spain. He holds a BA in Economics (1996) from Universidad de Navarra, and a PhD in Economics (2001) from Northwestern University. He has been a faculty member at Universidad de Navarra, both at the School of Economics, where he is currently Vice Dean, as well as at the Navarra Center for International Development. His research focuses on the economics of innovation and technology transfer and other topics in industrial organisation. His research has been published in journals including the Journal of Economics and Management Strategy, Research Policy, and Technological Forecasting and Social Change.



Dr Flávio Peixoto

Dr Peixoto is senior economist at the Brazilian Institute of Geography and Statistics where he currently coordinates the Brazilian Innovation Survey (PINTEC) and is a member of the working group for the Sustainable Development Goals indicators. He recently coordinated a pilot survey for the development of sustainable indicators in manufacturing firms in partnership with the Economic Commission for Latin America and the Caribbean. He is also associate researcher at the Research Network on Local Productive and Innovation Systems (RedeSist) at the Institute of Economics, Federal University of Rio de Janeiro, Brazil. Dr Peixoto holds an MSc and a PhD in Economics from the Federal University of Rio de Janeiro. He has worked on the convergence of Latin American structuralist and innovation system approaches, nanotechnology systems of innovation and innovation policy in Brazil. His current research work is on the interaction and co-evolution of innovation indicators and measurement and innovation policy.

RESEARCH THEMES

CeSTII's programme encompasses three research themes, generating a significant body of research and analysis in the 2022/23 reporting period. A fourth cross-cutting theme provides support to the research projects.

THEME 1: MEASURING R&D CAPACITY IN SOUTH AFRICA



Dr Nazeem Mustapha
Theme leader



Investment ■ Insight ■ Impact

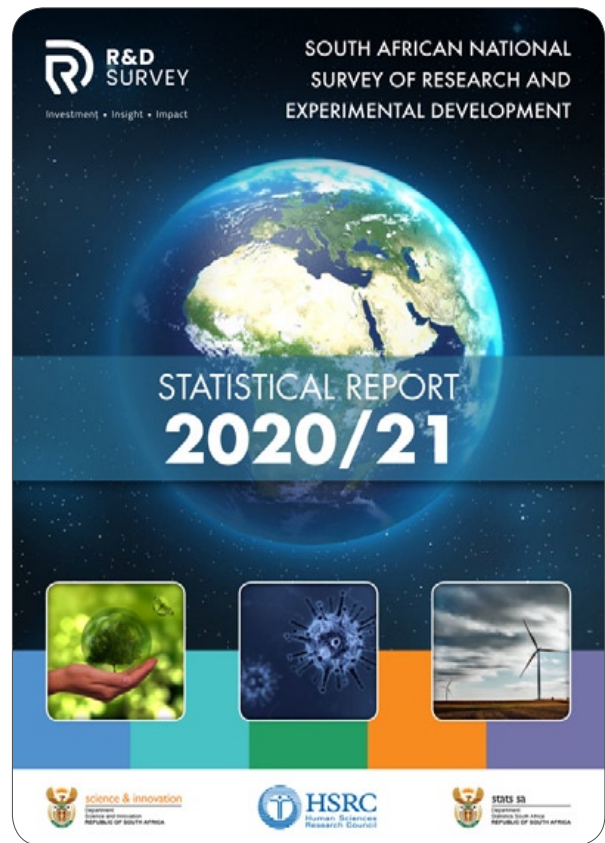
2020/2021 R&D Survey results published

The R&D Survey's 2020/21 Statistical Report was released by CeSTII and the Department of Science and Innovation on 18 January 2023. The survey, which has been conducted annually since 2001/02, reports the latest available data on R&D expenditure and performance across five sectors: higher education, science councils, government, business, and not-for-profit organisations.

The 2020/21 Survey found that the business sector reported the largest decrease in R&D expenditure. However, R&D personnel grew after a large decline in 2019/20, and government remained the largest funder of R&D.

R&D Survey responses increase

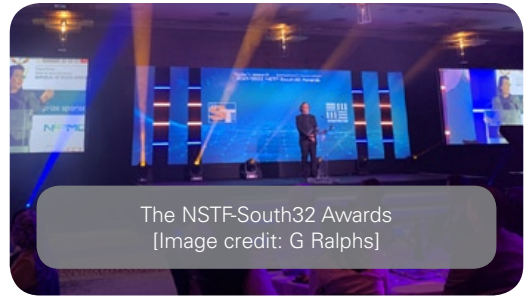
The R&D Survey was the most downloaded HSRC dataset for the 2022/23 year. As South Africa emerged from the COVID-19 pandemic and its disruptions, business responses to the R&D Survey increased once more. Field visits to companies previously commuted have brought them back into the Survey fold with the submission of data. New companies were added to the businesses surveyed in the year in review, and this will be reflected in the results of the forthcoming 2021/22 R&D Survey.



Read the Statistical Report:
<https://bit.ly/RDS2020-21>

NSTF-South32 Awards

CeSTII's R&D Team were finalists in the annual National Science and Technology Forum awards. Known as the NSTF-South32 Awards, they recognise outstanding contributions by teams, organisations and individuals to science, engineering, technology and innovation in South Africa.



The NSTF-South32 Awards
[Image credit: G Ralphs]

MOU with the Minerals Council

CeSTII officially signed a memorandum of understanding with Minerals Council South Africa, kicking off a project to explore new ways of collaborating with the industry body and developing a new survey.



Glenda Kruss and Nazeem Mustapha
at the NSTF-South32 Awards
[Image credit: G Ralphs]

Building African partnerships *Namibia*

Natasha Saunders and Natalie Vlotman were invited to assist the National Commission on Research Science and Technology (NCRST) to lead a R&D Survey Enumerator Training workshop in Windhoek, held at the University of Namibia from 12-13 September 2022. The enumerators were trained to help implement Namibia's national R&D survey in 2022.



R&D Survey Enumerator Training workshop
in Windhoek [Image credit: Natalie Vlotman]

Ghana

The HSRC and DSI hosted Ghana's Ministry of Environment, Science, Technology and Innovation. CeSTII participated in a meeting to explore potential areas of collaboration between Ghana and South Africa and Glenda Kruss and CeSTII colleagues shared a presentation titled: "STI surveys and indicators for the African context: how can South Africa and Ghana collaborate?"

R&D Survey information video

An information video on the R&D Survey was developed in 2022 and can be viewed on the HSRC's YouTube channel:



<https://www.youtube.com/watch?v=apvk0HGkT-0>

Behind the scenes of the filming at iThemba LABS in Cape Town:



INTERVIEW

Why strategic investment in R&D can deliver economic growth for South Africa

In January 2023 SAFM's Oliver Dickson spoke to Dr Nazeem Mustapha, who leads the annual R&D Survey on behalf of CeSTII at the HSRC, about the results of the 2020/21 R&D Survey. In this edited version of the interview Mustapha shares insights about SA's R&D landscape and the opportunities and challenges it represents.

Why is R&D important?

R&D has become more and more important in developing economies. Developed economies have been very successful in terms of economic growth, success in business, and providing modern and innovative solutions for society through R&D. It has become a key driver of economic growth and many governments put R&D at the centre of their development strategies. A case in point is China, which has, as we've all seen over the last 20 years, become the major growing economy in the world. A lot of that growth has centred on innovation. R&D is an activity that promotes ... innovation and is central in economic growth.

Can you draw a causal link between R&D and economic growth? How does an investment into R&D grow an economy?

We have three types of R&D. The first is basic research, which you can think of as being done in universities – research that is done with no actual product or process in sight. The second type of R&D is applied research, which is done with a specific goal. The third is experimental development, which is geared to producing new and innovative products. The production of new and innovative products allows for countries and societies to be more productive with the same inputs. So, it's really the spin-off that you get from being creative. R&D is known to be the activity that gives you the most creative solutions, when it comes to developing these innovation products.

Is there data that indicates the R&D dividend effect in the economy? For every Rand invested into R&D, what is the economic output thereof?

This is a problem that has been looked at for many years now and in many different contexts in different countries. There have been studies comparing different countries and the use of R&D linking it to GDP growth, and many of them find that there is a definite correlation between R&D activity and value-added growth, with a lag period, of course, because the R&D only impacts on economic growth years later once the products or processes have been developed. These studies have also been done in South Africa, and the ones that I'm aware of have shown that there's a positive spin-off effect from conducting R&D on your GDP growth.

Let's talk about South Africa's R&D investment historically. How have we done over the last 20 years?

Well, the last 20 years have been interesting! At the Centre for Science, Technology, and Innovation Indicators at the HSRC, we've been doing the R&D Survey 20 years now. When we look at the trends, let's focus on the business sector, because that's often the most important sector and certainly the most interesting. In the early parts of the new millennium, we were seeing R&D activity in the business sector at a relatively high level. We were very similar to many developed countries in the level of business R&D that we were doing. But over the last 20 years, that has been steadily in decline.

I think a watershed moment was 2009, with the financial crisis, and that was combined with some [policy] decisions within our local [business] sector, which resulted in some major R&D projects being shut down. That changed our business R&D expenditure, and it has been on the decline since. The other area in which we perform R&D is of course, the public sector, that includes higher education, universities, science councils, the government sector and state-owned enterprises, could be classified in the public sector. Generally, government has been able to keep up growth in expenditures on R&D over much of the last 20 years. Recently, in the last three to five years, we've seen the impact of cuts in government expenditure. Moreover, the COVID epidemic created a further decline in R&D expenditure, because a lot of businesses including the public sector, shut down many operations and that's resulted in a big decline in overall R&D expenditures.

How much is the government and business investing in R&D?

In real terms, around R19 billion rand per annum by government. The business sector funds around R9 billion, and that includes the state-owned enterprises. We shouldn't leave out the foreign funding of R&D, which is about half of what the business sector funds. That's quite a significant source of funding because it's essentially free funding of R&D, because it's funding that we, as a society, don't have to pay for. That's been steady over the last few years.

So, we're looking at about R33 billion collectively in R&D investment in South Africa each year.

You mentioned that 20 years ago, our R&D investment was comparable to developed countries. How do we fare now against economies of our size?

That's not an easy question and really, there is no definitive answer because every economy is very different, and the funding allocated to different areas would vary. But if you look at countries which historically have a similar trajectory as South Africa, some Eastern European countries, some smaller Western European countries, and South American countries like Argentina, I think, generally, we have performed in a very similar fashion. Of course, we can always do better, and we need to invest more,

so that we are able to reap the benefits of R&D. We really need to find some way of increasing the amount that we spend on R&D, and that means we need to create more R&D projects. That would ultimately be the solution.

It also means we need more researchers. Do we have enough?

The most important thing is to have the number of researchers increase. It

doesn't matter if you spend money on R&D and increase funding, if there aren't capable people to produce new knowledge and absorb it. One way that you can improve your performance in innovation, is to get foreign direct investment from firms that do R&D and even to locate in this country. If we can get them to locate, that's not going to be to our advantage, unless we have a local ecosystem of researchers that are able to absorb the new learnings and ensure that technologies can get transferred to our local innovation system. Currently, the number of researchers that we have is probably too low,

“We really need to find some way of increasing the amount that we spend on R&D, and that means we need to create more R&D projects.”

when compared to more developed countries. That's really at the core of it. If we produce more scientists and engineers, and also better ones, of course, then that is the greatest advantage that we can have as a country, attracting foreign investment in R&D and also growing our own skills and [developing] products that relate to our own context.

Is research an attractive career path now in South Africa?

For me it was. I think it depends on where you find yourself, most researchers find themselves as academics at university, but there's also a core of researchers that are required in the business sector to work in applied and experimental research. I'm not so sure that is as well known to the young people that passed matric last year. Certainly, the numbers have shown, in the trends over the last 20 years, that the proportion of researchers in our society relative to the number of people that we have employed, has been pretty much the same. It's around two or three people for every 1 000 in direct employment.

Are we paying researchers enough?

At one level, when we compare ourselves to other countries, I think our data shows that we are on a reasonable par with other countries, it really depends on the field that you are in, and the sector that you find interesting.

Can I ask an important question? Are we investing in the right areas, or are we investing in the wrong R&D that doesn't speak to our local needs?

That's the million-dollar question! It has several components. First, what is the best research,

specific to our own context, and what are the problems we want to solve? Historically, we've tended to do research that's been on an international agenda, if we put it that way, and perhaps more focused towards the developed parts of the country.

The Department of Science and Innovation's white paper on science and technology, is being put into action through a 10-year decadal plan which has recently been finalised. It looks at things like green R&D, a particular centre of activity where we could promote the development of capabilities in science and technology. An area that is also unique in South Africa is in terms of our biodiversity and the potential

for the bioeconomy. Everybody is looking at environmental issues, and solutions to the environmental challenges that we face. We also have a very high-tech space science programme and we've got a core of researchers that are very skilled and capable in space science and astronomy. All of these things have been looked at by the policymakers in the context of knowledge

and providing a strategy which promotes industrialisation.

If you had a magic wand Dr Mustapha, and you could increase R&D expenditure and investment, what figure would make you sleep well at night?

I'd say double where we are right now. But the composition of that would also be important. It would have to be based on adding more R&D projects. So we must have more research teams, more clever people. It does not have to be only scientists and engineers, but diverse teams, looking at big problems.

“We must have more research teams, more clever people. It does not have to be only scientists and engineers, but diverse teams, looking at big problems.”

THEME 2: MEASURING INNOVATION CAPACITY IN SOUTH AFRICAN FIRMS



Dr Moses Sithole
Theme leader

Quality indicators show significant improvement with three surveys in the field

The Business Innovation Survey (BIS), Agricultural Business Innovation Survey (AgriBIS) and the Innovation in the Informal Sector (IIS) Survey all went to field during the year under review. The survey data, once analysed, will cover recent reference periods, 2019-2021 for the BIS and AgriBIS, and 2021-2022 for the IIS.

The focus in all three surveys included:

- innovation measurement priorities for evidence-based policy and decision-making to address South African economic and societal challenges
- the adoption of recent, improved best practice survey methodologies, and
- data quality improvement practices.

The quality of the collected data with respect to a number of quality indicators improved significantly. For example, the response rate more than doubled in both the BIS and AgriBIS, as compared to the response rates in the previous rounds of these surveys.

BUSINESS INNOVATION SURVEY 2019 - 2021

For a more innovative South Africa

AGRICULTURAL BUSINESS INNOVATION SURVEY 2019 - 2021

For a more innovative South Africa

*INCLUDING FARMING, FORESTRY AND FISHERIES

Innovation in the South African Informal Sector Survey

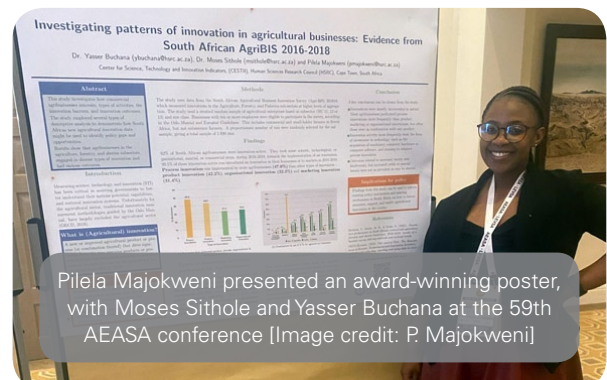
New fieldwork strategies

For the first time in the history of the BIS as conducted by CeSTII, the fieldwork was outsourced to a private fieldwork company. Given the increased response rate, the outsourcing of the fieldwork was successful. CeSTII monitored most of the fieldwork processes closely by working with the service provider and receiving regular updates.

However, a lesson learned from the fieldwork outsourcing strategy is that better monitoring and greater improvement in some data quality indicators, would be achieved if CeSTII continued to conduct those aspects of the fieldwork for which it has built up strengths and expertise over the years. This includes monitoring different stages and patterns of respondents' completion of questionnaires, while outsourcing aspects in which the fieldwork service provider has strengths, such as call centre management.

AgriBIS in-house team

The AgriBIS fieldwork was conducted internally by CeSTII with five fieldworkers. This team was smaller than the team involved in conducting the fieldwork for the BIS. This strategy worked very well for this survey, as the smaller number of fieldworkers was much easier to manage, and the survey core team could focus on closely monitoring the fieldwork and continually testing new problem-solving strategies as the need arose.



Pilela Majokweni presented an award-winning poster, with Moses Sithole and Yasser Buchana at the 59th AEASA conference [Image credit: P. Majokweni]

THEME 3: POLICY-RELATED INDICATOR DEVELOPMENT



Dr Il-haam Petersen
Theme leader

Working with Africa's science granting councils

Over the past two years, the Evi-Pol project team at CeSTII has engaged with African SGCs and Ministries participating in the Science Granting Council Initiative (SGCI) to support them in strengthening their capabilities to review and draft national STI policy and related documents, and to effectively manage grants and STI data. As part of this work, the Evi-Pol team hosted a set of participatory workshops and has developed tools that will be packaged for use by the SGCs after the conclusion of the project.

STI policy training workshop

In August 2022, ACTS and the Evi-Pol team hosted a 2.5-day training workshop to equip officials in selected African SGCs with basic knowledge in, and skills for, STI policy. Training included how to address the formulation, implementation and monitoring and evaluation of appropriate STI policies. These specialised skills are in short supply in African governments.

Workshop on STI policy reviews and managing STI data

The Evi-Pol project team hosted a three-day hybrid workshop on STI Policy and Data Management Systems from the 24-26 October 2022. Objective of the workshop was to share a set of tools for the review of STI policy and strengthening SGC data management systems; facilitate peer-to-peer learning on gathering and using evidence for STI policy and data management; and contribute towards building a community of practice to continue engagement on STI policy in Africa. The workshop was an important opportunity for co-learning and receiving feedback to improve the usability and usefulness of the tools, which will be compiled as a set of toolkits to gather evidence to inform the review of STI policy and map out a process to manage STI data.



Evi-Pol team and SGC stakeholders at the Zeitz MOCAA Museum on 26 October 2022 [Image credit: Antonio Erasmus]



Il-haam Petersen at the Evi-Pol workshop, 25 October 2022 [Image credit: Antonio Erasmus]



Glenda Kruss at the Evi-Pol workshop, 24 October 2022 [Image credit: Antonio Erasmus]

Building a community of practice to measure innovation in the informal sector

Africa's informal sector accounts for a large proportion of economic activity and continues to grow in response to crises, like COVID-19; a scarcity of formal employment opportunities; and local demand for the goods and services provided by this agile sector. Understanding how informal businesses innovate and learn, in order to survive and grow into sustainable employing businesses, can inform the policy making needed to support this impactful sector.

CeSTII began measuring innovation in the informal sector in 2017. A baseline study was conducted in Sweetwaters, KwaZulu-Natal, and a second survey is in progress in a township area in the Western Cape in 2023.

Unlike the measurement of innovation in the formal sector, there are no established guidelines for the informal sector. Using the existing international standards for formal business innovation measurement as a starting point, CeSTII has developed a novel methodology and instruments, that are appropriate to measure innovation in informal businesses.

This led to the formation of an international community of practice, convened by CeSTII, focused on measuring innovation in the informal sector in South Africa and other African countries. The National Centre for Technology Management in Nigeria, which also piloted CeSTII's research instruments, is a core partner in the initiative. The community of practice brings together stakeholders as a virtual think tank to further develop measurement guidelines and instruments that are suitable for the informal sector.

The community aims to expand its impact in this emerging area through:

- providing online training and resources for emerging scholars in Africa
- developing a living Measurement Manual for informal business innovation that can be improved through engagement across Africa's STI measurement networks

- engaging with informal business support organisations to include innovation in their skills training and coaching, and
- social media campaigns on innovation as a problem-solving strategy for informal businesses.

Core members of the innovation in the informal sector community of practice

- Dr Isabel Bortagaray: University of Uruguay, HSRC Visiting International Research Fellow
- Dr Abiodun Egbetokun: Deputy Director (Research) NACETEM, HSRC Visiting International Research Fellow
- Dr David Adeyeye: Head of Planning Programmes and Linkages NACETEM
- Dr Oluseye Jegede: Global Banking University, former HSRC African Research Fellow
- Dr Il-haam Petersen, Dr Nazeem Mustapha, Nicole van Rheede, Setsoheng Mayeki, Mbongeni Maziya and Dr Glenda Kruss: CeSTII

Other stakeholders in the community of practice include: Gernot Piepmeyer, Manager: Policies and Councils Services at the National Commission on Research, Science and Technology, Namibia; Prof Pedro Mendi, Department of Business, Universidad de Navarra, Spain; Rosheda Muller, South African Informal Traders Alliance, and the Informal Economy Development Forum; and Grace Dila, informal business owner.

The community of practice aims to broaden and deepen linkages with key actors whose knowledge, skills and resources can help grow the network and impact of our work in the informal sector. In 2022/3, engagements were ongoing with stakeholders within the STI measurement community, academia, government and the informal sector.

THEME 4: CAPACITY BUILDING, DIGITALISATION AND DATA MANAGEMENT



Gerard Ralphs
Theme leader

Theme 4 is composed of three projects that encompass cross-cutting skills and expertise required to support, coordinate and advance the research undertaken within themes 1 to 3.

Capacity building

Under the leadership of Dr Glenda Kruss and Makhaukane Maria Maluleke, the focus for CeSTII capacity building in 2022/23 was devising strategies and plans to ensure staff retention and the sustainability of the team over the long term. Key priorities included:

- promoting career progression within the team, particularly among mid-level researchers through project leadership and management skills
- building capacity development around journal writing, targeting groups of researchers at similar stages of career development
- promoting data analysis and writing skills for junior and mid-level researchers, and
- building the capacity of the senior team to lead and manage the programme, through individual coaching.

Monthly staff meetings, with a rotating chair, provided opportunities for groups of researchers at similar stages to interact on shared topics. Staff also attended various role-specific training workshops, arranged by HSRC's Capacity, Growth and Innovation.



R&D Theme Imbizo at the end of 2022
[Image credit: HSRC]



Glenda Kruss opened the annual 2022 CeSTII Lekgotla
[Image credit: HSRC]

The CeSTII Lekgotla in November 2022, held at the Mont Fleur Conference Centre, provided an excellent basis for consolidation of capacity building efforts, in the context of articulating a centre theory of change. Presentation opportunities within the CeSTII Advisory Committee also enhanced individual team members' capacities.

Working closely with the CeSTII Advisory Committee, as well as broader scholarly and practitioner networks, linkages and collaboration with researchers in the global south will continue to be pursued, with the aim of exposing CeSTII researchers to thinking and practice in other developmental contexts.

Digitalisation

The digitalisation of CeSTII's research business processes, from the way surveys are conducted to the way data is managed, continued to be an area of sustained focus in 2022/23. In the context of broader HSRC IT shifts to cloud-based technologies, CeSTII's focus was on the implementation of the R&D Survey team's custom-built platform available at rdisurveys.hsrc.ac.za, as well as incremental improvements to the R&D Survey's databank (the R&D Survey Management System). This platform enables respondents to complete survey responses and access their historical data in downloadable PDF format as well as through widgets. It also enables R&D Survey researchers to better manage and process data in accordance with statistical quality criteria. In parallel, applied research into digital transformation and data governance through the Evi-Pol project (Theme 3) provided an excellent opportunity for reflection and learning, as well as capacity building.

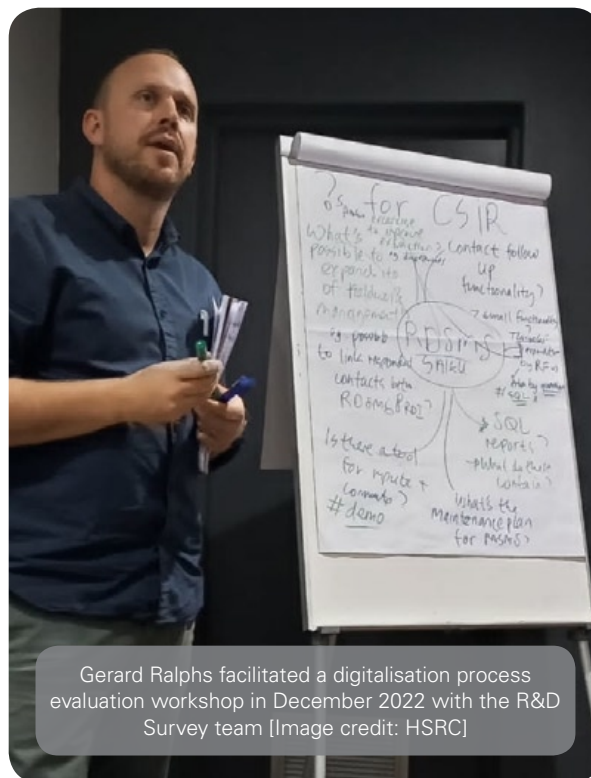
Under the leadership of Dr Yasser Buchana and Gerard Ralphs, a multi-disciplinary team of professionals worked collectively to evaluate user feedback from the pilot round of the platform in the R&D Survey 2020/21, to give effect to improvements for the R&D Survey 2021/22 round. A key result from the pilot was that PDF form submission was preferred to online submission. Greater attention was therefore paid to refining both the researchers' and respondents' user experience to enhance functionality and create smoother user journeys, based on the tasks users need to complete (whether a survey or capturing of a PDF survey response). The recruitment of a business analyst, for a short-term contract assignment contributed the necessary expertise to assist the R&D Survey team to specify their fieldwork monitoring information requirements from the system.

Apart from the technology development results, the Centre's digitalisation work in 2022/23 provided an excellent platform to deepen the practice of more agile and iterative ways of working across teams, both inside CeSTII and within the broader HSRC, toward a shared goal.

Data management

The CeSTII data team provides data management, extraction and analysis support, as well as statistical analysis expertise, across all themes and projects. Its aim is to enhance coordination and planning across projects and ensure more rapid turnaround on data requests, including improvement of data access for external users. Data curation for HSRC, OECD, UIS, NEPAD and the NACI STI portal is another core responsibility of this team.

With newly recruited staff working under the leadership of Dr Atoko Kasongo, the data team were well-positioned to contribute project data analysis and outputs in a more integrated manner. This ensured improved data management and data-sharing processes between CeSTII and NACI, as well as compliance with South African legislation on the protection of personal information. The data team was also involved in preparation for the South African Statistical Quality Assessment, to ensure that data management practices were at the requisite level. The data team also played a role in the implementation of new systems to digitalise data collection.



Gerard Ralphs facilitated a digitalisation process evaluation workshop in December 2022 with the R&D Survey team [Image credit: HSRC]



Dr Yasser Buchana
Chairperson, CeSTII Data Committee

Trends and insights from CeSTII data usage and dataset downloads

Over the past few years, there has been a steady increase in the downloads of HSRC and CeSTII datasets. More specifically, R&D Survey dataset downloads have grown more steadily and consistently over time than the Innovation Survey dataset downloads.

The increase in the number of downloads for the R&D Survey dataset indicates a persistent rise in interest in the R&D data by our stakeholders. Although the COVID-19 epidemic caused a small decline in R&D dataset downloads in 2019/20, the number of downloads significantly increased in the years that followed, especially 2021/22 and 2022/23. This rebound indicates the importance and value of R&D data to our stakeholders and underlines how successful CeSTII's strategies have been in promoting and increasing awareness of the R&D datasets. The digitalisation of the R&D survey process, which began during the COVID-19 pandemic, may also be partially credited for the increase in downloads of the R&D datasets.

In contrast, Innovation Survey (BIS) dataset downloads have varied substantially over time. This is partly since innovation surveys are conducted every three years, as opposed to the R&D surveys, which are conducted annually. Two other variables also played a role in the observed download trends (a) the official release of the BIS report in 2021 and (b) the curation of the BIS 2014-2016 dataset in 2021. These contributed substantially to the post-pandemic increase in downloads of the innovation dataset in financial year 2021/22. Furthermore, recent developments in innovation policy in South

Africa, such as the approval of the 2019 White Paper on Science, Technology and Innovation and its accompanying implementation plan – the 2022 Decadal Plan – also explains some of the demand for the innovation survey dataset.

The volume of our dataset downloads suggests a growing interest and usage of these datasets among our stakeholders – academia, policy makers, business and the general public. This is a positive reflection on CeSTII's efforts to promote these public datasets and improve our data management capabilities.

Moving forward, we anticipate that the volume of dataset downloads will continue to increase in the 2023/24 year, especially for the innovation dataset, given that the latest BIS data is currently being processed. Moreover, CeSTII has recently begun to streamline its internal data management processes and communication strategies to increase the adoption and use of our datasets. This will enable close monitoring and analysis of our dataset download trends, which will be critical in understanding our stakeholders' interests and demand for our data. It will also help to inform future strategies to enhance the accessibility and usage of CeSTII's datasets.

	2018/19	2019/20	2020/21	2021/22	2022/23
% of all HSRC datasets produced by CeSTII	47.0	18.6	21.0	50.0	43.0
Total number of HSRC dataset downloads	469	609	556	574	577
Total CeSTII dataset downloads	223	113	117	227	287
R&D Survey dataset downloads	207	97	108	197	277
% of all HSRC dataset downloads	44.3	15.9	19.4	34.3	48.1
% of all CeSTII dataset downloads	6.7	8.8	6.8	86.8	97%
Innovation Survey dataset downloads	15	10	8	29	9
% of all HSRC dataset downloads	3.2	1.6	1.4	5.1	1.56
% of all CeSTII dataset downloads	6.7	8.8	6.8	12.8	3.1
IP & Tech Transfer dataset downloads			1	1	1
% of all HSRC dataset downloads			0.2	0.2	0.2
% of all CeSTII dataset downloads			0.9	0.4	0.4
Agricultural Business Innovation Survey dataset downloads					0
Number of published errata	6	3	2	1	0

CeSTII data downloads are available from the HSRC's Research Data Curation website.

data.curation.hsrc.ac.za

Data and data analysis in this table courtesy of the HSRC's eResearch Knowledge Centre and CeSTII.

CeSTII welcomes data requests

If you would like to obtain specific data that are not available through the HSRC's Data Curation Unit, please review the CeSTII Guidelines for Public Data Access at

<https://hsrc.ac.za/accessing-cestii-data/>

We facilitate data use by preparing comprehensive metadata and disseminating data and related documents to appropriate target audiences.

Contact the Chair of the CeSTII Data Committee, Dr Yasser Buchana (ybuchana@hsrc.ac.za) for more information.

CONFERENCES, PAPERS○ AND REPORTS○

Conference Participation

Dr Glenda Kruss attended the **Sustainable Research and Innovation Congress 2022** held in Pretoria, South Africa from 20-24 June 2022. Dr Kruss was guest speaker in a session titled: "Transformative innovation policy as a model to drive sustainable development: perspectives from South Africa".

Dr Jacqueline Borel-Saladin attended the **Rethinking Economics for Africa Festival (REFA) 2022**, hosted in Johannesburg, South Africa from 16-17 September 2022 and presented on "Inequality - theories, hidden problems, and solutions".

Pilela Majokweni attended the **59th Conference of the Agricultural Economics Association of South Africa** in Swakopmund, Namibia from 2-5 October 2022, and presented on "Investigating patterns of innovation in agricultural businesses: Evidence from South African AgriBIS 2016-2018" co-authored with Dr Yasser Buchana.

Dr Glenda Kruss and Nicole van Rheede attended the **5th AfricaLics International Conference** in Yaoundé, Cameroon from 9-11 November 2022. Dr Kruss chaired a session titled: "Measuring innovation in the informal sector in Africa: theoretical and methodological considerations" and Ms van Rheede participated in a panel discussion. The panel was organised as an activity of the AfricaLics Thematic Chair on Africa-focused innovation measurement, which was led by CeSTII in collaboration with NACETEM.

Dr Glenda Kruss was guest speaker at the **NigeriaLics PhD Academy** held virtually on 3 February 2023 and presented on "Understanding the indicators of innovation capability building".

Dr Moses M. Sithole attended the **African Youth Graduates and Scholars (AYGS) Seventeenth Conference** hosted by the Human Sciences Research Council's Africa Institute of South Africa (AISA) in Pretoria, South Africa from 6-8 March 2023 and chaired the session titled: "Energy transition: Enablers and barriers for Africa".

Dr Glenda Kruss attended the **26th International Conference on Science, Technology and Innovation Indicators (STI) 2022** in Granada, Spain, from 7-9 September 2022 and presented on "An iterative model for the design of contextualised innovation indicators: experimentation oriented to food security development goals in South Africa".

Dr Glenda Kruss and Dr Il-haam Petersen attended the **13th International Sustainability Transitions Conference (IST)** in Stellenbosch, South Africa from 21-25 November 2022. Dr Kruss facilitated a dialogue session on "Spanning the boundaries between policymakers and researchers: A Transformative Innovation Policy approach to co-creating transitions".

HSRC Review

Borel-Saladin, J., Ralphps, G. & Mustapha, N. (2022) Lessons in public sector innovation: digitalising the R&D Survey. *HSRC Review*. 20(4):40-43. <http://hdl.handle.net/20.500.11910/19611>

Buchana, Y. (2023) The importance of measuring agricultural business innovation in South Africa. *HSRC Review*. 20(1):30-33. <http://hdl.handle.net/20.500.11910/20641>

Ralphps, G. & Mustapha, N. (2023) Indicators of R&D, innovation in South African SOEs. *HSRC Review*. 20(1):34-39. <http://hdl.handle.net/20.500.11910/20640>

Vlotman, N. & Clayford, M. (2023) Graduate unemployment: closing the demand-supply gap. *HSRC Review*. 20(1):40-43. <http://hdl.handle.net/20.500.11910/20639>

Peer-Reviewed Journal Articles

Boloshia, A., Sinyolo, S. & Ramoroka, K. (2022) Factors influencing innovation among small, micro and medium enterprises (SMMEs) in marginalized settings: evidence from South Africa. *Innovation and Development*. June: Online.

Buchana, Y. & Sithole, M.M. (2022) Towards a conceptual framework for measuring innovation in the agricultural sector in sub-Saharan developing countries. *African Journal of Science, Technology, Innovation and Development*. July: Online.

Jacobs, P.T., Molewa, O. & Ramoroka, K.H. (2022) Innovation networking in aspirational subnational innovative regions: exploring experiences from Frances Baard municipality, South Africa. *Local Economy*. April: Online.

Jegede, O. & Mustapha, N. (2022) Overcoming barriers to product innovation among businesses in the informal sector. *International Journal of Knowledge and Learning*. 15(4):319-341. Print.

Kasongo, A. (2022) The impact of capital flight on domestic investment: empirical evidence from South Africa. *African Review of Economics and Finance*. 2: Online.

Mathekga, M.J. (2021) Retail workers in the context of the Coronavirus (Covid-19) and lockdown regulations: an analysis of Shoprite workers in South Africa. *African Journal of Employee Relations*. 45:1-16. Online.

Mathekga, J., Mahlaela, A. & Maciko, L. (2022) Evidence of Sasol Limited's contribution to skills development in democratic South Africa. *African Journal of Employee Relations*. 46: Online.

Petersen, I., Kruss, G. & Van Rheede, N. (2022) Strengthening the university third mission through building community capabilities alongside university capabilities. *Science and Public Policy*. July: Online.

Ramoroka, K.H. (2022) Patterns of rural innovation processes along agro-processing value chains: the case of Mopani district South Africa. *African Journal of Science, Technology, Innovation and Development*. October: Online.

HSRC Policy Briefs

Borel-Saladin, J. & Petersen, I-h. (2022) Boosting innovation in small informal businesses through collaboration. (HSRC Policy Brief, December). <http://hdl.handle.net/20.500.11910/19682>

Ramoroka, K.H., Sithole, M.M. & Kruss, G. (2023) Addressing barriers to innovation by agribusiness to drive growth in South Africa. <http://hdl.handle.net/20.500.11910/20220>

Book Chapters

Kruss, G. & Petersen, I. (2022) Towards a transformation agenda for academic engagement in South Africa. In: Fongwa, S.N., Luescher, T.M., Mtawa, N.N. & Mataga, J. (eds). *Universities, society and development: African perspectives of university community engagement in secondary cities*. Cape Town: African Sun Media. 131-155. <http://hdl.handle.net/20.500.11910/19539>

Mustapha, N., Kruss, G., Petersen, I., Jegede, O. & Van Rheede, N. (2022) Towards an inclusive measurement programme for innovation in the informal sector of South Africa. In: Hongoro, C, Adonis, C. & Sobane, K. (eds). *Innovation for inclusive development and transformation in South Africa*. Cape Town: AOSIS Publishers. 137-162.

Reports

Centre for Science, Technology and Innovation Indicators (2022) *South African National Survey of Research and Experimental Development: statistical report 2020/21*. Pretoria: Department of Science and Innovation. <http://hdl.handle.net/20.500.11910/19686>

Fact sheets

Majokweni, P., Sithole, M. & Buchana, Y. (2022) *Digital technologies in South African agribusinesses*. (Fact sheet no.40). Pretoria: Department of Science and Innovation. <http://hdl.handle.net/20.500.11910/18884>

HSRC SEMINAR: STI AND SUSTAINABLE DEVELOPMENT IN SOUTH AFRICA AND URUGUAY

What we can learn from Uruguay's transition to renewable energy

South Africa and Uruguay have more than their location on the 34th parallel in common. As developing economies of the global south, they share many development challenges. These were explored in a seminar organised by CeSTII and addressed by guest speaker Prof. Isabel Bortagaray, a sociologist at the Universidad de la República Uruguay, and one of CeSTII's international research fellows. She discussed the role of STI policy in the two countries and provided a compelling case study of Uruguay's recent energy transition, the focus of much discussion by participants.

Uruguay's state-led energy policy is one of the few national policies that, "is really state led, not a government policy, but a state policy supported by the entire political system. That is not common in our country. So, it has been a radical transformation in terms of scale, scope, and timespan," said Bortagaray.

Factors that contributed to the policy change included, "a very traumatic beginning of the 21st century, with a very deep economic crisis, following Argentina's crisis. There was a realisation that we needed to increase energy security." At the time, Uruguay's energy supply was not meeting the needs of the country; the national electricity system was very dependent on hydroelectric sources and fossil fuel inputs and was disrupted by a severe drought and the high price of petrol. This resulted in a search for alternative energy strategies.

New strategies for energy alternatives

"The one that was looking the most likely was nuclear power, which we did not have. But that was very controversial," said Bortagaray. An expert commission was created to assess nuclear power for Uruguay. "We had a citizen jury, led and fostered by the university to explore different perspectives. That jury concluded that the social costs to future generations going into nuclear would be very high."

“A citizen jury ... concluded that the social costs to future generations going into nuclear would be very high.”

At the same time a new political party came to power. "With that, the environment, science, technology and innovation became part of the political narrative. Energy policy was conceived as a productive development policy," that should satisfy national energy needs affordably, contribute to competitiveness and promote healthier energy consumption habits.

It also aimed to achieve, “national energy independence” in the context of Uruguay’s economic integration with neighbouring states. “The scale of Uruguay’s energy transformation was dramatic. By 2019, 98% of the grid was based on renewable sources, while in 2005, only 37% of energy was generated by renewables.” This enabled Uruguay to export energy based on the country’s new, robust energy mix.

A key factor in this decisive shift was the country’s, “long-standing academic and research capabilities in wind energy”. A second important factor, said Bortagaray, was, “decisive political will – a crucial issue that really made a difference”. The public electricity company, which led the process, also played an important role, together with a mix of funding instruments to enable the transition. This allowed the electricity company to assure the purchase of wind energy for 20-year contract periods, mitigating risk for new energy suppliers. Today, most of Uruguay’s wind parks are privately owned and have long-term power purchase agreements with the national electricity utility.

STI policy and energy transitions

“Of course, I am simplifying the complexity that is behind this,” said Bortagaray acknowledging too that Uruguay, “missed having an explicit STI policy underlying this major transformation and development strategy, particularly having more endogenous development processes in place.”

On the relationship between STI policy and its practical implementation, Bortagaray called for deeper thinking about the linkages between governance, STI and other national policies. “We need to reflect on the learnings from COVID because we had very good management of the health crisis, based on a very strong connection between policy and research, and policy and the scientific community. But as soon as COVID finished, that was dismantled. We in the global south, also need to strengthen our linkages, and learning interactions, so I really appreciate the invitation to be here.”

Opportunities for SA in a just energy transition

Bortagaray’s presentation sparked much discussion, in the context of South Africa’s current energy crisis. Nina Callahan, a researcher at the Centre for Sustainability Transitions at Stellenbosch University, as discussant, noted that South Africa was undergoing an energy transition, with the desire to ensure a ‘just’ transition.

“To understand the role of policy in the transition, how to steer it, how we diagnose the problem and the ways that we respond to it,” was important for South Africa. Callahan and other speakers suggested that SA could learn from the Uruguay case including, the “renewed social contracting” that underpinned Uruguay’s energy transition, the focus on energy sovereignty, the institutional innovation that paved the way for change as well as the social coalition-building that served to identify common interests and negotiate trade offs.

Callahan noted that Uruguay had responded to its energy crisis “at the right time” even though this meant difficult negotiations within the society, while South Africa was “past the right time” and now required urgent and robust responses to address the electricity crisis imposed on the society and the economy. “We are also operating in the shadow of state capture,” said Callahan, “where there is low trust, and

low capability within the state and central institutions in our country.” This meant extra vigilance in approaching innovative solutions to prevent corruption.

While South Africa’s energy transition is not proceeding in an orderly manner, Callahan concluded by focusing on the opportunities that it holds: “The idea of decarbonisation for development is very much about a reindustrialisation programme, and harnessing the technologies available, not only in developing and manufacturing for renewable energy, but also the technologies around green hydrogen, battery storage and electric vehicles. There are so many opportunities for us that this energy transition presents.”

“The scale of Uruguay’s energy transformation was dramatic. By 2019, 98% of the grid was based on renewable sources, while in 2005 only 37% of energy was generated by renewables.”

Copy: Katharine McKenzie

Indicators of R&D and innovation in South African SOEs

State-owned entities can and should play a catalytic role in innovation. Revitalising their contribution is an explicit policy outlook for the national system of innovation, reflected in South Africa’s 2019 White Paper on Science, Technology and Innovation. An HSRC policy dialogue in October 2022 discussed CeSTII’s work on new indicators for research, development and innovation by state-owned entities to inform this commitment.

Recent public policy debate has been all but overwhelmed by the impact of large state-owned entities (SOEs), such as Eskom and Transnet, on South Africa’s fiscal and economic performance. Far less attention has been paid to their role in innovation, whether sectorally, nationally or globally.

Key trends before the global financial crisis of 2008/09, show that SOEs formed a substantial component of R&D activity in South Africa’s business sector, contributing as much as 28% in 2008/09 to this sector’s expenditure on R&D. Particularly worrying, then, is that in real terms, SOE expenditure on R&D in 2020/21 was the lowest since 2005/06.

In this context, the October 2022 dialogue served to reinforce the value of systematically tracking research, development and innovation in SOEs. Such tracking, to the extent that it informs broader SOE governance and decision-making, has thus far been peripheral, or missing, within organisational monitoring and evaluation towards improved delivery. This is an evidence gap the HSRC is working with partners across government to redress.

In 2016, CeSTII began working closely with the DSI on an analytical project to explore data on SOEs from the HSRC’s yearly R&D survey. The centre followed this with in-depth research focusing on three SOEs: the South African National Energy Development Institute (SANEDI), Air Traffic and Navigation Services (ATNS), and the South African Forestry Company SOC Limited (SAFCOL).



 Reports available for download from [hsrc.ac.za](https://www.hsrc.ac.za)

Interrogating the conditions that enable, support and facilitate R&D and innovation in SOEs informed a proposal for new indicators that SOEs and the government more broadly can use to track R&D and innovation. Speaking at the dialogue, HSRC director of strategic partnerships Dr Palesa Sekhejane said it was important to convene public policy dialogues to share this information.

The case study research performed by the HSRC-CeSTII adapted the management concept of gearing to shed light on the organisational features of SOEs considered key for R&D and innovation. These features included human and technological capabilities, networks, research infrastructure, and governance.

The research team's working hypothesis was that if an SOE was gearing appropriately, it would be in a position to leverage R&D and innovation to achieve its multiple mandates efficiently and effectively, and this would show up in the research findings. If it was not gearing appropriately, then a set of questions arise as to what investment or organisational change would be required to facilitate the development of R&D and innovation capabilities in the future.

Reflecting on the case study results for ATNS, senior manager for infrastructure research and management, Nokuthula Phakathi, said declining research funding, technology adoption and skills shortages in robotics and AI were among the barriers to advancing R&D and innovation. Solving these could help ATNS provide cheaper air travel. Networks and leadership were key to driving R&D and innovation investments. "We all know the environment is tricky and [there are] regulatory challenges. We need to be agile. We need to work towards goals [and] we need to allow our employees to be creative," she said.

CeSTII head Dr Glenda Kruss said there "is no single policy option for government". She highlighted the systemic, organisational and institutional dimensions of innovation policy interventions that were needed. "Indicators are needed at different levels for different purposes. Policy actors need systems indicators to see how the system is doing but SOEs themselves need RDI performance indicators and institutional indicators to strengthen organisational capabilities, which are difficult but vital to design."



Dr Glenda Kruss provided a synthesis of dialogue findings [Image credit: G. Ralphs]

Gearing as an organising concept

The concept of 'gearing' from an accounting perspective refers to the debt to equity ratio in terms of which an assessment of how a firm is 'sweating' its balance sheet can be made. From an automotive perspective, gearing (up or down) refers to the capacity of the engine and gears, working together, to alter a vehicle's rate of acceleration. Both perspectives emphasize dynamism and potentiality, but also posture or stance. The study team chose gearing as a useful organising concept — to shape our assessment of the extent to which SOEs are prepared, ready and capacitated, for R&D and innovation. The study team hypothesised that if an SOE is *gearing* — or indeed, *geared* — appropriately, then it is in a position to leverage R&D and innovation to achieve its mandate efficiently and effectively.

Source

This article is drawn from "Indicators of R&D, innovation in South African SOEs" by Gerard Ralphs and Nazeem Mustapha, published in HSRC Review 20(1):34-39.



See <https://repository.hsrc.ac.za/handle/20.500.11910/20640>

COLLABORATION AND NETWORKING

The Centre for Science, Technology and Innovation Indicators team interacted with a range of collaborators in the 2022/23 financial year. Our networks help us to deliver our goals more efficiently and effectively. As a public value research centre, and part of South Africa's Human Sciences Research Council, we also want to share our expertise nationally, regionally and globally.

Date	Meeting (Organiser(s))	CeSTII Representative(s)	Role
2022			
16 May	STI Indicators Working Group (SADC)	Dr Glenda Kruss, Dr Moses Sithole	Participants
1-2 June	SADC Regional Experts meeting on STI Indicators and Review of the Protocol on STI (SADC)	Dr Glenda Kruss, Dr Moses Sithole	Presenter
14-17 June	SADC Joint Ministerial Meeting on Education and STI (SADC)	Dr Glenda Kruss, Dr Moses Sithole	Presenter
20-24 June	Sustainable Research and Innovation Congress 2022	Dr Glenda Kruss	Presenter
20-24 June	UJ TRCTI AND TIP Engagement Week	Dr Glenda Kruss	Presenter
23 June	Improving Government Department Data Collection and Evaluation of South Africa' STI Expenditure (DSI/NACI)	Dr Moses Sithole	Moderator
28-29 June	Science Granting Council Initiative Regional Meetings	Dr Glenda Kruss, Dr Il-haam Petersen, Darryn Whisgary	Participants
29 June	Development of the DRC's National Innovation Policy (AUDA-NEPAD)	Dr Glenda Kruss, Dr Il-haam Petersen	Presenter
29 August	Knowledge-based Development and Local Learning Economies (GlobeLICS)	Dr Glenda Kruss	Presenter
8-9 September	Science, Technology and Innovation Colloquium (NACI)	Dr Jacqueline Borel-Saladin, Gerard Ralphs	Participation
14 September	2022 Meeting of the OECD Working Party of National Experts on Science and Technology Indicators (OECD)	Dr Glenda Kruss	Presenter
7 December	South Africa United Nations Educational, Scientific and Cultural Organisation Natural Sciences Sector Committee (2021-2024) (UNESCO)	Dr Glenda Kruss	Participant
7 December	Spanning the Boundaries between Policymakers and Researchers: A Transformative Innovation Policy Approach (TIPC)	Dr Glenda Kruss Nicole van Rheede	Panellist Moderator
2023			
26-27 January	Social Justice Assembly (University of Pretoria)	Pilela Majokweni	Presenter
7-10 March	2 nd Africa-Europe Science and Innovation Forum	Dr Nazeem Mustapha	Presenter
9 March	R&D Survey Knowledge-Sharing Workshop: Not-for-profit Sector	Natasha Saunders	Convenor
23 March	Developing New Innovation Indicators Suitable for Informing New Policy Mixes in African Countries (AfricaLICS)	Dr Glenda Kruss, Dr Il-haam Petersen, Dr Amy Kahn	Presenters
30 March	SADC Virtual Regional Experts meeting on STI Indicators and Review of the Protocol on STI (SADC)	Dr Glenda Kruss, Dr Moses Sithole	Presenter

HONORARY RESEARCH FELLOWS



Dr Isabel Bortagaray

Dr Isabel Bortagaray, a Uruguayan sociologist with a focus on Science, Technology and Innovation Policy, holds a PhD in Public Policy obtained in 2007 from Georgia Institute of Technology. Bortagaray is an Associate Professor at the Sectoral Commission of Scientific Research, Universidad de la República, Uruguay, and for more than 20 years, her academic work has concentrated on science, technology, innovation and development policy studies, and it has been aimed at better grasping the alternative policy and institutional environments that are more functional for socially inclusive and sustainable innovation processes. Bortagaray co-ordinates the National Researchers System of Uruguay, and is a University's delegate at the National Innovation, Science and Technology Council (CONICYT).



Dr Abiodun Egbetokun

Dr Abiodun Egbetokun is an economist with nearly two decades of experience in science, technology and innovation (STI) policy research. He holds a PhD in Economics from the Friedrich Schiller University, Jena, Germany. He was a Science Advice for Policy (SAP) Fellow at the CeSTII in 2019. Prior to that, he was visiting researcher at the University of Oxford and the United Nations University-MERIT in Maastricht. From 2019 to 2021, he was President of the Nigerian Young Academy, a group of Nigeria's leading young researchers and academics. He is currently Assistant Director, Research at the National Centre for Technology Management (NACETEM), Nigeria. He is co-editor of Innovation Systems and Capabilities in Developing Countries: Concepts, Issues and Cases (Gower, 2012), among many other publications.



Dr Isabel Bortagaray (centre) with members of the CeSTII team, Cape Town 2022 [Image credit: Antonio Erasmus]

TEAM BUILDING AND STAFF ACHIEVEMENTS



Team CeSTII made the most of an in-person Imbizo to plan for the months and years ahead. Held at Mont Fleur in Stellenbosch, it marked a new phase for the Centre after the disruptions of the COVID-19 era. [Image credit: HSRC]

Staff awards for long service at the HSRC

CeSTII celebrated the following team members for their long service to the organisation:



Zinziswa Hlakula



years of service



Viwe Sigenu



years of service



Lindiwe Binda



years of service

Master's degrees awarded

CeSTII congratulated these team members on their graduation with master's degrees in 2022:

- **Luthando Zondi**, MPhil in Development Finance, University of Stellenbosch Business School
- **Viwe Sigenu**, MPhil in Science and Technology Studies, University of Stellenbosch
- **Audrey Mahlaela**, MPhil in Sport for Development, University of Western Cape

New appointment to the admin team



Avuyile Ntozakhe,
CeSTII admin clerk
[Image credit: HSRC]

CeSTII welcomes the appointment of Avuyile Ntozakhe as Admin Clerk to support CeSTII's programmes. A graduate of Walter Sisulu University, Avuyile first joined CeSTII during the COVID era through the Presidential Youth Employment Initiative and was appointed as a member of staff in April 2023.

"I love the working style at CeSTII – we value each other's opinions, and our Executive Head pays attention to us as individuals when we face difficult challenges," she says. Joining the organisation when remote working was

still underway, Avuyile adapted quickly to the demands of the job, despite the challenges of working from home initially. She hopes to continue her studies and gain a certificate in project management.

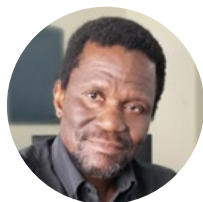


CeSTII researcher Luthando Zondi graduated with distinction
[Image credit: L. Zondi]

TEAM CeSTII



Dr Glenda Kruss
Executive Head



Dr Moses Sithole
Research Director



Dr Nazeem Mustapha
Chief Research
Specialist



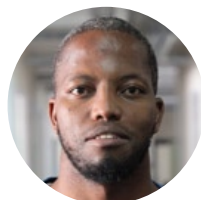
Dr Il-haam Petersen
Chief Research
Specialist



Dr Yasser Buchana
Senior Research
Specialist



**Dr Jacqueline
Madeleine Borel-Saladin**
Senior Research
Specialist



Dr Kgabo Ramoroka
Research Specialist



Dr Atoko Kasongo
Statistician



Dr Amy Kahn
Research Specialist



Dr Mario Clayford
Research Specialist



Natalie Vlotman
Research Manager



Darryn Whisgary
Research Manager



Jerry Mathekga
Senior Researcher



Pilela Majokweni
Chief Researcher



Theodore Sass
Senior Researcher



Audrey Mahlaela
Researcher



Luthando Zondi
Researcher



Nokhetho Mhlanga
Researcher



Setsoheng Mayeki
Researcher



Lindiwe Binda
Database Analyst



Tangelani Makamu
Data Analyst



Mbali Bongoza
Junior Data Analyst



Natasha Saunders
Fieldwork Manager



Gerard Ralphs
Programme Manager
& Policy Analyst



Nicole van Rheede
Chief Researcher



Mbongeni Mayiza
Phd Intern



Viwe Sigenu
Researcher



Sintu Mavi
PhD Research Intern



Maria Maluleke
Financial Administrator



Bongwiwe Ngqaqu
PA to Executive Head



Zinziswa Hlakula
Administrator



Avuyile Ntozakhe
Admin Clerk



Mieta Klaasen
Office Cleaner



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