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**CENTRE FOR SCIENCE,  
TECHNOLOGY AND  
INNOVATION INDICATORS**

2017/18  
ANNUAL REVIEW  
REPORT

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# WHY ASKING THE RIGHT QUESTIONS MATTERS



**Prof. Crain Soudien**

Chief Executive Officer, Human Sciences Research Council

The Human Sciences Research Council faces the not unique challenge of providing research evidence that can give shape to current policy processes, but also elaborating the research questions that can generate evidence for our future policy needs.

In the current era of rapid global technological change, but also deepening inequality and poverty in South Africa according to the latest indicators, the demands on the Council in these respects are both immediate and compelling.

The HSRC's Centre for Science, Technology and Innovation Indicators (CeSTII) faced up to these epistemic and contextual challenges with enthusiasm and commitment in 2017/18.

In particular, it delivered on its core business by releasing the 2014/15 and 2015/16 national R&D survey data, launching fieldwork for the South African Business Innovation Survey 2014-2016, and deepening its exploration of new research indicators, notably within a set of projects to examine innovation in the informal sector and the linkages between knowledge actors and communities. The Centre also delivered a series of excellent public events, which brought together actors from across the national system of innovation, to explore new data, new ideas, and new imperatives.

It is often said that undertaking exploratory work is risky. Whereas standardised R&D and innovation survey methodologies provide helpful roadmaps, devising methodologies for measuring informal innovation is an area far less well-defined. Yet, for South Africa, it is clear that this work is so very crucial to garnering a more nuanced understanding of the future trajectories of our communities and our society more broadly.

I thank the Department of Science and Technology for the confidence it has shown in mandating CeSTII to conduct the critical work of national STI measurement.

I want to congratulate the CeSTII team for their efforts in 2017/18, and encourage them to continue to build their contributions to our national discourse on the value of science, technology and innovation for inclusive development, poverty eradication and human well-being.



# OUR YEAR IN REVIEW



**Dr Glenda Kruss**

Deputy-Executive Director: CeSTII, Human Sciences Research Council

Speaking in his maiden State of the Nation Address in February 2018, President Cyril Ramaphosa reminded us that South Africa's "prosperity as a nation depends on our ability to take full advantage of rapid technological change."

He added: "This means that we urgently need to develop our capabilities in the areas of science, technology and innovation." To promote such capability building across the nation, we need measures and indicators that allow us to assess our progress, change direction, and find new pathways.

As the producers of South Africa's national R&D and innovation indicators, the Centre for Science, Technology and Innovation Indicators plays a pivotal role in the national system of innovation. To ensure that we continue to grow our capacity to deliver on this role, CeSTII set in place a new programme structure in 2017/18.

The highlights from the year were many. At the level of our projects, our team expanded significantly with the appointment of twenty young researchers, to accommodate the launch of one of our flagship projects, the South African Business Innovation Survey 2014-2016. We added to awareness of the significance of R&D through the launch of a new data fact sheet series. In terms of our work with partners from Africa, we signed an MOU with Namibia's National Commission for Research, Science and Technology (NCRST) in May 2017, cementing our collaborations from previous years.

We also drew on networks in the global South during our Innovation and Development Week (22-26 January 2018), where we were joined by **Helena M. Lastres** and **Jose Cassialato** from Brazil, to engage around local production and innovation systems and innovation measurement. Our honorary research fellow, **Dr Isabel Bortagaray**, added value through an extended visit in early 2018, working on innovation and inclusive development and innovation policy in the water sector.

Nationally, we arranged an event in collaboration with the National Advisory Council on Innovation (NACI) to profile their 2016 Science, Technology and Innovation Indicators Report. Moving forward, we will be working with NACI to deepen our collaboration.

Vitaly, given the significant organisational change CeSTII has undergone in recent years, we also invested some time in November 2017 for a vision-building and strategic planning workshop.

None of this would have been possible without the guidance and support of our colleagues in the Department of Science and Technology. In particular, we extend our appreciation to **Imraan Patel, Godfrey Mashamba, Kgomotso Matlapeng** and **Tshidi Mamogobo**.

The staff of the Centre can be proud of their achievements in 2017/18, and I look forward to building on these with the team in 2018/19.

“ 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 will be supported by an ethos of teamwork and inclusive diversity, shared learning, creativity, and a commitment to sustainability.”

**Team Vision Statement**

# INTERNATIONAL ADVISORY COMMITTEE

**Prof. Fred Gault (Chair)**

Tshwane University of Technology / United Nations University - Merit

An independent advisory committee, comprising of national and international experts, provides the Centre for Science, Technology and Innovation Indicators with advice on the conceptualisation and implementation of its research agenda.\*

## CHAIR'S REFLECTION

The CeSTII International Advisory Committee consists of eight appointed members from six countries and the HSRC Deputy-Executive Director responsible for CeSTII, **Dr Glenda Kruss**. The Committee meets electronically and did so on three occasions in 2017 to review topics of importance to CeSTII and to provide independent advice. The minutes of the Committee recorded the advice, which was made available to the CeSTII staff.

In addition to the membership of the Committee, CeSTII staff participate actively in the meetings, making presentations, providing information to the Committee and responding to questions. The Department of Science and Technology (DST) is present as an observer, and one of the members of the Committee comes from the Secretariat of the National Advisory Council on Innovation (NACI). The presence of DST and NACI ensures that matters relevant to CeSTII are shared with the other agencies engaged in supporting science, technology and innovation activities.

The Committee works electronically, and this requires a different way of functioning from committees where members attend physically. This is especially true of monitoring and evaluation of the contribution of the Committee to the programme of work of CeSTII and assessing the contribution is a topic for consideration in 2018/19.

As the members of the Committee are experts in many areas related to science, technology and innovation, there is an expectation that some support can be provided to CeSTII staff working on the analysis of data coming from the surveys for which CeSTII is responsible.

The Committee is also intent on supporting the CeSTII brand based on reports on surveys conducted, policy briefs following from the survey reports, and publication in the wider academic and policy communities. In addition, the revised White Paper on Science, Technology and Innovation is anticipated in 2018, with implications for statistical measurement and analysis conducted by CeSTII in support of policy development, implementation and monitoring.

### Box 1. Topics considered for advice in 2017/18

- The CeSTII Business/Strategic Plan for 2017/18
- The Business Innovation Survey 2014-2016
- Measuring innovation in the informal economy and in the informal sector
- A framework and research agenda to measure innovation for inclusive development
- The role of R&D within state-owned enterprises

\* The Committee's Secretariat is based at CeSTII and includes Dr Glenda Kruss (Deputy-Executive Director: CeSTII), Gerard Ralphs (Programme Manager & Policy Analyst), and Vuyiseka Mpikwa (PA to the Deputy-Executive Director).



## ADVISORY COMMITTEE MEMBERS



**Prof. Fred Gault (Chair)** is Professor Extraordinaire at the Tshwane University of Technology (TUT) in South Africa and a member of the TUT Institute for Economic Research on Innovation (IERI).

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 member of the Scientific Council of the Portuguese Observatory of Science, Technology and Qualifications and the South African DST-NRF Centre of Excellence in Scientometrics and Science, Technology and Innovation Policy (SciSTIP).



**Prof. Sunil Mani (Vice Chair)** is Director and Professor at the Centre for Development Studies (Trivandrum, Kerala, India) and is also 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). Sunil 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 studies of innovation, and one of his most recent publications is a book with Franco Malerba and Pamela Adams, *The Rise to Market Leadership: New Leading Firms From Emerging Countries (2017)*. Sunil Mani holds a PhD in Economics from Jawaharlal Nehru University (New Delhi), and has done post-doctoral research at the University of Oxford.



**Mr Petrus Letaba (MBA)** is Senior Specialist: STI Measurements and Evaluation at the National Advisory Council on Innovation (NACI) Secretariat. NACI is a statutory advisory body that advises the Minister of Science and

Technology, and through the Minister, the Cabinet. He has extensive experience in data and information management, policy analysis and technology management. He participates on several local and international expert committees on a wide range of issues such as science, technology and innovation policy analysis, and standards development.



**Dr Jeffrey Orozco** is Professor at the International Center of Economic Policies for Sustainable Development (CINPE) in the National University of Costa Rica. For several years, he has researched the economics of innovation, trade

and environment, and sustainable development. He also teaches in several Masters and PhD programmes. Since 2008, Jeffrey Orozco has coordinated the Innovation Survey in Costa Rica, through the Ministry of Science and Technology.



**Dr Erika Kraemer-Mbula**

is Associate Professor at the University of Johannesburg and Researcher at the DST-NRF Centre of Excellence in Scientometrics and Science, Technology and Innovation

Policy (SciSTIP). Initially trained

as an economist, she holds a Masters 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 to equitable and sustainable development. In the UK, Erika 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 has recently co-authored a book on *The Informal Economy in Developing Nations: Hidden Engine of Innovation?* published in 2016 by Cambridge University Press.



**Dr Susan Cozzens** is Professor

Emerita in the School of Public Policy at the Georgia Institute of Technology.

She most 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. Cozzens is active internationally in developing methods for research assessment, and science and technology indicators. Cozzens 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 before joining Tech, Cozzens 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).



**Dr Pedro Mendi** is Associate

Professor in the Department of Business, Universidad de Navarra. 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 on other selected topics in industrial organisation. His research has been published in journals such as *Journal of Economics and Management Strategy*, *Research Policy*, and *Technological Forecasting and Social Change*.



**Dr Ann Kingiri** is a science,

technology and innovation researcher with a focus on inclusive and sustainable development in Africa. Ann

Kingiri has held managerial positions in the public sector overseeing administration matters

as well as regulatory policy. She has also managed research portfolios and research grants in policy research settings. She has over 20 years of experience working with the public and private sectors, and with development partners in the area of development particularly targeting Africa. Currently, she is Senior Research Fellow at African Centre for Technology Studies (ACTS), a development policy think tank working to harness STI applications for sustainable development.





# CESTII POST-DOCTORAL FELLOWS

Post-doctoral fellows Dr Firdous Khan and Dr Hlamulo Makelane reached new personal and professional heights in 2017. Both were recognised as among the Mail & Guardian's 200 Young South Africans for 2017, and both developed their science diplomacy and leadership skills in key international fora.

## DR FIRDOUS KHAN



[Image credit: HSRC]

**Dr Firdous Khan** holds a PhD in Biotechnology, a MSc in Bioinformatics, and works on CeSTII's R&D and innovation surveys, as well as chairing the CeSTII Data Committee. In 2017, Dr Khan was selected to participate in the Ship for World Youth, which is a longstanding programme of the Management and Coordination Agency of the Japanese Government and the Cabinet Office. The programme provides a unique cross-cultural exchange opportunity for young leaders and an avenue to enhance their leadership and management skills.

### **How did the experience shape your perspective on the role of science, technology and innovation for inclusive development in South Africa, Africa and globally?\***

This year's programme was designed to give participants an introduction and in-depth understanding of pressing

issues, including economic development, the burden of disease, inclusion, and sustainability. Within all of these issues, and their national, regional and global manifestations, we know that science, technology and innovation has a vital role to play—and the Ship for World Youth was instrumental in shaping my understanding of how STI can really serve as an engine of global sustainable development.

### **What were the key professional lessons you learned from the experience?**

Through expert-led workshops, discussions, courses and participant-led seminars, we were all challenged to deepen our mutual understanding, broaden our perspectives, and strengthen our spirit of international cooperation. The key skills I honed in areas such as leadership and project management I will be able to directly transfer to the current projects and environment I work in. More than that, the experience also afforded me the opportunity to speak openly and publicly about global issues I care about with like-minded individuals, including with those holding opposing views. Perhaps most importantly, I was reminded through this experience what I am capable of and am able to exude that enthusiasm and drive to those around me.

### **In what ways did the experience help you to advance your career objectives?**

I have built a global network of connections in 11 different countries and with experts in various fields that I will be able to collaborate with on future projects. This programme has also taught me to probe deeper into my understanding of sustainability globally, and has helped me develop a global perspective for tackling global issues. Personally, I have developed a new-found enthusiasm to build on my existing goals and to set broader more challenging goals for the future.

\* Questions by Gerard Ralphs



## DR HLAMULO MAKELANE



[Image credit: HSRC]

**Dr Hlamulo Makelane** chose to enter research science because she wanted to make a positive difference through scientific research that matters, and is especially concerned about disturbing chemicals found in the environment.

“Science is the generation of evidence based solutions to national and global challenges,” she explains. “I strive to explore new relationships between ideas and facts to assess the environmental impact of water related issues, to develop a device that will accurately determine the levels of organic pollutants in wastewater.” She is currently a postdoctoral research specialist at the University of the Western Cape’s department of chemistry and the Human Sciences Research Council (HSRC), with research, teaching and supervising students among her daily tasks.

Makelane has found a major challenge in her career is that science is becoming much more interdisciplinary. “I was initially trained to focus in one discipline, but the move towards interdisciplinary research has been an

opportunity to contribute to work that advances critical and analytical points of view,” she says. “Combining my comfort zone and working on the interfaces of different fields has been a great way to bring new techniques and perspective to my science research. I also believe it is a way to build my own niche and distinguish myself from others in my research field.”

Makelane has authored and co-authored several peer-reviewed journal articles, and has presented in national and international conferences. She has been recognised by the Academy of Science of South Africa as one of the top five young South Africans in chemistry and has been included in the 400 young scientists from 76 countries selected to participate in 67th Lindau Nobel Laureate Meeting 2017 in Lindau, Germany. The event recognises outstanding students, graduate students and post-doctoral students under 35 years of age who are conducting research in the field of chemistry.

“If you are interested in scientific research, you should challenge yourself to go beyond the first degree and you will never regret it, because of the discovery that the journey brings,” she says. “I believe that if I made it, anyone can make it too and the skills you will acquire as a research scientist will play a vital role in the development and application of new and advanced technologies in the country and the world at large,” says Makelane.\*

“ I was initially trained to focus in one discipline, but the move towards interdisciplinary research has been an opportunity to contribute to work that advances critical and analytical point of view.”

**Dr Hlamulo Makelane**

\* Article by Tamsin Oxford. Republished with permission from the Mail & Guardian.  
To view the original article go to: <http://200ysa.mg.co.za/2017/dr-hlamulo-makelane/>



# RESEARCH THEMES & PROJECTS

In 2017/18, the Centre for Science, Technology and Innovation Indicators delivered work on a range of projects situated within three key thematic areas.

## THEME 1: MEASURING R&D CAPACITY IN SOUTH AFRICA



**Dr Neo Molotja**  
Theme Leader

### SA R&D Survey

The South African National Survey on Research and Experimental Development (R&D Survey) is a flagship annual project for CeSTII, which it performs on behalf of the South African Department of Science and Technology (DST). Each year the survey reports the latest available data on R&D performance across five sectors: higher education, science councils, government, business, and not-for-profit organisations.

In 2017/18, the CeSTII R&D Survey team completed fieldwork and reporting for the 2015/16 cycle of the survey (Box 2 overleaf), and initiated fieldwork for 2016/17 cycle. Statistical quality assurance of the 2015/16 results in terms of the South African Statistical Quality Assessment Framework (SASQAF) was performed through the R&D Survey Clearance Committee, headed up by Statistics South Africa. In addition to the production of the *Statistical Report* and *Main Analysis Report*, the R&D Survey team also developed a brand new series of sectoral fact sheets, which, at a glance, showcase some of the R&D Survey's key data points using infographics.

The R&D Survey Management System (RDSMS) project is a technology collaboration between CeSTII and the Meraka Institute at the Council for Scientific and Industrial Research. The RDSMS is a custom-designed platform for the management of time series data from the South African R&D Survey. In 2017/18, CeSTII worked closely with the Meraka Institute to deliver ongoing system maintenance and administrator training.



Reports and fact sheets > <https://goo.gl/JkTacy>

## Box 2. Headline results from the 2015/16 survey

Gross Domestic Expenditure on R&D (GERD) increased from 0.77% in 2014/15 to 0.80% in 2015/16.

The largest performer of R&D in 2015/16 was the business sector (42.7% of GERD), followed by higher education (30.5%), then science councils (17.8%), government (6.2%) and not-for-profit organisations (2.8%).

In Rand terms, expenditure on R&D by sector in 2015/16 was recorded as R13.8 billion (business), R9.9 billion (higher education), R5.7 billion (science councils), R2 billion (government) and R891 million (not-for-profit organisations).

Government provided the most funding for R&D in South Africa in 2015/16, notably R14.4 billion or 44.6% of total R&D funding. The business sector contributed R12.6 billion to R&D in South Africa, or 38.9% of total R&D funding. Foreign sources of R&D funding comprised R4.2 billion of total R&D funding or 13%.

Expenditure on applied research declined to 47.5% of GERD in 2015/16 from 48.8% of GERD in 2014/15. Expenditure on basic research was 25.4% in 2015/16 and expenditure on experimental development was 27.1%, both reflecting increases from the 2014/15 reference period.

In terms of R&D personnel, the total headcount grew by 3.5%, from 72,400 in 2014/15 to 74,931 in 2015/16.

Full report > <https://goo.gl/r1AY2s>

Continuous survey user engagement is also a key feature of the SA R&D Survey project. In 2017/18, CeSTII worked closely with the higher education and government sectors to assess respondent and stakeholder needs and to disseminate research results (Box 3).

## Box 3. R&D Survey higher education sector workshops

### R&D Survey HE Sector Workshop – 21 September 2017

This event attracted approximately 45 delegates at venues in Pretoria and Cape Town, representing four private universities and more than 15 public universities. The focus of the event was to provide feedback to respondents on the 2014/15 round of the R&D Survey, to provide a presentation on potential uses of R&D data for both institutional and national planning purposes, and to report back on methodological revisions within the Survey arising as a result of changes to the OECD's Frascati Manual. The event also provided an important opportunity for CeSTII to build and deepen relationships with its HE respondents, as well as to facilitate networking between respondents. The workshop's organisation, planning and facilitation work was led by **Natalie Vlotman** and **Janine Senekal**.

### R&D Survey Workshop at University of Fort Hare – 15 November 2017

**Natalie Vlotman** and **Janine Senekal** also organised and delivered a workshop on the R&D Survey at the University of Fort Hare. Its purpose? To review the University's participation in the survey, and to cultivate greater buy-in for the survey at the University. The Acting Dean of Research and 14 staff members attended the workshop, and the University expressed its appreciation for the efforts made by CeSTII in reaching out. One suggested next step emanating from the workshop was for the University to catalyse a provincial colloquium for universities from the Eastern Cape to interact with CeSTII in this way.

Contact the R&D Survey's Higher Education Sector Lead by writing to **Natalie Vlotman** ([nvlotman@hsrc.ac.za](mailto:nvlotman@hsrc.ac.za))



## R&D in State-Owned Enterprises

In 2016, the South African Department of Science and Technology commissioned the Centre to produce a research report in order to gauge the contribution of state-owned enterprises (SOEs) to R&D in the South African economy. The targeted audience and users of the research included sector stakeholders (i.e. SOEs) and policy makers from across the economic cluster. The research project was entitled 'Baseline Report on Research and Development Trends in State-Owned Enterprises'.

Led by **Dr Nazeem Mustapha**, a draft of the research was first presented at the DST to research users in February 2017. On 13 September 2017, a workshop was organised to validate the study's findings, which was attended by DST and Department of Public Enterprises officials, and representatives from the research and technology development units of key SOEs. In parallel, DST used the research as the foundation to draft a Cabinet Memorandum, and CeSTII prepared an HSRC *Policy Brief* for wider dissemination. In an aide-memoire summarising proceedings of the study validation workshop, the chief director for science and technology investment at the DST, **Godfrey Mashamba**, wrote to participants:

“ There is a commitment by the DST, Department of Public Enterprises and the SOEs that attended the workshop to work together to understand the R&D trends in SOEs and how that is contributing to national development. The analysis and discussion thus far brings up an important narrative about SOEs' innovation capability as an enabler for strategic competitiveness. This is positive.”

Contact CeSTII Chief Research Specialist, **Dr Nazeem Mustapha**, by writing to [nmustapha@hsrc.ac.za](mailto:nmustapha@hsrc.ac.za)



<https://goo.gl/AajinMA>

### Quick links to media coverage of SA R&D Survey 2015/16

#### South Africa's research system is faltering due to financial woes

Reporter: **Sarah Wild**  
Publication: *Africa Portal*  
<https://goo.gl/aZCfxF>

#### SA research intensity up—but not due to a boost in funding

Reporter: **Christiaan Van Der Merwe**  
Publication: *\*Research*  
<https://goo.gl/pwzNGm>

#### SOEs must double their research—report

Reporter: **Christiaan Van Der Merwe**  
Publication: *\*Research*  
<https://goo.gl/Bav4Av>

## THEME 2: MEASURING INNOVATION CAPACITY IN SOUTH AFRICAN FIRMS



**Dr Moses Sithole**  
Theme Leader

### Business Innovation Survey 2014-2016

The South African Business Innovation Survey (BIS) 2014-2016 project kicked off at the beginning of the 2017/18 financial year, following an extensive review of the project in the 2016/17 financial year (reported on in our *Annual Review Report 2016/17*). The Centre for Science, Technology and Innovation Indicators is undertaking the Survey on behalf of the Department of Science and Technology, with quality assurance provided by the BIS Clearance Committee, which consists of representatives from Statistics South Africa, the DST, and independent innovation experts. With this new round of the Survey, our goal is to measure the innovation activities in about 5,000 enterprises—from very small to very large—across the industrial and services sectors of the South African economy.<sup>1</sup>

Operationally, the first half of the year was spent recruiting and training the large project team based in Cape Town and preparing for the first postal dispatch; while in the second half of the year, the first phase of the fieldwork effort was rolled out. Setting this innovation survey apart from previous rounds performed by CeSTII has been the inclusion of a dedicated advocacy strategy. Its goal? To improve the perceptions of the Survey among business leaders across the country concerning the value of measuring innovation, not only for evidence-informed policy but also from the perspective of economic and firm competitiveness.

Just some of the advocacy actions introduced in 2017/18 included starting a blog ([sabizinnovationsurvey.blog](http://sabizinnovationsurvey.blog)) and Twitter feed (@BizInnovationSA), working with the media to announce our fieldwork kick-off, and

collaborating with Business Unity South Africa and the DST to arrange the 'Industry Associations Innovation Day 2018'.<sup>2</sup>

Our advocacy team and Survey 'ambassadors' from the DST and allied departments also attended a host of national and sectoral events, including the SA Innovation Bridge and SA Innovation Summit, to share project goals, build networks, and learn from thought leaders shaping innovation discourse in the country.



The Business Innovation Survey Hub in Cape Town is staffed by a team of 20 dedicated research assistants. [Image credit: A. Erasmus/HSRC]



Godfrey Mashamba (DST), Dr Nazeem Mustapha (CeSTII), Dr Glenda Kruss (CeSTII), Kgomotso Matlapeng (DST) and Gerard Ralphs promoting the Survey at the SA Innovation Bridge 2017. [Image credit: G. Ralphs]

<sup>1</sup> Watch Dr Glenda Kruss explaining the objectives of the Survey: [https://youtu.be/t\\_tjV9KLmRI](https://youtu.be/t_tjV9KLmRI)

<sup>2</sup> <https://sabizinnovationsurvey.blog/2018/06/12/tweets-and-slides-from-iaid2018/>

# BUSINESS INNOVATION SURVEY 2014 - 2016

FOR A MORE INNOVATIVE SOUTH AFRICA



Dr Moses Sithole interviewed by Aptivate radio at the SA Innovation Summit on 6 September 2017.  
[Image credit: G. Ralphs]

## Enhancing the Analysis and Usage of the Innovation Data

In 2017/18, our work on measuring innovation capacity in South African firms also yielded a number of analytical products, such as an HSRC *Policy Brief* published in March 2018 on barriers to innovation. In addition, building on her work in the field of eco-innovation, **Cheryl Moses** attended the Atlanta Conference on Science and Innovation Policy in September 2017 where she presented a poster entitled 'How Does Eco-Innovation in the Manufacturing Sector Contribute to Environmental Sustainability? Findings from the South African National Business Innovation Survey'. **Dr Moses Sithole** presented 'Why Innovation Measurement Can Help Firms Boost Their Competitiveness' at the SA Innovation Summit on 7 September 2017.

### Quick links to media coverage of Business Innovation Survey 2014-2016 kick-off

#### Service industries in the crosshairs as SA launches innovation survey

Linda Nordling  
Publication: *\*Research*  
<https://goo.gl/WvQRPV>

#### HSRC out to measure innovation levels in thousands of SA entities

African News Agency  
Publication: *Engineering News*  
<https://goo.gl/w1wnLK>

#### Fostering innovation will put South Africa on a higher growth trajectory

Schalk Burger  
Publication: *Engineering News*  
<https://goo.gl/ZCFmY>

#### Is SA keeping up with the pace of innovation globally?

SABC Digital News  
<https://goo.gl/wsaonZ>

#### Interview with Dr Glenda Kruss

PowerFM987  
<https://goo.gl/cMrwgt>



## THEME 3: NEW INDICATOR DEVELOPMENT



**Dr Nazeem Mustapha**  
Theme Leader

The Centre for Science, Technology and Innovation Indicators is in the process of consolidating a set of existing and new projects under the theme 'New Indicator Development'.

**Dr Glenda Kruss** and **Dr Il-haam Petersen** from CeSTII are leading this project, with collaborators in the HSRC from the Education and Skills Development programme.

### Engagement and Inclusive Development: Building the Interactive Capacities of Universities and Science Councils



This project focuses on interaction and knowledge flows between universities and science councils, and actors in informal settings and communities. It is funded by the NRF Community Engagement Programme for the period 2017-2019, and partners include the Bertha Centre for Social Innovation

at the University of Cape Town and the South African Higher Education Community Engagement Forum.

Through a focus on understanding the dynamic interactive capabilities of community-based actors, and not primarily on the academic and other formal intermediary actors in innovation networks, the research aims to identify spaces and opportunities for agency and change under greatly constrained structural conditions.

In 2017/18, CeSTII and its partners developed the foundations for comparative multi-level case studies of three networks, including a series of stakeholder workshops at Phillipi Village and at the Square Kilometer Array in Carnarvon, as well as planning toward a stakeholder workshop in Cofimvaba.

### Measuring Innovation in the Informal Sector

Informed by the contextual specificities of African development, a desktop project led by **Dr Nazeem Mustapha** was initiated in 2017/18, to experiment and pilot means of measurement of innovation in informal settings. Based on an analysis of existing research on the informal sector in South Africa, and emerging research on the nature, forms and outcomes of innovation in informal settings globally, a survey methodology was designed. The survey will be piloted in 2018/19 in the Sweetwaters area of KwaZulu-Natal, in collaboration with the Human and Social Development programme of the HSRC, who have built a research presence in the area. The pilot will involve three waves of surveying: a household survey to identify informal enterprises using place methodology, a survey to identify innovative businesses, and an in-depth exploration of innovative practices.

### Towards an Agenda for Measuring Innovation for Inclusive Development

The Centre is also especially interested in working with the DST to lead a new national research agenda over the next five years, building on the concept of innovation for inclusive development (also referred to as 'IID'), and to build expertise in the measurement of innovation in the informal economy. To this end, CeSTII was pleased to host honorary research fellow, **Dr Isabel Bortagaray**, from the Institute of Sustainable





Development, Innovation and Social Inclusion at the University of the Republic, Uruguay in February 2018 to assist and contribute to this work. Our work towards the broader HSRC Innovation and Development Week (Box 4) also contributed to laying key conceptual and methodological foundations.



Participants at the methodology workshop on the measurement of innovation for inclusive development [Image credit: HSRC]

#### Box 4. HSRC Innovation and Development Week 2018

Innovation has the potential to advance social and technological progress, but at the same time widen inequalities, especially in low income and emerging economies. So how do we understand the link between innovation and development in our local contexts? What research and policy tools will bring about transformative change in the South African economy and society? These questions formed the focus of the 2018 HSRC Innovation and Development Week in 22-24 January 2018. The Week encompassed a wide range of inputs, including: a lecture delivered by leading innovation scholar from Brazil, **Helena M. Lastres** (Federal University of Rio de Janeiro); a research agenda-setting workshop on measuring innovation for inclusive development; a project workshop focussed on linkages between universities and communities in Phillipi, Cape Town; and a workshop for policy makers to consider mechanisms to promote IID in Brazil. A key focus for the participants was elaborating novel ideas for the measurement of innovation for inclusive development.

Learn more > <https://goo.gl/rAj5Ap>



Watch **Helena M. Lastres** interviewed on eNCA > <https://goo.gl/aHwjZx>

“ The first step is to change our glasses. We say that theories and indicators and policies are like looking glasses. So we have to put in the centre of vision the main goals of our development, the requirements of our development, to solve the problem of exclusion and inequalities... The BRICS countries have a lot to teach the world in terms of new alternatives and inclusive modes of development.”

**Helena M. Lastres, Federal University of Rio de Janeiro, Brazil**

#### Intellectual Property and Technology Transfer

In 2017/18, the Centre also completed work on a baseline study of technology transfer and the exploitation of intellectual property from publicly funded research (reported on in our *Annual Review Report 2016/17*). CeSTII remains a partner with DST, NIPMO and SARIMA in institutionalising this survey. For 2018/19, there is much more work to be done to analyse and disseminate the results, and support plans for the next survey.

Read survey report > <https://goo.gl/bZWtqo>

# HSRC SEMINAR SERIES 2017/18

The Human Sciences Research Council seminar series is a key dissemination channel for the research of the Council to reach target audiences in South Africa and beyond. Each programme of the HSRC contributes to the series by showcasing research results. The overarching theme of CeSTII's 2017/18 contribution to the HSRC Seminar Series was 'Innovation for Inclusive Development'. Speakers included members of the CeSTII team as well as invited guest speakers, and seminars probed a spectrum of topical issues.

For copies of the presentation slides from these seminars, please contact **Gerard Ralphs** (gralphs@hsrc.ac.za).

## invitation



HSRC seminar series



An innovation-based, sustainable and inclusive water policy research agenda: Questions from the Uruguayan Case

Isabel Bortagaray, PhD, Honorary Research Fellow, Centre for Science, Technology & Innovation Indicators, HSRC & Institute for Sustainable Development, Innovation and Social Inclusion at the University of the Republic, Uruguay\*

**Date:** 20 February 2018 **Time:** 12h00 – 14h00  
**Venues:** Pretoria, Durban, Cape Town, PE and Sweetwaters

Water is one of the fundamental pillars of socio-economic development at all levels. It is essential for life, health, food, energy, employment, as well as for protecting the environment. Water security is of concern in almost all corners of the world, and constitutes one of the main global risks in terms of its impact on development in general, and on the achievement of the SDGs in particular. The complexity and uncertainty related to water and climate change, and the pervasiveness of water throughout the different SDGs call for a policy rationale in which innovation is prioritised along with sustainability and social inclusion. Innovation is called to play a crucial role in these processes—not only because water services are still missing for large groups of the population, but also because water quality and water management impose fundamental technological and institutional challenges. The role of innovation is even greater when taking into account the urgent need to place sustainability at the core of the design and implementation of solutions.

This seminar aims to contribute towards a research agenda on water policy in relation to inclusive and sustainable development. In particular, it focuses on the case of water policy in Uruguay, examining the recent launch of a national water plan by the Executive, and an irrigation law that is under scrutiny as it embodies the tensions between the economic use of water and the social and environmental dimensions of water that are prioritised by the Constitution.

\*Isabel Bortagaray holds a PhD in public policy from the Georgia Institute of Technology (2007), and has an extensive research trajectory in the field of innovation, science, and technology policy in developing countries, including Argentina, Colombia, Costa Rica, El Salvador, Panamá, and Uruguay.

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**Sweetwaters:** Old Bus Depot, Moubu Road, Sweetwaters. Tel: (033) 324 5000

The HSRC seminar series is funded by the Department of Science and Technology (DST). The views and opinions expressed therein as well as findings and statements of the seminar series do not necessarily represent the views of the DST.

Kindly note that seminars can now be accessed via the Video link:  
<https://hsrc-vc.tenet.ac.za/flux.htm?roomdirect.html&key=G6K6XUJnR6Zvns5M6pk73P71qu8>

Social science that makes a difference

## invitation



HSRC Seminar series in collaboration with  
The Centre for Science, Technology and Innovation Indicators (CeSTII)

### PATHS OF TECHNOLOGY UPGRADING IN THE BRICS ECONOMIES

Presenter: Dr Björn Jindra, Copenhagen Business School (Denmark) University of Bremen (Germany)



**Date:** 18 January 2018 **Time:** 12h30 – 13h30  
**Venues:** Pretoria, Durban, Cape Town, PE and Sweetwaters

This seminar explores technology upgrading of BRICS economies based on a three-pronged approach, which distinguishes between the intensity of technology upgrading, structural change and global interaction. We develop a statistical framework based on patent indicators to measure technological upgrading. This is applied to BRICS economies in comparison to selected high income economies in the period 1980 to 2011. The paper shows that there is no single path of technology upgrading. Instead, we find several unique paths with different trade-offs between intensity, structural change and the nature of global interaction. All BRICS economies display increased generation of frontier technological activities, while China and Russia have also increased the intensity of behind frontier technological activities. China has also diversified its technology knowledge base and entered into dynamic frontier areas. South Africa displays comparatively low dynamics with modest improvements regarding frontier technological intensity as well as increased breadth of technology upgrading. A particularity seems to be a relatively high rate of technology sourcing from abroad. However, this not coupled with behind the frontier technology activities and thus might be a substitute rather than a complement to frontier activities. Finally, we find that with increasing intensity of frontier technology activities of all BRICS, the relative, but not absolute, importance of foreign actors and international collaboration has declined. BRICS economies seem to lack the organisational and complementary capabilities to match the extent of technology sourcing from abroad, observed in high income countries. Our result represents the application of a new conceptual framework and contributes to assess the sustainability of innovation based growth in emerging economies.

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**Sweetwaters:** Old Bus Depot, Moubu Road, Sweetwaters. Tel: 033-324 5000

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## An Innovation-based, Sustainable and Inclusive Water Policy Research Agenda: Questions from the Uruguayan Case – 20 February 2018

Presented by Dr Isabel Bortagaray, HSRC Honorary Research Fellow (isabelbortagaray@gmail.com)

## Paths of Technology Upgrading in the BRICS Economies – 18 January 2018

Presented by Björn Jindra, Associate Professor for International Business, Copenhagen Business School (CBS) (bjj.int@cbs.dk)



HSRC Seminar Series on Innovation and Development in collaboration with the Centre for Science, Technology & Innovation Indicators

**invitation**

**Can information technology really boost performance in resource-constrained emergency healthcare organisations? A critical realist perspective**

**Presenter:** Yasser Buchana, Centre for Science, Technology and Innovation Indicators, HSRC  
**Chair:** Dr Moses Sithole, Centre for Science, Technology and Innovation Indicators, HSRC



**Date:** 3 October 2017 **Time:** 12h30 – 13h30  
**Venues:** Pretoria, Durban, Cape Town

Information and communication technologies (ICT) have been widely promoted as a mechanism for poverty eradication, wealth creation and well-being. While the term 'development' remains contentious, the use of ICT has become ubiquitous within healthcare organisations in developing countries. However, the typically telecentric approach of early ICT4D thinking and practice has thrown up as yet unanswered questions of sustainability, scalability, and evaluation.

Due to high levels of poverty and the resource constraints this creates, many people in developing countries remain excluded from the full benefits ICT can offer public healthcare organisations. In these resource-constrained contexts, emergency medical services (EMS) organisations face particular challenges when it comes to the use of ICT as tool for performance enhancement. Since the provision of emergency services to sick and injured patients involves intensive use of ICT, an investigation into the relationship between ICT use and organisational performance, in the context of resource-constrained EMS organisations, is therefore essential. This seminar will explore the micro-level ICT mechanisms that can enable EMS organisations in resource-constrained settings to achieve their performance outcomes. It will focus on how these micro-level mechanisms actually work, and what can be done to improve them.

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**Social science that makes a difference**

**Can Information Technology Really Boost Performance in Resource-constrained Emergency Healthcare Organisations? A Critical Realist Perspective – 3 October 2017**

Presented by Yasser Buchana, PhD Intern, CeSTII  
 ([ybuchana@hsrc.ac.za](mailto:ybuchana@hsrc.ac.za))

HSRC Seminar Series on Innovation and Development in collaboration with the Centre for Science, Technology & Innovation Indicators

**invitation**

**Social sciences and humanities R&D expenditure and performance in South Africa (2005-2015): Where to next?**

**Presenter:** Dr Neo Molotja, Senior Research Specialist, Centre for Science, Technology & Innovation Indicators  
**Chair:** Dr Glenda Kruss, Deputy-Executive Director, Centre for Science, Technology & Innovation Indicators




Photo credit: <http://mzu.edu.ng>

**Date:** 21 July 2017  
**Time:** 12h30 – 14h00  
**Venues:** Pretoria, Durban and Cape Town

The social sciences and humanities are widely understood to have a crucial role to play in addressing complex developmental and environmental issues, such as poverty, inequality or climate change. Building from the vision of the Charter for the Humanities and Social Sciences (2011), the establishment of the South African National Institute for the Humanities and Social Sciences (NISS) in 2013 has been part of a purposeful effort in South Africa to ensure research in the humanities and social sciences disciplines is advanced and coordinated. However, a very recent study performed by the University of KwaZulu-Natal for the Global Development Network has found that the "status of the social science research in the country is by and large not in an appreciable state and much deserves to be done for its enhancement" (GDN, 2016:89). Drawing from the latest data from the SA National Survey on Research & Experimental Development 2014/15, released on 12 April 2017, this seminar will address three key questions:

1. What are the notable patterns of R&D expenditure in the humanities and social sciences over the past ten years?
2. What are the drivers of R&D performance in humanities and social sciences related fields?
3. In what ways can policy be geared toward the mission of advancing and coordinating the humanities and social sciences in the context of the prioritisation of R&D expenditure and performance in the natural sciences and engineering?

For more information about the HSRC Seminar Series on Innovation and Development in collaboration with the Centre for Science, Technology & Innovation Indicators, contact Gerard Ralphs ([gralphs@hsrc.ac.za](mailto:gralphs@hsrc.ac.za)).

Kindly RSVP by 20 July 2017

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**Social Sciences and Humanities R&D Expenditure and Performance in South Africa (2005-2015): Where to Next? – 21 July 2017**

Presented by Dr Neo Molotja, Senior Research Specialist, CeSTII ([nmolotja@hsrc.ac.za](mailto:nmolotja@hsrc.ac.za))



HSRC Seminar Series on Innovation and Development in collaboration with the Centre for Science, Technology & Innovation Indicators

invitation

## Do high-tech multinational corporations with local subsidiary companies generate innovations in South Africa? A critical analysis of evidence from the Business Innovation Survey (2005-2007)

**Presenter:** Dr Nazeem Mustapha, Chief Research Specialist, Centre for Science, Technology and Innovation Indicators (CeSTII), HSRC

**Date:** 06 April 2017 | **Time:** 12h30 – 14h00 | **Venues:** Pretoria, Durban, Cape Town

There are several pathways through which technological diffusion routinely takes place—in the movement of highly skilled professionals and high-tech machinery, or through the trade in intellectual property—and there is a strong consensus among economists that diffusion has the potential to generate economic growth. More specific to the prevailing belief is the idea that high-tech multinational corporations (MNC) actively promote diffusion in local markets through the actions of their subsidiary firm(s) inside a country, which, in turn, results in greater innovative capability of local firms and people. However, in developing countries the evidence that this belief actually holds in practice is slim, and critical questions therefore need to be asked as to why this is so.

- Do MNC invest in local environments in order to conduct R&D activities locally?
- Do MNC engage in local innovative practices? Or, are MNC simply releasing or 'dumping' high-tech products onto local markets?
- Are the types of behaviour that MNC exhibit in developing countries creative/constructive or exploitative?

This seminar will present results from an econometric analysis that examined a series of six hypotheses concerning whether MNC subsidiaries are likely to produce more innovations in South Africa in relation to their 'indigenous' South African counterparts.

For more information about the CeSTII seminar series on Innovation and Development, contact Gerard Ralphs (gralphs@hsrc.ac.za).

Kindly RSVP by 5 April February 2017

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Social science that makes a difference

## Do High-tech Multinational Corporations with Local Subsidiary Companies Generate Innovations in South Africa? A Critical Analysis of Evidence from the Business Innovation Survey (2005-2007) – 6 April 2017

*Presented by Dr Nazeem Mustapha, Chief Research Specialist, CeSTII (nmustapha@hsrc.ac.za)*



# COLLABORATION & NETWORKS

The Centre for Science, Technology and Innovation Indicators interacted with a range of collaborators in 2017/18. Our networks help us to deliver on our goals more efficiently and effectively. As a public research institute, we also want to share our expertise nationally, regionally and globally.

## FORMAL INSTITUTIONAL LINKAGES

### CeSTII launches MOU with NCRST, Namibia



Loide Uahengo (NCRST), Mario Clayford (HSRC), Anneline Morgan (SADC), Tinyiko Mushwana (DST), Gerard Ralphs (HSRC), Refilwe Mashigo (DST), Gernot Piepmeyer (NCRST), Dr Glenda Kruss (HSRC), Dr Nazeem Mustapha (HSRC), Bridgette Prince (HSRC) in Windhoek, Namibia. [Image credit: G. Ralphs]



Dr Glenda Kruss and Gernot Piepmeyer observed formalities at a launch of the partnership held in Windhoek, Namibia. [Image credit: G. Ralphs]

Since 2016/17, CeSTII has collaborated with Namibia's National Commission for Research, Science and Technology (NCRST) to provide data analysis and survey management advice.

The collaboration was formalised through a MOU concluded in May 2017 by the HSRC CEO, **Crain Soudien**, and the CEO of NCRST, **Eino Mvula**, and

subsequently launched in Windhoek at the offices of the NCRST on 22 May 2017.

The launch event was attended by representatives of the South African Department of Science and Technology, **Refilwe Mashigo** and **Tinyiko Mushwana**; the STI Secretariat of the Southern African Development Community, **Anneline Morgan**, and **Bridgette Prince** (HSRC).

"We have established that this MOU was formed through a bottom-up approach, where the activities started, and look forward to this being an active two-way collaboration," said CeSTII's deputy-executive director, **Dr Glenda Kruss**.

"We have more countries in Southern Africa with support from NEPAD conducting R&D and innovation surveys. We want CeSTII to play a lead role in the Southern Africa region as a knowledge partner," said Morgan.

**Quick link to media coverage of CeSTII Mou with NCRST**

**South Africa, Namibia collaborate on science statistics**

Reporter: **Megan Van Wyngaardt**

Publication: *Engineering News*

<https://goo.gl/LNRtob>

Learn more about NCRST > <http://www.ncrst.na/>

## CeSTII and Nigeria's NACETEM work together

In early 2017, the Centre for Science, Technology and Innovation Indicators and the Nigeria's National Centre for Technology Management (NACETEM) concluded a memorandum of understanding for collaboration and sharing data on R&D and innovation in Africa. In the 2017/18 financial year, CeSTII and NACETEM elaborated plans for comparative research on STI indicators for inclusive development. CeSTII is represented in the agreement by deputy-executive director, **Dr Glenda Kruss**, and NACETEM by **Dr Abiodun Egbetokun**, who is Head of Science Policy and Innovation Studies.

Learn more about NACETEM > [www.nacetem.gov.ng/](http://www.nacetem.gov.ng/)



L-R: Dr Glenda Kruss, Helena M. Lastres and José Cassiolato. [Image credit: HSRC]

## VISITING RESEARCHERS

### Danish and Brazilian innovation scholars visit CeSTII

In 2017/18, CeSTII and HSRC welcomed a number of leading innovation scholars to its hallways and seminar rooms. Among these were **Björn Jindra** (Associate Professor for International Business, Copenhagen Business School), who delivered a seminar on technology upgrading in BRICS economies. **Helena M. Lastres** (Federal University of Rio de Janeiro) and **José Cassiolato** (Federal University of Rio de Janeiro) spent the week of 22-26 January 2018 at the HSRC participating in the Innovation and Development Week arranged by CeSTII (see Box 4, p. 15).

### Dr Oluseye Jegede appointed HSRC African Research Fellow

**Dr Oluseye Jegede** is a Research Fellow at the African Institute for Science Policy and Innovation (AISPI), Obafemi Awolowo University in Ile-Ife, Nigeria. Jegede holds a BSc in Geology and MSc and PhD in Technology Management from Obafemi Awolowo University.

Joining the team right at the end of the 2017/18 financial year, Dr Jegede's discussion paper 'Survey of informal innovation: Striking a balance between the known (convention) and the unknown (alternative)', which was presented in February 2018, provided insights from the Nigerian experience for CeSTII's pilot research on informal innovation.

### Dr Isabel Bortagaray appointed HSRC Honorary Research Fellow in 2017

**Dr Isabel Bortagaray** holds a PhD in public policy from the Georgia Institute of Technology (2007), and works at the Institute for Sustainable Development, Innovation and Social Inclusion at the University of the Republic, Uruguay. For three years, Dr Bortagaray was responsible for the Latin America and the Caribbean programme on Science, Technology and Innovation at Canada's International Development Research Centre. She has an extensive research trajectory in the field of innovation, science, and technology policy in developing countries, including Argentina, Colombia, Costa Rica, El Salvador, Panamá, and Uruguay.

## HIGH-LEVEL FORA

### OECD National Experts on Science and Technology Indicators 2017

13-15 December 2017 | Madrid, Spain



Dr Nazeem Mustapha represented CeSTII and the HSRC at the OECD National Experts on Science and Technology Indicators (NESTI) Meeting 2017 held at the Ministry of Economy and Competitiveness (MINECO) in Spain. [Image credit: HSRC]

The NESTI indicator group at the OECD is the international body that guides and provides direction on methodologies and future measurement priorities in Science, Technology and Innovation (STI) for OECD countries, and partner countries such as South Africa. The surveys that CeSTII performs follow manuals developed by this group of national experts; and CeSTII contributes to these processes on behalf of South Africa, formally represented by the DST, and has been doing so since its inception at the HSRC. The second meeting of NESTI in 2017 coincided with the adoption, in principle, of the fourth edition of the Oslo Manual as well as the approval of the forward-looking NESTI Roadmap drawing on the 2016 OECD Blue Sky Forum. As the premier international body for experts in STI measurement, NESTI is composed—as the name suggests—of measurement experts (methodologists, survey statisticians, some survey managers and economists) of countries, mostly OECD countries. Several non-OECD countries, such as South Africa, China and Brazil send representatives to the annual meeting of NESTI, in particular to provide input on standardisation of methods, new methodologies, and revisions of old ones.

### Frascati and Oslo under the spotlight

In addition to the usual country inputs arising from previous NESTI meetings and progress on work programmes, this year's NESTI meeting featured future measurement projects, such as measurement of innovation in new areas of study, such as user innovation. The implementation progress of the revised Frascati Manual for R&D surveys in each participating country was noted, given that CeSTII bears the responsibility of implementing this for the South African R&D Survey series.

NESTI is the developer of the Frascati Manual (the gold standard for R&D surveys) and the Oslo Manual (the gold standard for firm innovation surveys). CeSTII employs these standards in order to provide statistics that are commensurate with those produced by other countries. In this way, the data that CeSTII produces becomes of great value to policy makers, who have always been keen on international comparisons. Indeed, the R&D statistics that CeSTII produces on an annual basis have the status of official statistics, partially because of the strong relationship that CeSTII has with the NESTI group.

One specific point of interest for both CeSTII's work on measuring innovation capacity in South African firms (pages 12-13) and on new indicators (pages 14-15) was the ratification of the revised Oslo Manual. This will be formally announced early in 2018, and holds direct relevance for the new survey on measurement in the informal sector that CeSTII is piloting, as well as the next waves of the Business Innovation Survey. A workshop on results of an exhaustive econometric study of R&D tax incentives, relevant to the CeSTII R&D measurement theme (pages 10-11), was also workshopped after the NESTI meeting. In particular, the NESTI Secretariat provided a brief update on the state of NESTI work in this area, including initial efforts to assess the extent and coverage of national R&D project funding databases and it presented proposals for extending the international measurement of public support for R&D. The provision of information on direct public funding of R&D through grants and contracts is already part of the agreement reached in the Frascati Manual 2015, and implemented in OECD R&D data collection.

“ NESTI is the developer of the Frascati Manual (the gold standard for R&D surveys) and the Oslo Manual (the gold standard for firm innovation surveys). CeSTII employs these standards in order to provide statistics that are commensurate with those produced by other countries.”

**Dr Nazeem Mustapha**

### Statistics to capture the human factor in science and innovation

One of the key takeaways from the 2016 OECD Blue Sky Forum was the need to develop and mainstream instruments capable of capturing relevant aspects of people’s engagement in science, research and innovation. At recent NESTI meetings, delegates noted the importance of engaging relevant experts within countries both in order to secure existing data and propose new developments. A proposal was presented for the creation of an informal, dedicated NESTI Task Force on STI Human Resource statistics that reports to the group and coordinates its activities in relation to governmental and non-governmental actors working in these areas. NESTI has two ongoing activities and one new proposal in this area:

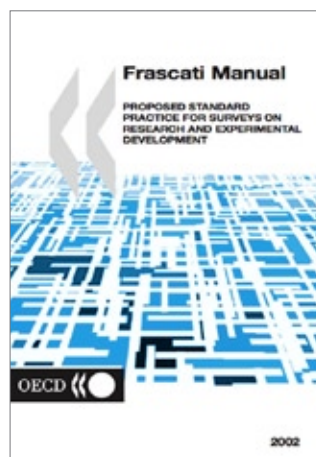
- Careers of Doctorate Holders
- The OECD International Survey of Scientific Authors
- Proposal for a study on economy-wide innovation based on information collected directly from individuals.

### Going digital

The 2016 OECD Blue Sky Forum also brought up digitalisation not only as a major area of STI research into potential new statistical evidence but also alluded to its transformational potential. As an outcome of the Forum, and in order to fulfil its mandate, NESTI needs to consider opportunities arising from:

- Use of the internet as a source of data and metadata on STI
- Use and analysis of unstructured data for STI statistical purposes
- International coordination on STI-related digital information management standards, in particular with regards to administrative records.

This report was prepared by **Dr Nazeem Mustapha**, Chief Research Specialist, Centre for Science, Technology and Innovation Indicators based on inputs from the NESTI Secretariat and other rapporteurs at the 2017 meeting. For more information write to [nmustapha@hrsc.ac.za](mailto:nmustapha@hrsc.ac.za)



<https://goo.gl/VFNK2c>



<https://goo.gl/VrLt38>



## National Advisory Council on Innovation hosts Western Cape roadshow event with HSRC

16 October 2017 | Cape Town, South Africa

South Africa's National Advisory Council on Innovation (NACI) plays a vital role in the national system of innovation. This role includes providing regular monitoring reports of key indicators. In October 2017, CeSTII arranged one of two provincial roadshow events hosted by the HSRC on behalf of NACI to showcase the results of its 2016 report.



In addition to showcasing NACI indicators, the event's goal was to facilitate local dialogue around measurement of systems of innovation in South Africa. It attracted approximately 40 participants, from across private, higher education, and local government sectors. The event was opened by HSRC CEO **Prof Crain Soudien** and Acting CEO of NACI, **Dr Mlungisi Cele**. Speakers included:

- **Dr Pieter Van Heyningen**, Developing Sustainable Innovation Solutions (SUSTNET)
- **Dr Azar Jammie**, NACI Council Member
- **Mr Naim Rassool**, Director: South African Renewable Energy Technology Centre
- **Ms Michelle Matthews**, Head of Innovation: Cape Innovation and Technology Initiative
- **Mr Jamie Martin**, Founder and CEO: Injini: Africa's EdTech Incubator
- **Dr William Cloete**, Technology Transfer Manager, InnovUS, Stellenbosch University.

“ I would like to express my sincere gratitude and appreciation for your support and contribution towards the two provincial roadshows in eThekweni and Cape Town. There are key issues that were raised by participants which we need to find mechanisms to take them forward. It will be important to exchange notes and identify areas of common interest which may lead to joint initiatives.”

**Mlungisi Cele, Acting CEO,  
National Advisory Council on Innovation**

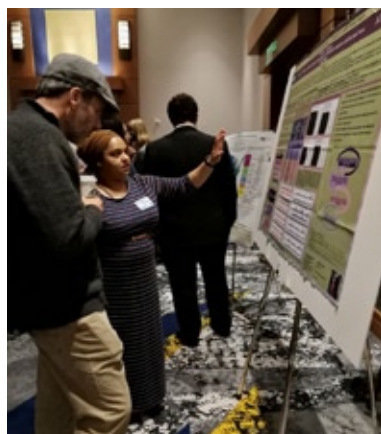
## CONFERENCES WE ATTENDED

CONFERENCE	DATE	CITY, COUNTRY	ATTENDED BY
Technology Innovation Conference	1-2 February 2018	Gauteng, South Africa	Dr Glenda Kruss Gerard Ralphs Cheryl Moses
OECD National Experts on Science and Technology Indicators 2017	13-15 December 2017	Barcelona, Spain	Dr Nazeem Mustapha
Regional Consultative Meeting of SADC Charter on Women in Science, Engineering and Technology	12-14 December 2017	Mbabane, Swaziland	Dr Neo Molotja
Science Forum South Africa	7-8 December 2017	Pretoria, South Africa	Dr Glenda Kruss Dr Firdous Khan Dr Saahier Parker Nhlanhla Malaza Gerard Ralphs
inno4SD.net & NCPC-SA Eco-innovation Workshop	1 December 2017	Pretoria, South Africa	Cheryl Moses
5th Annual Conference of the Statistical Association of South Africa	27-30 November 2017	Kimberley, South Africa	Precious Mudavanhu
Swaziland Economic Conference 2017	25-27 October 2017	Mbabane, Swaziland	Dr Moses Sithole
15th International Globelics Conference	10-13 October 2017	Athens, Greece	Dr Glenda Kruss Dr Saahier Parker Dr Il-haam Petersen Dr Nazeem Mustapha
2017 Atlanta Conference on Science and Innovation Policy	9-11 October 2017	Atlanta, US	Dr Firdous Khan Cheryl Moses

*Continues overleaf...*



Dr Glenda Kruss and Dr Il-haam Petersen at the 2017 Globelics Conference held in Athens (July 2017). [Image credit: G. Kruss]



Dr Firdous Khan runs a delegate through her scientific poster at the Atlanta Science and Innovation Policy Conference (October 2017). [Image credit: C. Moses]



Cheryl Moses addresses an audience at the CSIR during a 2017 meeting of the NCPC-SA/UNEP pilot project on eco-innovation in South Africa. [Image credit: CSIR]

CONFERENCE	DATE	CITY, COUNTRY	ATTENDED BY
Inaugural Transformative Innovation Policy Consortium Conference	20-21 September 2017	Pretoria, South Africa	Dr Il-haam Petersen Dr Nazeem Mustapha
South African Innovation Summit	7 September 2017	Cape Town, South Africa	Gerard Ralphs Dr Moses Sithole Dr Hlamulo Makelane Dr Glenda Kruss
Biennial Conference of the Economic Society of South Africa	30 August-1 September 2017	Grahamstown, South Africa	Jerry Mathekga Loyiso Maciko
23rd Americas Conference on Information Systems	10-12 August 2017	Boston, US	Yasser Buchana
2nd Multi/Interdisciplinary Research Conference	26-28 July 2017	Windhoek, Namibia	Jerry Mathekga
Innovation in Emerging Economies	13-14 July 2017	Berlin, Germany	Dr Glenda Kruss
BRICS Young Scientist Forum	11-15 July 2017	Zhejiang University, China	Dr Saahier Parker
National Cleaner Production Centre South Africa (NCPC-SA)/UNEP Eco-innovation Pilot Project	28 June 2017	Pretoria, SA	Cheryl Moses
African Science, Technology and Innovation Indicators Initiative - Validation Workshops	5-9 June 2017	Nairobi, Kenya	Dr Neo Molotja Precious Mudavanhu
	23-26 May 2017	Windhoek, Namibia	Dr Moses Sithole
Southern African Research and Innovation Management Association (SARIMA)	23-25 May 2017	Windhoek, Namibia	Dr Glenda Kruss Mario Clayford Natalie Vlotman Gerard Ralphs Dr Nazeem Mustapha
PhD Colloquium for the 2017 Africa Unity for Renaissance International Conference	20-22 May 2017	Pretoria, South Africa	Theodore Sass



Dr Saahier Parker (centre) at the BRICS Young Scientist Forum held at Zhejiang University, China (July 2017)  
[Image credit: S. Parker]



Jerry Mathekga presented work at the University of Namibia  
[Image credit: J. Mathekga]

# DATA COMMITTEE

## Dr Firdous Khan (Chair)

Research Specialist & Post-doctoral Fellow, CeSTII

### CHAIR'S REFLECTION

The Data Committee of the Centre for Science, Technology and Innovation Indicators performs a vital role in the processing of data requests from the general public to ensure that the data we collect through our surveys is used. These surveys include: South African National Survey on Research and Experimental Development; South African Business Innovation Survey; and, South African National Survey on Intellectual Property and Technology Transfer at Publicly Funded Research Institutions.

In 2017/18, we responded to numerous requests for data from our surveys, but also worked towards the development of a stronger framework to guide the Committee's activities moving forward.

I have provided some of the key points from this framework below to assist and enable interested parties to engage with CeSTII's Data Committee in the future.

- As a general rule, survey data is not provided prior to official publication. Published data that is not easily available from curated datasets in the public domain may be provided on request.

- If a data request is refused, the Committee will provide the reason for the refusal. In some cases, data may be provided at a higher level of aggregation than that requested.
- Subject to the nature of the request and complexity of the data output, a timeline to the requester will be communicated, subject to the availability of internal resources. The Data Committee will always endeavour to ensure as prompt a response as possible to all data requests.
- Requests deemed as urgent by the chair of the Data Committee will be dealt as soon as the Committee can be convened.

Last, the CeSTII Data Committee aims to ensure that the confidentiality of our respondents' information is protected at all times.

You can contact the CeSTII Data Committee by writing to [cestiidata@hsrc.ac.za](mailto:cestiidata@hsrc.ac.za) or [fkahn@hsrc.ac.za](mailto:fkahn@hsrc.ac.za).



# ABOUT CESTII

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

## CESTII'S NEW STRATEGIC TEAM VISION<sup>3</sup>

“ 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 will be supported by an ethos of teamwork and inclusive diversity, shared learning, creativity, and a commitment to sustainability.”

**Team Vision Statement**



Team-building orienteering exercise at Cape Town's Green Point Urban Park (November 2017). [Image credit: G. Ralphs]

<sup>3</sup> This vision statement is the outcome of a strategic visioning process at the CeSTII Lekgotla held on 2-3 November 2017.

## OUR MISSION

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



Dr Glenda Kruss, CeSTII Deputy-Executive Director, at the Innovation and Development Week 2018. [Image credit: HSRC]

## 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, DST's draft White Paper and towards national development goals.

## KEY STAKEHOLDERS

STAKEHOLDER ORGANISATION	HOW CESTII ENGAGES
<b>CORE PARTNERS</b>	
Department of Science and Technology	<ul style="list-style-type: none"> <li>• Work closely at the research-policy nexus to conduct the annual R&amp;D survey and bi-annual innovation survey and the production of official STI statistics in partnership with Statistics South Africa, the OECD and NESTI.</li> </ul>
National Advisory Council on Innovation	<ul style="list-style-type: none"> <li>• Collaboration on research and advocacy, hosting the NACI indicators provincial roadshow, as well as a standing arrangement for regular data and outputs sharing, to contribute to the creation of a national STI portal.</li> </ul>
Statistics South Africa	<ul style="list-style-type: none"> <li>• Ensuring compliance with SA Statistical Quality Framework through the R&amp;D Survey Clearance Committee, and provision of the Business Register and survey sample for the surveys and associated methodological support.</li> </ul>

*Continues overleaf...*



STAKEHOLDER ORGANISATION	HOW CESTII ENGAGES
<b>REGIONAL PARTNERSHIPS</b>	
African Union-NEPAD National Planning Commission	<ul style="list-style-type: none"> <li>• Collaboration with the ASTII programme to provide training on STI indicators and in the writing of the African Innovation Outlook. Training network includes partnership with the African Observatory on Science, Technology and Innovation, and the UN Institute of Statistics.</li> <li>• Provision of national R&amp;D and innovation data and indicators according to required templates.</li> </ul>
South African Development Community SADC Secretariat	<ul style="list-style-type: none"> <li>• Technical expert advisers on the implementation of science, technology and innovation policies and indicators in the region.</li> </ul>
NACETEM, Nigeria	<ul style="list-style-type: none"> <li>• Share expertise and co-author comparative papers on R&amp;D and innovation in SA and Nigeria.</li> </ul>
NCRST, Namibia	<ul style="list-style-type: none"> <li>• Training, share expertise and co-author comparative papers on R&amp;D and innovation in SA and Namibia.</li> </ul>
<b>GLOBAL PARTNERSHIPS</b>	
OECD/NESTI	<ul style="list-style-type: none"> <li>• Provision of national R&amp;D and innovation data and indicators according to required templates.</li> <li>• Participation in discussions to revise and implement changes to Frascati and Oslo manuals.</li> </ul>
UNESCO	<ul style="list-style-type: none"> <li>• Provision of national R&amp;D and innovation data and indicators according to required templates.</li> </ul>
REDeSIST, Federal university of Rio de Janeiro, Brazil	<ul style="list-style-type: none"> <li>• Research collaboration on local innovation and production systems, and innovation measurement.</li> </ul>
IFPRI / ARC	<ul style="list-style-type: none"> <li>• Research collaboration on STI measurement in the agricultural sector.</li> </ul>
<b>PROJECT-BASED COLLABORATIONS</b>	
SA Innovation Summit	<ul style="list-style-type: none"> <li>• Information sharing and advocacy.</li> </ul>
Science Councils (Medical Research Council, Council for Scientific and Industrial Research and Agricultural Research Council)	<ul style="list-style-type: none"> <li>• Share expertise and co-author analytical papers drawing on R&amp;D and innovation datasets to address new questions.</li> </ul>
Bertha Centre in the Graduate School of Business at UCT	<ul style="list-style-type: none"> <li>• Collaboration on NRF project and training of Masters students in social innovation.</li> </ul>
Southern African Higher Education Community Engagement Forum	<ul style="list-style-type: none"> <li>• Advocacy partner on NRF project, around community engagement, innovation and inclusive development.</li> </ul>
BRICS Research Centre, HSRC	<ul style="list-style-type: none"> <li>• Provision of national R&amp;D and innovation data and indicators according to required templates.</li> </ul>
Business Unity South Africa	<ul style="list-style-type: none"> <li>• Advocacy partner on BIS and R&amp;D surveys/ STI measurement.</li> </ul>

## TEAM CESTII



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Deputy-Executive Director



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Chief Research Specialist



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**Precious Mudavanhu**  
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**Lindiwe Binda**  
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**Natalie Vlotman**  
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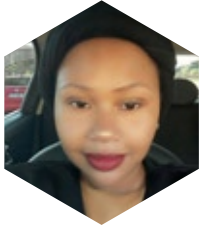


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