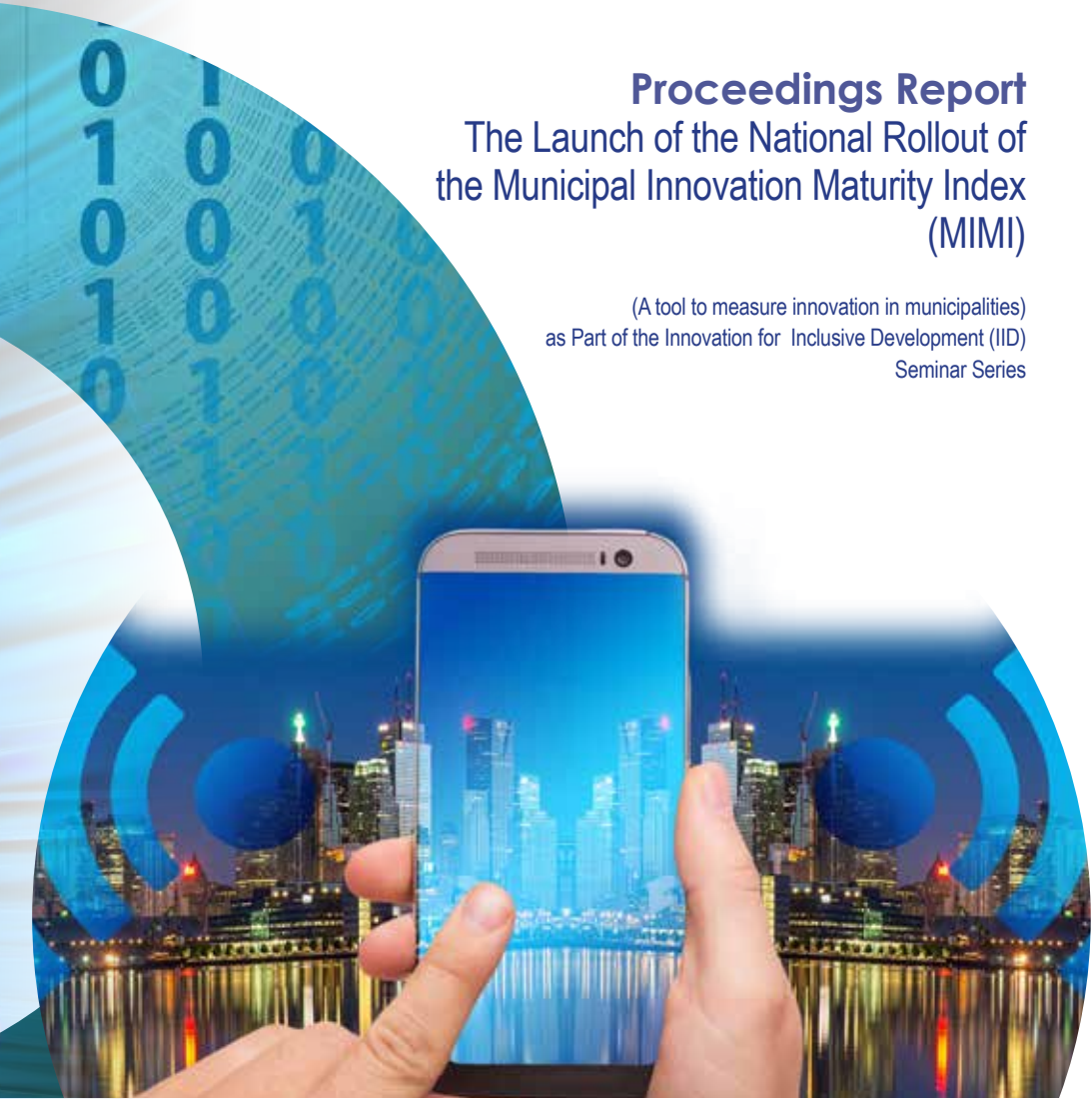# MIMI

MUNICIPAL INNOVATION MATURITY INDEX

Enabling Future Smart Cities

Proceedings Report
The Launch of the National Rollout of the Municipal Innovation Maturity Index (MIMI)

(A tool to measure innovation in municipalities)
as Part of the Innovation for Inclusive Development (IID)
Seminar Series

science & innovation
Department
Science and Innovation
REPUBLIC OF SOUTH AFRICA

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SALGA
SOUTH AFRICAN LOCAL
GOVERNMENT ASSOCIATION
Inspiring service delivery

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ASSAf

The Academy of Science of South Africa (ASSAf) was inaugurated in May 1996.
It was formed in response to the need for an academy of science consonant with
the dawn of democracy in South Africa: activist in its mission of using science and
scholarship for the benefit of society, with a mandate encompassing all scholarly
disciplines that use an open-minded and evidence-based approach to build
knowledge. ASSAf, thus, adopted in its name the term 'science' in the singular as
reflecting a common way of enquiring rather than an aggregation of different
disciplines. Its Members are elected based on a combination of two principal
criteria, academic excellence and significant contributions to society.
The Parliament of South Africa passed the Academy of Science of South Africa
Act (No 67 of 2001), which came into force on 15 May 2002. This made ASSAf
the only academy of science in South Africa officially recognised by government
and representing the country in the international community of science academies
and elsewhere.

This report reflects the proceedings report of the Launch of the National Rollout of
the Municipal Innovation Maturity Index (MIMI) (A tool to measure innovation in
municipalities) as part of the Innovation for Inclusive Development (IID) Seminar
Series held on Zoom Webinar.

The views expressed are those of the individual participants and
not necessarily those of the Academy, nor are they a consensus view
of the Academy based on an in-depth evidence-based study.

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ACKNOWLEDGEMENTS

The outcome of the implementation testing, based on the participation of 22 municipalities, demonstrated the value and the capacity of MIMI to produce innovation maturity scores for municipalities. The digital assessment tool looked at how a municipality, as an organisation, responds to science, technology and innovation (STI) linked to service delivery, and the innovation capabilities and readiness of the municipality and the officials themselves. The tool is also designed to recommend areas of improvements in adopting innovative practices and nurturing an innovation mindset for impactful municipal service delivery.

The plan going forward is to conduct learning forums to train municipal officials on how to use the MIMI digital platform, inform them about the nationwide implementation rollout plan and support municipal officials to engage in interactive and shared learnings to allow them to move to higher innovation maturity levels. The virtual launch attracted over 200 attendees from municipalities, government, business and private sector stakeholders, academics, policymakers and the international audience.

ASSAf gratefully acknowledges all the partners, speakers and participants in attendance and the contributions by Dr Stanley Maphosa and Dr Tebogo Mabotha from ASSAf to this project.

Prof Himla Soodyall
ASSAf Executive Officer

INTRODUCTION

Dr Tebogo Mabotha, Academy of Science of South Africa, ASSAf

Dr Mabotha welcomed the attendees. The opening of the seminar was preceded by a short video play.

VIDEO PLAY: INNOVATION PARTNERSHIPS FOR RURAL DEVELOPMENT PROGRAMME

Department of Science and Innovation, DSI

The video is available at **https://youtu.be/OSPUoXbo-8U**.

The Department of Science and Innovation (DSI) is a national government department that aims to boost social economic development in South Africa through research and innovation. A key aspect of this is the generation and dissemination of knowledge, learning and evidence, to inform and influence how science and technology may be used to achieve inclusive development.

Dr Phil Mjwara (DG, DSI) observed that the government had prioritised rural development. The department had a mandate to use knowledge to solve problems. The DSI therefore partners with other government departments to understand their problems and challenges, and to use the knowledge they generate to solve problems in institutions financed by the DSI.

Mr Tshepang Mosiea (Acting Chief Director for Innovation for Inclusive Development, DSI) noted that the DSI was looking at how innovation could be used to improve service delivery and to ensure that rural communities have access to infrastructure The context for the establishment of the Innovation Partnership for Rural Development Programme (IPRDP) was to explore how innovation could be introduced into municipalities, and how they could adopt technologies and innovations to improve service delivery.

Low-pour flush toilets
The South African constitution gives all citizens the right to dignity. The provision of sanitation forms part of this basic right, regardless of where one lives. Low-pour flush toilets had been developed for the South African rural landscape, combining the advantages of both waterborne and ventilated improved pit (VIP) systems while eliminating their disadvantages. Low-pour flush toilets incorporate twin leach pits, with filling rates dependant on the number of people using the toilet and the ground conditions. The project had been successfully piloted in the Eastern Cape, Northern Cape and Mpumalanga.

In 2014, a South African point of use (POU) technology had been developed to address the issue of access to safe drinking water. Household POU water treatment devices are an excellent alternative for immediate and safe water provision in rural communities. The woven fabric microfiltration gravity filter POU technology is driven by gravity alone, requires no water treatment chemicals, is robust, simple to operate, and easy to maintain. The technology meets the World Health Organisation (WHO) standards for safe drinking water. The project had been implemented in Capricorn District Municipality (Limpopo) and Mbizana Local Municipality (Eastern Cape).

Small-scale hydropower project
Small hydropower schemes play a critical role in providing energy access to remote areas in South Africa. As a result, a small-scale hydropower project had been introduced in Mhlontlo Local Municipality in order to provide a rural community with reliable grid-quality electricity supply, thereby improving their standard of living. The project had had a significant impact on the quality of life in the Kwa-Madiba community. The design of the Kwa-Madiba small-scale hydropower system had provided proof of the feasibility and technical potential of small-scale hydropower installations for rural electrification.

Integrated algal ponding system and waste water treatment works
The integrated algal ponding system had been integrated in rural towns in the Eastern Cape. This project focused on creating a demonstration-scale water treatment works, while also creating a viable platform to launch sustainable food security and job creation in vulnerable communities.

Another project looking at the treatment of waste water was algal-based tertiary treatment in maturation ponds of waste water treatment works (WWTW). This project implemented a self-sustaining system that operated independently of electricity or expensive chemicals to allow the effective removal of pathogens from WWTW effluent. The project had been implemented at the Motetema WWTW in the greater Sekhukhune District Municipality. This environmentally friendly treatment method supported a reduction in downstream human health risks.

Municipal Services Corrective Action Request and Report System
The Municipal Services Corrective Action Request and Report System (CARRS) was an incident-management system with a strong focus on enforcing accountability. This system would improve the way in which municipalities handle queries reported by communities. Further innovations linked to this project were being piloted, including setting up water service provision through community-based organisations, thereby decentralising some of the basic maintenance work to ordinary communities and thus supporting job creation.

Smart geyser project

The smart geyser project had been initiated in Mkhondo Local Municipality to address the challenges of water scarcity and lack of awareness of water as a scarce commodity in South Africa. This project used the influence of another resource, namely electricity, to raise awareness of the cost and quantity of water usage in a household. The project focused on the control of geysers measuring and managing electricity supply, temperature settings and water supply. Minute-by-minute information was presented to users in an easily digestible format, online or via an app on users' cell phones.

Water safety planning and waste water risk abatement planning

Water safety planning (WSP) and waste water risk abatement planning (W2RAP) are key elements of risk management planning. The purpose of the project was to assist in the assessment of current practices at identified municipalities, including the provision of guidance and technical support where required. The project focused on the development of new risk management for both water and waste water risk management at challenged district municipalities. The Eastern Cape and KwaZulu-Natal were the target provinces for the initial rollout of the project.

Youth journalism

The Science and Technology Youth Journalism Programme had been developed to promote interest in science and technology (S&T) amongst disadvantaged youth. Given that community media tend to focus on crime, politics and sport, a need was identified to expand the range of community media to cover S&T. The programme had been implemented in district municipalities where other technologies had been demonstrated by the IPRPD. The project had dramatically increased science reporting by community media, and interns were contributing science-related stories. Positive feedback had been received from community media on this initiative.

Mr Imraan Patel (Deputy DG, DSI) looked forward to improving the DSI's contribution to supporting the National Development Plan and other programmes. It was important for the DSI to be at the centre of national development efforts. Through programmes such as the IPRPD and others, the DSI was contributing to addressing the three core issues requiring attention in South Africa, namely poverty, inequality and unemployment.

Dr Phil Mjwara (DG, DSI) commented that the DSI had demonstrated that S&T could be used to improve people's lives, and that it would help the DSI and government as a whole to fulfil that mandate. It was important to get the public to realise that science was not the preserve of scientists alone, but could be used to change people's lives.

OPENING AND WELCOME

Programme Director: Prof David Walwyn, Member: Academy of Science of South Africa, ASSAf

Prof David Walwyn (Professor of Engineering and Technology Management, University of Pretoria and member of ASSAf), opened the meeting by welcoming the speakers, attendees and organisers. He gave a brief introduction to the Academy of Science of South Africa (ASSAf).

ASSAf was established in 1996 by then President Nelson Mandela and consisted of approximately 600 appointed members (mainly from the South African scientific academic community) and a highly efficient secretariat. Further information about ASSAf's objectives, role, programmes and activities was available on the ASSAf website. For Prof Walwyn, the most important stated objective was that "ASSAf aims to provide evidence-based scientific advice on issues of public interest to government and other stakeholders". That was partly why ASSAf was involved in the national rollout of the Municipal Innovation Maturity Index (MIMI). Other ways in which ASSAf was addressing this important role included the activities of the Scholarly Publishing Unit in managing the Scientific Electronic Library Online (SciELO SA) and the *South African Journal of Science*.

ASSAf's contribution to MIMI had mainly been to support the development of the initial concept note and the preparation of the preliminary report. Prof Walwyn was also playing a support role with respect to MIMI. The overarching objective of the launch event was to introduce MIMI to the wider community of stakeholders in local government, about 160 of whom were attending the seminar.

MIMI is a self-assessment and reflective tool that assesses the innovation, performance, practices and maturity levels of municipalities. Those familiar with the S&T landscape know that measurement and response is critical in policy space and policy experimentation. The launch event would share the preliminary report on municipal innovation measurements based on the insight gained from the pilot phase of MIMI.

PURPOSE OF THE INNOVATION FOR INCLUSIVE DEVELOPMENT (IID) SEMINAR

Mr Tshepang Mosiea, Acting Chief Director: Innovation for Inclusive Development (IID), Department of Science and Innovation, DSI

Mr Mosiea welcomed all participants to the Innovation for Inclusive Development (IID) seminar hosted by ASSAf, the DSI and MIMI partners, which formed part of a series of IID Seminars that the DSI organises through ASSAf, the most recent of which was in April 2021. The purpose of the present seminar was to launch the national rollout of MIMI.

The purpose of the IID seminars was to engage government policy-makers and decision-makers, civil society, academia and industry to showcase the knowledge, evidence and learning emanating from technology demonstration projects, such as the Innovation Partnership for Rural Development Programme (IPRDP), that might influence policy. The DSI sponsored the IID seminars to create a space for policy dialogue regarding technologies, innovations and decision-support tools arising from DSI-funded projects, with the potential for widespread adoption in government to improve service delivery and contribute to achieving a capable state in line with the 2030 vision of the National Development Plan.

MIMI is a decision-support tool funded by the DSI that has the potential for widespread adoption to improve service delivery by encouraging innovation uptake in municipalities. The DSI had funded the implementation and piloting of this tool and partnered with the South African Local Government Association (SALGA), the Human Sciences Research Council (HSRC) and the University of KwaZulu-Natal (UKZN) in developing and undertaking the pilot implementation of MIMI to inform the national rollout of the tool. A pilot implementation is an activity undertaken in the context of systems development and implementation in order to test a system in a realistic setting and thereby learn about the fit between the system and its use in an organisation, and identify any changes required before full-scale deployment.

The present seminar would share a report on municipal innovation measurements in the municipalities that participated in the pilot implementation. The seminar would show how this report provides a blueprint and a model for reporting on innovation practices, and the capabilities of individual employees and municipalities, with a view to learning, adopting, implementing and institutionalising innovations that could improve the functioning and performance of municipalities.

The Municipal Innovation Practices Report presented at the present seminar should be considered in the context of the MIMI pilot implementation and the challenges, lessons learnt and experiences of the MIMI partners in setting up a model for reporting about innovation in municipalities during the full-scale rollout of the MIMI initiative. Detailed engagements and feedback platforms with municipalities that participated in the pilot would be achieved through learning forums scheduled in August 2021 in order to engage on the MIMI pilot implementation report and the recommendations for each municipality. The MIMI partners would also use these engagements to further refine the MIMI data collection system, before full national rollout, with respect to the use of evidence during data collection.

The DSI was excited about the pilot implementation report that would be presented, as the initiative had the potential to support smart city initiatives in South Africa. The DSI was pleased with the partnerships formed with SALGA, the HSRC and UKZN to develop, pilot and roll MIMI out.

The DSI looked forward to fruitful engagement at the present seminar, increased participation of municipalities in the MIMI rollout survey, and the uptake and support of the initiative by as many municipalities as possible. The DSI was encouraging municipalities to consider ways in which they could adopt innovation to improve service delivery in the context of the DSI's innovation for service delivery support programmes, the Decadal Plan for Science, Technology and Innovation (STI), and the White Paper on STI.

AN INTERNATIONAL PERSPECTIVE ON INNOVATION MEASUREMENTS IN THE PUBLIC SECTOR AND CITIES

Prof Mehmet Akif Demircioglu, Assistant Professor: Lee Kuan Yew School of Public Policy, National University of Singapore

> ***Introduction by programme director:*** *Prof* Demircioglu *is an assistant professor at the Lee Kuan Yew School of Public Policy at the National University of Singapore and a research fellow at Arizona State University and Indiana University Bloomington. His main research focus is public sector innovation, and his work is published in Research Policy, Governance, Public Management Review, Journal of Technology Transfer, Small Business Economics and several other important academic journals.*

Prof Demircioglu had researched public sector innovation (PSI) since 2009 and had discovered many gaps, particularly in terms of the measurement of innovation. His presentation focused on the measurement of innovation, particularly from an international perspective, which could be adapted to South African cities and government organisations. The presentation would include the importance of PSI, why and how to measure PSI, examples of the conditions and drivers for PSI, lessons and findings from the Australian public service, and an introduction to the OECD Observatory of Public Sector Innovation (OPSI) and its case submission system.

'Public sector' is defined as being government owned and funded, excluding state-owned enterprises, without any aim to make a profit. Municipal governments form part of the public sector, which also includes ministers and agencies.

'Public sector innovation ' is any new and novel idea or practice implemented by a public organisation. The idea may or may not be new to the market or public service. Innovation is not the same as invention. The adoption of existing innovations is encouraged, as it does not require money and resources to test ideas that are already work in a similar context.

Prof Demircioglu quoted from a paper on public policy: "If the function of advising the emperors, kings, and sultans in the past can be considered a traditional kind of

public policy analysis, then the study of public policy is almost as old as history itself. In its modern sense, as a multidisciplinary, multi-method, problem-focused, and action-oriented discipline, the field of public policy is relatively new compared to the other social science disciplines."[1]

The same logic could be applied to innovation: innovation (including public sector innovation) was "as old as history itself", but as a multidisciplinary, multi-method, problem-focused and action-oriented discipline, it was very new.

Innovation is crucial for efficiency, effectiveness, survival and legitimacy. Innovation affects essential parts of daily life (e.g. education, health and security), both positively and negatively. A single innovation – for example, a security camera – could affect people's lives positively, but also have unexpected negative consequences. Innovation could also address large and complex challenges, for example, poverty and global warming. PSI could have a 'spill-over' effect, whereby it positively impacts private organisations.

Early studies of PSI were theory based, and the findings were generalised. Later studies used innovation surveys to measure innovation. Innovation surveys collect data from individuals and organisations to identify different types of innovation; identify whether innovations work or not; measure employer/employee attitudes; and assess whether leaders encourage or discourage innovation. PSI research started around 2010, and since then there had been a marked increase in innovation studies. Data collected from surveys could be used to advance knowledge; add to the available literature on innovation; and offer insights to practitioners, particularly in developing countries such as South Africa and Brazil.

When asked by prospective students about innovation study topics, Prof Demircioglu would direct them to existing research studies that had offered insight to policy-makers in terms of understanding why some organisations are more innovative than others. Examples of the topics that such studies had investigated included:
- Innovation as a dependent variable (i.e. drivers or conditions of innovation, such as resources)
- Innovation as an independent variable (i.e. outcomes of innovation and innovation performance)
- Sources of innovation (e.g. top down vs bottom up, collaborative innovation)
- Types of innovation (e.g. product, process, marketing)
- Innovation climate (e.g. the existence of established process)
- Innovation targets
- Barriers to innovation (e.g. budget constraints, overall development time, objectives)
- Measurement of innovation in terms of what, why, how, when, where, and 'so what'

1   Yildiz, M., Demircioğlu, M.A. & Babaoğlu, C. 2011. Teaching public policy to undergraduate students: Issues, experiences, and lessons in Turkey. *Journal of Public Affairs Education*, 17(3): 343–365.

- Levels of analysis (e.g. individual, group, organisation, agency, municipality, government, country).

If innovation can be measured, it is possible to understand, manage and lead effectively, and the performance of different organisations and municipalities can be compared. Innovation is typically linked to the success of an organisation. Performance can be increased by promoting individuals who are the most innovative.

The first step in measuring PSI is to decide on the focus area and units of analysis, for example: country level (e.g. innovation inputs vs innovation outputs); municipal government level (e.g. e-government, technological or process innovations); organisational level (e.g. budget changes, collaboration); group level (e.g. cooperation for innovation, leadership support); or individual level (e.g. innovative work behaviour, creativity, motivation to innovate).

Another step is to decide whether to focus on quality or quantity, in other words, on the most significant innovation (MSI), or other smaller changes that were adopted. The Seoul Metropolitan Government in South Korea, for example, considers innovations devised by employees and awards bonuses accordingly. Other municipal governments reward the best idea each year.

Other considerations to take into account include the period over which to measure innovation (e.g. the last 12 months, or the last three years) and which methodology and data collection tools to use (e.g. surveys, interviews, case studies, conceptual pieces and theory building).

It is important to consider the cultural context, whether national, social, organisational or demographic:
- National or society level, including the power-distance index, individualism vs collectivism, uncertainty avoidance, masculinity vs femininity, long-term orientation vs short-term orientation and indulgence vs restraint
- Organisational level, including production culture, bureaucratic culture and professional culture
- Organisational level, including process oriented vs results oriented; employee oriented vs job oriented; parochial vs professional; open system vs closed system; loose control vs tight control; pragmatic vs normative.

The factors to consider when formulating survey questions to measure PSI include sources, conditions, drivers, main targets, types, implementation, barriers, overall development time, objectives and outcomes. Innovation types include product, process, policy, marketing, communications and organisational. The main targets of innovations could be work groups, departments or agencies, government ministers or individual citizens. It is important to measure the outcomes and benefits of innovation, as many innovations fail.

When focusing on the MSI, the questions to consider include whether it increases quality, reduces costs, improves processes, increases employee job satisfaction, is sustainable, is radical or incremental, is invented vs ingested, and is ethical. The objectives of innovation could include reducing costs, improving quality and enhancing citizen satisfaction.

The detailed findings of Prof Demircioglu's research were available on the internet. He also directed attendees to the OECD OPSI website,[2] which housed a collection of PSI case studies, projects and publications submitted from around the world. Attendees could submit their own innovation case studies via the link.[3] The site already contained several successful innovation cases submitted by South African organisations.

Prof Demircioglu encouraged attendees to discuss innovative activities and issues in their organisations; articulate and examine how innovation could be applied in the context of their workplaces; construct and develop scalable and implementable solutions and action items to address different challenges faced by the sectors they represent; and then discuss whether and how innovative activities could offer solutions to these problems.

Q&A AND DISCUSSIONS

Prof David Walwyn (University of Pretoria, UP) observed that public sector workers are often told to simply do the work they have been asked to do, with the emphasis on the completion of routine operational tasks and no more. Other organisations encourage innovation and entrepreneurship, but appear to struggle with the concept of 'ambidexterity' in terms of combining both approaches. He asked whether these two cultures could be combined in a single organisation, and if so, how this could be done.

Prof Mehmet Akif Demircioglu (National University of Singapore) responded that there was ongoing debate whether theory (i.e. strategy, design, mission) was more important than behaviour (i.e. experimentation, motivation to innovate) in relation to public sector reforms, such as those in South Africa, New Zealand, Australia and many developing countries. Researchers had looked at why some reforms fail while others succeed. It is important to encourage innovation and entrepreneurship, but sometimes innovation leads to corruption and entrepreneurship undermines the public value. Many studies performed since the 1980s found that at government and organisational levels, if routine tasks are well established, and there is a clear accountability system and a high degree of trust, then innovation and entrepreneurship can increase performance. However, if there is insufficient institutionalisation, or if the system is already corrupt, without clear accountability systems in place, then reforms may fail. An environment where there is mutual trust

2   https://oecd-opsi.org/
3   https://oecd-opsi.org/submit-a-case-study

is important. Employees should be incentivised and empowered to try out new ideas, and they are often better placed than managers to interact with citizens and understand local problems.

Prof David Walwyn (UP) observed that the Global Innovation Index (GII) was very much oriented towards the private sector, motivated by the ideology that the locus of innovation is private firms and innovation does not take place in the government sector. He asked why a PSI index could not be developed as a comparative tool that looks at which local authorities are able to successfully integrate innovation into local government culture.

Prof Mehmet Akif Demircioglu (National University of Singapore) responded that an article that he had co-authored with Kohei Suzuki (Leiden University) had found that the focus of the GII on private sector firms was problematic. Currently, there was no way to compare the effectiveness of public service innovation and entrepreneurship. He hoped that in South Africa it would be possible to make such comparisons at city level.

Jean Laval Chue Him (Stella Aurorae Accountancy) enquired whether the the Capability Maturity Model (CMM) might be helpful in the context of measruing public sector innovation.

Prof Mehmet Akif Demircioglu (National University of Singapore) responded that many different models and innovation indices had merits and offered insights. Models could also be adapted to the local context. Even though some innovations might fail, the process of studying them would add value.

Mr Tshepang Mosiea (Department of Science and Innovation, DSI) added that the Project Management Institute (PMI) uses maturity levels for project management, applying P3O or P3M3 assessment as a tool. The model that the DSI was developing, piloting and rolling out was a maturity index for municipal innovation, not for project management.

Bernd Oellermann (Department of Trade, Industry and Competition, dtic) commented that it seemed that the PMI's Organizational Project Management Maturity Model was being alluded to. As a project management professional, Mr Oellermann considered that this model might be of value in the municipal context.
Mimmy Vezi (eThekwini Municipality) enquired about the advantages of submitting intellectual property in the form of innovative ideas to the OECD OPSI website.

Prof Mehmet Akif Demircioglu (National University of Singapore) responded that the idea was not to submit intellectual property, but to share case studies that had already been implemented and were working (not those that had failed). The unit of analysis for such submissions was the organisation or city, not the individual. The advantages would include receiving feedback and recognition from innovation

practitioners in the OECD. This could also potentially lead to reward from one's own managers or politicians. Researchers might also further study successful cases. Demircioglu and Vivona (2021) had published an article using five successful cases from the OECD OPSI database.[4]

Sipho Nxasane (City of Tshwane Metropolitan Municipality) enquired whether any previous studies had measured innovation culture in the public sector.

Prof Mehmet Akif Demircioglu (National University of Singapore) referred participants to articles by Lægreid, Roness and Verhoest (2011), Demircioglu and Berman (2019) and Demircioglu, Hameduddin and Knox (2021).[5] [6] [7]

Bernd Oellermann (dtic) added that Capability Maturity Model applies mainly in the software environment, but its five stages of development might be interesting to consider in the context of municipal innovation maturity.

Coetsee de Wit (Drakenstein Municipality) asked Prof Demircioglu, from his experience, how difficult it was to integrate innovation thinking into local government culture.

Prof Mehmet Akif Demircioglu (National University of Singapore) responded that understanding the local context and the need for innovation should be the first step. Innovation thinking requires a collaborative approach: employees need to be creative, and leaders should encourage employees to express their ideas and suggestions. It is possible to encourage and institutionalise innovation at the system or organisational level, thereby shifting the organisational culture towards becoming more innovative.

Coetsee de Wit (Drakenstein Municipality) posed the question of whether the culture of compliance in local government allows sufficient space for innovation. Innovation requires experimentation and making mistakes, which could imply non-compliance. If this assumption was correct, Mr de Wit asked how space could be created for innovation in local governance.

Prof Mehmet Akif Demircioglu (National University of Singapore) responded that the organisational structure of government, not only in local government but also in public agencies at national level, might unfortunately discourage innovation, but barriers to innovation could be reduced and empowerment could be encouraged.[8]

4   Demircioglu, M.A. & Vivona, R. 2021. Depoliticizing the European immigration debate: How to employ public sector innovation to integrate migrants. *Research Policy*, 50(2): 104–150.
5   Lægreid, P., Roness, P.G. & Verhoest, K. 2011. Explaining the innovative culture and activities of state agencies. *Organization Studies*, 32(10), 1321–1347, doi:10.1177/0170840611416744
6   Demircioglu, M.A. & Berman, E. 2019. Effects of the innovation climate on turnover intention in the Australian public service. *American Review of Public Administration*, 49(5): 614–628.
7   Demircioglu, M.A., Hameduddin, T. & Knox, C. 2021. Innovative work behaviours and networking across government. *International Review of Administrative Sciences*, doi.org/10.1177/00208523211017654.
8   Demircioglu, M.A. 2018. The effects of empowerment practices on perceived barriers to innovation: Evidence from public organizations. *International Journal of Public Administration*, 41(15), 1302-1313.

There was a question on how innovation or reforms could be adopted in the public sector in a developing nation such as South Africa if the political heads and other stakeholders lacked political will.

Prof Mehmet Akif Demircioglu (National University of Singapore) responded that this was a major issue for many developing countries. If politicians were convinced that innovation could help government, the private sector and citizens, through positive spill-over to firms and other organisations and increased investment, it could help them to be re-elected. Some types of innovation take longer than others to become established. Process innovations, for example, which are related to culture, take relatively longer to introduce, since cultural change tends to be slow. While product innovations might take less time to introduce, they could require more resources (e.g. developing renewable energy). Politicians might therefore choose to start with product or technological innovations. Bureaucrats might also drive innovation if there are incentives for employees to innovate. Such incentives could be financial, but are more often intrinsic, such as being involved in exciting work, or the satisfaction of helping citizens.

Busisiwe Nkonki (Council for Scientific and Industrial Research, CSIR) asked whether the assessment tool would it an additional measure, over and above current annual performance plans, or whether it would only look at innovation.

The **MIMI team** responded that the assessment tool could be linked to annual performance plans. Annual goals or plans could be measured at the level of individual employees, groups or teams, or the organisation. An event could be organised to provide an opportunity to share innovative ideas suggested or developed by employees and managers. Even if there were no rewards for innovation (since governments around the world are generally prohibited from using bonuses or monetary incentives), involving employees, showing appreciation for them and their work, and giving non-monetary awards could motivate them to innovate.

There was a comment that the effectiveness of scholarly work was not evident when practitioners did not take into account the recommendations suggested by researchers.

Prof Mehmet Akif Demircioglu (National University of Singapore) concurred that there was often a gap between academics and practitioners. One way of addressing this would be to invite researchers to contribute to policies developed by public organisations or municipal government. Another would be for practitioners to teach a course or module at universities. Interaction between academics and practitioners could be fruitful.

Daniel Meyer (University of Johannesburg, UJ) commented that measurement tools had been developed at municipal level to assess the enabling environment, economic development and financial health. Municipalities need to be supported to carry out basic activities first before attemping more complex initiatives.

KEYNOTE ADDRESS

Dr Phil Mjwara, Director General, Department of Science and Innovation, DSI

> *Introduction by programme director: Dr Phil Mjwara holds a BSc, MSc and PhD from the University of the Witwatersrand. His academic career includes serving as professor of science and technology policy at the University of Pretoria, and physics lectureships at the universities of the Witwatersrand, South Africa and Fort Hare. He is well known as the Director General of the DSI. His experience includes working as a director in the former Department of Arts, Culture, Science and Technology and serving on the National Advisory Council on Innovation (NACI). Dr Mjwara is a celebrity within the S&T community.*

Dr Mjwara addressed the question of why the DSI was involved in the Municipal Innovation Maturity Index. The 2030 vision of the National Development Plan describes a capable state as one that is able to achieve national priorities of economic transformation, inclusive growth and efficient public service delivery, through good public management and the introduction of innovation and technology to improve the capability of the state.

The DSI derived its mission from that NDP target. The department had started developing an implementation plan (the Decadal Plan for STI) for the White Paper on STI. The decadal plan had identified the use of innovation to achieve a capable state as a focus area for the next ten years. The DSI believed that a capable state was both developmental and transformative. Good financial management, evidence-based policy and decision-making processes, and management support for innovation in the public sector were all prerequisites for an efficient and effective municipal enterprise.

A local government sector that performs well, and is supported by technology, systems, data and innovation investments, would improve governance, build confidence amongst citizens, enhance the quality of basic services, reduce poverty and help to combat corruption.

In line with the White Paper policy intent to position government as an enabler of innovation and to ensure a holistic government approach to innovation, the DSI had appointed the South African Local Government Association (SALGA), the Human Sciences Research Council (HSRC) and the University of KwaZulu-Natal (UKZN) to develop, pilot and roll the Municipal Innovation Maturity Index (MIMI) out in municipalities in order to encourage the adoption and uptake of innovation by municipalities.

MIMI measures the capabilities of individual employees and municipalities to learn, implement, adopt and institutionalise innovations that could improve the delivery

of services. The tool benchmarks and assesses the STI readiness levels of municipalities, and determines their innovation maturity levels.

The project team had targeted 68 municipalities to participate in the pilot and implementation testing of MIMI, but it had eventually only been possible to recruit 24 municipalities (nine metros, nine district municipalities and six local municipalities) to take part. The results of the pilot would be presented to participants as part of the programme for the present seminar. Dr Mjwara acknowledged and appreciated the ongoing partnership with SALGA, UKZN and the HSRC for the rollout of the pilot.

The DSI was working towards setting up a governance structure within government, comprising an inter-ministerial committee with representation of several government departments that could use innovation to improve service delivery, modernise their sectors or adopt new sources of growth. The outcome of the present seminar would feed into discussions planned for early September 2021 on institutionalising innovation in the public sector.

Dr Mjwara invited municipalities to partner with the DSI in the national rollout of MIMI, and encouraged participation in DSI programmes designed to support municipalities to scale up innovations that could improve service delivery. These programmes were funded not only by the DSI but also by National Treasury and the European Union. The Technology Acquisition and Deployment Fund (TADF) had been implemented by the Technology Innovation Agency (TIA) with the aim of funding and supporting innovation by local innovators, NGOs or public institutions that could assist government and municipalities to improve public service delivery.

The District Development Model provides a new way for government to work together, and offers an excellent approach to introduce innovations and technologies that could renew existing economic sectors, drive new sources of growth, and create a capable public sector, driven and supported by technology and innovation, to improve standards of living and the quality of basic services.

The DSI had started to draw together a range of activities from the national system of innovation that the department had been funding over the years, and to consider how those activities could contribute to the District Development Model and help citizens to have a better life though innovation. The Television White Spaces[9] initiative at the CSIR, and the new model of providing broadband in rural areas developed by the University of the Western Cape, for example, were excellent models not only for providing broadband to neglected rural communities, but also driving social entrepreneurship in rural areas to ensure better service delivery and improve the quality of life.

9   Television white spaces (TVWS) is a term used to describe the interleaved or contiguous unused portions of spectrum found between the frequency bands allocated for broadcast television. TVWS spectrum has superior propagation characteristics such as the ability to penetrate natural and man-made obstacles and can provide signal coverage over a very large geographical area.

Dr Mjwara invited participants to work with the DSI in rolling out the Decadal Plan, driving innovation to support a capable state, and creating an enabling environment for innovation across the state and municipalities.

MESSAGES OF SUPPORT FROM MIMI PARTNERS

Prof Mosa Moshabela, Acting DVC of Research, University of KwaZulu-Natal, UKZN

> ***Introduction by programme director****: Prof Mosa Moshabela is Acting DVC for Research at UKZN. Prof Walwyn reminded Prof Moshabela that they had previously worked together on a brochure on HIV/AIDS treatment, in which Prof Moshabela had written a section on the integration of traditional medicine.*

Prof Moshabela greeted the panellists and attendees, and thanked Dr Mjwara and the DSI for bringing together the partners involved in the project. It was gratifying to see the progress to date, and it would be interesting to learn more about the history behind the MIMI project. Prof Moshabela thanked his colleagues from the School of Built Environment and Development Studies at UKZN who had been actively engaged in the project and congratulated them on their excellent work.

Prof Moshabela mentioned Dr Mjwara's request for support, and said that the MIMI rollout was extremely important in the province of KwaZulu-Natal. The University of KwaZulu-Natal (UKZN) was under pressure to become more entrepreneurial. Innovation was taking place, but often on a small scale without significant impact in the province. Many UKZN graduates were unable to find employment, and the university was reconsidering its approach. The university received recognition for its research, but many of the more inventive students found themselves outside the standard research structures and funding schemes, and this needed to change.

Prof Moshabela, as DVC for Research, was tasked with addressing these issues. He was excited to be involved. The leadership of UKZN was firmly committed to advancing innovation. One such example was that the university had assessed the value chain for the local manufacture of COVID-19 vaccines and found shortcomings, which had reinforced the need for innovations that would ensure that the value chains were better supported. Following the recent civil unrest in KwaZulu-Natal, there was also a need for the university to better integrate with communities, cities, metros and municipalities. The MIMI rollout had the full support of UKZN.

Prof Leickness Simbayi, Acting CEO, Human Sciences Research Council, HSRC

> ***Introduction by programme director:*** *Prof Leickness Simbayi is a South African research psychologist and professor. He is the Acting CEO at the HSRC and has been an honorary professor in the Department of Psychiatry and Mental Health at the University of Cape Town for the past ten years.*

Prof Simbayi thanked the DSI and partners for supporting the HSRC on the MIMI project, which had been developed and piloted since 2015. The HSRC as a national science council was working together with the DSI as a key partner in the national system of innovation. The HSRC mandate included working closely with the rest of the national system of innovation, especially with universities, to provide evidence-based policy support for government. This was in line with two of the five strategic outcomes of the HSRC Strategic Plan (2020–2025):

- 2nd strategic outcome: To develop a consolidated relationship of trust and influence with government to help guide and inform policy.
- 3rd strategic outcome: To be recognised as a trusted and engaged research partner with scientific communities and civil society.

The HSRC, like other science councils that fell under the DSI, was tasked with promoting innovation across various areas, including service delivery innovation. With strong support from the DSI over the years, the team working on MIMI, under the leadership of Dr Peter Jacobs, had successfully completed other similar research projects, for example:

- Innovation Partnership for Rural Development Programme (IPRDP), which entailed customising and monitoring an evaluation framework to strengthen technology and innovation capabilities and learning within the targeted marginalised rural districts
- Local Innovation Advancement Tools (LIAT) to enhance the contribution of S&T interventions to rural development, deepen understanding of the social and institutional dynamics of rural innovations, and inform the work of the multi-stakeholder innovation partnership.

The MIMI project was a continuation of this tradition. The project demonstrated the advantages of close collaboration with government and other partners in applied research, thereby shortening the process of converting research evidence into policy and practice. Apart from the additional financial support that the DSI had provided, the process was facilitated by the joint identification of key policy issues and the development of interventions. The HSRC looked forward to continuing partnerships in this initiative.

SOUTH AFRICA'S CITY DIGITAL DEVELOPMENT: A PERSPECTIVE ON SOUTH AFRICA'S SMART CITY FRAMEWORK VISION

Mr Siyanda Nkehli, Manager: Municipal Institutional Establishment, Department of Cooperative Governance and Traditional Affairs, COGTA

Introduction by programme director: Mr Siyanda Nkehli is Manager, Municipal Institutional Establishment in the Department of Cooperative Governance and Traditional Affairs (COGTA). He has a Bachelor of Administration degree from UNISA, a Master's degree in Development Studies (University of the Free State), and a CPMD (University of the Witwatersrand).

> *He was formerly the Municipal Manager and Executive Director, Corporate Services at uThukela District Municipality.*

In the June 2019 State of the Nation Address (SONA), the President expressed his dream of building a South African smart city. In the February 2020 SONA, the President announced more concrete plans to develop a smart city. These pronouncements provoked discussion around the notion of smart cities in the South African context. A 'smart city' could be described as a settlement where investments in human and social capital take place, traditional and modern communication infrastructure fuels sustainable economic development, a better quality of life is provided and there is prudent management of natural resources.

To provide impetus to the above, COGTA in collaboration with the CSIR had developed a South African Smart Cities Framework (SCF). Noting that a framework is merely a conceptual structure, the SCF is intended to share learning on smart cities and perceived limitations of these types of interventions; outline a set of principles and critical issues to guide decision-making for smart cities; and identify preconditions and enablers when initiating smart city interventions.

The purpose of the SCF was to guide decision-making and provide role players with a structured approach to identifying, planning and implementing smart city initiatives in municipalities. The SCF was not intended to be instructive, and did not provide specifications, or prescribe norms and standards.

The objectives of the SCF included the following:
- Share local and international learning to provide all role players with factual information on the benefits and advantages, as well as the challenges and disadvantages, that need to be considered when planning and implementing smart city initiatives
- Highlight the South African realities that need to be considered when planning and implementing smart city initiatives, to ensure that such initiatives are appropriate to the local context
- Assist in developing a common understanding of the concept of a smart city and propose a South African interpretation of various aspects related to smart city initiatives
- Outline a set of principles to provide guidance when decisions are needed regarding the identification, planning and implementation of smart initiatives and technologies
- Outline the factors to consider, and the steps to be taken, when identifying, planning and implementing smart city initiatives.

The term 'smart' is generally associated with a range of technological and digital concepts and interventions, especially information and communications technology (ICT). There also seems to be a particular focus on 4IR (4th Industrial Revolution) technologies. However, in addition to this technology-intensive interpretation,

'smart' could also mean 'intelligent' or 'knowledge intensive'. The understanding of the term 'technology' could be expanded to also include innovative approaches, techniques and processes, as well as non-conventional interventions and scientific innovation.

The word 'city' has multiple meanings in the smart city context. It is a catch-all phrase that includes various types of settlements, or parts of settlements, and could refer to:
- Cities, towns and villages of any size, including those in rural locations
- Municipalities (metropolitan, district or local)
- A custom-built greenfield development ('city'), which may or may not be linked to an existing city
- Large new precinct developments linked to an existing city (e.g. business parks)
- Upgrading or retrofitting aspects (e.g. transportation or connectivity) or parts (e.g. an educational precinct) of an existing city or town
- New residential, commercial or mixed-use developments, such as privately developed gated communities.

The smart city concept originated in the early 1990s with cities starting to label themselves as 'smart' upon introducing ICT infrastructure, embracing e-governance and attempting to attract high-technology industries to encourage economic growth. Research identified three dominant discourses:
1. Infrastructure-based services using ICTs
2. Urban development, creating conditions conducive to business development
3. Social inclusion, learning and development as central to better meeting community needs.

Smart city promises and opportunities that could create and spread public value include more effective, data-driven decision-making; reduced environmental footprint and impact; new economic development opportunities; improved quality of life; safer communities; enhanced engagement between municipalities and residents; and cost savings. Smart city concerns and limitations include interventions that are not appropriate to the context; vested corporate interests; technology as a starting point rather than as an enabler; understanding and defining a city; and ethical concerns.

To make a meaningful contribution to improving the quality of life of all South African citizens, smart initiatives should address the key problems faced by South African cities and towns. To be successful, smart cities initiatives should take into consideration the following factors: the socio-economic characteristics of South African society including poverty, inequality and unemployment; the nature of South African cities and towns as a result of apartheid planning; municipal realities in relation to functionality, political stability, corruption and competence; and the regulatory environment of national policies and initiatives, smart-specific policies, guidelines and initiatives.

For a South African smart city to be inclusive, it should adhere to the following six interdependent principles in order to inform decision-making relating to the identification, planning and implementation of smart initiatives and technologies:

1. **Is smart for all:** Initiatives should not be implemented at the expense of, or to the detriment of, certain parts of a municipality or sectors of society.
2. **Uses technology as an enabler rather than a driver:** A city is not smart because it uses technology; it is smart because it uses technology to make its citizens' lives better.
3. **Is shaped by, and responds to, the local context:** An ideal of a smart city should not drive the planning and implementation of smart cities.
4. **Is informed by the real needs of the community:** Active participation of the community is required in the identification, development and implementation of smart city initiatives.
5. **Embraces innovation, partnerships and collaboration:** A smart city should incorporate a collection of several projects, initiatives and actions.
6. **Is sustainable, resilient and safe:** A smart city should complement Sustainable Development Goal (SDG) 11, namely that cities should be inclusive, safe, resilient and sustainable.

The following factors should inform the planning and implementation of smart city initiatives:

- A thorough understanding of the nature and purpose of a proposed smart city initiative is critical to fully comprehending the role and impact of the initiative within the wider city. 'Smart' associated with ICTs and cities has multiple meanings, and could be applied city-wide, or only to a part of the city, or to a particular greenfield development.
- The likelihood of smart city initiatives succeeding depends on alignment with existing plans and initiatives in the municipality. Intergovernmental relations are important and should link to national and provincial government and entities.
- Smart city initiatives can be enhanced by learning from the experiences of peers. Appropriate customising must be performed, without implementing just 'as is'.

Any smart city initiative should be informed by the answers to the following questions:

- Are the people living in our city or town satisfied with the services we (as local government) provide? If not, improving the delivery of basic services should be the first priority, rather than a smart city initiative that may not satisfy people's most pressing needs.
- How can the city become smarter and use smart technologies to enhance the effectiveness and efficiency of the services we deliver to improve the quality of life of those we serve as a local government?

Preconditions for becoming smarter require an assessment of the municipality and the current situation to gain an understanding of the ability of the municipality to provide services under current conditions The intention is to establish whether there is a strong foundation, with the basics in place, on which to build a smart city initiative. Preconditions for becoming smarter include institutional and organisational arrangements, existing infrastructure, and the capacity of government officials and communities.

Smart city initiatives and technologies should start with assessing where the municipality could improve its ability to deliver services. The purpose of this assessment is to establish whether the municipality has the means and ability (or could acquire the ability) to harness and leverage smart technologies and initiatives to improve the effectiveness and efficiency of the services delivered. Enablers for implementing smart city initiatives and technologies include a smart city plan, digital infrastructure, skilled people, partnerships and community involvement.

To have impact, the SCF needs to be applied in practice. Municipalities would require support for the implementation of the SCF from the Department of Cooperative Governance and Traditional Affairs (COGTA) and other national government departments, provincial government and SALGA. This could involve assistance with assessments to establish the 'smart readiness' of a municipality, the development of a local smart city strategy, and the planning and implementation of smart city initiatives. A capacity building programme to empower local government officials, councillors and other role players would also be of value to ensure that appropriate, inclusive smart initiatives are implemented. In addition, a platform needs to be provided for the sharing of smart city learning amongst all role players. This would assist in creating a strong learning culture, establishing communities of practice, and building national capacity for smart city planning and implementation.

Planning processes need to be imbued with a set of principles and values upon which solidarity, commitment and unity can be built. This SCF outlines a set of principles that supports these ideals and could be used to measure collective progress in creating inclusive smart cities. It is recommended that the content of the South African Smart Cities Framework be noted, and that the implementation of the SCF be supported when it is required.

Q&A AND DISCUSSIONS

Thato Tshepang Sekgoele (Seto Laishizo Creationz) enquired about the constraints to transformational innovative solutions to stimulate the economy, provide direction for national research and development, nurture talent and quality of life, and bridge the gap between the public and private sectors.

Dr Phil Mjwara (DSI) responded that government officials sometimes need to be 'evangelists'. Things that seemed straightforward in other sectors were not always

easy in government. The public sector, organisations and society did not necessarily always value their own innovations. This was a significant cultural problem to be addressed in order to drive innovation. There should be no fear of introducing innovation in the public service or the private sector.

The question was where to place an innovative person in an organisational culture that wanted to get a job done. The answer came from the South African president. When he was chairman the board of a telecommunications company, he met an employee of the company and asked what his job was. The employee replied that he had no job description, but his role was to visit all the telecommunications units and observe their processes. The president was surprised that there was a position such as this, to advise units how to optimise their business processes based on his observations. It is necessary to create space for those that can introduce innovation.

Public procurement processes should be designed to promote innovation. Examples of countries that had developed their innovation capabilities by using public procurement included the Republic of Korea, which had successfully used this strategy to build its nuclear energy export programmes.

Rules and regulations could be a constraint to innovation.

Segofatso Thepa (City of Ekurhuleni) referred to the Smart City Framework developed by the Department of Communications and Digital Technologies (DCDT) and asked why COGTA was developing a dual strategy.

Mr Siyanda Nkehli (Department of Cooperative Governance and Traditional Affairs, COGTA) responded that the Smart City Framework (SCF) had been developed in collaboration with other stakeholders and contributions by various government departments. There was no duplication as the SCF encompassed other initiatives.

Jean Laval Chue Him (Stella Aurorae Accountancy) posed the question of whether South Africa could afford to invest in smart cities when the basic needs of citizens were not yet being met.

Mr Siyanda Nkehli (COGTA) responded that the Smart City Framework document outlines the process to be followed to assess smart city readiness. Municipalities would be at different levels of readiness.

Thato Tshepang Sekgoele (Seto Laishizo Creationz) was concerned at the narrow definition of a 'smart city' based only on technology. Ekurhuleni was moving away from that notion and taking into account all city-wide sectors that respond to complex problems, even though they might not necessarily be driven by technology.

Mr Siyanda Nkehli (COGTA) responded that it was incorrect to believe that the smart city initiative was related only to technological advancement. The implementation of smart city initiatives was guided by the following six principles:
1. Promotes open source
2. Collaboration and participation
3. Protection of privacy and personal information
4. Bottom-up crowdsourced innovation through open government
5. Promoting open data
6. Creates new business models with shared risks.

Demian Mukansi (University of KwaZulu-Natal, UKZN) asked whether the intention of the Smart City Framework was to try to make all South African cities smart, rather than just developing one new place, as presented by the South African president.

Mr Siyanda Nkehli (COGTA) responded that the SCF was a policy framework to guide spheres of government in implementing smart city initiatives. Municipalities would be starting from different levels. The SCF provided a guide to be followed leading towards cities graduating to become smart. It was acknowledged that this process would vary between different municipalities.

Tinus Kruger (CSIR) clarified that the SCF did not identify gated communities as an example of smart cities. The intention was to indicate that 'city' was a catch-all term that could refer to an entire city or just a neighbourhood. Some gated communities were marketing themselves as smart cities, whether rightly or wrongly.

Geci Karuri-Sebina (South African Cities Network, SACN) was surprised that gated communities were indicated as examples of smart cities. He referred participants to the Discussion Paper on a South African Approach to Smart, Sustainable Cities, published by the South African Cities Network in 2020, which attempted to propose appropriate inter-governmental roles for a beneficial interface between national and local government.[10]

Hope Magidimisha (UKZN) was also surprised that gated communities were seen as smart cities. She considered this misleading and suggested that the matter would require further discussion.

Colin Johnston (Hilton Ratepayers Association) responded to the question of whether South Africa could afford to invest in smart cities when the basic needs of citizens were not yet being met. His view was that South Africa could *not* afford *not* to have smart cities.

Thato Tshepang Sekgoele (Seto Laishizo Creationz) commented that smart cities in South Africa could be integrated through social engineering and cohesion of various intelligent systems and dynamic systems thinking for the smart built environment.

10   https://www.sacities.net/wp-content/uploads/2020/08/SMART-CITIES-DISCUSSION-PAPER-Final-20200508.pdf

Busisiwe Nkonki (CSIR) enquired whether the Ekurhuleni Metropolitan Municipality's Aerotropolis Master Plan formed part of the South African Smart City Framework.

Mr Siyanda Nkehli (COGTA) responded that the Smart City Framework was a guide within which smart city initiatives should be implemented. The extent to which the Ekurhuleni Aerotropolis conformed to the interdependent SCF principles would determine whether it could be considered smart or not.

Purshottama Reddy (UKZN) asked whether any South African cities had yet graduated to smart cities, and what challenges cities were facing in that regard.

Mr Siyanda Nkehli (COGTA) did not believe that any South African cities had yet graduated as smart cities. The MIMI initiative sought to create awareness and encourage thinking to embrace innovation by cities. While service delivery challenges persisted, it was unlikely that South African cities would graduate to become smart cities.

THE MUNICIPAL INNOVATION MATURITY INDEX SURVEY INSTRUMENT: KEY LESSONS

Dr Peter Jacobs, Human Sciences Research Council, HSRC

> ***Introduction by programme director:*** *Dr Peter Jacobs is a strategic lead researcher at the Human Sciences Research Council (HSRC). He holds a PhD in economics and is a C1 researcher rated by the National Research Foundation. His research concentrates on the economics of agrarian change and socioeconomic transitions, including the socioeconomic dynamics of innovation. With research experience spanning roughly two decades, he continues to lead large multi-year projects and has published extensively on a wide range of questions about innovation value chains and how to maximise the benefits of innovation for poor people. Since 2015, he has helped to develop the scientific and methodological foundations of MIMI and to demonstrate how it benefits municipal innovation initiatives.*

Dr Jacobs referred to the relationship between MIMI and the Centre for Public Service Innovation (CPSI), which was mandated to develop innovative, sustainable and responsive models for improved service delivery. The HSRC had interacted with the CPSI , including instruments developed by the CPSI and the framework for their annual Public sector Innovation Awards. The CPSI was represented through delegates on the MIMI reference team. The CPSI had become integral to advising on the development of the MIMI platform.

Several concept papers, scientific publications and articles would be accessible on the MIMI website that was being developed.

The development of MIMI began with phase 1 (2015–2017), and then transitioned to Digital MIMI in phase 2 (2019–2021), in which the HSRC, UKZN and SALGA were involved. Dr Jacobs likened phase 1 to a drop of water, and phase 2 to a cloud. Digital MIMI was a digital platform that could enable municipal officials to engage with the underlying instrument. Phase 1 had comprised the basic foundational work that contributed to the large body of work internationally on innovation in the public sector. Phase 2 provided the digital platform that would enable easier access by municipal officials, as end users, to engage with and utilise the platform.

MIMI had multiple interacting facets. The following five facets were fundamental to understanding MIMI:

1. **Innovation maturity framework:** A great deal had been written about this framework. The MIMI team had looked at the experiences of the CPSI and other frameworks, for example, the maturity framework developed by Tshwane Metropolitan Municipality. The MIMI maturity framework was rooted in the tradition of understanding learning capabilities, related to 'learning to learn', and learning within organisations.
2. **Information engagement instrument:** This referred to self-reflective learning and underpinned the first facet on learning capabilities.
3. **Information processing and analysis:** This facet referred to the survey analysis involved in developing the maturity indicators and index scores.
4. **Learning forums:** MIMI's inbuilt learning forum distinguished it from other instruments and enabled engagement across different municipalities. In practice, MIMI was rooted in the concept of reflective learning, including self-learning, interactive learning and shared learning, in which people learnt from one another to improve their own performance.
5. **Uptake and use in decision support:** Ultimately, the goal of MIMI was the institutionalisation, uptake and incorporation of shared ideas into policy change.

MIMI was a multidimensional framework that served as an action-oriented information and decision tool. Maturity levels, as measured by index scores, could be considered in terms of two dimensions: firstly, organisational innovation capability, and secondly, individual innovation capability. A number of constraints and barriers to innovation were linked to individual behaviour within an organisation.

Phase 1 had used the innovation maturity levels from the Innovation Partnership for Rural Development Programme, namely:

- **Level 1:** Limited, if any – awareness or evidence of innovation on the part of individual officials or the organisation is limited, if any.
- **Level 2:** Define and apply – innovation is defined, applied and repeatable. Officials understand innovation principles, but innovation activities occur irregularly.
- **Level 3:** Manage and entrench – innovation is managed, and innovation principles are entrenched in the organisation. Officials seek to optimise and evaluate solutions, and to improve on these for internal benefit.

- **Level 4:** Share learning externally – innovation is open and outward looking. New knowledge is applied creatively, based on evidence, in different contexts, and shared with others outside the organisation.

The maturity levels had been refined as follows after learning from phase 1:
- **Level 1:** Limited, if any – awareness or evidence of innovation on the part of individual officials or the organisation is limited, if any.
- **Level 2:** Defined – innovation is defined. Officials understand innovation principles and innovation strategies are in place, but there is little, if any, evidence of innovation implementation.
- **Level 3:** Applied – innovation is applied. There is evidence of implementation in certain departments of the municipality. Innovation is repeatable, but irregular.
- **Level 4:** Managed – innovation is managed. Innovation occurs on an ongoing basis, and processes in relation to this are managed well in the municipality.
- **Level 5:** Entrenched – innovation principles and practices are entrenched throughout the municipality. Officials seek to optimise and evaluate solutions, and improve on these continuously for internal benefit.
- **Level 6:** Shared learning – innovation is open and outward looking. New knowledge is applied creatively, based on evidence, in different contexts, and shared with others outside the organisation.

The project team had learnt several lessons in the evolution of MIMI. Learning capabilities that are critical for moving from developmental states to higher levels of capability and maturity need to be documented and could be applied in different spheres. The CPSI was utilising a framework oriented to largescale projects, rather than ongoing interactive engagement with officials. MIMI's inbuilt learning forum was vital for reflective self-learning on the usefulness of innovation, and for the uptake and use of innovation in local government.

The MIMI instrument required strengthening in several areas:
- Sample size and unit of observation: Even though the instrument had been validated through various itemised testing processes, there were insufficient municipalities embracing MIMI and participating in the project. This presentation was a call to invite greater participation.
- Moving from average scores to weighted indexing for principal component analysis and factor analysis: Scores would need to be weighted so as to more accurately reflect realities within a municipality.
- Control in relation to institutional governance issues.

Prof Walwyn thanked Dr Jacobs and commented that MIMI's inbuilt learning forum was reminiscent of Lundvall's work on the innovation system and the learning economy.

PILOT IMPLEMENTATION REPORT: INNOVATION PRACTICES IN MUNICIPALITIES THAT PARTICIPATED IN THE MIMI PILOT IMPLEMENTATION

Dr Andrew Okem, MIMI: Co-principal Investigator, University of KwaZulu-Natal, UKZN

Introduction by programme director: Dr Okem holds a doctorate in policy and development studies from UKZN, where he currently works as a science officer. Before his current post, he worked as a senior researcher with the Maurice Webb Race Relations Institute, where he led impact assessment projects and trained public officials in monitoring and evaluation skills. Dr Okem is a co-principal investigator of MIMI.

The presentation was based on the MIMI implementation testing phase. The preliminary results of the MIMI implementation pilot would be presented. The model for the Municipal Innovation Practices Report, to be produced following the national rollout, would be shared. An example of feedback to participating municipalities would be discussed.

MIMI is an initiative of the DSI to promote a process of self-reflection and shared learning on innovation practices among municipalities and their officials. It seeks to enhance the innovation capabilities of municipalities and their officials to stimulate and support innovation. MIMI assesses the innovation maturity levels of municipalities and the individual capabilities of municipal officials to innovate for improved service delivery. The earlier version of the framework was developed by the HSRC in 2016. To build on the success of the first phase, the DSI contracted UKZN, the HSRC and SALGA to facilitate a sector-wide scale up via an online platform.

The MIMI instrument has four sections:
1. Profiles of participating municipal officials
2. Municipal arrangements for innovation
3. Three constructs for assessing the innovation maturity levels of municipalities, each of which comprises a set of self-assessment questions by which municipal officials assess themselves and their municipalities:
   A. Municipal enablers of innovation
   B. Managers' support for innovation
   C. Individual innovation behaviour
4. Municipal maturity level (levels 1 to 6), calculated from the responses of officials.

The implementation testing builds on the piloting of MIMI in 2020. The pilot phase examined the applicability and feasibility of the MIMI instrument in collecting information needed to benchmark municipalities and municipal officials' innovation maturity levels. The pilot phase involved 16 officials from seven provinces, spread across four metros, three district and six local municipalities. The implementation testing targeted all 278 municipalities.

SALGA invited municipal managers to nominate innovation champions from their municipalities to be the contact person within each municipality and promote communication between municipal officials and the MIMI project team throughout the implementation testing. Forty-three nominations were received. Innovation champions participated in a briefing workshop to inform them about the implementation testing. MIMI implementation testing was completely voluntary and targeted at least 50 officials per municipality. During the implementation testing period, reminders were sent every week, followed by telephone calls.

Only 55 officials from 18 municipalities participated in the implementation testing during the testing period. The highest participation rate was from the City of Tshwane Metropolitan Municipality (15 officials). The low participation rate implies that no municipality reached the threshold of 30 participants, which was the underlying assumption of the MIMI index for the development of a robust maturity level.

A limited number of responses were received from municipal officials during the implementation testing due to the challenges of responding to the COVID 19 pandemic. Technical issues prevented the participation of district municipalities during the first two weeks of testing.

The profiles of participants are shown in the following table:

Province	
Eastern Cape	3.6%
Gauteng	41.8%
KwaZulu-Natal	7.3%
Limpopo	7.3%
Mpumalanga	1.8%
Western Cape	38.2%
Municipal category	
District	7,3%
Metropolitan	34.5%
Local	58.2%
Gender	
Male	61.8%
Female	38.2%
Position	
Junior	32.7%
Middle management	47.3%
Senior management	20.0%

Years in current position	
0–5	41.8%
6–10	34.5%
11–15	14.5%
16–20	5.5%
>20	1.8%
No response	1.8%
Highest qualification	
Master's	27.3%
Honours	14.5%
Bachelor's degree	18.2%
Diploma or higher certificate	32.7%
Matric / Grade 12 / NSC	3.6%
Grade 9 or below	3.6%
Incorporation of innovation in municipal strategies	
Yes	16.4%
No	3.6%
No response	80.0%

Innovation is considered important and incorporated in municipal strategies (number of respondents per municipality)	
City of Tshwane Metropolitan Municipality	5
Msunduzi Local Municipality	1
City of Cape Town Metropolitan Municipality	1
Bergrivier Local Municipality	1
Buffalo City Metropolitan Municipality	9
Municipalities with a dedicated unit to manage innovation	
Yes	12.7%
No	7.3%
No response	80.0%
Year in which innovation units were established	
2011	3.6%
2013	3.6%
2014	1.8%
2017	3.6%
No response	87.3%

Number of people employed in innovation division/unit/department by municipality	
City of Tshwane Metropolitan Municipality	4
City of Cape Town Metropolitan Municipality	10
Local municipalities with innovation unit and champions	
Yes	10.9%
No	9.1%
No response	80.0%
Local municipalities with innovation unit and champions (number of respondents per municipality that reported that the municipality has an innovation unit and champions)	
City of Tshwane Metropolitan Municipality	3
Ba-Phalaborwa Local Municipality	1
Swellendam Local Municipality	1
Waterberg District Municipality	1
Municipality implemented innovation projects or initiatives in the last three years	
Yes	12.7%
No	7.3%
No response	80.0%
Municipality implemented innovation projects or initiatives in the last three years (number of respondents per municipality that reported that the municipality has implemented innovation projects or initiatives)	
City of Tshwane Metropolitan Municipality	4
City of Cape Town Metropolitan Municipality	1
Bergrivier Local Municipality	1
Buffalo City Metropolitan Municipality	1
Established partnerships with external actor/s for innovation in municipalities	
Yes	20.0%
No response	80.0%
Municipality established partnerships with external actor/s for innovation projects or initiatives (number of respondents per municipality that reported that the municipality has established partnerships with external actors for innovation projects)	
City of Tshwane Metropolitan Municipality	6
Msunduzi Local Municipality	1
City of Cape Town Metropolitan Municipality	1
Bergrivier Local Municipality	1
Buffalo City Metropolitan Municipality	2
Constraints to implementing innovation	
Yes	18.2%
No	1.8%

No response	80.0%
Key constraints: Legislative red tape, funding, human resources, and management	
Municipality faces constraints to implementing innovation (number of respondents per municipality that reported that the municipality is facing constraints implementing innovation)	
City of Tshwane Metropolitan Municipality	6
Msunduzi Local Municipality	1
City of Cape Town Metropolitan Municipality	1
Bergrivier Local Municipality	1
Buffalo City Metropolitan Municipality	1

Participants provided the following examples of external stakeholders: Innovation Hub, Tshwane University of Technology, Technology Innovation Agency, Department of Trade, Industry and Competition, French Embassy in South Africa, Barloworld, Chamber of Business, Belgian Twin City (Heist-op-den-Berg), International Finance Corporation, National Treasury, World Bank, City of Oldenburg (Germany), Cape Innovation and Technology Initiative, Green Cape and Cape Higher Education Consortium (CHEC).

With respect to the three constructs for assessing the innovation maturity levels of municipalities, municipal officials assessed their municipalities as shown in the following table.

	National	District	Metros	Local
A Municipal enablers of innovation	2	1	3	3
B Managers' support for innovation	2	1	2	3
C Individual innovation behaviour	3	2	3	3

Dr Okem briefly showed examples of the feedback given to municipalities, which was in report form and included the project background and methodology; descriptions of the maturity levels; advice on underperforming areas and how to improve in those areas; a section comparing performance across all municipalities; and final conclusions and recommendations.

The report documents the outcome of the implementation testing of the MIMI framework. MIMI enhances the learning process towards the adoption of innovation for service delivery. Although the participation rate did not meet the expected threshold, valuable insights were provided into innovation processes within participating municipalities. The implementation testing demonstrated the value and capacity of MIMI to produce innovation maturity scores for municipalities and provided useful insights. Further refinements would be implemented based on the experience and feedback. Fifty per cent coverage of municipalities was targeted over the Medium-Term Strategic Framework (MTSF) period.

Prof Walwyn thanked Dr Okem and emphasised the importance of institutionalising innovation as a key target.

LESSONS LEARNT, CHALLENGES, ACCOMPLISHMENTS OF MIMI AND THE NATIONAL ROLLOUT PLAN

Dr Sithembiso Myeni, MIMI: Project Leader, University of KwaZulu-Natal, UKZN

Introduction by programme director: Dr Myeni is a senior lecturer in the discipline of housing and was a research associate of the SARChI Chair in Applied Poverty Reduction Assessment in the School of Built Environment and Development Studies at UKZN. He is a co-editor of a recently published book entitled 'The Political Economy of Government Subsidised Housing in South Africa'. He has a Diploma and BTech in Public Management from the Durban University of Technology, a Master of Development Studies from UKZN, and a PhD in Development Policy and Management from the University of Manchester.

The presentation would provide a background to the nationwide implementation of the MIMI rollout; introduce the MIMI rollout plan to municipalities and other stakeholders; share a plan for the full implementation of MIMI and universal access; encourage wider participation in the MIMI rollout; discuss the implementation processes for the nationwide rollout of the MIMI instrument; identify the benefits of the MIMI nationwide rollout to municipalities; and consider the future direction of MIMI.

The first activity of the nationwide implementation of MIMI would be to provide feedback to municipalities that participated in implementation testing through learning forums and individual reports, such as the example provided by Dr Okem. Municipal managers would then be invited to nominate innovation champions to be the contact person within each municipality to promote communication between municipal officials and the MIMI team throughout the nationwide rollout of MIMI. The team received 43 nominations during implementation testing. The plan was to train municipal officials to use the MIMI digital platform and to inform them about the nationwide implementation rollout of universal access. The MIMI nationwide rollout would be voluntary, targeting at least 50 officials per municipality, and aiming to reach all South Africa's municipalities during the MTSF period.

The medium-term strategic plan for MIMI rollout between 2021 and 2024 would be implemented according to three phases, during which the indicated numbers of municipalities would be targeted nationally:
- **Phase 1** (September 2021–June 2022): 8 metros, 50 local municipalities and 20 district municipalities
- **Phase 2** (July 2022–November 2023): 70 local municipalities and 22 district municipalities
- **Phase 3** (February–August 2023): 85 local municipalities.

The MIMI website would be launched and would allow municipalities to access the online tool. Municipal officials would be trained to use the MIMI digital platform, and learning forums would be utilised to encourage municipalities to enrol for the online MIMI tool. Municipalities that did not participate in the implementation testing would be specifically targeted, and full participation in the MIMI rollout would be encouraged. The intention was to scale up implementation to provide universal access to Digital MIMI.

Municipalities would have an opportunity to interact with the MIMI instrument, and to learn and reflect on their innovation capabilities for improved service delivery solutions. Municipal feedback would include recommendations to municipalities on how to plan for innovation and integrate innovation in their strategies and plans. Municipal feedback would also help municipalities to consider ways of managing innovation ideas, institutionalising innovation and developing plans to migrate to higher levels of innovation maturity. Municipalities that participated in MIMI were likely to have an advantage in applying for innovation support through DSI innovation funding instruments such as the Technology Acquisition and Deployment Fund (TADF), the Innovation for Service Delivery Programme and others. MIMI would allow comparison between different municipalities to assist low performers and motivate them to improve their performance.

With respect to the future direction of MIMI, the aim was to institutionalise MIMI in a potential host, and then launch that host institution. The intention was to establish a MIMI accreditation system and to institute municipal innovation awards through an annual Municipal Innovation Awards event to motivate participation in innovation. Institutions should not work in isolation. Public and private sector investment partners would therefore be attracted through lobbying, and MIMI would support other DSI innovation funding instruments such as the TADF.

The success of the rollout would depend on the support of leadership at municipal level. The success of the introduction of the Municipal Innovation Awards would depend on the participation of municipalities, allowing the generation of a maturity score, which would contribute to incentivising performers while providing the motivation to improve. The participation of municipalities would also allow comparison between different municipalities. Municipalities were invited to register their interest by sending an email to ZunguS3@ukzn.ac.za.

Q&A AND DISCUSSIONS

Nokubonga Caluza (COGTA) enquired whether the MIMI initiative was linked to or aligned with the Centre for Public Service Innovation (CPSI) programmes.

Mr Tshepang Mosiea (DSI) responded that the DSI was in discussions with the CPSI.

Lydia Sebokedi (Centre for Public Service Innovation, CPSI) added that the CPSI was working with the DSI, the National Advisory Council on Innovation and other organisations in the national system of innovation. The CPSI had been consulted when the MIMI tool was being developed.

Izak Minnaar (South African National Editors' Forum) enquired whether the MIMI index, reports and datasets could be accessed.

Sinethemba Zungu (UKZN) responded that datasets could not be shared with the public for ethical reasons, but the website could be accessed at www.mimi.org. za, or queries could be addressed to ZunguS3@ukzn.ac.za.

Prof David Walwyn (UP) asked how MIMI was integrated with other programmes such as the Centre for Public Service Innovation (CPSI), the Centre for Science, Technology and Innovation Indicators (CeSTII) and the National Advisory Council on Innovation (NACI).

Mr Tshepang Mosiea (DSI) responded that in the context of the White Paper on Science, Technology and Innovation, the DSI needs to work across a number of institutions, including knowledge-generating institutions as well as SALGA and CeSTII, and consider ways of bringing these institutions together. At a recent meeting between the DSI DG and the CPSI, the broad role of the CPSI within the national system of innovation had been discussed. When the MIMI tool matures, the DSI might consider working with CeSTII or the CPSI, or supporting similar initiatives for measuring public sector innovation.

Gerard Ralphs (Human Sciences Research Council, HSRC) informed participants that the Centre for Science, Technology and Innovation Indicators (CeSTII), located within the HSRC, conducts national STI surveys, including innovation and R&D surveys, on behalf of the DSI. Information about CeSTII's innovation measurement and recent studies was available at https://sabizinnovationsurvey.blog/.

Rendani Mamphiswana (UJ) urged an increase in the frequency of surveys so that information is available closer to real time.

The **MIMI team** responded that municipal officials could participate in MIMI at any time once the rollout commenced.

Thokozani Mkhize (UKZN) suggested that the approach to innovation exemplified by MIMI should be implemented across all government departments to promote multidirectional innovation inputs involving internal and external stakeholders in an integrated effort to achieve public service transformation, the Integrated Development Plan (IDP) and other long-term government strategies.

Delia North (UKZN) emphasised that what could not be measured, could not be managed. Without accurate measurement, the view of the maturity of municipal

innovation would be distorted. Statisticians at UKZN had expertise and experience in this regard, having worked on projects with the eThekwini Municipality, the Office of the Premier of KwaZulu-Natal and Statistics South Africa. Prof North invited anyone interested in linking with the group of statisticians at UKZN to email her on northd@ukzn.ac.za.

Thato Tshepang Sekgoele (Seto Laishizo Creationz) commented that municipalities were experiencing difficulties in relation to inefficient service delivery and the cost of quality operations management, which made it difficult for them to develop innovative solutions and provide direction for national research and development. He asked why municipal management was allowed to continue with the status quo, failing to implement innovative solutions.

Kwena-Prince Mashita (South African Local Government Association, SALGA) responded that MIMI aims to assist municipalities to see areas of improvement and compare themselves with other municipalities, which could lead to benchmarking to realise higher maturity levels.

Justin Macaskill (Stellenbosch University, SU) asked why there had been so many 'no responses' registered in relation to many of the statistics.

Mr Tshepang Mosiea (DSI) responded that municipal leadership needs to champion innovation and support the tool, and it was worrying that the response was low. A limiting factor had been that the MIMI piloting had been done during the difficult year of the COVID-19 pandemic.

Thembinkosi Gervase Mkhize (South African Students Congress, SASCO) asked about the strengths and limitations of municipal innovations or reforms in relation to attaining the 2030 targets of the Sustainable Development Goals (SDGs).

The **MIMI team** responded that innovation is understood in terms of new or improved products and processes. Before addressing the limitations and strengths of innovation, the first question to consider is whether municipal officials are capable of being innovative. Given that municipalities are expected to deliver basic infrastructure and services and to play an important role in facilitating social transformation and poverty reduction, it is important to understand the extent to which local municipalities in South Africa are oriented or inclined towards using STI to improve service delivery. Municipal officials must have the capability to learn and implement innovations to improve public service delivery. If municipalities could find new and improved ways to deal with the challenges of water and sanitation, housing, health infrastructure and energy, South Africa would be on the right trajectory to realising some of the SDG 2030 targets.

Justin Macaskill (SU) asked whether higher education institutions could access the MIMI tool for research purposes.

Mr Tshepang Mosiea (DSI) invited anyone who was interested in accessing the MIMI tool for research purposes to contact him at Myenis1@ukzn.ac.za.

Geci Karuri-Sebina (SACN) enquired which municipalities had been involved in the MIMI pilot.

The **MIMI team** responded that the following municipalities had taken part in the pilot project:

Municipality	Province
Buffalo City Metropolitan Municipality	Eastern Cape
Midvaal Local Municipality	Gauteng
Sedibeng District Municipality	Gauteng
West Rand District Municipality	Gauteng
City of Tshwane Metropolitan Municipality	Gauteng
AbaQulusi Local Municipality	KwaZulu-Natal
Msunduzi Local Municipality	KwaZulu-Natal
eThekwini Metropolitan Municipality	KwaZulu-Natal
Ba-Phalaborwa Local Municipality	Limpopo
Waterberg District Municipality	Limpopo
City of Mbombela Local Municipality	Mpumalanga
Bergrivier Local Municipality	Western Cape
Cape Agulhas Local Municipality	Western Cape
Drakenstein Local Municipality	Western Cape
Oudtshoorn Local Municipality	Western Cape
Swellendam Local Municipality	Western Cape
Witzenberg Local Municipality	Western Cape
City of Cape Town Metropolitan Municipality	Western Cape

Gary Quilling (GaRos) commented that the outcome of the survey might be impacted by the actual selected champions, which could skew the results with respect to maturity levels.

Thokozani Mkhize (UKZN) responded that the profile of participants showed very low participation by senior management, and that an interaction gap had between academics and practitioners had been found in such initiatives, as pointed out by Prof Demircioglu. A possible recommendation to address this might be that participation and engagement should be driven through the Presidency and the offices of provincial premiers. It should also be emphasised that the inputs of senior management are essential, given their responsibility for service delivery monitoring and evaluation.

Ashiq Pramchand (UKZN) asked whom one should contact if one had an innovative idea that could help the municipality.

The **MIMI team** responded that municipal employees could complete the assessment to share their innovation idea when the MIMI national rollout commenced. Ideas could also be shared with the MIMI team via email to ZunguS3@ukzn.ac.za.

Cecil Masoka (DSI) asked whether the responses from municipalities in Gauteng and the Western Cape had been influenced by the innovation index or the availability of qualified innovation champions within their middle and senior management.

The **MIMI team** responded that it was too early to make such associations because of the low response rate in the implementation testing phase.

Derek Alberts (Pietermaritzburg and Midlands Chamber of Business) observed that the success of the public service innovation and MIMI initiatives seemed to be dependent on the degree of engagement by municipal officials. He asked whether their participation was voluntary, and if so, what measures would be employed to encourage participation.

The **MIMI team** responded that participation was voluntary. MIMI awards would take place annually, which would be an incentive for municipalities, especially local municipalities, to participate.

Annual learning forums would also encourage participation, because both participating and non-participating municipalities would be invited to the learning forums to share their knowledge and experience.

MIMI should be viewed as a learning experience. Municipalities must have a mindset of embracing and cultivating a culture of innovation to improve the services they provide to communities.

Hope Magidimisha (UKZN) enquired about strategies to improve the response rate, given the low rate of responses to some questions. Th 80% 'no response' rate to some of the questions was concerning. She asked whether the MIMI team was confident that this response rate could be improved during the rollout in all municipalities.

The **MIMI team** responded that they would be engaging with municipalities through the use of learning forums as an integral part of the MIMI rollout process.

Chandra Ellaurie (UKZN) asked if the innovation tool would allow members of the public to access the different municipalities and see how they were performing

with respect to service delivery, whether they were achieving their targets, and any reasons for not doing so.

The **MIMI team** responded that the dashboard would allow municipalities to view one another's innovation maturity levels.

CONCLUDING REMARKS AND WAY FORWARD

Mr Tiyani Ngoveni (DSI) thanked Prof Walwyn and assured attendees that any unanswered questions would be addressed, where possible, in follow-up sessions, such as additional IID seminars and learning forums. He thanked attendees for their participation and presenters for their contributions. The DSI was grateful for the partnerships with UKZN, the HSRC and SALGA and their role in supporting the scale-up of MIMI. Mr Ngobeni thanked ASSAf for hosting the webinar and for ensuring that the proceedings ran smoothly. Dr Okem's report and all seminar presentations would be shared with participants.

The materials and proceedings could be accessed at:

Facebook link:
https://web.facebook.com/watch/live/?v=530316664707069&ref=watch_perma-link

YouTube link: https://youtu.be/lOVWIahCx3E

Presentations and video recording: IID Webinar_Launch-Municipal Innovation Maturity Index (MIMI)

Hashtags: #MIMI_Launch, #IID

ANNEXURE A: LIST OF ACRONYMS

AIDS	Acquired immunodeficiency syndrome
ASSAf	Academy of Science of South Africa
CEO	Chief executive officer
CeSTII	Centre for Science, Technology and Innovation Indicators
COVID-19	SARS-CoV-2 virus
CPSI	Centre for Public Service Innovation
CSIR	Council for Scientific and Industrial Research
CSIR	Council for Scientific and Industrial Research
COGTA	Department of Cooperative Governance and Traditional Affairs
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DG	Director-General
DSI	Department of Science and Innovation
DVC	Deputy Vice-Chancellor
GII	Global Innovation Index
HIV	Human immunodeficiency virus
HSRC	Human Sciences Research Council
IID	Innovation for Inclusive Development
IPRDP	Innovation Partnership for Rural Development Programme
MEPIN	Measuring Public Innovation in the Nordic Countries
MIMI	Municipal Innovation Maturity Index
MTSF	Medium-Term Strategic Framework
NACI	National Advisory Council on Innovation

NDP	National Development Plan
NGO	Non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
OPSI	Observatory of Public Sector Innovation
PMI	Project Management Institute
POU	Point of use
PSI	Public sector innovation
S&T	Science and Technology
SALGA	South African Local Government Association
SARChI	South African Research Chairs Initiative
SCF	Smart Cities Framework
SciELO	Scientific Electronic Library Online
SONA	State of the Nation Address
STI	Science, Technology and Innovation
TADF	Technology Acquisition and Deployment Fund
TVWS	Television White Spaces
UKZN	University of KwaZulu-Natal
WWTW	Waste Water Treatment Works

ANNEXURE B: LIST OF PARTICIPANTS

Name	Surname	Organisation	Region
Angel	Bolosha	Human Sciences Research Council (HSRC)	Gauteng
Rudi	Botha	GreenCape	Western Cape
Sarah	Bracking	Kings College London	United Kingdom
Nosipho	Bungane	eThekwini Municipality	KwaZulu-Natal
Anita	Burger	University of the Western Cape (UWC)	Western Cape
Robert	Buwule	Kyambogo University	Uganda
Laura	Byrne	Carte Blanche	Gauteng
Nokubonga	Caluza	Department of Cooperative Governance and Traditional Affairs (COGTA)	KwaZulu-Natal
Anati	Canca	Malangana Innovation Advisory	Gauteng
Mario	Carelse	City of Cape Town Municipality	Western Cape
Bradley	Carpenter	South African Medical Research Council (SAMRC)	Western Cape
Stefanie	Chetty	Department of Cooperative Governance and Traditional Affairs (COGTA)	Gauteng
Danford	Chibvongodze	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Retius	Chifurira	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Chantal	Christopher	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Jean Laval	Chue Him	Stella Aurorae Accountancy (Pty) Ltd	Australia
Jodine	Cloete	Namakwa District Municipality	Northern Cape
Kurt	Conning	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Trudie	Conway	City of Tshwane Metropolitan Municipality	Gauteng
Antony	Cooper	Council for Scientific and Industrial Research (CSIR)	Gauteng
Marlies	Craig	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Salman	Damons	Garden Route District Municipality	Western Cape
Harsha	Dayal	Department of Planning, Monitoring and Evaluation (DPME)	Gauteng
Coetsee	de Wit	Drakenstein Municipality	Western Cape
Mehmet Akif (Prof)	Demircioglu	National University of Singapore	Singapore
Sifiso	Dhlamini	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Kelly	Dingwall	City of Cape Town Municipality	Western Cape
Thembelihle	Dlamini	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal

Name	Surname	Organisation	Region
Nsizwa	Dlamini	Centre for Public Service Innovation (CPSI)	Gauteng
Maud	Donda	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Phila	Dyantyi	Human Sciences Research Council (HSRC)	Western Cape
Debora	Fabiano	Private	Angola
Bhekiwe	Fakudze	International Water Management Institute (IWMI)	Gauteng
Joseph	Francis	University of Venda (Univen)	Limpopo
Lindiwe	Gama	Department of Science and Innovation (DSI)	Gauteng
Rebecca	Gatang'i	South African Cities Network (SACN)	Eastern Cape
Tendayi	Gondo	University of Venda (Univen)	Limpopo
Teddy	Gounden	eThekwini Municipality (Water and Sanitation)	KwaZulu-Natal
Predeshni	Govender	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Nirmala (Dr)	Govender	Private	KwaZulu-Natal
Dawie	Griesel	Akhile	Western Cape
Thobani	Gumede	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Bheki	Gwala	Department of Economic Development Tourism & Environmental Affairs (DEDaT)	KwaZulu-Natal
Jill	Hanass-Hancock	South African Medical Research Council (SAMRC)	KwaZulu-Natal
Akshay	Hiralall	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Mbongeni	Hlongwa	Gabhisa Planning and Investment (GPI)	KwaZulu-Natal
Madeleine	Jackson	Msunduzi Municipality	KwaZulu-Natal
Peter (Dr)	Jacobs	Human Sciences Research Council (HSRC)	Gauteng
Londiwe	Jali	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Angela	James	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Albert	Jeleni	Limpopo Chamber of Commerce and Industry	Limpopo
Colin	Johnston	Hilton Ratepayers Association	KwaZulu-Natal
David	Joubert	West Coast District Municipality	Western Cape
Mukanda Gedeon	Kadima	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Phyllis	Kalele	Academy of Science of South Africa (ASSAf)	Gauteng
Levin	Kaligan	Risk ZA Group	KwaZulu-Natal
Geci	Karuri-Sebina	South African Cities Network (SACN)	Gauteng
Adrian	Kearns	Openup	Western Cape

Name	Surname	Organisation	Region
Lorato	Kegakilwe-Piki	eThekwini Municipality	KwaZulu-Natal
Claudette	Kercival	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Nnenesi	Kgabi	North-West University (NWU)	North West
Lino	Khalau	Mozambique Research and Education Network	Mozambique
Mohamed Fayaz	Khan	Eskom	KwaZulu-Natal
Mbali	Khumalo	Mhlathuze	KwaZulu-Natal
Avarn	Kooblal	eThekwini Municipality	KwaZulu-Natal
Tinus	Kruger	Council for Scientific and Industrial Research (CSIR)	Gauteng
Jones	Kubyana	City of Tshwane Metropolitan Municipality	Gauteng
Sandise	Kumalo	University of KwaZulu-Natal (UKZN)	Eastern Cape
Siphukuthula	Kumalo	Department of Science and Innovation (DSI)	Gauteng
Phyllis	Kwenda	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Eleanor	Langley	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Floyd	Lekoma	Waterberg District Municipality	Limpopo
Yolandi	Leuvennink	ITWeb	Gauteng
Thembelihle	Luthuli	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Tebogo (Dr)	Mabotha	Academy of Science of South Africa (ASSAf)	Gauteng
Justin	Macaskill	Stellenbosch University (SU)	Western Cape
Sduduzo	Madlala	St Joseph Catholic Church	KwaZulu-Natal
Thulisisizwe	Magagula	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Hope	Magidimisha	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Nkululeko	Magwaza	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Darma	Mahadea	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Nyeleti	Mahlaule	City of Ekurhuleni	Gauteng
Dinesha	Maistry	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Haseena	Majid	USAWA/uMungungundlovu District Municipality	KwaZulu-Natal
Nonhlelo	Majola	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Lazola	Makalima	Makalima Consulting (Pty) Ltd	KwaZulu-Natal
Bisimwa Timo-thee	Makanishe	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Sengwayo	Makhoba	N/A	Gauteng
Nhlanhla	Maluleke	Nabio Consulting Pty Ltd	Gauteng
Given Ronny	Maluleke	City of Tshwane Metropolitan Municipality	Gauteng

Name	Surname	Organisation	Region
Rendani	Mamphiswana	University of Johannesburg (UJ)	Gauteng
Marvin	Mandiwana	Academy of Science of South Africa (ASSAf)	Gauteng
Myra	Manthree	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Rashaka	Maphagela	City of Johannesburg	Gauteng
Mark (Dr)	Marais	Dr Mark Marais Development Facilitation	Eastern Cape
Ntombini	Marrengane	University of Cape Town (UCT)	Western Cape
Robert	Martin	University of Venda (Univen)	Limpopo
Sibusisiwe	Maseko	GreenCape	Western Cape
Kwena-Prince	Mashita	South African Local Government Association (SALGA)	Gauteng
Cecil	Masoka	Department of Science and Innovation (DSI)	Gauteng
Justice	Matarutse	eThekwini Municipality	KwaZulu-Natal
Sanele	Mbambo	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Thokozani	Mbhele	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
skhumbuzo	Mbona	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Nelisiwe	Mbongwa	University of KwaZulu-Natal (UKZN)	KwaZulu Natal
Delani	Mdunge	University of KwaZulu-Natal (UKZN)	KwaZulu Natal
Johanna	Meier	University of Stuttgart	Germany
Susan	Mercer	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Daniel	Meyer	University of Johannesburg (UJ)	Gauteng
Bongani	Mhlongo	ABSA	KwaZulu-Natal
Sphamandla	Mhlongo	Emalahleni Local Municipality	Mpumalanga
Izak	Minnaar	South African National Editors' Forum (SANEF)	Gauteng
Phil (Dr)	Mjwara	Department of Science and Innovation (DSI)	Gauteng
Thembinkosi Gervase	Mkhize	South African Students Congress (SASCO)	KwaZulu-Natal
Samukelisiwe	Mkhize	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Thokozani	Mkhize	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Mzwandile	Mkhize	City of Cape Town Municipality	Western Cape
Mbuso	Mkhungo	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Karabo	Mlambo	Department of Science and Innovation (DSI)	Gauteng
Mhlalisi	Mndzebele	University of Johannesburg (UJ)	Gauteng
Khetha	Mngadi	Private	KwaZulu-Natal
Simphiwe	Mngomezulu	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal

Name	Surname	Organisation	Region
Sbusiso	Mntungwa	uPhongolo Local Municipality	KwaZulu-Natal
Moses	Mnyaka	Statistics South Africa (Stas SA)	Gauteng
Albert	Modi	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Tumisang	Modiole	Department of Science and Innovation (DSI)	Gauteng
Veronica	Mohapeloa	Department of Science and Innovation (DSI)	Gauteng
Lindile Thabo	Mokhobo	Decision Intelliqt (DI)	Gauteng
Olebogeng	Molewa	Human Sciences Research Council (HSRC)	Gauteng
Kaylene	Moodley	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Kaizer	Moroka	Department of Science and Innovation (DSI)	Gauteng
Thato	Morokong	Academy of Science of South Africa (ASSAf)	Gauteng
Mosa (Prof)	Moshabela	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Tshepang	Mosiea	Department of Science and Innovation (DSI)	Gauteng
Surprise	Mothiba	Steve Tshwete Local Municipality	Mpumalanga
Nape	Mothiba	Centre for Public Service Innovation (CPSI)	Gauteng
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Lindelwa	Mthembu	N/A	KwaZulu-Natal
Zama	Mthethwa	Department of Science and Innovation (DSI)	Gauteng
Ncamisile	Mthiyane	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Fanisa	Mthombeni	The World Bank	Gauteng
Betty	Mubangizi	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Demian	Mukansi	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Zvanai	Mukanya	Richfield	KwaZulu-Natal
Melissa	Mungroo	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Ahmed	Muslim	2063 Research & Advisory Collaborative	KwaZulu-Natal
Bongekile	Mvuyana	Mangosuthu University of Technology (MUT)	KwaZulu-Natal
Liboster	Mwadzingeni	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Sithembiso (Dr)	Myeni	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Nonzwakazi	Mzobe	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Jayson	Nagadu	Afrospice	KwaZulu-Natal

Name	Surname	Organisation	Region
Eriva	Nanyonjo	CITEPLAN (Pty) Ltd	Gauteng
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Jacqueline	Nel	Department of Planning, Monitoring and Evaluation (DPME)	Gauteng
Harold	Ngalawa	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Silindile	Ngcobo	University of Cape Town (UCT)	Western Cape
Sifiso	Ngcobo	Innovation and Strategy Media	KwaZulu-Natal
Sibongile	Ngcobo	Human Sciences Research Council (HSRC)	KwaZulu-Natal
Pfumelani	Ngobeni	City of Ekurhuleni	Gauteng
Tiyani	Ngoveni	Department of Science and Innovation (DSI)	Gauteng
Clementine	Ngwane	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Benny	Nhlapo	National Advisory Council on Innovation (NACI)	Gauteng
Nomvuyo	Nhlengethwa	Sikhunyana High School	Eswatini
Sphamandla	Nkambule	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
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Busisiwe	Nkonki	Council for Scientific and Industrial Research (CSIR)	Gauteng
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Daphne	Ntlhe	University of KwaZulu-Natal (UKZN)	KwaZulu -Natal
Tinyiko	Ntshongwana	Department of Science and Innovation (DSI)	Gauteng
Kopano	Ntsoane	South African Cities Network (SACN)	Gauteng
Sipho	Nxasane	City of Tshwane Metropolitan Municipality	Gauteng
Karabo	Nyezi	Human Sciences Research Council (HSRC)	Gauteng
Frances	O'Brien	N/A	United States
Bernd	Oellermann	Department of Trade, Industry and Competition (the dtic)	Gauteng
Elizabeth	Ojewole	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
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Istell	Orton	CITEPLAN (Pty) Ltd	Gauteng
Raymond	Parkies	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Gary	Parsons	Council for Scientific and Industrial Research (CSIR)	KwaZulu-Natal

Name	Surname	Organisation	Region
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Ephraim	Phalafala	Department of Science and Innovation (DSI)	Gauteng
Tankiso	Phidza	Gemini GIS and Environmental Services (GGES)	Gauteng
Paul	Plantinga	Human Sciences Research Council (HSRC)	Gauteng
Sanet	Pohl	Department of Planning, Monitoring and Evaluation (DPME)	Gauteng
Slulami Vusumzi	Poswa	Nyandeni Local Municipality	Eastern Cape
Ashiq	Pramchand	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Gary	Quilling	GaRos	KwaZulu-Natal
Mkhuseli	Qumba	University of KwaZulu-Natal (UKZN)	KwaZulu Natal
Sibongile	Radebe	Technology Innovation Agency (TIA)	Gauteng
Matsussbu	Ragoasha	Council for Scientific and Industrial Research (CSIR)	Gauteng
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Gerard	Ralphs	Human Sciences Research Council (HSRC)	Western Cape
Alka	Ramnath	Umgeni Water	KwaZulu-Natal
Susanne	Ramsunder	Innovate Durban	KwaZulu-Natal
Preciousstone	Raputsoa	Waterberg District Municipality	Limpopo
Purshottama	Reddy	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Emerald	Reddy	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
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Nosizo	Sebake	Council for Scientific and Industrial Research (CSIR)	Gauteng
Lydia	Sebokedi	Centre for Public Service Innovation (CPSI)	Gauteng
Desiree	Sehlapelo	Waterberg District Municipality	Limpopo
Thato Tshepang	Sekgoele	Seto Laishizo Creationz (Pty) Ltd	Gauteng
Nicholas	Senyane	Rand West City Municipality	Gauteng
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Precious	Sibanda	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Rakshika	Sibran	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
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Name	Surname	Organisation	Region
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Andile	Skosana	CityCon Africa	Gauteng
Kagiso Enos	Skosana	City of Tshwane Metropolitan Municipality	Gauteng
Theodore	Steenberg	Overstrand Municipality	Western Cape
Alison	Sussex	Write Connection	Gauteng
Fave	Tata	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Thando	Tenza	Sustainable and Healthy Food Systems	KwaZulu-Natal
Nonopa	Tenza	Independent	Gauteng
Limakatso	Thakalekoala	Umgeni Water	KwaZulu-Natal
Segofatso	Thepa	City of Ekurhuleni	Gauteng
Freddie	Thompson	TQM-SA	Gauteng
Thuthukani	Thusi	IT	KwaZulu-Natal
Nduduzo	Thusini	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Mamohloding	Tlhagale	Water Research Commission (WRC)	Gauteng
Nichilis	Tredoux	City of Cape Town Municipality	Western Cape
Letlhogonolo	Tsoai	LLD Growth	Gauteng
Susan	Venter	VdW&Co	Gauteng
Mimmy	Vezi	eThekwini Municipality	KwaZulu-Natal
Henriette	Wagener	Academy of Science of South Africa (ASSAf)	Gauteng
Kevin	Wall	University of Pretoria (UP)	Gauteng
Malcolm	Wallis	DementiaSA	Western Cape
David (Prof)	Walwyn	University of Pretoria (UP)	Gauteng
Fred-Earl	Williams	West Coast District Municipality	Western Cape
Diana	Zhou	Department of Planning, Monitoring and Evaluation (DPME)	Gauteng
Sebenzile	Zibani	Department of Public Service and Administration (DPSA)	Gauteng
Mthokozisi	Zondi	eThekwini Municipality	KwaZulu-Natal
Nokuphiwa	Zondi	eThekwini Municipality (Water and Sanitation)	KwaZulu-Natal
Sinethemba	Zungu	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal
Knowledge	Zungu	University of KwaZulu-Natal (UKZN)	KwaZulu-Natal

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