

Proceedings Report

Science, Technology and Innovation for the Sustainable Development Goals (SDGs)

as part of the

Annual Multi-Stakeholder Forum

5 December 2018

Venue: CSIR International Convention Centre, Pretoria

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March 2019

ISBN 978-1-928496-09-0

DOI <http://dx.doi.org/10.17159/assaf.2019/0044>

Cite: Academy of Science of South Africa (ASSAf), (2019). Science, Technology and Innovation for the Sustainable Development Goals (SDGs) – Annual Multi-stakeholder Forum [Available online] DOI <http://dx.doi.org/10.17159/assaf.2019/0044>.

Published by:

Academy of Science of South Africa (ASSAf)

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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 on the basis of 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 of the Science, Technology and Innovation for the Sustainable Development Goals (SDGs) – Annual Multi-stakeholder Forum held on 5 December 2018 in Pretoria, Gauteng, South Africa, unless otherwise stated.

Views expressed are those of the individuals and not necessarily those of the Academy nor a consensus view of the Academy based on an in-depth evidence-based study.

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WELCOME AND INTRODUCTION

Prof Himla Soodyall, Executive Officer, Academy of Science of South Africa (ASSAf)

Prof Soodyall welcomed participants to the forum, which was part of a very important discussion aimed at a better understanding of the activities surrounding the Sustainable Development Goals (SDGs), in particular with respect to science, technology and innovation (STI) in populating the STI Strategy for Africa (STI-SA) 2024 Agenda going forward.

Prof Soodyall served on the InterAcademy Partnership (IAP) Working Group on Science, Medicine and Engineering, which aimed to harness and promote activities in these areas in Africa to deal with the continent's challenges. Prof Robin Crewe was the South African Co-chair of the working group.

The purpose of the forum was to gain insights into what the various stakeholders were doing and consider possible areas of common interest in order to formulate a strategic way in which South Africa could take leadership towards addressing the agenda that the Department of Science and Technology (DST) has set.

Prof Soodyall emphasised that participants' comments and contributions to the discussions would be greatly valued and that the presentations on the local environment should be considered from the perspective of how to enhance the STI agenda.

OVERVIEW OF THE ANNUAL MULTI-STAKEHOLDER FORUM

Mr Imraan Patel, Deputy Director-General: Socio-Economic Innovation Partnerships, DST

The question of coordination was raised repeatedly in the science and technology space and as part of the DST's reflections on the implementation of the department's previous White Paper. As it was impossible to coordinate such a diverse system, experts in national systems of innovation preferred the term 'concertation' rather than 'coordination'. This 1st Annual Multi-Stakeholder Forum was an important instrument to try to achieve concertation, providing the opportunity for stakeholders to come together annually for creating a space to have conversations and create a community around the SDGs, particularly through interactions that arise out of the forum discussions. The agenda of this forum focused on introducing stakeholders to the current status with respect to country coordination at the broader level with regard to the STI response to SDGs, noting the necessity for the STI sector to engage with other government departments, sectors, and the private sector.

The DST was recently requested to make a presentation to the Parliamentary Portfolio Committee (PPC) on the STI system's contribution to the SDGs. Although the STI system was making a remarkable contribution towards the SDGs, it was evident that mechanisms that were more strategic needed to be put in place to pull together the activities in a more programmatic and impactful way. The DST hoped to achieve this through soft incentive mechanisms, using its funding resources strategically to force coordination, and to

highlight the value of different sectors working together towards achieving the SDGs. During the presentation to the PPC it emerged that South Africa had not yet developed a strategic response, particularly on the STI front, to how the SDGs could be used to address other national interests and the country's STI strengths could be used for socio-economic gain and to open up new markets. It also emerged that the interactions between the SDGs provided opportunities for transformative change and broad integrative interventions that brought together elements of the SDGs.

It was anticipated that these forums would inform how the DST's policy levers should be utilised in a more strategic way to highlight the gains the country was making through using STI to achieve local targets and priorities and to position the country as one that is able to provide lessons, solutions and approaches that feed the global environment.

Mr Patel invited participants to offer their suggestions on how future forums should be structured and to indicate whether the platforms were useful and who else ought to be invited to join the discussions.

SESSION 1: NATIONAL STRATEGY: FACILITATION AND REPORTING MECHANISMS OF STI FOR SDGs

Technology Facilitation Mechanism (TFM) of STI for SDGs (Ms Nonhlanhla Mkhize, DST)

It was important to acknowledge that SDGs were not a government responsibility but a national responsibility. Every stakeholder within the various levels of government, the private sector, non-government organisations (NGOs) and the research community has a role to play in ensuring that the country does what it can, within the context of national priorities, to contribute to the global agenda.

The list of questions sent to participants in preparation for this forum served to highlight the importance of thinking beyond South Africa's responsibilities and commitments in terms of the United Nations (UN) 2030 Agenda. South Africa would submit its first Voluntary National Review (VNR) in 2019 to report on progress with regard to the SDGs.

One of the UN resolutions as part of 2030 Agenda was the establishment of a TFM, which recognises the critical role of STI in achieving the SDGs. The TFM has three elements namely:

- annual multi-stakeholder STI Forum to share lessons learnt and best practice in the integration of STI in the SDGs;
- online platform to share information on existing STI initiatives, mechanisms and innovative solutions in support of the SDGs;
- A United Nations Interagency Task Team (IATT) on Science, Technology and Innovation for the SDGs, including the ten-member group of representatives from civil society, the private sector and the scientific community.

The DST, together with the relevant national stakeholders, is exploring a 'clearing house' mechanism to support submissions from South Africa to this global online platform. This platform is based on "an independent technical assessment, which takes into account best practices and lessons learned from other initiatives, within and beyond the United

Nations, in order to ensure that it will complement, facilitates access to and provides adequate information on existing science, technology and innovation platforms, avoiding duplications and enhancing synergies".

Based on a recent review by the IATT, although there was agreement among member states about the role of STI in the SDGs, STI is yet to be fully and efficiently adapted and integrated into the SDGs agenda. Since the first annual multi-stakeholder STI Forum, much consideration is given to framing national STI for SDG Action Plans. Such plans are guides and ensure deliberate and intentional integration and leveraging of STI for the SDGs, and as such, need to be aligned with policies and programmes and the domestication processes. STI for SDG Action Plans or roadmaps need to be co-owned by all stakeholders of the national system of innovation.

Appropriate indicators were required in order to plan, monitor progress and evaluate the impact of STI on the SDGs. The Centre for Science, Technology and Innovation Indicators (CeSTII) was working on developing indicators for the SDGs and the framework document would be shared with the STI community for comment and input. The DST's document on the STI for SDGs Action Plan would be shared with stakeholders to give critical input to the document and in order for them to engage in the STI for SDGs conversation. The critical elements of the STI for SDG Action Plan pursued by the country were policy coherence (with developmental priorities), monitoring and evaluation (M&E), interdisciplinary research and development (R&D), technology deployment and transfer, resourcing, and dialogue. South Africa needed a concerted strategy to address its response to the SDGs from a STI perspective and a comprehensive list of all STI-related activities responding to each of the SDGs.

South Africa's Baseline Reporting on SDGs (Mr Desmond Booysen and Ms Aluwani Makuya, Statistics South Africa (Stats SA))

The suite of SDG indicators used in the 2017 Baseline Report included the UN's SDG indicators, domesticated (or proxy) indicators and additional (supplementary to SDG) indicators. The SDGs were grouped under four themes: social, economic, environmental, and peace and security goals. South Africa was able to report on 68% of the social goals, 54% of the economic goals, 60% of the environmental goals and 73% of the peace and security goals. However, challenges were experienced in relation to the sheer volume of indicators, accessing new data sources and from non-traditional data suppliers, and a lack of data for reporting on SDGs. Stats SA invited stakeholders to give input concerning possible (domesticated) indicators for STI for purposes of SDG reporting that related to either SDG indicators or targets, provided that relevant data existed.

Sectoral working groups (SWGs) discussed the indicators in detail and decide which ones the country would report on and ensured that sufficient quality data was available for the baseline report. Data gaps were identified during the SWGs' activities. Once compiled, the 2017 Baseline Report followed a validation process before ratification by the National Coordinating Committee (NCC), followed by a sensitisation period. The final report was launched in September 2017.

Stats SA began preparing the first full-scale SDG Country Report in June 2018 and the report was due to be launched in September 2019. It would incorporate reports on each of the 17 SDGs, as well as four thematic reports, which would be key inputs to the VNR. Updates on the 2019 report are submitted every two years and the final full-scale Country Report would be in 2031.

National Coordination of National Development Plan (NDP) and Agenda 2030 in Preparation for 2019 VNR (Dr Kefiloe Masiteng, Department of Planning, Monitoring and Evaluation (DPME))

The work on institutionalisation of South Africa's developmental agenda did not begin with the SDGs. It was important to understand that this work had been done for the past 17 years and that biannual reports on progress made with regard to the SDGs, as well as reports on progress with regard to the indicators for the 2063 Agenda and the NDP, would build on the existing models and ensure that the M&E mechanisms used were coordinated. The DPME developed a coordination model for the country that would ensure that systems were in place to coordinate the work that was being done in terms of reporting and reviewing the SDGs, their domestication and the country's own development trajectories alongside the regional, continental and global development agenda. The first Country Report would contain integrated information based on South Africa's development agenda using the data collated by Stats SA and the substantial knowledge available.

However, it would be necessary to present the indicators in a better way and use the data to plan ahead in terms of the country's developmental agenda. Development in South Africa cannot only reflect the SDG slogan that "no-one would be left behind", but also about applying the M&E processes to enhance future sustainability of the developmental trajectory by inculcating and institutionalising the coordination model. Another important factor was the full participation of all sectors, including civil society, in these processes. The domesticated indicators should be owned and supported by all sectors. Planning, implementing, policymaking, M&E and reporting ought to be fully coordinated and not independent of each other.

The VNR cannot be a mere summary of the thematic report. It is necessary to address the questions highlighted through the data provided by Stats SA and use the information to determine the *status quo* and the way forward to advance the country's development agenda. The coordination model will be useful in this regard and will ensure participation from all sectors.

Questions/Comments

(Question) Prof Linda Godfrey, Council for Scientific and Industrial Research (CSIR):

- We have heard from Stats SA about the complexity of putting together the biannual reports, including the appointment of various committees and a group of authors. Why is it being done this way? Perhaps there should be a 'SDG dashboard' that facilitates assessment of progress made in terms of the SDGs.
- There is a scarcity of data in the country. In terms of STI, what is being done to get reliable, comprehensive and accurate data that could be plugged in to the dashboard to be able to provide real-time information?
- It appears that there is no data for the domesticated (proxy) indicators for some of the SDG indicators. This is a concern. If we are serious about the SDGs, then why is the data that is needed not being collected?

(Response) Mr Desmond Booysen, Stats SA:

- Stats SA's task is to measure according to a set of standards and methods (internationally recognised or nationally agreed upon) and to put the data in the public domain. Stats SA does not get involved in policy matters nor does it do M&E. These are the tasks of the DPME. Interpretation of the data is up to the stakeholders.
- An SDG dashboard could be very efficient, although mechanical. A process of consistently updating the information is not only feasible but already being developed. A portal to track the indicators will be up and running soon. It will be expanded to not only track SDG performance but also that of the national development agenda and the 2063 Agenda, and systematically and progressively include regional and other development agendas. The portal will be a mechanism to communicate the outcomes of the process. However, the portal is not very helpful in terms of participation. All stakeholders need to be part of a process of active discussion and participation in the development of what goes into the portal. This is where the SWG structures play a role.
- Proxy indicators need to be put into perspective. Reporting is done in a way that everybody understands the same thing the same way. This requires that whatever is measured is described in a particular way. Any deviation from standards means that it can no longer be used for comparative purposes. SDG indicators need to speak to the country. Any deviation from SDG indicators to make them country-focused means that they become proxy indicators, which are the core indicators that are reported on as far as the SDGs are concerned. The aim is to find the best way to represent the performance of the country in terms of its international obligations.

(Question) Prof Stephanie Burton, University of Pretoria (UP):

- What is the participation of academia in this process? How is academia contributing to the data generation and data gathering, and to the synthesis around data analytics of what is being put into the reports?
- Contributions from research and academia in terms of implementation and development take time. To what extent is data being gathered and the progress being made in developing the technologies that will contribute to achieving the SDGs being monitored?

(Response) Dr Kefiloe Masiteng, DPME:

Stats SA provides the information with the data. I am sure that working with academia would change the narrative. It will be synthesised and the analytics would be at a different level. It would also assist in elevating it to the policy analysis level and add value by improving the use of the data. The dashboard should allow us to be able to find the story

behind the figures in a manner that can inform the country going forward.

(Response) Mr Desmond Booysen, Stats SA:

Research is a key part of the synthesis of the data because it needs to look at the outcomes of the process that is measured by Stats SA. The impact of outcome indicators on the lives of people is where research is needed and is the most critical part of all the measurement and is part of the national statistics system that others need to build on.

(Response) Ms Nonhlanhla Mkhize, DST:

- The drafting of the national report, e.g. the Baseline Report and the VNR are ongoing processes and Stats SA and the DPME will provide guidance in this regard. Further consultation is required with the different multi-stakeholders to improve and optimise engagements for national, regional, continental and UN-level benefit. The DST is open to proposals in this regard.
- The South African SDG Hub at the UP captures research that is being done in South Africa in support of the SDG agenda and the DST is setting up a platform that captures innovative technology solutions. We have had discussions with the science councils about the need to ensure that South African technology solutions are validated before they are submitted to the global innovation exchange. It is up to the country to show how the research that is being invested in is contributing to evidence-based decision-making as far as the entire development agenda is concerned.
- In terms of the VNR, the DST would welcome STI case studies that demonstrate how the investment aligns with the country's development agenda and contributes towards the SDGs.

(Response) Ms Aluwani Makuya, Stats SA:

There was limited participation from business and academia in the production of the 2017 Baseline Report. Certainly, more participation is necessary.

(Comment) Ms Mapula Tshangela, Department of Environmental Affairs (DEA):

It is commendable that Stats SA recognises non-traditional sources of data. Building the narrative is important. An inclusive process is needed to define domesticated indicators so that the appropriate data is collected consistently (possibly by DST entities).

(Response) Mr Desmond Booysen, Stats SA:

Stats SA will include non-traditional sources of data, but these will have to go through a validation process, especially when talking about issues relating to small areas of the country that are possibly not relevant to the whole country. These could be included as case studies. Stats SA measures the national footprint. The main thrust for the non-traditional sources is to move away from the very expensive activity of undertaking surveys. Stats SA is looking at the better use of underutilised data sources (such as administrative data) in government departments to transform it into usable statistical information. This is a long-term process.

(Comment) Mr Mark Bannister, Department of Water and Sanitation (DWS):

DWS is responsible to deliver on SDG#6 and has an obligation to support the other SDGs. We need to work with others towards integration. DWS has internal structures in place to deal with the SDGs and is ready to deliver on SDG#6 but needs a process to allow communication between the SDG leaders in order to support the other SDGs. Possibly

Stats SA as the coordinator of the report could take the lead in this regard. These conversations need to be about creating an enabling environment and not only about STI for SDGs.

(Response) Mr Desmond Booysen, Stats SA:

The issue around communication is the one of the most vexing issues for Stats SA, but it is being worked on. Stats SA is currently working on a national strategy for the development of statistics that will integrate the production of statistics across the country and deal with the silo issue, as well as the current gaps in communication to create inter-institutional communication channels. A community will be built around every thematic area to ensure that there is good data in all the areas of importance for the country. This strategy will be discussed with other stakeholders in time. In the interim, the current SWGs will have to be used to integrate matters that straddle the various sectors.

(Comment) Ms Thabisa Mbungwana, South African Bureau of Standards (SABS):

SABS has been left out of these discussions for too long. SABS's involvement in SDG work is through a UN platform on voluntary sustainability standards and it does work across the sectors. Please would the DPME, as the national coordinator of the SDGs, ensure that SABS is involved in discussions and reports on the SDGs?

(Question) Mr Tiyani Chauke, Water Research Commission (WRC):

As all the SDGs are interconnected, how can this work be tackled from an interdisciplinary and water, energy and food nexus perspective? I have noted that it is mainly government and its entities that are leading the SDG work, whereas the implementers of the technologies are also in the private sector. How can the private sector be brought on board to take up the research and technology that are developed in the country to address the SDG-related challenges?

(Comment) Mr Kev Storie, Commercial Aviation Association of Southern Africa (CAASA):

It is the first time that CAASA has been involved in discussions on the SDGs. Remote Pilot Aircraft Systems, such as drones, are an innovative technology that can be used widely and rapidly assist in many areas. However, there are challenges to integrate this technology into society and there has been no assistance from government in this regard. In terms of data, the commercial aviation index gives real-time data from the economic perspective about everything to do with aviation in South Africa. This can be made available for use by Stats SA and DPME to be used as required.

(Response) Ms Nonhlanhla Mkhize, DST:

The offer from CAASA is welcomed and would be taken up with Mr Storie and CAASA.

(Question/Comment) Prof Himla Soodyall, ASSAf:

How do we know who is who? How do we speak to each other better so as to collectively aggregate commonality towards being more productive and strategic in the way that government has to report? There is lots of information, but it needs to be packaged in a format that is communicated to those who want to get uptake of the information. What strategy would be put in place for this?

(Comment) Dr Mohammed Jeenah, Agricultural Research Council (ARC):

It appears that we are being data-driven instead of strategy-driven. Those who are running the strategies require the data to see where they are going. The data sits with the researchers. We do not need to fit into the SDGs. We need to fit into the development goals of the country.

(Response) Ms Nonhlanhla Mkhize, DST:

The idea of the forum is for the STI community to discuss how STI could contribute to the SDGs. In order to be part of this discussion, participants are urged to inform themselves of the individual SDGs, as well as the relevant targets and indicators that are relevant to their specific sectors and give input that contributes to an STI for SDG Action Plan, which is not a DST document but one that is owned by, and inclusive of, all stakeholders. Participants are also encouraged to familiarise themselves with key UN documents in the context of STI for SDGs. This information would be made available by the DST.

(Comment) Prof Himla Soodyall, ASSAf:

It is clear that all the action happens from the coalface upwards while all the reporting comes from the top down, but the linkages are not merging. This needs to be kept in mind in understanding who is doing what. Academics take on research in terms of how they conceive of the idea, but how it feeds into selling the outcomes and outputs of the research with respect to the development agenda may be different to the way the private sector or NGOs have conceived of it. It is important to think about how to bring these discussions under a common umbrella.

(Comment) Dr Karen Stander, University of South Africa (Unisa):

'Structured communication' has been referred to in the discussions. However, business management students are taught that less structure is better. Care should be taken not to structure the communication too much.

(Response) Ms Nonhlanhla Mkhize, DST:

Perhaps structure is the wrong term. The intention is to ensure that as many stakeholders as possible are included and contribute in this conversation and relevant activities. We need to think how to use the existing mechanisms to engage as much as possible with academia.

(Question/Comment) Ms Mmaphefo Thwala, Energy and Water Sector Education and Training Authority (EWSETA):

Stats SA has emphasised the difficulties in accessing data from the private sector. The National Business Initiative (NBI) has consulted business about the SDGs. Has the work being done by the NBI and other NGOs been taken into account by Stats SA and the DPME?

(Question/Comment) Dr Nonhlanhla Dlamini, National Department of Health:

- I support the position that better communication is needed among the SDG leaders. We use the World Health Organisation's infographic that clearly defines how health fits into to each of the SDGs.
- Sometimes we have to report to surveys because the quality of administrative data is

questionable. A case in point is the immunisation coverage data. In reporting, survey data is trusted more than the administrative data.

- I like the idea of including case studies, because they often show the most innovation. However, how will you choose which case studies to follow in the report?

(Response) Dr Kefiloe Masiteng, DPME:

Survey data is collected to estimate in areas where we could not measure. The systems in the various departments that collect administrative data have improved over time. Survey data cannot answer all the questions. Academia uses an interpretation of data for correct use and ensures that the questions that are answered were those that were asked. Collaboration between academia, those who collect the data, research institutions and policymakers is essential.

(Response) Ms Nonhlanhla Mkhize, DST:

The DST has had conversations with the DPME and Stats SA on case studies, but no decision has yet been made about a mechanism for their selection. Once a decision has been made in this regard, colleagues will be alerted accordingly.

(Question) Prof Igle Gledhill (University of the Witwatersrand (Wits) and ASSAf):

In putting together the SDG reports, how is it best to avoid defining indicators that drive unintended behaviour?

(Response) Ms Nonhlanhla Mkhize, DST:

This is a discussion on its own. The national reports, e.g. the Baseline Report is being led by Stats SA and it would be ideal to reflect with this institution on this matter.

(Question) Mr Lesetja Mogoba, Denel Aeronautics:

What is the weakness of implementing any of the SDGs? Not much progress will be made unless we find a way to deal with the commercialisation aspect of the solutions to the problems. Is there any appetite to consider using intellectual property (IP) as an asset that generates revenue to fund these exercises going forward? It will also be an interesting way to engage the entrepreneurial community to drive this and implement it from a distribution point of view.

(Response) Ms Nonhlanhla Mkhize, DST:

The DST is open to the entrepreneurship aspect mentioned by Mr Mogoba and regards innovation and entrepreneurship as a priority realising that deployment of technologies is necessary as part of the SDGs. Some technologies are developed by science councils and the relevant technology transfer needs to happen, within the relevant legislative frameworks.

(Response) Dr Kefiloe Masiteng, DPME:

There is an understanding of technology as an enabler of the SDGs. If we organise ourselves correctly to measure the development agenda of the country, the use of STI as an enabler would become more evident.

SESSION 2: THE SOUTH AFRICAN SGD HUB

South African SDG Hub as an Enabler in the Implementation of SDGs (Prof Willem Fourie, Albert Luthuli Centre for Responsible Leadership and South African SDG Hub, UP)

About six years ago, the African Union (AU) requested Prof Fourie to assist with its work with regard to the effective implementation of development agendas with a focus on leadership and transformative leadership. This led him to reflect on the specific role of scientists in supporting inclusive and sustainable development in policymaking. It was clear that peer-reviewed research articles produced by scientists failed to influence policymaking and policy implementation processes. The initial explanation for this was that there was a lack of willingness on the side of policymakers or on the side of researchers. Later it became clear that the issue had to do with the absence of meta-platforms and translational platforms to tease out the relevance of research for policymaking. The South African SDG Hub, hosted by UP and supported by the DST, emerged in this context. Prof Fourie highlighted some of the elements that impede the uptake of research in policymaking processes and shared a few enablers on the demand, as well as the supply side.

The SDG Hub was broadly positioned in the field of evidence-informed decision or policymaking, which was built on the question, “how can we ensure that the willingness of researchers to produce research for social impact, and the openness of policymakers to use this research lead to evidence-informed policies?” A few things made this difficult. One of the key barriers on the supply side was the perceived lack of timeliness and relevance of research. However, this perception did not necessarily mean that the research was truly irrelevant or out of sync. One of the key barriers on the demand side had to do with the lack of analytical capacity in government. Improving accessibility of research did not suffice, and governments needed to invest more in creating the capabilities to use the research well. The other barrier concerned financial constraints.

The literature identified a few enablers of evidence-informed policymaking on the demand and supply sides. The work done at the Africa Centre for Evidence (ACE) at the University of Johannesburg was helpful in understanding the demand-side enablers. Based on this work, ACE refuted the common response that blamed the lack of awareness raising among policymakers, and argued that complex interplay between awareness raising, capability creating, and decision-making was key. Success should not simply be measured by how many research findings were included in policy. Such an approach undervalued the sources of evidence policymakers relied on. Researchers were often not honest about the controversy in the respective fields nor about the sources of evidence that were drawn on to make effective policies. Political and institutional know-how was essential. Even if a policy was viewed as evidence-informed there was no guarantee that it would be implemented effectively. Researchers at ACE argued for a systemic approach, saying that evidence-informed policymaking was about incremental shifts throughout the demand-side system. This was also the case for complex development agendas such as the 2030 Agenda and the SDGs. There was a need to develop and sustain an ecosystem of activities that enabled evidence-informed decision-making.

Supply-side enablers included the notion of science leadership, which had been found to be a phenomenon that emerged in groups. All scientists were leaders in different respects and had opportunities to exert influence in a number of groups. In terms of fostering evidence-informed policymaking, scientists have a role to play in the policymaking community. Science leadership in relation to accelerating the realisation of the SDGs in South Africa was not about developing generic leadership skills, but rather to chart policy making processes, infrastructure and actors, and then to identify one's own position within this ecosystem. In collaboration with colleagues, quick wins and existing opportunities for contributions, as well as inefficiencies within the system should be identified.

As a translational platform, the SDG Hub could be seen as an important supply-side enabler for evidence-informed policymaking relating to the SDGs in this country. The initiative was established to strengthen knowledge dissemination activities nationally in order to support the evidence-informed implementation of the SDGs. More practically, it was initially established as an online research repository and later added face-to-face platforms to facilitate the dissemination of research. An artificial intelligence (AI) research grant contributed to improving the search function and the intention was to build a tool to do text summarisation and develop synthesis products. South Africa's first multi-stakeholder publication on the SDGs was launched early in 2018 and there had been several face-to-face engagements with government colleagues to assess the needs and how the SDG Hub could respond to these. A monthly SDG newsletter was co-produced with the UN.

The dream was to use the SDG Hub as a starting point for establishing sector specific hubs at institutions of higher education across the country. This conversation was taking place with the Sustainable Solutions Network.

The SDG Hub did not have expertise in all the SDGs, but served as a meta-platform in the true sense. It would be helpful for colleagues from across the country to be brought on board and for them to bring their expertise to the various networks.

Questions/Comments

(Comment) Ms Joyce Myezi, University of KwaZulu-Natal (UKZN):

I head up the libraries at UKZN. I think that people on the ground will adopt the platform. If you want a place to archive and ensure that the data is safe, the way to go is to look to the public institutions and their libraries. All these are free of charge and offer skills to students.

(Response) Prof Willem Fourie, UP:

Your support is appreciated. One of the biggest mind shifts necessary is appreciating all the resources already available in our system. We started with the idea of reinventing the wheel then we realised that we have excellent students and free research is available in the many institutional repositories. We began to see this as a capacity building process. This was a useful mind shift.

(Question) Dr Nompumelelo Zungu, Human Sciences Research Council (HSRC):

Do your data sources include the research councils? The HSRC has a wealth of data that is curated and made available in the public domain.

(Response) Prof Willem Fourie, UP:

We currently draw the distinction between data and research, and we are focusing on research, simply because we are a very small team and even though people are more interested in the data than the research. We might want a conversation to see how we can incorporate the data.

(Comment) Mr Garth Williams, Technology Innovation Agency (TIA):

In terms of the different expectations around evidence for policymaking, the natural inclination is to see success as a policy impact, but there are degrees of success. There is a process of creating awareness and changing the debate on policy options to influence the agenda, leading to policy action. Every researcher intends making policy impact but this is impossible given the number of publications locally and across the world.

(Response) Prof Willem Fourie, UP:

Success is not easy to measure. This links to the question of how to influence the policymaking cycle. We took a pragmatic process realising the limitations of what we are trying to do by not looking at the other elements of the ecosystem.

(Question) Dr Mohammed Jeenah, Agricultural Research Council (ARC):

Prof Fourie made the point that the policymaking is complex and the evidence is just one part of it, yet there is concentration on the evidence. From the literature it seems that the policymaking process is much more important than the data and the data merely supports one's theory. How do you hope to deal with that?

(Question) Prof Robin Crewe, UP:

Do you see the SDG Hub primarily as a national resource or a resource that is available regionally and on the rest of the continent? Assuming that most published research is going to be available without a pay wall after 2020, are you considering ways in which we could start harvesting that to increase the value of the research in the repositories at the moment?

(Response) Prof Willem Fourie, UP:

The SDG Hub started as a conversation between us and the AU and they suggested making this an Africa-wide resource, but this was complex. In conversation with the South African government, we decided that it makes more sense to start nationally. We have already had conversations with colleagues in other parts of Africa where we have said that they are more than welcome to replicate this model. In terms of the free availability of research after 2020, the more resources we get on board the less useful the platform becomes. It cannot be managed.

We are currently focusing on making the search function as intelligent as possible. As soon as this is in place, we can start to expand the cohort of research. Currently, we are focusing on UP, University of Stellenbosch, University of Cape Town and UKZN, and the

ideal would be to expand it to the rest of the South African universities. We are grappling with the notion of quality and only use peer-reviewed research currently.

(Question) Ms Ravni Moodley, CSIR:

You are using a lot of artificial intelligence (AI) to curate resources. What are you doing about introducing biases and what kind of mechanisms are there to prevent this?

(Response) Prof Willem Fourie, UP:

AI is a huge disappointment. We are not even close to getting the type of AI that has the capability to introduce biases. The answer relies in getting access to a lot of training data from users that can be trusted. We are still considering adding the journal impact factor as another layer to the decision-making tool.

(Question) Mr Garth Williams, TIA:

To what extent are you translating publication results into policy briefs and communicating those? What success have you had in this regard?

(Response) Prof Willem Fourie, UP:

In conversation with partners in government, we are investigating the opportunity to produce demand-based policy briefs. Often, people produce research and hope that it is relevant to some or other policy.

(Question/Comment) Prof Igle Gledhill, Wits and ASSAf:

AI has been demonstrated to amplify gender inequality (SDG#5) referring to tradition as a reason and uses the information to conclude what the policy should be in the future. For example, if most doctors are men and most nurses are women, the web will advertise doctors' jobs for men and nurses jobs for women. Do you think this would be possible in terms of other SDGs?

(Response) Prof Willem Fourie, UP:

It is possible and this is a problem. The quality and effectiveness of the checks and balances that we put in place will make the difference.

(Comment) Prof Robin Crewe, UP

The task of the IAP working group was to mobilise academies on the continent around how to do things better with respect to addressing SDGs. Having an influence on policy and understanding the importance of the SDGs in relation to that was complicated when moving beyond the national level where there was ongoing conversation between the individuals involved in the system. The regional and continental contexts were much more complicated and more difficult to find an area for leverage. In addition, there was the unfortunate tendency for policymakers to move outside their country and the continent to find advice.

The Network of African Science Academies (NASAC) was of the view that national academies of science were much more likely points of leverage than a continent-wide body. The working group was engaging with a number of these academies to indicate to them that the SDGs provided a framework for understanding where their work could

have a particular impact, but also to make the members of the academies aware of the fact that by mobilising themselves in the national context and engaging with their policy makers about the research they do, there would be a greater likelihood of success and of raising the profile of the work they were doing with policymakers.

WAY FORWARD AND RECOMMENDATIONS

Ms Nonhlanhla Mkhize, DST

Ms Mkhize reiterated that the DST was in the process of developing an STI for SDG Action Plan and needed to get a sense of the proposals put forward by the other platforms that stakeholders were involved in. She requested the stakeholders (individuals as well as institutions) to give input to the DST in this regard taking cognisance of the work they were doing within the context of the SDGs, its competitiveness and possible deployment beyond the borders of South Africa, highlighting critical aspects that the country needed to prioritise. Although implementation of the Action Plan would depend on existing resources, it was anticipated that additional resources may have to be secured (for example through advancing the country's research agenda) within the context of the SDGs. The deadline for the DST's draft Action Plan was the end of March 2019.

The DST requested stakeholders to advise the department on how the indicators for reporting on STI for SDGs should be framed, taking into consideration the following illustrative topics:

- What critical aspects should be prioritised for the STI for SDGs Action Plan?
- What domestic and international platforms should be pursued for the realisation of the STI for SDGs Action Plan?
- How can South Africa leverage on STI for SDGs?
- How can South Africa harness its innovation and link it with the global innovation platforms?
- What key messages should South Africa be advancing in international platforms such as the Africa Regional Forum for Sustainable Development and the UN Multi-Stakeholder on STI for SDGs?
- What coordination mechanisms would be most effective for the National System of Innovation (NSI)?
- Do SDGs offer opportunities for South African innovations in the continent and how can these be exploited?
- What activities has your organisation embarked on or have planned in order to leverage on STI for SDGs?

The following comments were made regarding the way forward:

Dr Kefiloe Masiteng, DPME:

We need to integrate what already exists for the good of STI for SDGs. Before considering the 'how' aspect, it is important to put in place mechanisms to build partnerships relating to STI for SDGs.

Mr Mark Bannister, DWS:

- We cannot wait for the communication model to be developed in two years' time and need to start talking now. I suggest that forum participants be added to an email group to allow us to begin sharing information, policies, guidelines and so on.
- It would be helpful to have contact names for each of the 17 SDGs so that the interdepartmental conversations can start now.

Prof Graham Jewitt, UKZN:

A lot of time has been spent on talking about the SDGs rather than on achieving the SDGs and Prof Fourie's presentation was around influencing policy to implement the SDGs. I do not think we necessarily achieve anything (in terms of making a difference to the lives of people on the ground) just by influencing policy. There are research, development and innovation (RDI) roadmaps in waste water, information and communication technology (ICT) and other areas. Through the RDIs there is scope for academics and practitioners to develop the research to achieve the technology deployment. The DST should consider how much integration there is between the RDIs in terms of inter-disciplinary research and the opportunities to link for example, water with health, water with ICT.

Prof Himla Soodyall, ASSAf:

These comments are very valuable, but it would be necessary to aggregate within SDGs before these links can be made, possibly through the idea of a dashboard.

Dr Karen Stander, Unisa:

Microsoft's theme function can be used to communicate and upload documents to do with a certain theme. This works much better than emails and could be a useful platform to share information on specific SDG related themes, such as water.

Mr Garth Williams, TIA:

Nominations have recently been invited for people to serve on the Presidential Commission on the 4th Industrial Revolution. This provides a high-priority, short-term opportunity to influence the STI for SDG agenda at the highest level, and collectively, strategic nominations from the STI community should be made.

Mr Mdu Mkhonza, 2063 Innovators' Network Cooperative:

Is it possible to identify the 20% key performance areas among the SDGs that would have an 80% impact on the rest? This would help us to harness energies and all efforts channelled to the minimum to achieve the optimal. There are tools and instruments to map the country's priorities against the SDG indicators, and to do a ranking exercise to come up with the top few areas of focus for the action plan.

Dr Nonhlanhla Dlamini, National Department of Health:

It is difficult to select the priorities without input from the departments not represented at this forum. Their input is necessary in order to decide on priorities. How will the DST ensure that there is participation from all government departments?

Comment: ICT, a subset of STI, cuts across all the SDGs. In an exercise to see how ICT can bring the SDGs together we found that SDG#1 (end poverty in all its forms everywhere) forms the basis of all the other SDGs. All efforts could be concentrated on this SDG and this will help address all the other SDGs. All the SDGs need STI as well as ICT.

Dr Thobela Nkukwana, UP:

Agriculture is central to realising the SDGs. Until hunger and poverty are addressed it will be difficult to tackle the other SDGs.

Ms Mkhize responded as follows:

- Part of the discussions with colleagues in government around the DPME's national coordination mechanism have to do with ensuring representation from the STI community (not only the DST), possibly in a subcommittee, to look at STI for SDGs at a national level.
- In terms of ensuring participation from all government departments, the DST has bilateral agreements with other departments and there has been agreement to ensure that work is reflected from an SDG perspective.
- The research agenda is a collective responsibility.
- The DST will set up a platform to be able to share as much information as possible with and between participants about what is happening within the area of STI for SDGs. Participants should note the DST's request for inputs in this regard, as well as the deadline for the draft STI for SDG action plan (31 March 2019). The document should be owned collectively and participants are encouraged to share the document within their relevant networks.
- Identifying SDG champions (or contact persons) within the various departments will have to be sorted out with the DPME.
- Integration is at the core of the RDIs. There is engagement with colleagues responsible for the RDIs within the DST to ensure that the work responds to the SDGs.

CLOSING REMARKS

Prof Soodyall thanked all the participants for their stimulating contributions to the STI for SDG discussion and invited them to send further comments to Dr Tebogo Mabothe at ASSAf until an appropriate platform has been put in place by the DST.

ANNEXURE A: LIST OF PARTICIPANTS

Title	Name	Surname	Affiliation
Ms	Nadia	Algera	Academy of Science of South Africa (ASSAf)
Mr	Gordon	Ayres	AGAMA Biogas (Pty) Ltd
Mr	Mark	Bannister	Department of Water and Sanitation (DWS)
Mr	Lusanda	Batala	Department of Planning, Monitoring and Evaluation (DPME)
Mr	Gawie	Bestbier	South African Civil Aviation Authority (SACAA)
Mr	Mothusi	Boihang	CSIR
Mr	Desmond	Booyesen	Stats SA
Mr	Walter	Brown	SAKAN
Prof	Stephanie	Burton	University of Pretoria (UP)
Mr	Tiyani	Chauke	Water Research Commission (WRC)
Prof	Robin	Crewe	IAP Working Group
Ms	Alina	Datz	German Embassy
Mr	Marwaan	Davids	MIBCO
Dr	Nonhlanhla	Dlamini	National Department of Health
Ms	Prudence	Dlamini	COGTA-NDMC
Ms	Heather	Erasmus	Write Connection
Prof	Willem	Fourie	UP
Ms	Lindiwe	Gama	Department of Science and Technology (DST)
Prof	Igle	Gledhill	University of the Witwatersrand and ASSAf
Prof	Linda	Godfrey	CSIR
Ms	Hanlie	Griesel	UP
Dr	Lorren	Haywood	CSIR
Ms	Khanyisa	Hoveni-Maphutha	The Department of Trade and Industry (the dti)
Dr	Mohammed	Jeenah	Agricultural Research Council (ARC)
Prof	Graham	Jewitt	University of KwaZulu-Natal (UKZN)
Mr	Nkateko	Khoza	LEZA Private Equity
Ms	Sbusisiwe	Khumalo	DWS
Dr	Phiyani	Lebea	TokaBio
Ms	Precious	Lukhele	DST
Dr	Tebogo	Mabotha	ASSAf
Ms	Anele	Madlala	Outreach Social Care Project
Ms	Sthabile	Madlala	Outreach Social Care Project
Mr	Matome	Maila	DWS
Ms	Princess	Majola	MSD

Title	Name	Surname	Affiliation
Ms	Sibu	Majozi	DWS
Ms	Kaeka	Makanda	DWS
Ms	Aluwani	Makuya	Stats SA
Prof	Peter	Mallon	South African Chemical Institute (SACI)
Ms	Nondumo	Maluleke	DST
Ms	Marvin	Mandiwana	ASSAf
Mr	Stanley	Maphosa	ASSAf
Mr	Ignatious	Mashinini	Department of Agriculture, Forestry and Fisheries (DAFF)
Dr	Kefiloe	Masiteng	DPME
Mr	Cecil	Masoka	DST
Ms	Iris	Mathye	DWS
Ms	Thabisa	Mbungwana	SABS
Ms	Hayley	McKuur	Department of Human Settlements
Ms	Nonhlanhla	Mkhize	DST
Mr	Mdu	Mkhonza	2063 Innovators' Network Cooperative
Mr	Mkhevu	Mnisi	DWS
Ms	Dinah	Modiba	Office of the Premier: Limpopo Province
Ms	Alina	Mofokeng	ARC
Ms	Mahadi	Mofokeng	DWS
Mr	Lesetja	Mogoba	Denel Aeronautics
Ms	Thato	Morokong	ASSAf
Mr	Tshepang	Mosiea	DST
Ms	Khothatso	Mpheqeke	SANEDI
Mr	Rex	Mtileni	DWS
Ms	Joyce	Myeza	UKZN
Dr	Sphumelele	Ndlovu	Indabuko Institute
Dr	Malindi	Neluheni	South African College of Aeronautics & Technology
Ms	Nombuso	Ngcobo	SANEDI
Mr	Tiyani	Ngoveni	DST
Dr	Luxon	Nhamo	International Water Management Institute (IWMI)
Mr	Barry	Nkomo	Motor Industry Bargaining Council (MIBCO)
Dr	Thobela	Nkukwana	UP
Mr	Ayanda	Noma	SARIMA
Dr	Xolelwa	Ntsham	Sefako Makgatho University
Mr	Welcome	Nyalungu	DWS
Mr	Imraan	Patel	DST

Title	Name	Surname	Affiliation
Mr	Ephraim	Phalafala	Department of Science and Technology (DST)
Dr	Jasper	Rees	Technology Innovation Agency (TIA)
Mr	Richard	Sadiki	SABS
Ms	Palesa	Sibeko	SiGNL
Mr	Nirdesh	Singh	Mintek
Prof	Himla	Soodyall	ASSAf
Dr	Karen	Stander	UNISA
Mr	Kev	Storie	Commercial Aviation Association of South Africa (CAASA)
Dr	Jacqueline	Tembu	Tshwane University of Technology (TUT)
Dr	Nkululeko	Thunzi	SMU
Ms	Mmaphefo	Thwala	Energy and Water Sector Education and Training Authority (EWSETA)
Dr	Mamohlosing	Tlhagale	WRC
Ms	Mapula	Tshangela	Department of Environmental Affairs (DEA)
Mr	Sarel	van der Walt	TIA
Dr	Carina	van Rooyen	University of Johannesburg
Ms	Cornia	Vosloo	ARC
Ms	Henriette	Wagener	ASSAf
Mr	Garth	Williams	TIA
Ms	Zinzi	Zilwa	SAYCC
Dr	Nompumelelo	Zungu	Human Resources Research Council (HSRC)

ANNEXURE B: LIST OF ACRONYMS

ACE	Africa Centre for Evidence
AI	Artificial intelligence
ARC	Agricultural Research Council
ASSAf	Academy of Science of South Africa
AU	African Union
CAASA	Commercial Aviation Association of Southern Africa
CeSTII	Centre for Science, Technology and Innovation Indicators
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs
DPME	Department of Planning, Monitoring and Evaluation
DST	Department of Science and Technology
DWS	Department of Water and Sanitation
EWSETA	Energy and Water Sector Education and Training Authority
HSRC	Human Sciences Research Council
IAP	InterAcademy Partnership
ICT	Information and communication technology
IP	Intellectual property
M&E	Monitoring and evaluation
NASAC	Network of African Science Academies
NBI	National Business Initiative
NCC	National Coordinating Committee
NDP	National Development Plan
NGO	Non-government organisation
NSI	National System of Innovation
PPC	Parliamentary Portfolio Committee
R&D	Research and development
RDI	Research, development and innovation
SABS	South African Bureau of Standards
SDG	Sustainable Development Goal
Stats SA	Statistics South Africa
STI	Science, technology and innovation
SWG	Sectoral working group
TFM	Technology facilitation mechanism
TIA	Technology Innovation Agency
UKZN	University of KwaZulu-Natal
UN	United Nations
UP	University of Pretoria
Unisa	University of South Africa
VNR	Voluntary National Review
Wits	University of the Witwatersrand
WRC	Water Research Commission