

**INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION
ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

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Contribution of South Africa

to the CSTD 2018-19 priority theme on ‘The role of science, technology and innovation in building resilient communities, including through the contribution of citizen science’

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2018/19 UNCSTD Inter-Sessional Panel discussion topics

Priority Theme 2

“The role of science, technology and innovation in building resilient communities, including through the contribution of citizen science”

South African perspective...

Introduction

Resilience is often associated with an ability to cope, withstand, absorb or recover from shocks and stresses. For example, Adger (in Folke 2006: 259) defines social resilience as ‘the ability of human communities to withstand external shocks to their social infrastructure such as environmental variability or social, economic and political upheaval’. However, emphasising the robustness and persistence of a system following a disturbance assumes a level of constancy and predictability that, more often than not, is non-existent, particularly in relation to complex systems. In fact, resilience thinking recognises that uncertainty is inherent to complex systems, and that living with change and uncertainty is unavoidable (Berkes 2007; Folke 2006). As John F Kennedy once remarked, ‘there is nothing more certain and unchanging than uncertainty and change’.

Question 1: *Can you give examples of projects/policies in your country aimed at using science, technology and innovation (STI) to build resilient communities? What are the main challenges confronted while trying to implement these projects/policies in your country or region?*

The Draft 2018 White Paper on Science, Technology and Innovation sets the long-term policy direction for the South African government to ensure a growing role for STI in a more prosperous and inclusive society. It focuses on using STI to help South Africa benefit from developments such as rapid technological advancement and geopolitical and demographic shifts, as well as respond to the threat associated with some of these global trends. In particular, the White Paper engages with the significant changes that are associated with the Fourth Industrial Revolution.

We do, however, not start from a blank slate. Since the adoption of the 1996 White Paper on Science and Technology, just after the attainment of democracy, the national system of innovation (NSI) has shown good progress. Institutions such as the Technology Innovation Agency were set up, significant advances in transformation took place, publications increased three-fold, and South Africa built up extensive international networks through its science diplomacy efforts.

Recent reviews indicate that challenges remain, resulting in South Africa not yet fully benefiting from the potential of the NSI to help address our socio-economic problems. Policy on STI is still fragmented across government, business and civil society are not sufficiently involved, the NSI is significantly underfunded, and the participation of black people and women at the highest levels (e.g. as professors) remains too low – to name but a few.

To maximise the considerable potential of STI to help South Africa thrive in a challenging and changing environment, this Draft White Paper, while learning from what has worked in the past, introduces a number of policy shifts. Some of these relate to:

- Increasing the focus on inclusivity, transformation and linkages in the NSI.
- Enhancing the innovation culture in society and government.
- Improving policy coherence and budget coordination across government.
- Developing a more enabling environment for innovation.
- Developing local innovation systems.
- Supporting social and grassroots innovation.
- Expanding the research system.
- Developing high -level human capital.
- Endorsing a pan-African STI agenda.
- Increasing the investment in the NSI.

The draft White Paper focuses on the following areas:

- Looking to the future.

- Developing a coherent and inclusive National System of Innovation.
- Building an enabling innovation environment in South Africa.
- Increasing human capital and expanded knowledge enterprise.
- Avenues to finance science, technology and innovation.

The implementation of science, technology and innovation activities prioritises gender inclusion through programmes such as the Women in Science and support youth e.g. the Youth Technology Innovation Fund and Grassroots Innovation Programmes. Women and the youth require support and empowerment from government in order to improve their standards (education&employment/skills development) of living and their chances of becoming productive citizens.

Question 2: *Can you provide examples of policies/projects/initiatives aimed at using/promoting citizen science to build resilient communities? Do these projects incorporate a gender approach? What are the main challenges confronted in implementing these projects?*

Building an effective and successful national system of innovation (NSI) is a priority of the Department of Science and Technology (DST). To achieve these requires the participation of all South Africans, a society that understands and values science and its critical role in ensuring national prosperity and a sustainable environment. Against this background, the DST adopted the Science Engagement Strategy (SES) in 2015. The Strategy seeks to develop a society that is knowledgeable about science, able to form opinions about science issues and scientifically literate. The SES provides strategic direction to the DST-led science awareness and engagement programme that started in 1998. In South Africa, citizen science, which is “understood as a participatory collaboration between scientists and members of the public who work together in scientific research takes place within the context of the SES.

The intentions of the SES are pursued by implementing projects or initiatives that target 11 designated sections of society (referred to as the publics). Figure 1 below, depicts the publics targeted by the SES.

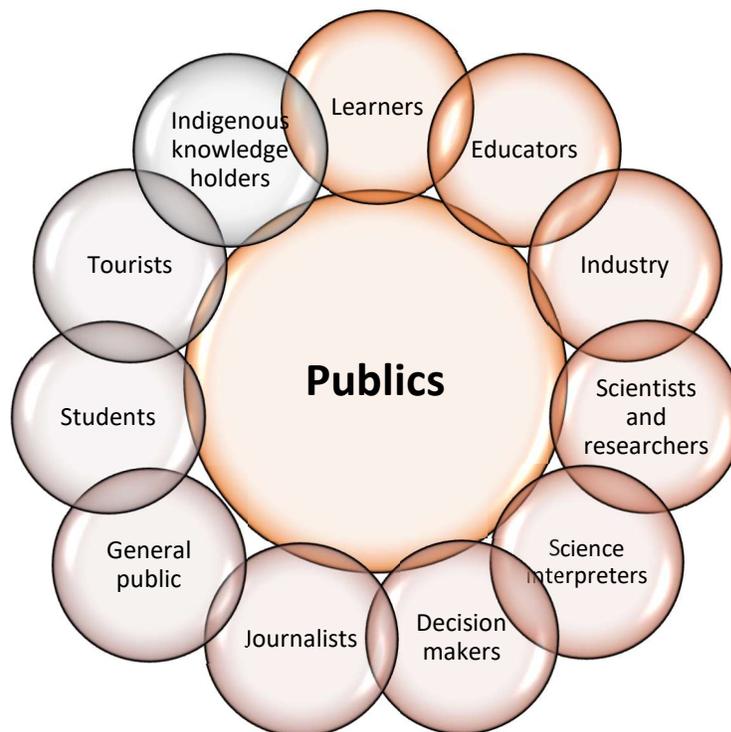


Figure 1: Publics targeted by the SES

There are reasons for targeting the 11 publics, which in turn provide the contextual basis of the participative collaboration between scientists and the target publics. Using learners as an example, the rationale of targeting this public includes stimulating interest in and build positive attitudes towards science subjects and careers. This is meant to contribute to the development of new generation researchers. Such intentions informed the choice of citizen science activities in which learners participate. In this regard, an international initiative called the Global Learning and Observations to Benefit the Environment

(GLOBE) Programme has been adopted. This science and education programme provides learners and the public worldwide with the opportunity to participate in data collection and the scientific process, and contribute meaningfully to the understanding of the Earth system and global environment. GLOBE provides grade level-appropriate, interdisciplinary activities and investigations about the atmosphere, biosphere, hydrosphere, and soil/pedosphere, which have been developed by the scientific community and validated by teachers. GLOBE connects students, teachers, scientists, and citizens from different parts of the world to conduct real, hands-on science about their local environment and to put this in a global perspective.

The GLOBE Programme was started by the government of United States of America (USA), which then established partnerships with various countries including South Africa. South African schools' participation in the GLOBE Programme started in 1997 after an agreement was signed between the Governments of South Africa (SA) and the USA. The Governments of SA and USA were represented by their then Deputy and/or Vice Presidents, Mr Thabo Mbeki and Mr Al Gore, respectively.

As part of implementing the SES, the DST in collaboration with the provincial departments of Education is embarking on implementing a structured school-based science engagement initiative that encompasses the GLOBE Programme. Collaboration Agreements in this regard have since been signed between the DST and four provincial departments of Education (Gauteng, Mpumalanga, Limpopo and Northern Cape). The initiative will expand the GLOBE Programme in South Africa, as the focus so far has been on a few schools. As a result, more South African learners will use appropriate scientific instruments to collect environmental data and upload it into the official GLOBE Programme database. Such information is used by scientists from all over the world.

Question 3: *What are the actions that the international community, including the CSTD, can take to leverage the potential of STI in building resilient societies, including through the contribution of citizen science? Can you give any success stories in this regard from your country or region?*

The following approaches are suggested to encourage collaboration to enhance citizen science among the UNCSTD members:

- Countries could share information about citizen science projects they have established. Where there are no sensitivities around such projects, such projects could be internationalised to enable participation of members from all over the world. The GLOBE Programme can be considered an international best practice in this regard.
- Members could adopt a peer review mechanism as a tool to assess the state of citizen science in their countries.

Question 4: *Could you suggest some contact persons of the nodal agency responsible for projects/policies, related to resilient communities, STI and the citizen science as well as any experts (from academia, private sector, civil society or government) dealing with projects in this area? We might contact them directly for further inputs or invite some of them as speakers for the CSTD inter-sessional panel and annual session.*

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