South Africa debuts world-class Science Forum

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In the culture of science, knowledge is built not only by research in the lab and in the field, but also by sharing and reviewing that research. Conferences, therefore, have great importance: scientists come together and share their latest work; they debate it, and they plan future research. The model has evolved over hundreds of years.

But it has been given an injection of new energy in the past 15 years. Events such as EuroScience Open Forum and Japan's Science Agora not only bring scientists together to discuss the frontiers of research, they also create a powerful new dynamic by including policymakers, business leaders, students and the public in a decidedly international context. And now Africa has an impressive meeting of its own.

Science Forum South Africa, held 8–9 December 2015 in Pretoria, was a showcase for Africa's vision and strength before an audience that included high-level researchers and policymakers from Africa and around the world. It offered discussions on topics ranging from space science and climate change to education and science diplomacy. And it hosted the launch of a major global accord, 'Open Data in a Big Data World', by four leading international science organisations: the International Council for Science (ICSU), The World Academy of Sciences (TWAS), the International Social Sciences Council (ISSC) and the InterAcademy Partnership (IAP).

The central message was clear: Africa, with South Africa in a leadership role, is a committed partner in applying science and technology to regional and global challenges.

'Our primary rationale for this conference resides in our conviction that science, technology and innovation can and must play a central role in achieving sustainable development', said Naledi Pandor, South Africa's Minister of Science and Technology. 'Africa cannot advance without investing in science', Pandor added in her opening address. 'At present, there are efforts to enhance the status of science and to increase investment in research development and innovation. Unfortunately, science is still at the margins of government attention, seen as less significant than water scarcity, food security and disease burdens. Yet all of these can be addressed through science.'

Nkosazana Dlamini-Zuma, Chairperson of the African Union Commission, underscored that message in her keynote address. 'Research in agriculture and related fields, such as geology and climate, is critical to Africa's health', Dlamini-Zuma said. 'We are about science', she asserted. 'We have to ensure that we improve our intra-African trade, global trade, governance, infrastructure and security, all of which require science.'

Another key to strong science in Africa: providing influential roles for women and young people. Dlamini-Zuma called young people 'our biggest assets'. And she added: 'None of this will go anywhere if women are not involved.... They are actually more than 50% of the population, so if you leave them out of your development agenda, how do you think we will compete with those who are using all their potential and talent?'

An African forum with global vision

Science Forum South Africa (http://www.sfsa.co.za) drew its inspiration from Japan's Science Agora and the EuroScience Open Forum, and all three were influenced by the American Association for the Advancement of Science (AAAS), which held its first science meeting in 1848. AAAS, EuroScience, the Japan Science and Technology Agency (which organises the Agora), and the Hungarian Academy of Sciences (organiser of the World Science Forum) were among the Forum partners.

In all, the Forum convened more than 1500 participants from 40 African nations, plus representatives from Asia, Europe, Latin America, North America and the South Pacific. There were four plenary sessions, 32 short seminars and 18 lectures. The forum, organised by South Africa's Department of Science and Technology (DST), was held at the Council for Scientific and Industrial Research (CSIR) Convention Centre.

The Academy of Science of South Africa (ASSAf) and South Africa's National Research Foundation (NRF) provided key support for the Forum. The African Union, ICSU, TWAS, the European Commission and the United Nations Organization for Education, Science and Culture (UNESCO) were among the organisations that sent high-level representatives.

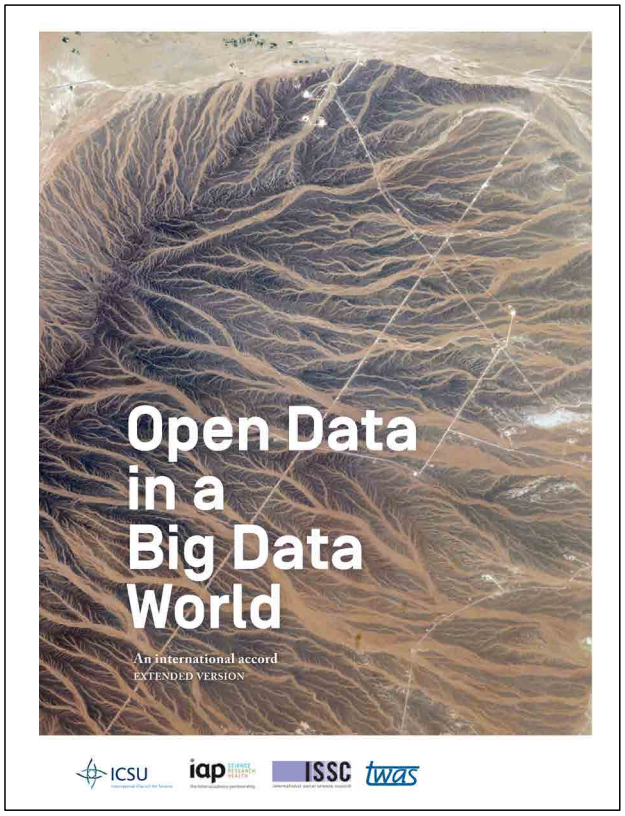
ICSU and TWAS each made significant contributions to the forum. ICSU President Gordon McBean and Executive Director Heide Hackmann each made comments at the opening ceremony; McBean later sat on a panel on climate change. TWAS Executive Director Romain Murenzi sat on panels focused on gender in science; education for science, technology, engineering and mathematics; and science advice to government. He then delivered closing remarks to thank the organisers, partners and participants.

'Open Data in a Big Data World'

With the open data accord, ICSU and TWAS expressed far-reaching ambitions, joined by ISSC and IAP. And it was clear at the Forum that they had strong allies at DST and among leading African scientists.

'As the data revolution accelerates and the scientific potential of big data becomes clearer, it is timely that the major representative bodies of international science promote the importance of open data,' said Geoffrey Boulton, President of CODATA, ICSU's Committee on Data, and leader of the working group that developed the accord. 'South Africa and other African nations have expressed support for the accord and the need to take full advantage of the transformative opportunities that are at hand.'

The accord, 'Open Data in a Big Data World', was the first project by the Science International partners. It now will be the focus of a year-long campaign to enlist endorsements and other support from science and policy bodies worldwide. It will also be the basis for a capacity-building initiative focused on Africa.



The open data accord can be retrieved at www.icsu.org/science-international/accord

The four organisations have come together on open data at a historic moment: the digital revolution has created an explosion in the data available for analysis by scientists, policymakers and others. Extremely large data sets, or 'big data', are the engine of this revolution, and they can be used to discern and analyse powerful patterns in areas ranging from security and biodiversity to genetic research and human behaviour.

But the privatisation of knowledge poses a risk to the traditional conduct of research, and particularly to research in developing nations, they say. If big data sets that are the basis of research are not open and available, then other scientists will not be able to review the research to evaluate its conclusions.

'Open Data in a Big Data World' identifies the opportunities and challenges of the data revolution as an overarching interest for global science policy. It proposes 12 principles to guide the practice of open data, focused on the roles played by scientists, publishers, libraries and other stakeholders, and on technical requirements for open data. It also assesses the 'boundaries of openness'.

'Open data should be the default position for publicly funded science', according to the accord. 'Exceptions should be limited to issues of privacy, safety, security and to commercial use in the public interest. Proposed exceptions should be justified on a case-by-case basis and not as blanket exclusions.'

A further concern is that, without open data, developing nations in Africa and worldwide will be excluded from a vitally important new era of technology-driven research.

'Open access to data will be essential if developing countries are to join in the benefits of the big data revolution', said Murenzi. 'If developing nations are left behind, if they are unable to make a full contribution to the global research enterprise, that will be costly not only for them and their people, but for all nations.'

A key element of Science International is a big data/open data capacity-mobilising initiative for Africa. That project, already underway, is being led by ICSU and CODATA in concert with partners in Africa and other areas. It proposes the establishment of an African Open Data Platform, which will coordinate actions with national science systems.

The Science International partners represent more than 250 national and regional science academies, scientific unions and other organisations worldwide, with individual members at the highest levels of scientific research, policy and education. Science International is conceived as a series of annual meetings that bring together leaders of the four organisations and experts from around the world to address a key science policy challenge.

'Africa is the future'

The open data accord contributed to the substantive accomplishment of Science Forum South Africa. But the success of the Forum also was evident in its spirit.

The discussions and presentations included top African scientists and policymakers describing their work to address challenges in health, food security, education and other fields. Women played prominent roles throughout the Forum, and young South Africans were well represented on stage; in between sessions, they talked with scientists and policymakers in crowded halls and corridors. And the proceedings were imbued with the ideals of Nelson Mandela, the visionary political leader who died just 2 years earlier.

This combination of expertise, energy and idealism gave the Forum a powerful spirit of confidence about the present and optimism about the future. And this spirit was conveyed in extensive news coverage of the Forum sessions and the open data initiative.

In her opening address, Minister Pandor urged participants to take energy from the Forum and use it to build African science in the months and years ahead. They should urge government leaders to invest in science, and devote time to building innovation ecosystems. They must work to attract more pioneering science projects such as the Square Kilometre Array radiotelescope, which bring benefits across nations and regions. Global science collaboration should be encouraged. Young scientists should be supported. And science, she said, must reach out to society and encourage people 'to value the potential for development intrinsic to science, technology and innovation'.

In the closing session, science leaders reflected on the Forum's positive energy, with their focus on the future.

The Forum, Pandor said, was 'an extremely important occasion for our ambitions for science, technology and innovation'.

In remarks thanking Pandor and South Africa, Murenzi called the event 'historic'. 'For the first time', he said, 'an African nation has staged an international science forum – and it truly has attracted global attention. We have explored some of the most far-reaching issues of our time... All of these initiatives touch directly on sustainable development. All of these issues have a direct bearing on the health and prosperity of Africa, and of every nation on earth.'

These views were echoed by Peggy Oti-Boateng, a UNESCO Senior Programme Specialist for Science and Technology. The success of the Forum 'indicates that Africa has come of age', she said. 'Africa is the future.'