GOVERNMENT'S VISION FOR ENVIRONMENTAL SCIENCE

Opening address by Derek Hanekom
Deputy Minister of Science and Technology
SAEON Summit: 27 March, 2006

Mr Johan Pauw: Chairman of the SAEON Summit and Head of SAEON;
Professor Albert van Jaarsveld: Chairman of the SAEON Advisory Board and Dean of Science, University of Stellenbosch;
Representatives from various participating government departments and their agencies, research organisations, industry, science councils and non-government organisations;
Distinguished Guests;
Ladies & Gentlemen

Pull-out quotes:

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“If society accepts sustainability as a goal, then it must develop economically and socially in a way that inspires and promotes innovative plans and actions to sustain life on Earth, while relying on science to contribute tools, technologies and information to promote sustainable development, as well as monitor the ecological footprint of development over space and time.”

I am very pleased to be associated with this first SAEON Summit, a landmark event on the Earth Observation and Environmental Science Calendar of South Africa. So often conferences come and go, stimulating scientific discourse but leaving behind only a collection of reports of scientific progress, and a few additions to the CVs of those who presented papers. I mention this, not to belittle these building blocks of the science system, but to highlight the need for science, when the time is ripe for it, to consider the meaning of scientific progress for humankind and to raise science to the next level, as is being done here today under the theme: *Harnessing Environmental Observations for Science and Society.*

Why then is the time ripe for us to consider the meaning of progress in Earth and Environmental Observation? Firstly, we already have a rich base of information. Through the foresight and persistence of individuals and organisations, we have managed to establish important long-term datasets of environmental variables, some already spanning many decades. Some of these, such as weather and climate observations, were indeed established for the benefit of society. Others, such as the “burn plots” of the Kruger National Park were established to inform decision making in the management of the Park. However, various observation programmes, such as on Marion Island, were kept purely to advance ecosystem understanding.

Due to technological advances in Information and Communication Technology, we are now able to work with large, distributed and diverse datasets in order to analyse those for correlated trends and to synthesize the results so that our understanding of the complexity of the Earth's systems, and how these are changing over time and space, may be better informed, and so that we might be able to prepare to absorb or mitigate any harmful changes. The time is therefore ripe to take stock of what long-term datasets we have, what we can learn from them, what we are missing and what we should do to fill those gaps, if not during our own lifetimes, then at least for future generations.

Secondly, the equipment, instrumentation and methodologies for Earth and Environmental Observation have seen dramatic advances, so much so that we are today able to continuously measure even unseen and unimaginable details, either by direct observations or by indirect and space-based technologies. This is matched by advances in computation that allows for data mining and modelling of complex systems. The time is therefore ripe to establish comprehensive and coordinated observation systems operating at different scales of intensity and coverage, from Sensorwebs to satellite images, and to deliver useful and reliable information derived from those systems.

Thirdly, science is a cultural dimension of society, and can therefore not escape from societal change such as what we have so dramatically experienced in South Africa. The democratisation of South Africa is a particularly strong driving force in science at large, but very specifically also in Environmental Science. Issues of transformation such as environmental justice, capacity development, racial and gender representativity, transparency, accountability, sustainable development and research ethics have become non-negotiable agenda items for Environmental Science.

Culturally we are experiencing fast growing environmental and science awareness in our society, and this has lent greater support for Environmental

Science, but has also led to greater expectations of it. Once perceived common wisdoms of science are currently being challenged. A good example of this is the elephant management debate, and generally development and environmental management are subject to sound scientific justification and scrutiny, as exemplified by the exponential growth of the Environmental Impact Assessment industry.

Global developments such as the Internet, environmental conventions, globalisation and global change are dramatically shaping our priorities and changing the culture of science, specifically with regard to collaboration and data sharing. It has become suicidal for an individual, an organisation or a country, to resist joint research projects or to restrict access to important datasets and information - this would have serious negative consequences for its scientific, environmental and economic competitiveness in the global arena.

The time is therefore ripe for Environmental Science to rise to the challenge of demonstrating its relevance to society, by maximising the considerable historical and ongoing, but widely distributed government investment in environmental observation systems, and by rapidly transforming its culture into one of all-round openness.

Mr Chairman, Ladies and Gentlemen, we believe that the correctness of our decision in 2002 to take the leading investment role in the development of SAEON, as proposed jointly by the research community and several government departments, has been confirmed by the consistent growth of SAEON and the ongoing support that it is receiving from all its stakeholders and participants.

SAEON is unique in its composition as a network organisation, standing squarely in the middle of the Earth Observation arena and functioning as an agent of government at large. Its neutral position among all the participants and stakeholders is key to its continued growth and success. It is therefore important

for us to note that it would be fatal for us, on the one hand, to attempt to exert undue political control over SAEON, or, at the other extreme, for SAEON to attempt to become an environmental activist. Its credibility and usefulness as a provider of reliable data will be questioned and its participants will be antagonized, resulting in withdrawal and collapse of the SAEON system. It is also important for us to note that SAEON does not dictate an agenda to the rest of South Africa, but that it obtains its frameworks jointly from science and society, with government representing the latter on the organisational structure of SAEON.

The pursuit of these frameworks, the focus around the SAEON nodes, and the collaborative work required for the delivery of information based on SAEON data, will automatically lead to voluntary coordination and congruence of our national environmental observation effort, reducing unnecessary effort and filling the gaps that are caused by the current fragmented approach. The longer term outcome will surely be to raise our current environmental science effort to higher levels of excellence, relevance and cost-effectiveness.

This brings me to the broader role of the Department of Science and Technology within the South African Government. Our role is to ensure the application of science and technology to advance growth and development in a sustainable manner. We are well aware of our unique status on the continent as a stand-alone department, but clearly we cannot fulfil our mandate without engagement of other role players, both within and outside of government, as well as internationally.

We participate in various interdepartmental fora, some with direct bearing on Environmental Science such as the Committee for Environmental Coordination, the Climate Change Committee and others. Apart from participating on boards of a number of science councils, it is our responsibility to take the lead in and to support the establishment of scientific infrastructure and new directions, of which

SAEON is an excellent example. Some other examples are the Southern African Large Telescope, the Square Kilometer Array, various Centres of Excellence, the South African Biodiversity Information Facility and the South African National Antarctic Programme. The latter two examples are of collaborative efforts with the Department of Environmental Affairs and Tourism and its South African National Biodiversity Institute.

A very recent example is the draft South African Earth Observation Strategy, which is being developed in consultation with numerous stakeholders. This followed on the leading role that the DST played in the establishment of the Group on Earth Observation, an intergovernmental initiative that has started a 10-year Implementation Plan for a Global Earth Observation System of Systems.

The Department of Science and Technology takes its priorities from two insightful documents, namely the 1996 Science and Technology White Paper and the 2002 Research and Development Strategy. Of particular relevance for the SAEON Summit is that the White Paper commits us to "*work towards environmental sustainability*", and it identifies Bio-Resources, Earth Observation and the Southern Ocean as investment and growth opportunities for South African science, based on strategic advantages.

The emphasis on Sustainable Development is pervasive in Government policies, and is of course high on the global agenda. It is often criticised because it means different things to different people. However, the flexibility of the term is useful as it provides a framework that can be applied at different scales: global, national, regional or local, and in different contexts and places. Most people would agree that the underlying principles and goals that a sustainability agenda seeks to address, are clear and well established. If society accepts sustainability as a goal, then it must develop economically and socially in a way that inspires and promotes innovative plans and actions to sustain life on Earth, while relying on science to contribute tools, technologies and information to promote sustainable

development, and to monitor the impact of development on our ecosystems over space and time.

Given the broad definition of sustainable development coupled with the persistent divide among the natural and social sciences, it is clear that the boundaries of science need to be explored and challenged to meet the goals of the sustainability agenda. Natural scientists may be tempted to interpret the world as being made up of sets of ordered phenomena that are related primarily by cause and effect regulations, operating independently of human activity or thought. This limits the objects of study to the empirical and the observable, excludes any normative information from the research, and in doing so reduces the likelihood of a holistic understanding of the phenomenon or problem being obtained. This understanding led Suzuki in 1989 to lament that

“ … no results from science are neutral, objective and representative; the very act of observing nature changes it, because in order to see it, we have to control it; thus we can never know nature as it really is".

Some of us may find these sentiments rather harsh, but they do point to the need for social sciences contributions to design, contextualise and assist the interpretation of sustainability studies. The need for integrative observations and research is further motivated by Morgan, *et al.,* who in 1993 argued that:

"We cannot regard environmental issues simply as scientific or technical problems; they almost always have political and economic roots".

It should therefore be clear that for a large number of government priorities, such as climate change, food security, population health, land reform, economic development, waste and pollution management, energy supply and environmental security, where there is a significant reliance on Environmental Science to charter guidelines for sustainable development, our vision includes

the integration of natural and social sciences in ways that will be appropriate for developing comprehensive and durable policies and strategies. A concerted effort to break down the barriers for this to happen will be required. It is therefore gratifying to note that such discourse will be attended to during the course of the SAEON Summit, and is already integral to SAEON's frameworks.

Mr Chairman, Ladies and Gentlemen, my department and I are confident that the SAEON Summit will proceed well and will meet its objectives of establishing a baseline understanding of the status of our observation systems. It should also result in a process of conceptualising the way forward, for the benefit of both science and society.

It therefore gives me great pleasure to declare the first SAEON Summit open.