

PROCEEDINGS ON NACI / WRC WATER AND SANITATION ADVISORY DIALOGUE:

Summary Report



science
& technology

Department:
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REPUBLIC OF SOUTH AFRICA



NATIONAL ADVISORY COUNCIL ON INNOVATION

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1. Background and Objectives

On 28 July 2015, the National Advisory Council on Innovation (NACI) and the Water Research Commission (WRC) jointly hosted the Water and Sanitation Advisory Dialogue. The workshop was intended to explore the role of water and sanitation within the broader national system of innovation (NSI), the challenges and opportunities for further investment, and the resource and partnership model needed to enable such growth.

The objective of the dialogue was to seek strategic inputs to a draft water and sanitation Advice Paper developed on request by the Minister of Science and Technology as part of a series of Rapid Science, Technology and Innovation (STI) Advice to be delivered by NACI during 2015/16 financial year. The dialogue was expected to be interactive in design to allow for the interrogation of current research and the identification of new research needed to better inform policy decisions and actions on how incentives can be improved and capabilities strengthened.

2. Setting the Scene for Discussion

Three presentations; introductory remarks, keynote address and the water and sanitation Advice Paper, set the scene for the workshop. Presentations raised a number of important water and sanitation issues that warranted attention and those were as follows:

- Knowledge and expertise to help unpack water and sanitation challenges (including underlying constraints) and propose practical interventions
- Relevant stakeholders to work together to contribute to 9-Point Plan on water and sanitation and beyond so as to facilitate realisation of water and sanitation targets of the National Development Plan
- Water scarcity, supply, quality, quantity, and complications thereof.
- Consideration of local and international efforts (initiatives) on water and sanitation
- Consideration of an enabling environment and the role of cross-cutting science and technology (S&T) in resolving existing water scarcity to ensure effective use of water
- Paying attention to trade-offs between water and other sectors such as mining, food, energy and agriculture i.e. using water for economic services or consumption. This interplay complexity should be understood
- Role of the NSI players in water and sanitation to assess if they make maximum contributions to the discussion or if innovation is fit for the purpose i.e. maximising returns from innovation for different issues
- Effectiveness of the country in terms of developing, deploying and re-deploying relevant water and sanitation technologies and in terms of the right players and institutions
- Mechanisms to grow R&D i.e. tax incentives, venture capital funding and investment in water research
- Efforts for publications in water and sanitation
- Water and sanitation technologies to tackle the challenge of sustainable livelihoods

3. Discussion Points

This discussion is premised on aspects covered in Section 2 above. Participants raised and discussed several water and sanitation issues as outlined below.

EVIDENCE-BASED SCIENCE DATA

It is important to look at the benefits of better use of water, but not only for economic benefits as the social and environmental benefits also need attention. All around the world the 'growth at any cost' approach has not worked. Society has not yet felt the consequences of a water shortage and that is probably why it is not being discussed. Hopefully we can have the discussion before we feel the consequences. The trade-offs between water consumption and mining and water consumption and agriculture are noted, as are the benefits of water use with power generation being a big consumer in South Africa. Even coal plants and the new power plants that use new technology use a considerable amount of water. However, renewable alternatives have low water consumption; so we must also look at power generation. In terms of evidence-based points made, there is a need to use science to ensure we know and do not assume. There are scientific methods available to forecast water usage in the country and we need to take a step back and obtain the information needed to make predictions, using base information that will ensure we know where we stand so that we know where we need to get to. We need information and it is out there, but is there a co-ordinated effort to create databases that scientists can use to provide the evidence to devise evidence-based policies and strategies? Fortunately, the discussion has revealed that there is data already available. There are also huge opportunities arising out of new technologies that make it cost effective to collect a range of data, but there is no concerted campaign as yet e.g. use of a combination concept is required. It remains a public investment to ensure there is a minimum amount of data e.g. inflation data, which is an investment the state must make. We need to be able to exploit any available information as much as possible. However, there is a problem with institutions that guard their data despite there being a clear policy framework on how to create win-win partnerships with institutions taking a long-term view and considering how to work with companies and collect data, etc.

SUPPORT FOR WATER AND SANITATION OUTPUTS

An initiative that places emphasis on innovation in the field of water research and development is commendable. In Sweden, the government is allergic to having public money supporting ongoing initiatives and in order to obtain state money, the research and innovation must place emphasis on the exit strategy e.g. a ten-year programme for water management should have an exit strategy that leads to a private company being formed. Then you do not need an ongoing effort by universities (as efforts are not being taken up) when private companies are involved. Perhaps the institutional framework is even more important than specific topics and issues for research. To address this challenge, a tougher stance is required regarding outputs from public finance, with a clear exit strategy required and the barriers between different players being considered. Triple-Es may work better, but how to measure connections may need to be explored further. A roadmap and processes would prove useful in terms of areas to focus on, and that the roadmap defines seven areas that bring people together. It also allows for a stock-take or audit of what exists and we can then look at ways to exploit that intelligence and ensure more interaction between different players.

TAX INCENTIVES

Mining has created a water department on R&D, which is busy with ensuring the tax incentives for research, but is struggling to explain what differentiates the research being done there and elsewhere. There may be specific technology available, but the evaluation of the technology and resources needed are problematic, as there are five different types of water. There may be a problem with having to say what is new and what is to be patented, as the specific technology required for that particular water source may be unknown. The projects to be undertaken in this regard have been submitted

and the second round of clarification is under way i.e. to address the question about why is the work new or why should it be classified as R&D? A meeting has been set up with SARS and Finance to discuss tax incentives in order to ensure incentives are clearly defined to indicate when evaluation of basic research may not constitute R&D for tax incentives.

A PUSH FOR WATER RDI ROADMAP

The framework for water and sanitation is useful to consider a balanced portfolio, but one area of concern is the minimal funding. A push for a water RDI Roadmap has potential to indicate where we need to be lending more strongly. It is hoped that this will be able to coordinate all the other little systems happening all over.

WATER AND SANITATION R&D FUNDING

The statistics on government and private funding show a stark opposite of what is seen in Singapore. There is therefore a need to establish factors that are hindering greater R&D funding from the private sector.

ENCOURAGING PUBLIC-PRIVATE PARTNERSHIPS TO DEAL WITH WATER AND SANITATION

It appears to be difficult to go from the university level to the industrial scale. There is a view that if something is funded in the public sector why it should not go to the private sector. This behaviour is also seen around the world with the universities. It must be acknowledged that the public sector is not prepared to pay people to do the R&D and the 'competition' approach is not applied to some problems we are facing where this could work well e.g. stopping toilets from leaking. This type of innovative approach is not seen in South Africa. To address this challenge there is a need to change attitudes in order for the public and private sectors to work together.

PUBLIC INSTRUMENTS TO FORM CLUSTERS FOR WATER AND SANITATION

An interesting issue is how clusters developed around universities, as none of these happened on the back of public policy – they happened in either public or private sectors only after recognising an opportunity and then putting resources together e.g. the total contribution of Oxford (from the public sector) was a tax holiday. In South Africa we need new public instruments that will facilitate such approaches. We need to ask: What will incentivise these partnerships in a different way, so that work can begin?

WATER SCARCITY ISSUES

In South Africa we lack root analysis regarding water scarcity and how to brace ourselves for the future. We need to know whether water scarcity is a national issue; geo-political issue; or a matter of a smart water system. Then we need to deal with standardisation and what must be changed in the water and sanitation sector.

AN APPROACH FOR WATER AND SANITATION

Sometimes the issue is not availability of water and sanitation systems e.g. in water and sanitation there are a lot of technologies. So, why use a different approach between water and the energy sector? Is it because the challenges of the energy sector are so 'in your face'?

PROCUREMENT FOR LATEST WATER AND SANITATION INNOVATIONS

Mining deals with the issue of acid mine drainage and public money is being spent on innovation and it may be a matter of how to remove disincentives, rather than how to provide incentives. The experience is that we keep banging our heads against the disincentives and people eventually simply invest elsewhere. It is not easy to bring innovation to a municipality as, when it comes to Supply Chain Management, the lowest price rules, regardless of evidence-based work or innovation. As only the lowest cost item will win, you will keep getting the oldest and cheapest technologies / innovations. Then there is the issue of so many gatekeepers along the way with a pilot project to show what can be done, that it becomes very difficult to see any pilot project emerging from the layers and layers of gatekeepers that have to be fought. There are a number of important matters to reflect on. It is important to look at the systems and barriers in the water and sanitation sector and consider if so many barriers have been created that we have 'lost the prize.' Performance and expenditure reviews are needed e.g. an interesting programme the USA put in place through the SIPR programme. This did not involve new funding, but a new concept in putting out a challenge through the public procurement process with a small company focus and grants provided in stages. Because of the vigour in the process, it was not just about price, but about the way of validating local technologies. Lobbying is being done to adopt this approach for water and infrastructure spending, as there are many figures with no content in terms of infrastructure spending. If we frame an innovation argument around this matter, it will provide an opportunity to go to Treasury to request that it sets aside 3% of what we can spend as we think that innovation can make a difference. This suggested that our spending needs to be much more targeted, as per the example of Defence, which went to market with a request for specific items for the Mars Rover. This had a big focus on small high-tech businesses, which means we also need to think about the instruments used. Right now there are many construction projects, but these are not being used to shape innovation.

4. Priority Areas and Enabling Mechanisms

Participants were split into two groups and requested to focus on priority areas for knowledge generation in water and sanitation and the enabling mechanisms thereof. As briefly outlined below, group discussions yielded many mechanisms on how to deal with various water and sanitation issues.

Inclusive approach to water and sanitation challenges – There is a need for a systems approach, instead of piecemeal-type action and to think through the implications of everything in order to get to a complete solution.

Scouting for readily available innovations - Look at harvesting other innovations. We are not alone – the rest of the world is looking at water and sanitation innovation and we would be silly to re-develop everything ourselves. So there must be a strategy to harvest innovation and a technical acquisition strategy to bring people, systems and innovation to the country.

Understanding barriers that stifle innovation - What are the barriers to innovation? Why can't we move ahead with new things? Are municipalities putting up additional barriers on top of national governments and, if so, how can we move ahead? Consider EIA and procurement that is stifling innovation. Also consider processes and procurement as barriers that are stifling innovation i.e. when someone offers something different, procurement considers it to be unacceptable. The private sector must do what it is told otherwise innovation cannot move from the laboratory and be up-scaled, as government processes are anti-innovation.

Establishment of joint ventures by stakeholders - What is the possibility for municipal and public joint ventures in water systems handling – the mining sector is very aware of and is also monitoring their balances. Are Rand Water and municipalities having a joint venture, and what is the potential for joint venture there?

Cost for scaling up innovations - Manage the cost of taking innovation to the demonstration and scale or use phase. In South Africa, we undermine this, as it costs a user to take up new innovation. Bring this aspect to the fore, so that it is part of the system, i.e. when innovation is produced, resources must fund it e.g. DTI and NRF partnerships that bring together innovators and the sector. Do this with the water sector, in order to fast-track some useful innovations. Also look at the lack of funding to upscale innovations to the required level.

Well positioned institution for knowledge generation in water and sanitation – There is a need to think about a water technology institute that can capture and package information / frame information in a way that it can be used by policy makers.

Centre of excellence - There is also a need to think about a centre of excellence, placement programmes for qualified students, as some cannot get jobs, but talk about the lack of skills and the mismatch between the skills needed and the skills produced – and consequently South Africa continues getting skills from outside the country.

Alignment of technologies / innovations with contexts - We need to think about deploying the right technology, as that used in urban areas may be inappropriate for implementation in rural areas, i.e. fit for purpose.

Documentation of water and sanitation technologies - As a country, we should be able to document our home-grown technologies. e.g. CSIR's recording system. This must be documented so that up-scaling can happen – otherwise we will look for solutions elsewhere, when they are on our doorstep.

Information on water scarcity - Water scarcity is an issue and how much information does the municipality have on this and what is the lack of knowledge regarding industrial water usage, for purposes of billing at industrial level, as some types of industrial level water are safe to drink while others are not. Access to knowledge will allow appropriate billing. So look at how industry and households are using water and incentivise consumer behaviour.

Infrastructure - Look at infrastructure expansion, maintenance and funding to support consumer behaviour.

Appropriate communication to avert ambiguity - Lack of appropriate communication may be an issue. We often assume that others understand what we are saying, but in reality they do not. The Minister may not be a water expert and may not understand the concept of megalitres per day. So be careful when writing papers, even if we are repeating ourselves, this may be necessary, as people may not have understood us previously. If we adopt a different approach in our writing, perhaps we will ensure a different response.



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