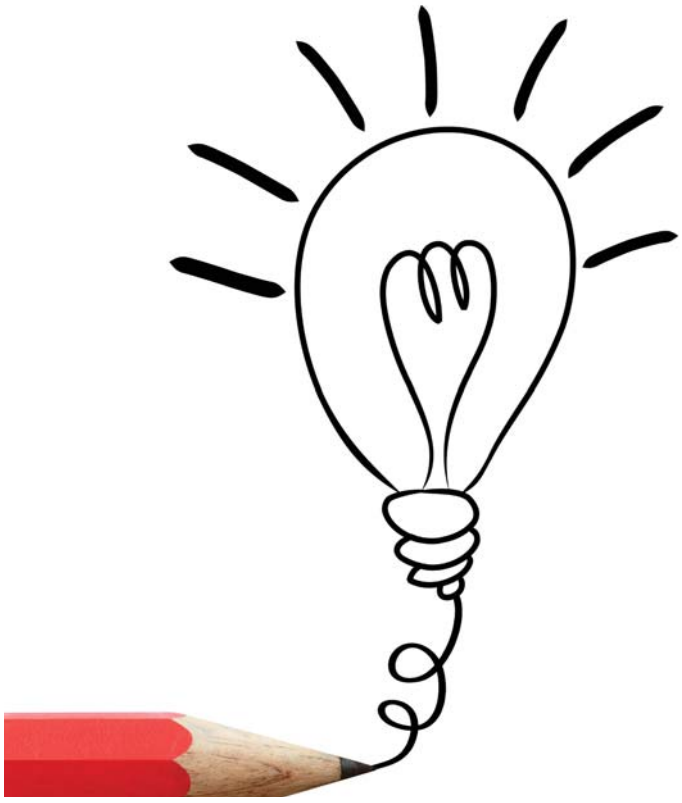
RESEARCH AND DEVELOPMENT

Financing opportunities and models for water-linked research, development and innovation



The ongoing drought in the Cape provinces throws into stark relief the reality that access to, management and optimisation of water will become increasingly challenging for South Africa for years to come. This reality reiterates the findings of the last three World Economic Forum's Global Risk Reports, which have identified water among the top three most important challenges worldwide. Research, Development and Innovation (RDI) is pivotal in optimally dealing with these challenges. So writes Rajiv Paladh, Kevin Foster and Chantal Ramcharan-Kotze.

In 2015, the Department of Science and Technology (DST), the Department of Water and Sanitation (DWS) and the Water Research Commission (WRC) produced the National Water RDI Roadmap. The Roadmap presents a vision for South Africa to be a leading middle-income country in the development and deployment of water management practices and technologies. It seeks to ensure that South Africa competes with leading countries in providing sustainable water sector solutions. However, the investment and financial resource alignment required to ensure that the recommendations of the Roadmap are implemented are estimated at R8 billion between 2015 and 2025.

This investment will require funding well beyond traditional funding sources. The WRC has embarked on an exercise to identify the potential sources of funding for the R8 billion investment to support the water sector in achieving its mandate. Potential funders across the traditional public sector as well as private funding sources were approached and engaged on the areas of the Roadmap that they would have an appetite to partner on or fund. Funding sources that have been identified for each thematic RDI focus area of the Water RDI Roadmap, and their potential to fund are depicted on the funding map, on the right.

Funding for research related to water and sanitation activities

Significant research and development has been, and continues to be, undertaken within the South African water sector. A significant proportion of this has been funded by the WRC, DST, academic institutions and international donors, who all remain important sources for funding. Industry has also

Table 1: Investment areas identified by the Water RDI Roadmap

RDI Focus Area	Definition
Research	Research related to water and sanitation services.
Advisory units for practitioners	Advisory units for practitioners in the water and sanitation sector (e.g. a professional services centre and knowledge brokering).
Demonstration of technology	Demonstrations of technology to decrease investors' risk in the water and sanitation sector.
Knowledge development	Skills and training for managers and practitioners in the water and sanitation sector.
SMME and enterprise development	Enterprise development and the inclusion and development of Small, Medium and Micro Enterprises (WRC SMME Development Programme).
City scale projects and programmes	Projects that could be rolled out at a city or small settlement scale (e.g. RESILIM, USAID). These could include supply side interventions, such as new infrastructure, or demand side, such as an area-based water stewardship programme.
Infrastructure	Infrastructure projects in the water and sanitation sector.

Funding Map

Potential Funding Source	Research	Advisory units for practitioners	Demonstration of technology	Skills development and training	SMME and enterprise development	City scale projects and programmes	Infrastructure
National Government Institutions							
Local Government Institutions							
State Owned Entities (National							
Development Agencies							
Philanthropic Organisations							
Business							
Private Equity & Venture Capital							
Commercial and Investment Banks							

Strong potential funding source
Possible potential funding source
Unlikely funding source
No data

been a significant funder of applied research, driven by the need for market demands and efficiency and optimisation in operations. Industry's willingness to fund research, will largely be driven by the expected return and commercial potential. All these institutions are vital for ongoing funding and ongoing collaboration in respect of research activities, and have indicated the appetite for doing so.

Local government is also able to fund and provide resources and facilities which could be utilised for research and test beds where it serves to address their specific challenges. Institutions that represent interests of collective groups could also provide funding and partnerships for research. These institutions are particularly interested in interventions related to challenges faced by their members.

Funding for advisory units for practitioners

There is an opportunity to establish advisory units with the requisite capacity to address some of the common challenges facing the water sector. The South African water sector constitutes a varied and diverse institutional landscape. Some of the challenges experienced are unique to certain areas whilst others are common across the water sector. Where common challenges are experienced there is scope for advisory units to be established to assist and share experiences widely with water sector institutions. Where unique challenges are experienced, expertise can be deployed to find solutions to these.

Advisory capabilities exist within certain public sector institutions, such as the Government Technical Advisory Centre. There is potential to create additional advisory units, and draw on existing ones, through funding from the national fiscus. This should be done in the context that any investment in the advisory units could lead to savings in for example, deferred capital expenditure and/or improved operational efficiency.

Funding for demonstration of technology

Emerging technologies in institutions in the water sector face a difficult path to market. These vary from small technologies targeted at individual consumers to large-scale components of infrastructure. There is a need to demonstrate or exhibit these technologies to provide practitioners, consumers and

decision makers with the assurance that they can be reliably implemented. For investors, there is a need to demonstrate that a viable market exists to justify investments in the technology.

Funds for relatively early stage technology demonstration projects will need to be sourced from public sector institutions and, possibly, philanthropic organisations who fund these types of projects. However, water boards and local government partners can and have provided funding for the demonstration of new technologies that enhance service delivery. Development Finance Institutions may also be in a position to provide funding for large scale technology demonstration projects linked to national priorities, infrastructure and socio-economic development.

Funding for skills development and training

Skills development plays an important role in water sector RDI, with the ability to adapt to and implement new solutions, be they technical, managerial or operational innovations. Implementation of South Africa's innovation plans and policies has proven to be a challenge. A lack of experience and capacity has been identified as one of the primary reasons for the failure to manage, adapt and transform the water sector. Thus, specific training in innovation and the upskilling and education of practitioners at all levels of the water value chain will contribute to embracing the uptake of research and innovation in South Africa and result in improved delivery of services and enhanced security.

Most institutions in the water value chain have budgets allocated towards the training and development of their staff. However, these are not always effectively deployed in areas of skills need. These funds can be accessed for appropriate training and development programmes, and collaboration between all stakeholders will also serve to identify and enhance existing training programmes and develop new ones. The potential exists to develop programmes specific to the water sector that are targeted at senior management or leadership level local government and municipal officials, where the curriculum specifically focusses on innovation. This will better equip key functions to develop key competencies in innovation and adaptive management of solutions focused on dealing with the unique challenges within the water sector.

Funding for SMME and enterprise development

Private sector SMMEs are ideally positioned to offer numerous services and innovations to the water sector. These can enhance the delivery of water services and at the same time promote innovation, economic growth and job creation in South Africa. Emerging entrepreneurs will often require financial, laboratory to market bridging and managerial or leadership support to establish a sustainable enterprise to deliver their services and innovation to the water sector market.

There are several funding sources available for established enterprises with a demonstrable track record, such as commercial and investment banks. However, funding and support for relatively early stage enterprises is not as readily accessible. An opportunity exists to direct the finance from existing funders to SMMEs in the water sector by matching the right entrepreneurs with them. Private equity, in particular impact investors, are an increasingly valuable source of funding and expertise for small enterprises producing goods and services with social impact. There is also the potential to attract funding that organisations are required to spend on enterprise and supplier development as part of the Broad-Based Black Economic Empowerment Act (Act No. 53 of 2003).

Funding for city scale projects and programmes

South African cities are operating within a complex environment that is characterised by uncertainty due to high levels of inward migration, as well as external challenges such as climate change. These challenges can threaten water security. Thus, it is important to innovate to develop projects and programmes at a city scale (city, suburban or small settlement pilot projects) that could contribute to enhanced water security.

Funding opportunities exist via international multilateral partners that are focussed on climate change initiatives, such as the 100 Resilient Cities initiative and the Renewable Energy and Energy Efficiency Partnership (REEEP). Some Metropolitan municipalities also have established partnerships that could be used to access additional funding.

Additional findings

In addition to the funding opportunities that have been identified for the key thematic areas, a programmatic approach needs to be developed to ensure effective implementation of the RDI Roadmap.

The benefits of a programmatic approach include the pooling of relevant skills and resources for project planning and design, structuring and funding, project execution, operation and management. If implemented effectively, a programmatic approach can result in the delivery of multiple projects or projects covering a large area economically (economies of scale). It could provide an enabling platform for learning and transfer of skills to under-resourced project participants, promote cooperation between multiple stakeholders, address bureaucracy (which often impedes project development), and enable gathering intelligence for future advantage.

There is a compelling argument to develop a fund focused on a specific area within the water sector to address identified funding gaps or to release funding to other areas in the water value chain. This fund could be structured based on specific objectives and potentially pool financial and human resources from several contributing institutions to integrate know-how, align support and create the pipeline required in South Africa. Public private partnerships (PPPs) also present a viable option to unlock private sector funding to complement public sector infrastructure development in the water sector. These need to be targeted at strategic projects because PPPs are usually implemented over an extended period, can be complex to structure and execute, and often have high transactional costs. The form and substance of PPPs as they are currently structured by Treasury may not fit the needs of the water sector in all instances, requiring a review of PPPs for a water secure future.