

The Water Crisis: How can the RDI Community Respond?



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**science
& technology**

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



Water in SA

Creamer Review of water sector 2014

Published by:
RESEARCH CHANNEL
AFRICA

Presented by:
Powertech

WATER

A review of South Africa's water sector
December 2014



- April 2014
 - DWS notes critical scarce skills shortage
- September 2014
 - 3-week water shortage in parts of Gauteng – worst crisis in 110 years
- September 2014
 - Minister of DWS states that 103 mines are operating without WULs

Creamer Review of water sector 2014 - continued

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RESEARCH CHANNEL
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WATER

A review of South Africa's water sector
December 2014



- Mismanagement of water also an environmental concern
- Environment and ecosystems reliant on correctly managed water resources
- Northern KZN experiencing drought
 - Spreading southwards
 - Dam levels decreasing – Durban under threat



Policy Space

Government Strategic Plans

National Development Plan

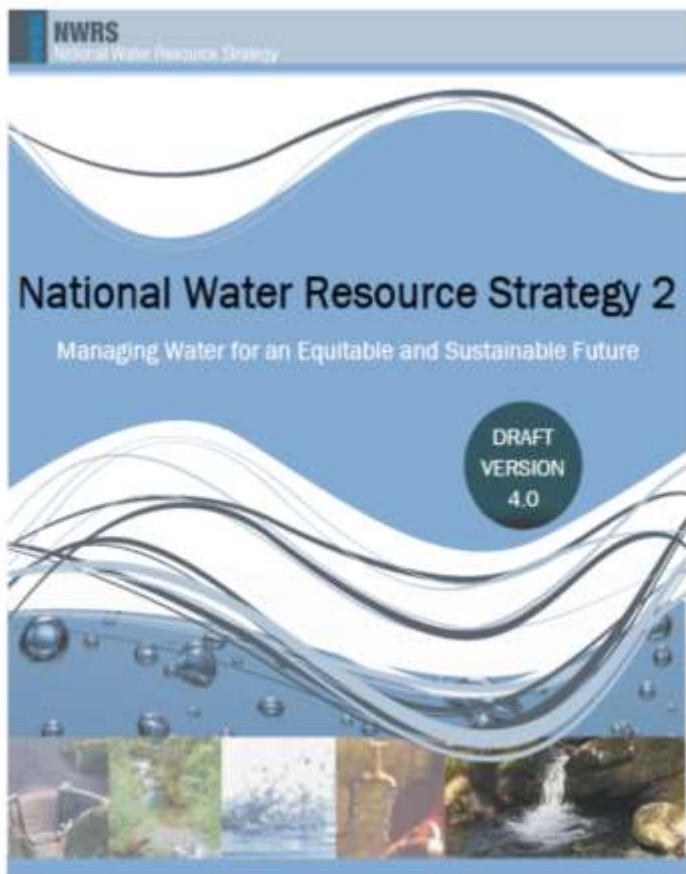
Vision for 2030

Factors to realise Vision 2030:

- Requires sufficient water resources
- Water must provide for growth and development
- Water scarcity threatens energy production, food security, economic growth & quality of life

Water is central to achieving Vision 2030

Government Strategic Plans



Priority Focus areas:

1. Achieving Equity and Water Allocation Reform
2. Water Conservation and Demand management
3. Institutional establishment and governance
4. Compliance monitoring and enforcement
5. Planning, infrastructure development and O&M

Government Strategic Plans

South Africa's Water Research, Development, and Innovation (RDI) Roadmap: 2015-2025

Water Research Commission
Department of Science and Technology
Department of Water and Sanitation

WRC Report No. 2305/1/15
ISBN 978-1-4312-0683-4

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Science and Technology
Water and Sanitation



- By 2030 the water demand will exceed supply by 17% based on
 - Population growth
 - Economic growth projections
 - Scarcity of resource
 - Current use and efficiency levels

Strategically directing water RDI in support of impact

Problem — Means — How —> Opportunities

Problem Statement:

- 98% of all water resources already allocated
- Non-revenue water is 36% on average ~R7 billion / yr
- By 2030 demand will outstrip supply by 17%

Human Capital Development (HCD)
(Skills)

Research and Development (R&D)
(Evidence)

Innovation (technological and non-technological)
(Technology)

Use of sources

Govern, plan & manage

Supply infrastructure

Operational performance

Govern, plan & manage

Efficiency

Monitoring and collection

Increase ability to make use of more sources of water, including alternatives.

Improve governance, planning and management of supply and delivery.

Improve adequacy of performance of supply infrastructure.

Run water as a financially sustainable business by improving operational performance.

Improve governance, planning and management of demand and use.

Reduce losses and increase efficiency of productive use.

Improve performance of pricing, monitoring, metering, billing and collection.

Opportunities:

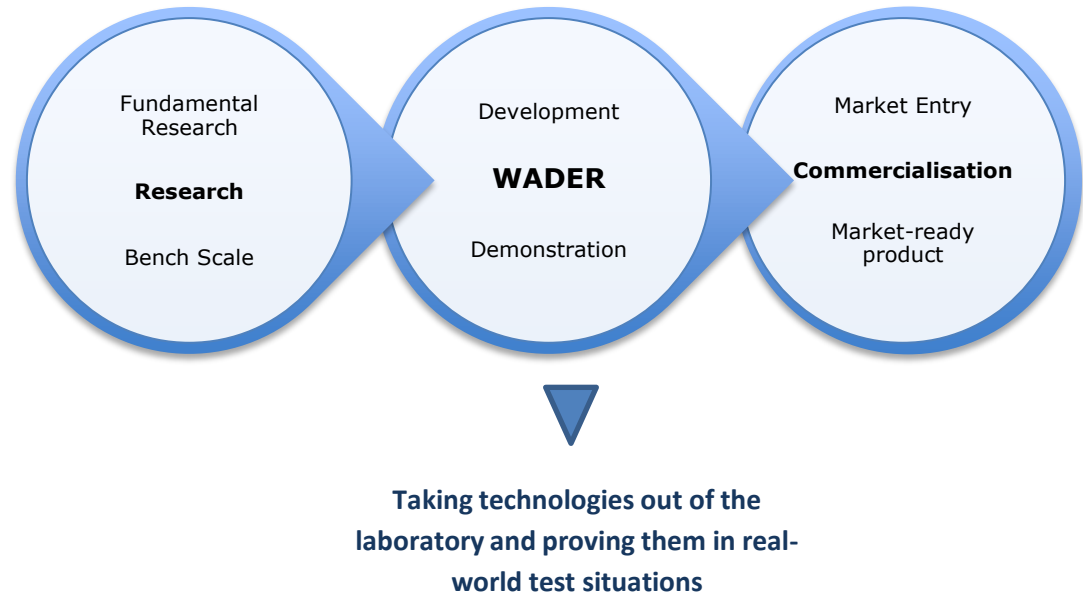
- Better coordination and improved decision making supported by the translation of research into practise
- More products and services to reach the market through a better coordinated water innovation pipeline
- National savings through targeted RDI investments (e.g. By reducing water losses to 15%, through innovation interventions, an approximate R3.5 bil would become available for investment in other needs/areas)



Driving technological innovation

Innovation broker

- Pull together the research and commercialisation stages of the water innovation continuum.
- Demonstrate water technologies in operational environments (piloted at scale).
- Assess the performance, validity, impact (social, environmental, etc.) and suitability of the technology.
- Build multi-sectoral and cross-disciplinary partnerships in support of technology demonstrators.
- Disseminate information widely to promote technology adoption, investment, and user-confidence as well as communicate gaps in research, etc.
- Promote and support water entrepreneurship and relevant skills development in the water technologies space.





Returns and Investment

Returns: Anticipated RDD Outputs, by Objective and Indicator

Objectives	Key Performance Indicator	RDD Outputs*	Explanatory notes
Technology Development	Products and services to market	2	Successful breakthrough technologies
	Technology packages	11	New technols. successfully developed / deployed
	Prototypes	32	Brand new technols. developed
Knowledge Generation	Registered full patents	80	New, full patents
	Provisional patents / applications	220	Provisional pct applications
	Publications	1940	Peer-reviewed
		Water SET - related HCD	<i>In addition to current national HCD numbers, which are:</i>
Human Capital Development	Post doctoral researchers	220	425
	Doctorates	540	1274
	Masters	800	7516

Assumptions in respect of investment in Human Capital Development and Knowledge Generation are derived from prior domain experience in South Africa. Anticipated conversion rates in technology development are consistent with international benchmarks in the translation of science to end-use technology. The investment per patent application refers to the level of investment in R&D activity that typically results in one patent application, and not to the cost of patent application fees and management.



Concluding remarks

- Mix of sources critical in a water scarce world
- Increasing urbanisation requiring more energy and food impacts already strained water resource
- Without good science, bad decisions are made which further impact the resource
- Good science, leading to good decisions and correct deployment of technological and non-technological innovation will lead to a water-secure country



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