



INTRODUCTION



DHESIGEN NAIDOO | CEO

INTRODUCTION

INVESTING IN THE CREATION AND SHARING OF WATER-CENTRED KNOWLEDGE

During 2012/13, the WRC fulfilled its mandate to contribute positively to South Africa's ability to address its water challenges through research and development solutions. The WRC supported the sector with research products aimed at informed decision-making, improving monitoring and assessment tools, and making available a range of new and improved technologies related to water resource management, improved use of water in agriculture and the provision of water and sanitation services. The research portfolio for 2012/13 was set on the basis of the WRC's Corporate Plan.

The WRC continued to invest in the creation of knowledge via its four main key strategic areas (KSAs): **Water Resource Management, Water-Linked Ecosystems, Water Use and Waste Management, and Water Utilisation in Agriculture** (Fig. 1). A further development in 2012/13 was the reorientation of **KSA 5: Business Development, Marketing and Communications** to provide strategic direction to the business development, communication, marketing and branding goals of the WRC, with an emphasis on research uptake and knowledge dissemination.



WATER RESOURCE MANAGEMENT

- Water resource assessment and planning
- Water quality management
- Water resource protection
- Water resources and climate
- Water resource institutional arrangements



WATER-LINKED ECOSYSTEMS

- Ecosystem processes
- Ecosystem management and utilisation
- Ecosystem rehabilitation



WATER USE AND WASTE MANAGEMENT

- Water services - Institutional and management issues
- Water supply and treatment technology
- Sustainable municipal wastewater and sanitation
- Sustainable and integrated industrial water management
- Mine-water treatment and management
- WaterSmart Fund



WATER UTILISATION IN AGRICULTURE

- Water utilisation for food and fibre production
- Water utilisation for fuelwood and timber production
- Water utilisation for poverty reduction and wealth creation in agriculture
- Water resource protection and reclamation in agriculture

Figure 1. Key strategic research areas and thrusts

Contributing towards achieving Government Outcomes

As a national public agency, the WRC actively strives to support the Government of South Africa in achieving its strategic outcomes, with particular reference to the Corporate Plan (Annual Performance Plan) of the Department of Water Affairs (DWA) and the performance agreement of the Minister of Water and Environmental Affairs. Of particular relevance to the work of the Commission is Government Outcome 10, as well as Outcomes 6, 7, and 9:

- Outcome 6 – the WRC actively strives to align its projects and activities with achieving an efficient, competitive and responsive economic infrastructure network.
- Outcome 7 – the WRC actively strives to align its projects and activities with achieving vibrant, equitable and sustainable rural communities and food security for all.
- Outcome 9 – the WRC actively strives to align its projects and activities with achieving a responsive, accountable, effective and efficient local government system.
- Outcome 10 – the WRC actively strives to align its projects and activities with achieving protection and enhancement of the country's environmental assets and natural resources.

Achieving the goals of the WRC Knowledge Tree

A fundamental guiding framework and corporate planning tool for the WRC's operations at the beginning of its fifth decade is the construct of the WRC Knowledge Tree (Fig. 2). The tree metaphor reflects strength in foundation (i.e., 'roots' firmly embedded in sound knowledge) and strong growth (i.e., 'branches and leaves' growing vigorously from this knowledge). It also acts as a yardstick with which to measure the WRC's impact in key domains.



Figure 2. The WRC Knowledge Tree

Each of the Knowledge Tree strategic outcome-oriented goals provides a specific priority categorisation for the WRC's projects and activities. Each has its own kind of contribution to the Government Outcomes, either directly or indirectly. The goals are not mutually exclusive. For example, a 'new product' may be a 'sustainable development solution' that 'empowers communities' and 'informs policy and decision making'.

The guiding principle is that every WRC project will strive to achieve as many of the WRC Knowledge Tree outcomes as reasonably possible. This applies within the project, to post-project actions, and to follow-on projects.

Supporting research projects

In 2012/13 the WRC managed 305 research projects at various stages of the project lifecycle (Table 1) of which 79% (242 projects) were active projects.

The remainder mostly comprised of projects that have been finalised and are in the process of being financially closed. A total of 85 projects were completed during 2012/13, distributed across Water Resource Management (KSA 1: 21 projects), Water-Linked Ecosystems (KSA 2: 18 projects), Water Use and Waste Management (KSA 3: 37 projects), and Water Utilisation in Agriculture (KSA 4: 9 projects). The WRC also initiated 81 new projects: 28 focusing on Water Resource Management (KSA 1), 13 on Water-Linked Ecosystems (KSA 2), 32 on Water Use and Waste Management (KSA 3) and 8 on Water Utilisation in Agriculture (KSA 4). The WRC published 151 research reports in this period as well as 3 DVDs. The various funding streams included both open projects, accommodating projects within the broad research strategy of each key strategic area, and directed projects, where research projects are developed in accordance with clear terms of reference, aimed at solving specific

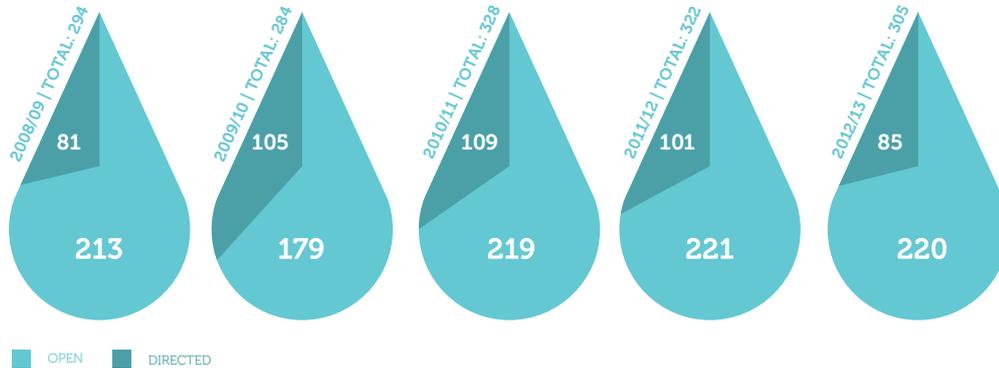
problems. Open research projects are mostly long-term, consortia-based, and address multifaceted issues, often calling for more than one research discipline and a substantial budget. About 28% of the total number of projects were directed projects.

Table 1. Overview of research project activity for the year under review

Financial year	2012/13	2011/12
<i>Total number of projects</i>	305	322
<i>Number of active projects</i>	242	258
<i>Number of new projects</i>	81	74
<i>Number of finalised projects</i>	85	96
<i>Number of directed projects</i>	85	101

Figure 3 provides a schematic representation of the total number of research projects per annum for the past five years. The average number of projects per year remains around 300.

Figure 3. Total number of open and directed research projects per annum for the past five years



Over the past 5 years the WRC has finalised 378 research projects (Fig. 4) indicating a significant contribution to knowledge in the water sector. An average number of 76 projects were finalised per year, for the past 5 years. Over the same 5-year period 356 new projects (Fig. 5) were initiated, ensuring the continuous contribution of new knowledge to the sector. An average of 71 new projects were started per year, for the past 5 years.

Figure 4. Annual and cumulative number of projects finalised over the past five years



Figure 5. Annual and cumulative number of projects initiated over the past five years

The percentage utilisation of research project funds by the KSAs during 2012/13 (Fig. 6) indicates that approximately 48% (in comparison with about 45% for 2011/12) was invested in projects that focused on water resources (including water-linked ecosystems) and approximately 52% (compared with 55% for 2011/12) in projects that focused on water utilisation (including effluent treatment and management, as well as agriculture). This is based on the actual amount paid out as well as accrued for research projects during the financial year under review. The allocation of about 50% of the fund to issues related to resource management and 50% to issues related to water utilisation was a strategic allocation based on the medium- to long-term needs for research. The percentage of funds utilised for the different KSAs is shown in Fig. 6.

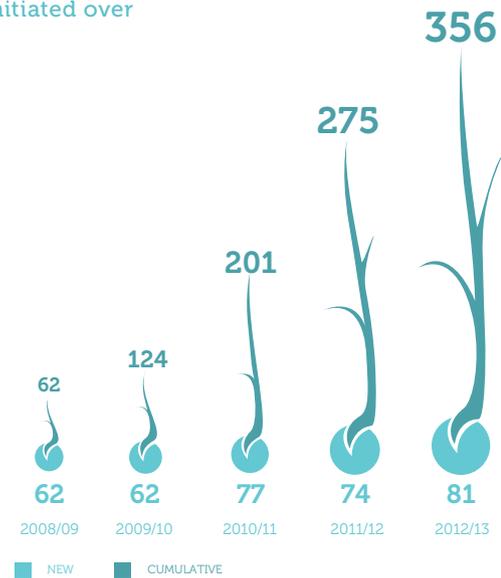
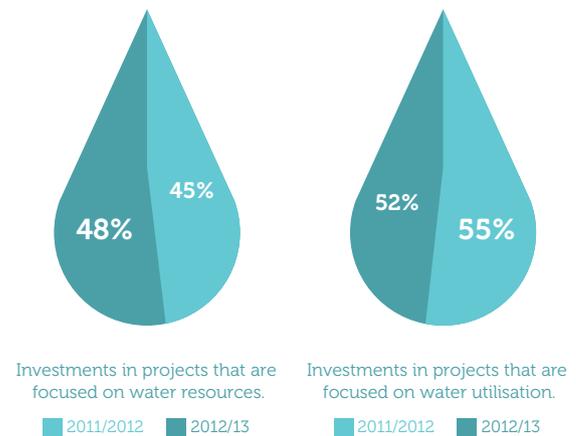


Figure 6. Percentage of funds utilised for the different KSAs in 2012/13

The overall investment in research projects (knowledge creation) amounted to R116.7 m. This was marginally more than that reported for 2011/12 (R110.5 m.), with an increase of 6%. Total investment in the support of knowledge creation, sharing and dissemination amounted to R144.7 m. This represents an increase of 3% from the previous year (R140.9 m.).



Leveraging income for the creation, sharing and dissemination of water knowledge

During the year under review the WRC continued to leverage levy income by striving to obtain funds from other sources to support water research. During 2012/13 this drive was fairly successful, but substantial amounts have been rolled over into 2013/14, e.g., the upfront funding received from the Melinda and Bill Gates Foundation. The WRC income originating from sources other than the levy for 2012/13 amounted to R19.6 m. Leveraged income included funds allocated to a number of KSAs for direct support of research projects and funds provided for capacity building, knowledge sharing and dissemination. Leveraged income was obtained from both local and international sources, where the main source of income was due to support by various Government departments for specific research and for other knowledge-sharing projects. Sources of income other than the levy for 2012/13 amounted to about 13% of the total income.

BUILDING CAPACITY

The WRC aims to provide South Africa with future researchers as well as a source of skilled human capital for other institutions within the water sector. This is done by encouraging project leaders to include students on their projects, enabling them to participate in water research through the various projects supported by the WRC.

During the year under review, the WRC continued to place strong emphasis on building research capacity

in South Africa as well as supporting a number of related capacity-building initiatives. In many areas of research supported by the WRC, it is evident that students who participated in earlier WRC projects are now leading Commission-funded research projects and/or are serving as members of steering committees as well as representatives of new proposals.

Capacity building trends

During the year under review, the WRC gathered more comprehensive demographic data for the students working on WRC-funded projects. Of the 494 students supported by WRC-funded projects in 2012/13, 207 or 42% were female, which is encouraging as most WRC projects fall within the engineering or science category of research where the involvement of females in general remains low. The large number of masters (201 students) and doctoral (142 students) candidates provides a critical mass for the next generation of academics and researchers in the water sector. The wide range of bachelor degrees supported also reflects the WRC's commitment to support a diverse range of disciplines to address water resource challenges in a holistic manner. It is encouraging to note the support provided to a mixture of natural, technical and social science degrees.

Table 2 reflects the number of previously-disadvantaged students involved in WRC-funded projects, as reported for the various lead organisations contracted by the WRC, in the 2012/13 financial year.



Table 2. Number of previously-disadvantaged students (PDI) involved in WRC-funded projects per lead organisation in 2012/13

Institution name	Total PDI
Higher-education institutions	
Cape Peninsula University of Technology	4
Durban University of Technology	7
Nelson Mandela Metropolitan University	5
North-West University	6
Rhodes University	21
Tshwane University of Technology	7
University of Cape Town	13
University of Fort Hare	15
University of Johannesburg	9
University of KwaZulu-Natal	36
University of Pretoria	25
University of South Africa	5
University of Stellenbosch	9
University of the Free State	4
University of the Western Cape	17
University of Venda	4
University of the Witwatersrand	2
Subtotal	189

Table 2. Number of previously-disadvantaged students (PDI) involved in WRC-funded projects per lead organisation in 2012/13 (continued)

Science councils and state agencies	
Agricultural Research Council	6
Council for Geoscience	3
CSIR	16
National Institute of Occupational Health	1
South African National Parks	5
South African Weather Service	2
Subtotal	33
Non-governmental institutions	
Counterpoint Development	1
Dames	6
Duncan Hay and Associates	4
Eon Consulting	1
Freshwater Research Centre	1
Golder Associates Africa	5

Table 2. Number of previously-disadvantaged students (PDI) involved in WRC-funded projects per lead organisation in 2012/13 (continued)

Hlathi Development Services	1
Hydrosoft Institute	2
Institute of Natural Resources	2
Kaleo Consulting	1
Metago Water Geosciences (Pty) Ltd	1
Muondli Consulting and Projects	1
Pegasys Strategy and Development (Pty) Ltd	1
Pegram and Associates (Pty) Ltd	3
Prime Africa Consultants (previously CIC International)	1
Southern Waters Ecological Research and Consulting	1
SSI	4
Umhlaba Consulting Group	5
Virtual Consulting	3
WRP Consulting Engineers (Pty) Ltd	1
Subtotal	45
Total	267

Other capacity building initiatives

In addition to its support for the training of students, the WRC has initiated and supported a number of national capacity building initiatives. Examples of such initiatives are given below:

Exposing girl learners to water science

The WRC 'adopted' four girl learners during the year as part of Government's Techno Girls initiative. The initiative identifies high-achieving 15- to 18-year-old school girls from previously disadvantaged communities and places them in corporate mentorship and skills development programmes.

Supporting young professional involvement in water law

The role and importance of water law expertise for effective water governance is well recognised in the South African water sector. The governing of how water is used, who uses it and how much is used is consequently very complex and is the substance of a substantial body of law at local, national and international levels. It is therefore critically important that countries encourage the development of water law expertise amongst water professionals in order to draft sound and implementable legal frameworks. In collaboration with the International Water Association (IWA) / Water Institute of Southern Africa (WISA) Young Water Professionals (YWPs), and kindly sponsored by the DWA, the International Conference on Freshwater Governance for Sustainable Development, held in the Drakensburg from 4–7 November 2012, provided the opportunity for students of law to engage in public debates on a range of pertinent issues affecting the South African water sector and also addressed in conference sessions. The YWP debates were listed as one of the highlights of the conference.

WRC 101 for project leaders and research and finance offices

Over the past few years, the WRC has noted an encouraging trend of proposals being submitted by research groups who have previously not applied to the WRC for funding. Many established research groups also have new project leaders managing WRC projects. The WRC, like any other research funding organisation, has project management and administrative requirements, which are reviewed periodically. The more established project leaders will also have noted that the proposal submission, project management, intellectual property management and financial requirements have changed as the different modules of the WRC Fund Management System (FMS) have been completed. Additionally, the WRC has sought to improve its interaction and coordination with current and prospective project teams, in order to streamline administrative processes and to render to the research community a better understanding of the WRC's strategic objectives as defined in its five-year Strategic Plan. This involves informing institutions of the WRC's focus areas and direction for the prioritisation of funds in the next financial year, and encouraging WRC staff members to gain a better understanding of how various institutions operate. In this regard, the WRC conducted the increasingly popular one-day WRC 101 Course for aspiring and new project leaders to:

- Understand the WRC research cycle
- Discover the research priorities of the WRC and the fund allocation for each of the priorities
- Prepare a comprehensive proposal (taking note of tips provided to improve the chances of success)

- Manage the technical, administrative and financial aspects of a WRC project
- Understand the contractual and financial audit requirements
- Know what resources are available to enhance the success of the project

Courses were conducted in Gauteng, the Western Cape and KwaZulu-Natal.

Supporting SA's future water engineers

Water distribution systems are important to supply safe and clean drinking water to people. The Aqualibrium Schools Water Competition, hosted by the South African Institution of Civil Engineering (SAICE), exposes learners, especially those from disadvantaged backgrounds, to the practical application of water-supply processes. They are made aware of the intricacies involved in the design of water distribution networks and the actual delivery of water to households. This competition strengthens Government's initiatives aimed at encouraging learners to take mathematics and science at school and to follow a career as a science or civil engineering professional. During the year under review, the WRC successfully came on board as the main sponsor, a valuable and mutually beneficial arrangement to contribute towards addressing the scarce-skills situation in South Africa. Around 100 learners participated in the final round of the event.

organisation's strategic focus based on assessment and integration of the needs, opportunities and priorities presented by the current context and challenges facing the water sector in South Africa, and globally.

KNOWLEDGE REVIEW 2012/13

What follows is a summary of the WRC's investment in the creation and sharing of water-centred knowledge, over the 2012/13 financial year. This reflects the