Chapter 1

Introduction

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The establishment of the Water Research Commission (WRC) in 1971 was an innovative response to the then current needs of the country. In the ensuing 30 years the WRC has made notable contributions to achieving mobilisation and development of research expertise over a wide range of disciplines. An important spin-off has been the significant expansion and upgrading of expertise in the South African water industry.

Internationally it has received acclaim for its many achievements and has moved into a position of acceptance and respect, which creates real potential for collaborative ventures.

Since 1994 a new focus has been required in terms of the socio-economic, technological and political challenges posed at a national level and the period 1994 to 2001 ushered in a phase of new thinking and new policies which paved the way for the substantial changes required in order to ensure sustainable growth and relevance .

The 15-month period under review has been an eventful one, with many changes to the way things had been done before, resulting in a comprehensive turnaround for the WRC. This process is continuing as the WRC is positioning itself to achieve its primary objective, which is to serve the nation as a dynamic hub for water-centred knowledge, innovation and intellectual capital as well as to provide leadership for research and development (R&D) through the support of knowledge creation, transfer and application.

Through its various funding- and networking-based activities and by aligning itself with national priorities and presidential imperatives, the WRC aims to engage stakeholders and partners in solving water-related problems which are crucial to South Africa's sustainable development and economic growth, while assisting in positioning the country in the African Continent through the WRC's involvement in the New Partnership for Africa's Development (NEPAD).

The new strategic direction of the WRC focuses on:

- An integrated approach to meeting South Africa's societal/water sector R&D needs
- Integrated solutions to invariably complex, interdisciplinary problems
- Ongoing strategic identification of needs (short-, medium- and long-term needs, both explicit and implicit)
- A set of key strategic areas (KSAs) for investing in knowledge creation, transfer and dissemination.

In order to meet the challenges ahead, a sound organisational basis is required and the following strategic initiatives have been launched and are well under way.

Restructuring and Transforming the Organisation

The key to this transformation is being relevant and effective and supporting both the creation of knowledge (by funding R&D) and the transfer and dissemination of the created knowledge.

- In order to improve efficiency and competitiveness to strengthen its local and international position as South Africa's water-centred knowledge hub, the WRC core competencies were re-visited and transformed by re-aligning and re-grouping the water research and dissemination components. Of the WRC's portfolio of 18 research fields, the field addressing ***Hydraulics*** has been closed and the current projects have been re-allocated to linking fields. These 17 fields have been re-grouped into 4 water-centred key strategic areas (KSAs), focusing mainly on knowledge creation. In addition one knowledge-centred KSA was added. This KSA will address the need for an integrated knowledge-management approach and will focus on knowledge dissemination, technology transfer and information management.

  The 5 KSAs are:
  - Water Resource Management
  - Water-Linked Ecosystems
  - Water Use and Waste Management
  - Water Utilisation in Agriculture
  - Water-Centred Knowledge

While each of the KSAs is unique and mutually exclusive (minimal overlaps), they collectively attempt to cover the complete spectrum of water-related topics of strategic importance. A crucial characteristic of a KSA is its *modus operandi*. In order to function effectively, each of the KSAs is aligned with the WRC's mission and vision having a clear business plan and forming an impact area where output and impact may be assessed. Each of the KSAs addresses a distinct research portfolio and provides for pilot or seed investigations, R&D projects/programmes and capacity-building initiatives. The KSAs also aim to support technology transfer, commercialisation and pilot implementation projects as well as other knowledge dissemination drives. They are headed at director level by top-level scientists/ engineers who are also successful research managers.

- The new strategy of the WRC, with its KSAs forming strategic portfolios of investment in the creation of knowledge, also calls for specific mechanisms to address key strategic issues of national importance. These issues will be dealt with in a number of crosscutting domains which will form integrating frameworks across the KSAs.

  The crosscutting domains will support programmes and projects which address the key issues within the portfolio of each KSA and also drive specific programmes/projects that are overarching and relate to all KSAs in a general manner.

  The crosscutting domains which aim to build focus on the role of water with regard to major strategic issues are the following:

  - Water and Society
  - Water and the Environment
  - Water and the Economy
  - Water and Health.

- Dissemination of knowledge requires an appropriate, sustainable knowledge base that will be effective in its ability to absorb new knowledge. The WRC aims to support and develop a representative, sustainable water-related knowledge base (intellectual capital) in South Africa. This includes all necessary competencies and capacity vested in the corps of experts and practitioners within academia, science councils, other research organisations, government (central, provincial and local) and the water industry.
- The WRC financial year was aligned to that of the State, in terms of the promulgation, by Government, of the Public Finance Management Act (PFMA).

The transformed operational activities officially commenced on 1 April 2002.

Capacity / Competence Development

The WRC supports the transformation of South Africa's water-related knowledge base (i.e. the water-related expert and practitioner portfolio in terms of race, gender, age and sustainability) in academia, science councils, other research organisations, Government (central, provincial and local) and the water industry.

Overall, there is a clear trend of increased involvement of designated individuals in academic and governmental institutions while the transformation of the water industry still shows a relatively low level of progress. At an organisational (academic) level, a number of historically disadvantaged institutions (HDIs) have, during the past decade, developed a significant capacity/competence in certain aspects of water-centred R&D. Examples are the Universities of Venda, Fort Hare and Western Cape as well as a number of technikons such as the Peninsula Technikon and the ML Sultan Technikon.

Innovation / Application of Knowledge

The WRC aims to provide the country with applied knowledge and water-related innovation by translating needs into research ideas and by transferring research results and new technology-based products and processes to the end-users.

The WRC is committed to improving the strategic management of innovative research and strives to increase the commercialisation of intellectual property (IP), generating wealth (in South Africa) as well as increasing the income stream to the WRC for further investment in R&D. Two WRC directors have recently attended a course addressing IP management issues and will support the organisation's drive in this regard.

Women in Water Awards

In order to recognise the role that women play in water management in South Africa, the WRC, the Department of Water Affairs and Forestry and the Water Institute of South Africa (WISA) have jointly developed the *Women in Water Awards*. This initiative aims to honour and celebrate the hard work of women, to highlight their participation in water management and the key role that women play with regard to water and poverty eradication, education and sustainable development both in rural and urban environments.

The launch of the *Women in Water Awards* in 2002 marked the beginning of an important

tradition in the water sector in South Africa. Each year during Water Week, awards will be presented to women who have played leading roles in five categories:

- Research (over 35 years old)
- Research (under 35 years old)
- Policy
- Management
- Community Development

At a gala event on 19 March 2002, the Minister of Water Affairs and Forestry, Mr Ronnie Kasrils, presented the first awards to the following women:

- Prof Carolyn Palmer, Institute for Water Research, Rhodes University, Grahamstown
- Dr Heather McKay, CSIR, Pretoria
- Ms Mapula Lebone, Tsinde Development Consultants
- Ms Marthie Janse van Rensburg, Trans-Caledon Tunnel Authority
- Ms Marna de Lange, IWMI
- Dr Robyn Stein, Bowman & Gilfillan Inc.
- Ms Janet Love, Reserve Bank
- Ms Ma-Tshepo Khumbane
- Ms Ethne Davey, Built Environment Support Group
- Ms Buyelwa Sonjica, Portfolio Committee
- Ms Nosipho Jezile, Working for Water
- Ms Makwena Lydia Ngwenya, Portfolio Committee
- Ms Mavis Sibetha, Working for Water, KZN
- Ms Nondyebo Taki, Working for Water, Gauteng

Marketing the WRC

During the past 15 months, the WRC formally exhibited at the following events:

- 21-22 May 2001
  Consultative Group of International Agricultural Research (CGIAR), Durban
- 11-13 September 2001
  13th Biannual Congress of the SA Irrigation Institute (SABI), Warmbaths
- 22-26 October 2001
  65th Annual Conference of the Institution of Municipal Engineering of Southern Africa (IMESA), Rustenburg
- 21-23 November 2001
  Conference on Appropriate Technology for Sustainable Water Supply and Sanitation Services, Muldersdrift
- 3-8 March 2002
  Environmental Flows for River Systems & 4th International Ecohydraulics Symposium, Cape Town
- 25-26 March 2002
  Workshop on the Protection and Strategic Uses of Groundwater Resources of the Trans-Boundary Limpopo Basin and the Drought-Prone Areas in the SADC Region, Centurion, Pretoria

In an attempt to introduce the WRC to non-research groups in South Africa, the organisation also participated in the following special publications:

- The WRC developed and edited an edition of *Archimedes* specifically addressing water (in co-operation with the Foundation for Education, Science and Technology, FEST). Copies of this youth magazine were distributed to all high schools during Water Week in March 2002.
- A number of articles addressing the role of the WRC were published in the technical and daily press (e.g. *Engineering News*, *Water 21*, *SA Irrigation*, various newspapers), both locally and internationally.

Table 1
Allocation of funds (%) per research field during 1999, 2000 and 2001/02

Field	1999		2000		2001/02	
	Past and present budgets					
	R	%	R	%	R	%
Water policy	2 308 624	4.8	2 487 100	4.0	1 970 680	3.3
Integrated water resource management	4 486 491	9.3	5 051 000	8.1	3 691 500	6.2
Conservation of water ecosystems	5 262 048	10.9	6 528 800	10.5	5 993 550	10.1
Catchment hydrology	2 906 207	6.0	3 328 400	5.4	2 829 200	4.7
Groundwater	4 370 655	9.1	4 971 500	8.0	4 552 670	7.7
Hydroclimatology	2 309 400	4.8	3 314 400	5.3	3 643 800	6.2
Municipal wastewater management	2 587 897	5.4	3 528 800	5.7	4 260 900	7.2
Water quality management	2 915 700	6.0	2 640 400	4.3	2 658 500	4.5
Mine-water management	4 371 700	9.1	4 109 800	6.6	3 371 000	5.6
Agricultural water management	5 012 129	10.4	5 779 100	9.3	5 240 180	8.9
Industrial water management	3 569 920	7.4	3 962 900	6.4	4 761 100	8.1
Membrane technology	2 634 692	5.5	3 036 700	4.9	3 553 800	6.1
Hydraulics	1 376 850	2.9	2 243 400	3.6	1 276 400	2.2
Rural water supply and sanitation	-	-	2 796 900	4.5	1 962 100	3.3
Water services: Institutional and management issues	-	-	2 342 900	3.8	2 583 600	4.4
Integrated urban water management	-	-	1 317 400	2.1	1 819 100	3.1
Potable water treatment	4 147 965	8.6	2 485 800	4.0	2 511 700	4.3
Health-related water issues	-	-	2 143 800	3.5	2 385 600	4.1
	48 260 278	100	62 069 100	100	59 065 380	100

Distribution of Funds among Research Fields

An overview of WRC funding per research field for 1999, 2000 and 2001/02 is given in **Table 1** and **Table 2** lists the research sectors which were responsible for the research during 2001/02, as well as the extent of their involvement. **Table 3** gives a breakdown of organisations receiving funds from the WRC during 2001/02.

From the tables it is evident that universities are involved in 156 or 51.49% of the total number of contracts. During this period under review the WRC financially supported 303 projects at a budgeted amount of R59 065 380 and 118 deliverables for projects were accepted by the WRC Executive.

Table 2
Research sectors responsible for the research during 2001/02

Research sector	Number of times involved	%
Universities	156	51.49
Private consultants	64	21.12
Science councils	49	16.17
Water boards	13	4.29
Technikons	11	3.63
Industry	4	1.32
Local authorities	2	0.66
Government	2	0.66
NGOs	2	0.66
Total	303	100

TABLE 3
Breakdown of organisations receiving funds from the WRC during 2001/02

	No of projects	2001/02 R		No of projects	2001/02 R
Agricultural Research Council	11	1 519 000	Palmer Development Group	2	111 200
Abbot Grobicki (Pty) Ltd	1	150 000	Palmiet CMP	1	28 000
Afridev (Pty) Ltd	1	351 400	PARC Scientific	1	218 700
BKS (CE) Ltd	3	121 500	Partners in Development	1	161 100
Business Partners for Development (BPD)	1	396 000	Peninsula Technikon	1	202 000
Cape Technikon	1	105 000	Prestedge Retief Dresner Wijnberg (CE)	1	88 200
Chamber of Mines	1	385 700	Potchefstroom University for CHO	4	760 700
Chris Swartz Utilisation Engineering	2	198 400	Pula Strategic Resources	1	332 400
Africon Engineering International	1	275 000	Pulles Howard and de Lange Inc.	4	971 600
Coaltech 2020	1	365 000	Rand Afrikaans University	1	195 000
Conningarth Consultants	1	110 500	Rand Water	5	1 098 700
Council for Geoscience	5	693 200	Rhodes University	20	3 909 900
CSIR	31	4 844 000	SA Weather Bureau	2	825 900
DB Thermal (Pty) Ltd	1	119 000	The Association of Water Boards	1	350 000
Development, Planning and Research	2	405 900	Semenya Furumele	1	200 000
Dinax Technologies cc	1	226 400	Sigma Beta (CE)	1	30 000
Du Pisani and Associates	1	139 300	Sigodi Marah Martin Development Consultants	2	544 500
Durban Metro Water Services	1	300 000	Sineke Developments (Pty) Ltd	1	273 500
DWAF	2	291 400	Southern Water Research and Ecological Consulting cc	1	273 000
Economic Project Evaluation (Pty) Ltd	1	124 500	SRK (CE) Inc	2	493 500
Ecosun cc	1	260 000	Stewart Scott (Pty) Ltd	3	839 800
Envirogreen and Freegold	1	35 700	Technikon Northern Gauteng	1	260 000
Eskom	2	276 000	Technikon Natal	2	373 700
Geohydrological and Spatial Solutions	1	79 670	Technikon SA	2	242 500
Greater Johannesburg Metropolitan Council	1	150 000	University of Cape Town	21	3 901 800
Envirogreen and Freegold	1	124 400	University Durban Westville	1	340 000
Highveld Biological Association	1	99 000	University of Fort Hare	15	2 400
Independent Economic Researchers cc	1	111 200	University of Natal	27	7 837 050
Innovative Water Solutions (Pty) Ltd	1	98 000	University of the North	2	435 700
In-Touch Community Development and Project Management	1	61 500	University of the Free State	15	2 419 480
Lenehan Engineering and Environmental Consulting	1	132 200	University of Port Elizabeth	7	1 026 000
MBB (CE) Inc	1	315 300	University of Pretoria	17	3 197 700
McIntosh Xaba and Associates	1	68 000	University of Stellenbosch	18	3 572 800
McCracken Solar Stills (Pty) Ltd	1	75 300	University of Venda	3	316 400
Metago Environmental Engineers (Pty) Ltd	1	335 300	University of the Western Cape	10	1 849 900
ML Sultan Technikon	4	546 000	University of Zululand	4	753 900
Market Survey and Statistical Analysis	1	271 580	Umgeni Water	7	946 900
Mvula Trust	2	394 900	Vista University	1	24 800
NCE cc	1	452 800	Wates, Meiring and Barnard (CE) Inc	1	25 600
Ninham Shand (Pty) Ltd	4	972 800	WITS University	4	724 600
Options to Solutions	1	110 000	WRP (Pty) Ltd	1	75 000
Pipeline Performance Technologies	1	192 000	Water Systems Management	1	226 000
PAA Ramsden Private Consultant	1	45 500			

The transformed operational activities officially commenced on 1 April 2002 and the* Knowledge Review *before you covers the 15-month period up to 31 March 2002 and presents a 2001/02 strategic overview and specific examples where research has led to improved technology, decision-making and operational management in terms of the current 18 research fields.