11

Water and sanitation

Introduction

Government priority is to provide 6 kilolitres of water free to all households

Clean water is the most significant resource for reducing poverty, diseases, and improving the quality of life of poor South Africans. Available water is also important for promoting rural development and increasing food security. Government has made the provision of water to all South Africans a high priority, and is implementing a free basic water policy of up to 6 kilolitres free per month to all households.

Water is also critical for the development of the agricultural sector, for commercial, emerging and subsistence farming and other economic activities.

As a water-poor country with erratic rainfall patterns, South Africa has to manage its water resources carefully if it is to meet social and economic needs. To meet this challenge, the establishment of a coherent policy and regulatory framework, appropriate to the physical realities of South Africa is essential. This must go hand-in-hand with establishing institutions capable of implementing the policy.

Institutional support required to roll out sanitation programme

Recent outbreaks of cholera have emphasised the need for prioritising sanitation, which falls under the municipal water services function. This is particularly relevant in the context of the large number of unplanned settlements and overcrowding, resulting in effluent run-off into nearby streams and rivers. Government has developed a comprehensive policy on sanitation but its implementation requires the development of financial and institutional structures to support the municipalities which are responsible for delivery.

The national Department of Water Affairs and Forestry's budget for water resources and services is R3,1 billion for 2002/03, local Government budgets for water services are estimated at R11,0 billion in 2002-03[1], while the Water Boards budgeted R4,0 billion. In 2002/03 a total of 9 900 personnel are employed in the national

[1] These totals cannot be added for a consolidated total, as the three budgets include transfers between them (for example, from the national Department to Water Boards and municipalities).

department, 6 800 by Water Boards and around 12 000 by municipalities for their water activities.

Policy and legislative framework

The South African water sector is complex, with a wide range of organisations contributing to the development of water resources. The public sector plays a key role in the water sector. Apart from a few public-private partnerships, the private sector plays a minor role in the direct provision of water services, but does play an important supporting role.

South African policy and legislation distinguishes between water resources and water services. In terms of the Constitution, water services (retail distribution) are a concurrent Schedule 4B municipal function. Water resource management (for dams and rivers), on the other hand, is an exclusive national government function.

Municipalities and water services

The responsibility for water services rests primarily with municipalities as established under the Water Services Act (108 of 1997). The Act assigns municipalities the water services authority (WSA) function. The actual delivery of services is undertaken by water services providers (WSPs) appointed by the water services authority. Whilst most municipalities are water service providers, some municipalities utilise municipal entities (Johannesburg Water, Erwat (Ekurhuleni)), water boards or contracted service providers (e.g. community based organisations) as their water service providers.

National government and water boards

The national Department of Water Affairs and Forestry (DWAF) performs functions in both water resources, such as dams and rivers, and water services, which are mainly bulk water services provided by the 15 Water Boards. In addition to outlining the framework for water service provision and its regulation, the Water Services Act provides for the establishment of Water Boards.

The Act distinguishes between primary and secondary activities of Water Boards. The primary activity is seen to be the provision of bulk water to users like municipalities, by bringing water from dams and rivers (water resources) to local reservoirs. The regional Water Boards abstract, treat and transport bulk water to service providers like municipalities. As a secondary activity, some Water Boards also undertake retail water supply on behalf of poorly capacitated municipalities, and operate bulk waste water works.

Municipalities as water service authorities

New division of powers and functions takes effect on 1 July 2003

While metropolitan municipalities are the water service authorities for their jurisdiction, this power is divided differently in two-tiered municipalities. A recent gazette (no 24228 of 3 January 2003) issued by the Minister of Provincial and Local Government makes this determination, taking into account regional and capacity considerations. This new division of functions takes effect on

1 July 2003, and may involve reallocating the assets, liabilities, personnel and budgets between the two types of municipalities.

Five public-private partnerships in water sector

Current arrangements also allow for public-private partnerships, where private companies are contracted to provide water on behalf of a municipality. There are currently five public-private partnership concessions in Dolphin Coast, Mbombela (Nelspruit), Queenstown, Stutterheim and Fort Beaufort. There are also a range of public-public partnerships in terms of which Water Boards provide retail water services with operating agreements in areas such a Harrismith and Maluti-a-Phofung.

The water services policy also recognises the role of community-based organisations as water services providers, particularly for small-scale rural water services schemes. An effective policy framework to ensure that these community-based organisations receive an appropriate share of the financial transfers intended for water service provision has still to be developed within the context of service providers in terms of the Municipal Systems Act.

DWAF transferring water schemes to municipalities

The Department of Water Affairs and Forestry is also undertaking water services provision, operating 512 large water schemes and a further 1 032 rudimentary schemes serving approximately 8 million people, mainly in the former homeland areas. The Department is in the process of transferring these schemes to municipalities over the next three years. However, many municipalities are reluctant to take transfer, citing unwillingness to take over existing staff and the need for further financial resources to upgrade or maintain them.

Free basic services

6 kl free of charge to all households

One of Government's key objectives is the free provision of up to 6 kilolitres (kl) of water to all households. Most municipalities appear to be making progress in implementing free basic services. The Department of Water Affairs and Forestry estimates that 76 per cent of municipalities provided at least the first 6kl of water free during 2002. A small number of municipalities provided more than this: !Kei!Kariep, (formally, Eksteenkuil, Kakamas, Keimoes and Kenhardt), Gammagara (Deben, Kathu) and Umvoti (Kranskop, Greytown) provided between 10 kl and 12 kl of free water. At the other extreme, a few municipalities supplied only the first 1,2 kl or 3 kl free.

About one third of municipalities outside Gauteng currently provide their whole jurisdiction with water services, while the remainder is provided by external providers (national department, Water Boards and community-based organisations).

Challenge to roll out sanitation

The free basic policy does not extend to sanitation beyond the provision of basic levels of on-site sanitation such as the ventilated improved pit toilet (VIP), which has minimal operating costs. There is little information available on how municipalities are providing sanitation services to poor households. A sanitation policy for communities with access to water-borne sanitation is under development by DWAF.

Trends in expenditure and budgets

National Government

Table 11.1 shows expenditure and budgets for the national Department of Water Affairs over a seven-year period from 1999/00 to 2005/06. This period includes the three-year MTEF, starting in 2003/04. In 2002/03 the budget amounted to R 3,7 billion. Over the seven-year period, the programmes receiving the bulk of the budget are Water Resource Management, receiving an average of 24 per cent of the total budget, and Water Services, receiving an average of 59 per cent of the total budget.

Table 11.1 Budget of the National Department of Water Affairs and Forestry

R thousand	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Administration	182 965	190 265	211 373	225 917	237 071	251 129	267 210
Water Resource	550 751	723 586	904 470	1 161 485	1 056 113	768 061	827 376
Water Services	1 591 583	1 786 540	1 932 744	1 944 155	2 439 722	2 287 241	2 487 539
Forestry	350 998	341 226	434 468	401 134	353 637	347 935	371 410
Total	**2 676 297**	**3 041 617**	**3 483 055**	**3 732 691**	**4 086 543**	**3 654 366**	**3 953 535**
Growth		*13,7%*	*14,5%*	*7,2%*	*9,5%*	*-10,6%*	*8,2%*

Source: 2003 Estimates of National Expenditure.

Fiscal resources in the water sector

Table 11.2 shows the transfers from the national Department to local government. The national budget provides R1,0 billion for capital programmes on basic water and sanitation infrastructure in 2002/03 and R700 million for the operation of water services. The capital budget grows from R600 million in 1999/00 to R1,1 billion in 2003/04. During the seven-year period, over R6,2 billion goes to infrastructure. The operational support budget grows from R727 million in 1999/00 to R836 million in 2003/04. The total funding provided for operational support from 1999/00 to 2005/06 amounts to just over R5,5 billion.

Part of the capital grant and the operational subsidy is provided directly to municipalities, or indirectly as allocations-in-kind to fund investments in, and operation of, specific water projects in that municipality. It is the intention of national Government to phase in all allocations for municipal services to local Government, either through the equitable share or the new Municipal Infrastructure Grant.

Table 11.2 DWAF transfers to local government

R million	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Institutional Support	3	4	5	–	–	–	–
Basic Water and Sanitation Infrastructure	612	725	757	999	1 102	948	1 037
Operations of Water Resources	727	786	692	700	836	858	934
Total	**1 342**	**1 515**	**1 454**	**1 699**	**1 938**	**1 806**	**1 971**
Growth		*12,9%*	*-4,0%*	*16,8%*	*14,1%*	*-6,8%*	*9,1%*

Source: 2003 Estimates of National Expenditure.

Community Water Supply and Sanitation Programme

The Department of Water Affairs and Forestry's 2000/01 annual report outlines the activities of the Community Water Supply and Sanitation Programme. The programme implemented 590 water services projects serving 1,6 million people with water and/or sanitation infrastructure; it held 2 227 community awareness meetings during the 2000/01 financial year; and it employed over 17 000 people nationwide, through the 'Improved Health through Sanitation and Hygiene' (WASH) awareness campaigns.

For the 2001/02 financial year, the programme's total expenditure was in excess of R1,2 billion. This included the R175,4 million in transferred funds to district municipalities. During this financial year, 81 water and sanitation projects were completed, 95 899 jobs were created and over 1,6 million people were served.

Though provinces do not generally play a role in water and sanitation, some provincial housing or local government departments also provide grants to municipalities for this purpose. For example, the Gauteng housing department has budgeted R43,0 million for this purpose in 2002/03 and R98,8 million over the MTEF period. Figures from other provinces were not available.

Water boards

Combined revenue for Water Boards total R4,5 billion in 2002/03

Table 11.3 provides a summary of the budgets for the Water Boards for the 2001/02 and 2002/03 financial years. The Boards combined revenue figures grow by 9,7 per cent from R4,1 billion in 2001/02 to R4,5 billion in 2002/03. The combined capital budget grew by 13,9 per cent from R587 million to R 669 million and combined operating budget grew by 10,3 percent from R1,8 billion to R2 billion over the corresponding period. The figures exclude cost of sales (raw water costs) however, net operating income of over R700 million for 2001/02 is reported.

Five Water Boards generate 91 per cent of all revenues, with Rand Water (R2,6 billion) and Umgeni (R800 million) by far the largest. The value of the combined assets amount to about R10,9 billion, with an external debt of just over R7,3 billion. Capital spending among the 15 Water Boards varies, with Rand Water and Umgeni making capital investments during 2001/02 of R276 million and R192 million, respectively. Capital against revenue for Rand Water amounted to 10,9 and 10,1 per cent for 2001/02 and 2002/03 while in the case of Umgeni this was 26 and 25 per cent, respectively. However, in many other Water boards capital spending amounts to zero.

Table 11.3 Income and Expenditure of Water Boards

	Revenue		Capital Expenditure		Operating Expenditure	
R thousand	2001/02 Actual	2002/03 Estimated actual	2001/02 Actual	2002/03 Estimated actual	2001/02 Actual	2002/03 Estimated actual
Albany Coast	2 115	1 968	1 358	1 966	1 448	1 347
Amatola	54 321	62 139	5 252	13 989	30 378	45 462
Bloem	92 692	114 656	4 750	2 300	55 798	69 156
Botshelo	79 907	85 000	–	–	80 077	82 000
Bushbuckridge	9 351	102 901	44 916	22 856	15 962	38 095
Ikangala	1 920	79 869	–	56	2 054	79 749
Lepelle	132 431	135 146	–	–	73 382	79 565
Magalies	86 818	86 132	–	27 400	37 957	46 720
Mhlathuze	124 166	144 200	60 500	119 600	84 842	101 600
Namakwa	8 866	9 753	–	–	6 769	7 446
Overberg	12 284	14 206	512	1 172	11 435	12 290
Pelladrift	5 149	5 786	–	–	5 045	5 774
Rand Water	2 513 342	2 616 000	276 100	266 400	1 031 534	1 077 400
Sedibeng	239 631	260 053	1 857	11 103	122 712	143 162
Umgeni	738 503	802 446	192 266	202 248	287 414	247 848
Total	**4 101 496**	**4 520 255**	**587 511**	**669 090**	**1 846 806**	**2 037 614**

Source: Department of Water Affairs and Forestry.

Information on Water Boards to be made available by DWAF

The Department of Water Affairs and Forestry will make the detailed information on the Water Boards' medium-term budgets available when it completes the annual review of Water Board Business Plans. According to the *2002 Estimates of National Expenditure*, over the medium term from 2001/02 to 2004/05, an amount of R420 million is due to be transferred to the Water Boards from the Department's budget.

Municipal Budgets

Municipalities spend close to R11 billion on water and sanitation

Although municipalities have not yet ring-fenced their water and sanitation operations to generate separate budgets, it is estimated that municipalities will spend about R11 billion for the 2002-03 municipal year. Annexure C provides disaggregated operating and capital budgets. Operating income is estimated to be over R9 billion, with expenditure for the purchase of bulk water at R4,4 billion, salaries in the region of R2 billion, and close to R600 million for repairs, maintenance and general consumables. The capital budget is R2 billion with the six metro municipalities spending in the region of R700 million.

Table 11.4 shows water and sanitation budgets for district (category C) municipalities amounts to R297 million, which is close to 10 per cent of the R2,3 billion budget of local (category B) municipalities. The figure is reflective of bulk water purchases and does not capture all the associated costs involved in the water and sanitation function.

District municipalities spend less

The low district budgets for water and sanitation reflect the current division of the water and sanitation function with local municipalities. It is not clear how these budgets will change once the new division of functions is implemented from 1 July 2003, particularly in cases where the district municipality becomes responsible for this function.

Table 11.4 Water and sanitation expenditure by category of municipalities

	Operating		Capital		Total		% Change
R thousand	2001-02	2002-03	2001-02	2002-03	2001-02	2002-03	
Category A (Metros)	2 947 644	3 400 552	683 776	708 041	3 631 420	4 108 593	13,1%
Category B (Locals)	1 184 621	1 309 067	682 852	1 024 293	1 867 473	2 333 360	24,9%
Category C (Districts)	32 773	50 197	302 411	246 643	335 184	296 840	-11,4%
Total	**4 165 038**	**4 759 816**	**1 669 039**	**1 978 977**	**5 834 077**	**6 738 793**	**15,5%**

Source: National Treasury Local Government Database.

Delivery in rural areas remains a challenge

Municipalities are not in a position to report separately on their rural services. Before 1994, services to rural areas were not provided by former white municipalities, but by homeland governments and regional water providers. Some of these projects were transferred to the Department of Water Affairs and Forestry directly, and are yet to be transferred to new municipalities. Given that water is probably the biggest priority for rural areas, it is critical that the capacity of municipalities to provide water to rural areas be improved. The fact that piped water is expensive for sparsely populated areas makes this challenge a difficult one.

Government's objective is to ensure access to water within 200 metres of all households. However, this is made difficult in rural areas, as homesteads are often more than 200 metres apart, hence in some cases the delivery point is further than the 200 metres. It is only since the local government elections of 2000 and the attribution of powers and functions in January 2003, that it has been possible for local governments to take over the water service function for their entire areas. For these reasons of legacy and costs, it is mainly the Water Boards, the national Department and districts that have been providing water to rural areas, rather than local municipalities.

Analysing municipalities by size of budget

Table 11.5 presents municipal budget categorised in different bands. This provides a different analytical perspective on capital budgets for local Government. The municipalities have been divided into six groups:

- Metros: Six municipalities with 31 per cent of households
- B1: Secondary cities: top 21 local municipalities with 18 per cent of households
- B2: Local municipalities with a medium to large town as core: 31 municipalities with 9 per cent of households
- B3: Local municipalities with a small town or several small towns as core and with a relatively small rural population: 119 municipalities with 20 per cent of households

- B4: largely rural municipalities: 60 municipalities with 22 per cent of households)
- District municipalities.

The table indicates the low levels of capital budgeted by the poor rural B4 local municipalities and districts. In analysing the data, the recent decision to divide the assignment of powers and functions between district and local municipalities should be taken into account. Given that the greatest backlogs are in the B4 municipalities, it is not clear whether the small budgets reflect the lack of funds, poor spending capacity or other problems.

Table 11.5 Water and sanitation capital expenditure by municipal group - 2001

Group	House-holds	Water			Sanitation			Total capex (all municipal services) (R'000)
		Capex (R'000)	Capex per household (Rand)	% of all munic capex	Capex (R'000)	Capex per household (Rand)	% of all munic capex	
Metros	2 526 639	546 745	216	10,0%	313 159	124	6,0%	5 238 173
Group B1s	1 473 426	202 266	137	17,0%	72 891	49	6,0%	1 169 721
Group B2s	719 867	35 861	50	12,0%	24 456	34	8,0%	289 120
Group B3s	1 697 044	113 567	67	18,0%	4 809	29	8,0%	616 490
Group B4s	1 829 033	60 657	33	29,0%	10 782	6	5,0%	211 115
Districts	5 836 300	177 597	30	36,0%	13 647	2	3,0%	493 226
Total	**8 246 000**	**1 136 693**	**81**	**14,0%**	**484 745**	**34**	**6,0%**	**8 017 845**

Source: National Treasury Local Government Database.

Using the same division, Table 11.6 provides a summary of the way municipalities anticipate financing their capital expenditure for water.

Table 11.6 Capital financing by source (all municipal services) - 2001

Group	Capital Financing						
	Grants			Loans	Internal	Other	Total
R million	National	Provincial	Total				
Metros	292	658	950	788	2 578	922	5 238
Group B1s	133	125	258	317	356	238	1 170
Group B2s	49	37	86	33	129	41	289
Group B3s	169	73	243	38	179	157	616
Group B4s	124	5	130	0	24	57	211
Districts	163	92	255	5	89	144	493
Total	**931**	**991**	**1 922**	**1 181**	**3 355**	**1 560**	**8 018**
% Distribution	12,0%	12,0%	24,0%	15,0%	42,0%	19,0%	100,0%

Source: National Treasury Local Government Database.

The best indicator of water and sanitation budgets is in the metros and large local municipalities. Although the water and sanitation budgets are not ring-fenced, they still provide valuable information on operating expenditure and income and planned capital for 2002-03 for a selected number of municipalities.

Analysis from selected sample of municipalities

The National Treasury sample of 18 municipalities accounts for just over R7 billion in income from this function. Annexure C provides details on selected municipalities. Planned capital expenditure is R1 billion, or 13,5 per cent of total income. The operating expenditure

is primarily the cost of bulk water purchase and does not include staff and other costs associated with this service. This explains the large difference ("surplus") of R3,6 billion between income (R7,2 billion) and expenditure (R3,6 billion), which reduces significantly once salary, administrative, repair and maintenance charges are deducted. It is therefore difficult to assess whether municipalities profit from their water and sanitation function, or to what extent such activities have to be subsidised from other income sources.

Case study of Johannesburg Water

Johannesburg is one of the few municipalities that has begun to ring-fence its water and sanitation activity, by establishing the Johannesburg Water municipal entity in 2001. Table 11.7 shows that the purchase of bulk water makes up 44 per cent of its spending, salary costs make up 13 per cent, but may be masked by the extent of contracted services, which if included push this amount up to 20 per cent; a provision for bad debtors makes up 6 per cent; and a contribution to the metropolitan council makes up 4,5 per cent of total budgets for 2002-03. The Johannesburg Water case study shows that water and sanitation operated at a small deficit, indicating the need, even in metros, to fund water and sanitation services from other revenue. The actual deficit for Johannesburg Water may be larger, as not all water and sanitation support functions have been apportioned.

Table 11.7 Multi-year Budget for Johannesburg Water: 2002-03

Total Income and Expenditure	Revised	Budget	Forecast	
R millions	**2001/02**	**2002/03**	**2003/04**	**2004/05**
Income	1 947 000	2 180 917	2 428 243	2 649 702
Expenditure	2 064 208	2 246 460	2 430 539	2 634 299
Income				
User Charges for Services	1 941 000	2 163 276	2 407 460	2 627 597
Other Income	6 000	17 641	20 783	22 105
Total operating income	**1 947 000**	**2 180 917**	**2 428 243**	**2 649 702**
Expenditure				
Employee Costs - Wages & Salaries	193 732	229 930	254 887	291 503
Employee Costs - Social Contributions	45 443	53 934	59 788	68 377
Bad Debts	156 000	171 845	189 892	205 768
Depreciation	128 088	136 000	148 000	159 000
Repairs and Maintenance	57 170	11 613	12 298	12 943
Interest Expense - External borrowings	178 600	159 000	176 000	188 000
Bulk Purchases	844 000	983 353	1 087 293	1 200 945
Contracted Services	139 500	167 832	155 123	145 793
General Expenses - Other	197 190	232 953	247 258	261 979
Direct operating expenditure	**1 939 723**	**2 146 460**	**2 330 539**	**2 534 299**
Internal Transfers				
Contributions to Johannesburg	100 000	100 000	100 000	100 000
Internal Charges	24 485			
Total operating expenditure	**2 064 208**	**2 246 460**	**2 430 539**	**2 634 299**
Deficit/(surplus)	**117 208**	**65 543**	**2 296**	**-15 403**

Source: Johannesburg Budget.

Water losses

The high level of water losses is cause for concern

A major problem in most municipalities is the extent of unaccounted-for water, which includes physical losses as well as water not billed

and/or paid for. Unaccounted-for water is an important performance indicator, as it measures both business efficiency in metering, billing and collection, as well as technical efficiency in the maintenance and repair of infrastructure.

Table 11.8 shows the unaccounted for water that ranges from 10 per cent to 42 per cent. The lower range losses may be understated by non-reporting. Unaccounted-for water in the City of Johannesburg, eThekwini and Nelson Mandela metropolitan areas fall between 20 per cent and 42 per cent. Some of these losses are the result of poor infrastructure in former black townships, like leakage of pipes which cannot be identified, illegal water connections; and physical losses. In resolving this problem, municipalities will have to spend considerable resources on repairing, upgrading or replacing existing infrastructure. The new Municipal Infrastructure Grant announced in the 2003 Budget will help municipalities to fund such projects.

Table 11.8 Unaccounted-for figures from Rand Water survey - 2001

Rand Water supply area	Water bought (Ml/yr)	Water sold (Ml/yr)	Unaccounted-for water Percentage
Johannesburg	392 000	227 000	42,0%
Tshwane (Pretoria)	122 000	93 000	24,0%
Mogale City (Krugersdorp)	20 000	17 000	15,0%
Other areas			
Cape Town	295 000	259 000	12,0%
eThekwini (Durban)	267 000	182 000	32,0%
Nelson Mandela (Port Elizabeth)	68 000	54 000	20,0%
Mangaung (Bloemfontein)	48 000	43 000	10,0%

Source: Rand Water Survey.

Personnel in the water sector

Approximately 29 000 staff employed in the water sector

The water sector employs about 29 000 employees between the national Department of Water Affairs and Forestry, Water Boards and municipalities working in this sector. Table 11.9 provides numbers of people employed in the Department's different programmes. Employee numbers in the Water Resources Management Programme have risen from 3 364 in 1999/00 to 4 104 in 2003/04, representing a 22 per cent increase. The overall per employee cost is R65 000 in 2002/03. DWAF estimates that 8 168 personnel are expected to be transferred to local government over the next three years.

Table 11.9 Personnel numbers and costs for DWAF

Number	1999/00	2000/01	2001/02	2002/03	2003/04
Administration	650	730	772	772	772
Water Resources Management	3 364	3 866	4 023	4 104	4 104
Water Services	54	76	74	74	74
Forestry	935	1 978	1 843	4 893	4 893
Total personnel numbers	**5 003**	**6 650**	**6 712**	**9 843**	**9 843**
Total personnel expenditure (R'000)	306 389	373 294	406 708	641 067	585 929
Personnel unit cost (R'000)	61,24	56,13	60,59	65,13	59,53

Source: 2003 Estimates of National Expenditure.

Table 11.10 indicates the number of staff employed by Water Boards, the population they serve and their associated costs.

Rand Water is the biggest employer in the sector

The 15 Water Boards employ over 6 700 personnel at an average salary of R 117 235 per annum. Rand Water is the biggest employer, with 3 172 staff. Its total personnel expenditure amounts to R423 million per annum, or an average cost per employee of R133 417. The average cost per employee for Amatola is R108 407 and for Mhlatuze, R198 780. It should be noted that Pelladrift Water Board, in the Northern Cape is operated by Anglo mines and Ikangala Water Board only commenced operations during 2000.

Table 11.10 Staffing at water boards - 2002/03

Water board	Population served (R '000)	Service area (sq km)	Staff (no)	Personnel costs	Average costs (R' 000)
Rand Water	10 000	18 001	3 172	423 200	133
Umgeni Water	4 302	32 000	1 050	112 342	107
Sedibeng Water	1 600	86 000	595	27 967	47
Lepelle Northern	1 000	82 000	263	32 628	124
Mhlathuze Water	380	37 000	164	32 600	199
Bloem Water	800	35 150	244	28 830	118
Ikangala Water	1 530	4 008	6	26 118	4 353
Botshelo Water	821	49 858	388	34 000	88
Amatola Water	1 200	43 400	233	25 259	108
Bushbuck Ridge	1 200	12 320	282	26 472	94
Magalies Water	800	35 000	281	14 693	52
Overberg Water	2 070	6 700	70	6 393	91
Pelladrift Water	7	9 531	–	–	–
Namakwa Water	45	1 487	26	1 930	74
Albany Coast Water	10		6	2 427	404
Total	**25 765**	**452 455**	**6 780**	**794 858**	**117**

Source:Department of Water Affairs and Forestry.

Salaries in municipalities differ considerably

Personnel information for municipalities is only available for a sample of selected municipalities. Table 11.11 reflects the average cost per employee in metropolitan areas at R96 000, compared to R63 000 in medium sized municipalities, with an overall average of R88 000. It also shows that over 8 000 personnel are employed in the six metropolitan municipalities. It is not clear to what extent the coming shifts in the water service function between some category B and C municipalities will increase personnel costs.

Table 11.11 Water and sanitation services budgeted employee costs: 2002-03

Municipality	Budgeted No. of employees	Total cost of employees R'000	Average costs R'000
City of Johannesburg	2 533	283 864	112
eThekwini (Durban)	2 654	228 930	86
Ekurhuleni (East Rand)	1 270	112 088	88
Tshwane (Pretoria)	967	110 101	114
Nelson Mandela (Port Elizabeth)	981	74 119	76
Total Metros	**8 405**	**809 102**	**96**
Buffalo City (East London)	570	28 274	50
Mangaung (Bloemfontein)	298	35 219	118
Msunduzi (Pietermaritzburg)	316	6 848	22
Polokwane (Pietersburg)	103	5 446	53
Rustenburg	153	8 798	58
Umhlathuze (Richardsbay)	230	16 968	74
Drakenstein (Paarl)	187	13 114	70
Sol Plaatje (Kimberley)	244	12 526	51
Mbombela (Nelspruit)	64	4 696	73
Govan Mbeki (Highveld East)	230	14 772	64
Stellenbosch	142	11 108	78
Mafikeng	76	5 554	73
Total largest 12 municipalities	**2 613**	**163 323**	**63**
Total largest 17 municipalities[1]	**11 018**	**972 425**	**159**

1. Data for Cape Town not available.

Source: National Treasury Local Government Database.

Table 11.12 provides an analysis of selected municipalities, from the perspective of staff cost to total cost. These range from 32 per cent in Cape Town to 41 per cent in Randfontein. The table shows the wide variations in different municipalities. Particularly in the case of water supply, the variations can be attributed to the following:

- The extent to which the municipality runs a bulk service
- The complexity of bulk and distribution networks, including storage reservoirs and purification plants
- The extent to which services are performed through alternative mechanisms or service providers
- The levels of services offered and the age of the distribution network.

Table 11.12 Staff expenditure as a proportion of total expenditure for a selection of municipalities - 2001

	Water supply			Sanitation		
R thousand	**Total**	**Staff**	**%**	**Total**	**Staff**	**%**
Laingsburg	224	160	71,0%	281	207	74,0%
Saldanha				5 013	1 489	30,0%
Randfontein	3 695	1 525	41,0%	8 114	2 892	36,0%
Nelson Mandela (Port Elizabeth)	194 800	35 300	18,0%	126 300	32 600	26,0%
Buffalo City (East London)	58 313	13 776	24,0%	43 528	14 106	32,0%
Mogale City (Krugersdorp)	61 622	3 665	6,0%	12 801	3 253	25,0%
eThekwini (Durban)	898 524	116 832	13,0%	282 024	108 866	39,0%
Cape Town	613 034	193 961	32,0%	478 883	85 210	18,0%
Sol Plaatje (Kimberley)	56 262	3 634	6,0%	25 690	8 892	35,0%
Mangaung (Bloemfontein)	161 405	18 365	11,0%	32 216	12 056	37,0%
Nokeng Tsa Taemane	5 961	144	2,0%	2 161	1 009	47,0%
Lesedi (Heidelberg)	14 732	1 484	10,0%	6 419	1 206	19,0%

Source: National Treasury Local Government Database.

Water resources

Water users

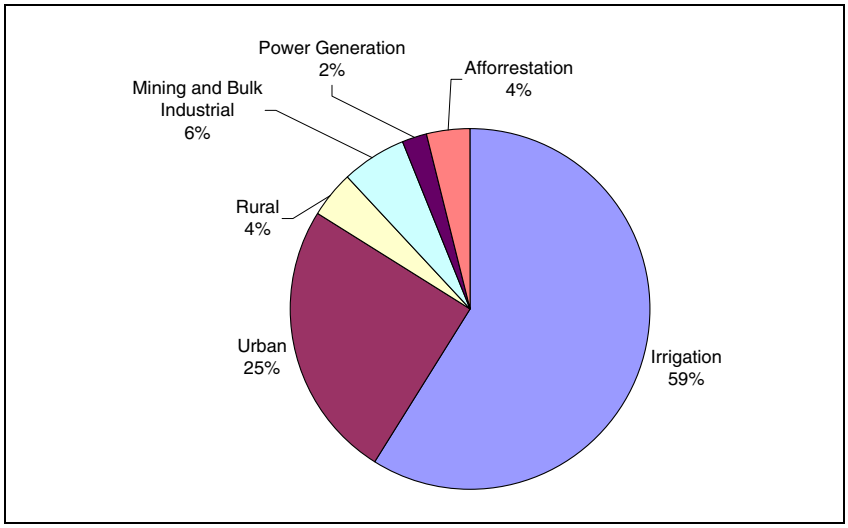
The many users of water fall into the following categories:

- Domestic (both rural and urban)
- Commercial: including offices; shops; 'dry' industries that do not use water for processing; and institutions such as schools, churches and recreation facilities
- Industrial and Mining, where water is used in the production process
- Irrigation and Agriculture
- The Environment is sometimes considered a water user since between 10 and 25 per cent of available water is reserved to sustain aquatic ecosystems

Agriculture is the biggest user of water

The largest users of water resources are the agriculture, urban and mining sectors: irrigation consumes 59 per cent, followed by urban (25 per cent), industrial and mining (6 per cent), rural and afforestation (4 per cent each) and power generation (2 per cent).

Figure 11.1: Sectoral breakdown of water use in South Africa



Source: Department of Water Affairs and Forestry

Irrigation

Figure 11.1 reflects the high consumption levels for irrigation users. Irrigation water is supplied in a number of ways:

- By water user associations, which are currently in transition from former Irrigation Boards
- Directly by the Department of Water Affairs and Forestry if they are running the schemes. (These are in the process of being transferred to Water User Associations (WUAs)
- Direct abstraction by individual farmers.

There are over 300 Water User Associations and Irrigation Boards. While the smaller organisations are not monitored on a regular basis, information is available for larger areas, such as the Breede area in the Western Cape and the Komati area in Mpumalanga.

Water consumption

In terms of the Constitution, municipalities are responsible for providing water to domestic, commercial and certain industrial and mining consumers, particularly in urban areas. Table 11.14 provides information on the split between the three categories. The splits are important for a number of reasons. In particular, the proportion of domestic to total consumption is an important indicator of viability as non-domestic consumers are more able to afford water services. Further, each group of users usually has different water supply and sanitation tariffs.

Table 11.13 Split of municipal water consumption - 2001

	Domestic	Commercial and institutional	Wet industries
Ngqushwa	98%	2%	0%
Laingsburg	73%	27%	0%
Randfontein	71%	15%	14%
Nelson Mandela (Port Elizabeth)	66%	19%	15%
Tshwane (Pretoria)	57%	23%	20%

Source: National Treasury Study.

Consumption patterns vary widely

The figures in Table 11.13 indicate the wide variety in shares of users, with domestic consumption having a smaller share in a municipality which has a higher level of economic development. For example, Ngqushwa, a largely rural municipality in the Eastern Cape (Amatola district), with a low level of commercial and industrial economic activity, has a 98 per cent share for domestic users. In contrast, Tshwane, with a high level of commercial and industrial activity, has a lower 57 per cent share for domestic users.

Table 11.14 shows patterns of consumption in a selected sample of municipalities.

Table 11.14 Water consumer profile in selected municipalities: 2002-03

Number	Mafikeng	Rustenburg	Msunduzi
Domestic / residential consumers	58 980	68 482	43 238
Commercial consumers	1 000	4 404	2 301
Industrial and mining consumers	20	170	775
Irrigation and agricultural consumers	–	29	–
Total	**60 000**	**73 085**	**46 314**

Source: National Treasury Survey (March 2003).

Access to water resources

Table 11.15 outlines how the Department of Water Affairs and Forestry assesses current and future water resources needs and deficits.

The areas indicated in the table below do not correlate with new municipal boundaries, so it is difficult to provide any detailed analysis linking water resource needs to municipalities. For the country as a whole, the overall balance shows a surplus. However, regional differences are apparent, with more than half the water management areas showing a deficit in terms of water requirements.

Table 11.15 Reconciliation of water requirements and availability for year 2000 - million m^3/annum

Water Management Area	Reliable local yield [1]	Transfers In	Local Requirements	Transfers Out	Balance
Limpopo	282	19	325	–	-24
Luvuvhu/Letaba	310	–	334	13	-37
Crocodile West and Marico	693	656	1 328	10	11
Olifants	611	172	971	8	-196
Inkomati	943	–	1 048	148	-253
Usutu to Mhlatuze	1 010	32	693	114	235
Thukela	738	–	338	497	-97
Upper Vaal	1 723	1 443	1 204	1 481	481
Middle Vaal	201	791	389	605	-2
Lower Vaal	50	651	653	–	48
Mvoti to Umzimkulu	527	34	828	–	-267
Mzimvubu to Keiskamma	855	–	375	–	480
Upper Orange	4 557	2	968	3 105	486
Lower Orange	-1 007	1 886	834	54	-9
Fish to Tsitsikamma	437	571	902	–	106
Gouritz	277	–	342	1	-66
Olifants/Doring	335	3	373	–	-35
Breede	868	1	637	203	29
Berg	501	203	738	–	-34

1. The amount that can reliably be provided 98 years out of 100.

Source: Department of Water Affairs and Forestry.

Water management areas

The National Water Act lays the basis for the establishment of catchment management agencies and water user associations responsible for water resources management.

Development of catchment management strategy

Within each Water Management Area, the Act envisages the creation of a Catchment Management Agency (CMA). This is a statutory river-basin organisation responsible for the integrated management of water resources and securing the participation of local stakeholders in decision-making. The primary role of the agencies is to develop a catchment management strategy outlining the framework and objectives of water resources management within the management area. The strategy must be consistent with the national water resources strategy and include measures for resource protection. Feasibility studies are currently under way for the establishment of Catchment Management Agencies. To date, only one is close to being set up, and the Department is till carrying out catchment management functions.

The National Water Act also makes provision for Water User Associations (WUAs). In effect, these are co-operative institutions of individual water users who wish to undertake water-related activities for their mutual benefit. Most associations serve farmers and are based at the former irrigation boards.

Finally, in the absence of a single utility structure for major water resource development, special-purpose vehicles such as the Trans Caledon Tunnel Authority have been established to support the implementation of major multi-user projects.

Water resource development

In many parts of South Africa, access to reliable sources of water is only possible through water resource development. The construction of dams and transfer schemes enables available resources to be appropriately managed.

Water resource development and management key to sustainability

Traditionally, the financing of water resource development has been through the national Department's budget for larger multi-purpose schemes. Where the needs of a single user can be met from a single project, financing is effected through the relevant user sector, such as agriculture, mining and municipalities.

In terms of the water pricing policy, users are expected to pay for the costs of making water available. In 2001/2, the Department of Water Affairs and Forestry sold water to the value of R1,8 billion; this was up from R1,6 billion in 2000/01. This system is enabling more water resource development projects to be funded from user charges. This includes the R25 billion Lesotho Highlands Water Project and the soon-to-be-constructed R1,5 billion Berg River project which will increase water supply to the Western Cape peninsula. Smaller-scale projects such as the R160 million Bivane Dam near Pongola in KwaZulu-Natal and the R340 million platinum pipeline in Limpopo have been funded by agricultural and mining water users.

High costs involved in large-water projects

The process of water resource development is being hindered by the 'lumpiness' of large water projects. The establishment of special-purpose vehicles such as the Trans Caledon Tunnel Authority is an example of how a project can be handled. The Department is currently preparing proposals to establish a National Water Utility, which would be able to pool funding requirements and support projects from the cash flow of the existing stock of large water infrastructure. The utility would also ensure that the stock of national water infrastructure, presently valued at approximately R55 billion, is properly maintained.

Tariffs and pricing policy

The water pricing chain

In evaluating water pricing, it is helpful to distinguish the pricing of water resources (bulk, 'raw' water) and water services as provided by municipalities, as they are regulated by separate policies and regulations. It is also necessary to consider the pricing of interventions to protect water quality. These include water services, waste water treatment, as well as pollution control and waste discharge pricing mechanisms.

Municipal water services prices

When assessing trends in pricing for water services, it is best to begin by considering the price at the end of the chain – the price set by the retail sector, namely municipalities – and then to consider the impact of the cost of providing water to the retail distributors. The pricing of bulk water varies substantially from site to site and it is thus difficult to provide a general analysis of costs and pricing trends.

Price increases fuel inflation

The most independent analysis of pricing trends in water is from the CPI index of Stats SA. The water component's average annual percentage increase was 13,2 per cent in 2002, 10,4 per cent in 2001 and 10,1 per cent in 2002. The Governor of the Reserve Bank has noted with concern the adverse impact on Government's inflation target of such significant real increases through administered prices. The Department of Water Affairs and Forestry points out that the period under review coincides with a process of substantial municipal restructuring. In many cases, the tariff adjustments reflect the incorporation of high-cost, low-income communities by municipalities.

Cost of bulk water supply

In addition, a major component of the cost of retail water derives from the cost of bulk water supply. This is illustrated in Gauteng, where large new projects are required to provide additional water. As in many other parts of the world, the costs of bulk water rises with each new project as earlier cheap options are exhausted and water has to be brought from more distant, and expensive, sources. In addition, in terms of the national water policy, pricing is recognised as an efficient mechanism for allocating water between different users and the cost of raw water will rise as a function of its scarcity.

Retail pricing

At the municipal level, tariff structures are regulated by the Department of Water Affairs and Forestry in terms of the Water Services Act. The majority of municipalities apply a rising block tariff of which the first block, from 0 to 6 kl/month is free.

Cross-subsidisation through block tariffs

The rising block tariff mechanism is used to generate a local cross-subsidy to supplement the equitable share. A portion of the equitable share is to be used for basic service provision.

Table 11.16 shows that the first 6kl per month are provided free by most municipalities. However, within the 7 to 10kl range the tariff varies considerably. For example, the tariff for this range is R2,49 in Johannesburg and R4,15 in Tshwane. Note that the higher rate here impacts directly on poor households whose consumption exceeds 6kl. The tariff structure is reversed, however, when comparing the range up to 30kl. Johannesburg charges R5,81 compared to Tshwane at R4,51. This reflects a small penalty rate for high-end users in Johannesburg. Water consumption at 30kl will cost R139,44 in Johannesburg, R108,24 in Tshwane, and R148,10 in eThekwini.

Block tariffs penalise high consumption

While the rising block tariff approach is easy to administer, as it is universal, there is some evidence to suggest that poor households using more than 6 kl per month are adversely affected due to the steep increase in tariffs after the free 6 kl. This raises an important issue on the appropriateness of indigent policies adopted by municipalities. An important factor which limits cross subsidisation within local jurisdictions is the ratio of rich to poor consumers. For this reason, the continued use of a portion of the equitable share allocation to municipalities will continue to be needed to provide free basic water.

Table 11.16 Service Charges - 2002

	City of Johannes-burg	City of Tshwane	Musina Municipality	Nkomazi Municipality (Malelane)	Emthanjeni Local Municipality	eThekwini Municipality	
						Semi-Pressure	Full Pressure
First 6kl	Free	Free	Free		Free	Free	Free
7-10 kl	R2,49 per kl	R4,15 per kl		R40,00 basic charge R1,70 per kl	R23,43 basic charge and R2,72 per kl	R3,55 per kl (up to 30 kl)	R29,10 basic charge (up to 12 kl) or R41,60 basic charge (greater than 12kl) and R3,55 per kl (up to 30 kl)
11-15kl	R4,48 per kl	R4,42 per kl		R40,00 basic charge R1,70 per kl	R23,43 basic charge and R2,72 per kl		
16-20kl	R5,00 per kl	R4,46 per kl		R40,00 basic charge R1,70 per kl	R23,43 basic charge and R2,72 per kl		
20-40kl	R5,81 per kl	R4,51 per kl		R40,00 basic charge R1,70 per kl			
Greater than 40kl	R7,09 per kl	R4,87 per kl		R40,00 basic charge R1,70 per kl		R10,65 per kl (greater than 30 kl)	R41,60 basic charge (greater than 12kl) and R10,65 per kl (greater than 30 kl)
7-75kl			R3,01 per kl	R40,00 basic charge R1,70 per kl			
Greater than 76kl			R3,11 per kl	R40,00 basic charge R1,70 per kl			

Source: National Treasury Survey.

Table 11.17 shows the results of a Rand Water Board study based on a sample of municipalities, tracking trends in billing for 20kl over a period of five years. The information reflects variances as great as 50 per cent between the providers. Apart from Tshwane, the study points to real increases in most municipalities in the sample, from 1,5 per cent to as much as 8,6 per cent in real terms.

Table 11.17 Comparison of water bills and trends in bills for a sample of large municipalities

Municipality	Bill for 20kl/month of water – 2001/02	Increase in bill over 5 years in real terms
Johannesburg	53	1,4%
Tshwane (Pretoria)	60	-3,5%
Ekurhuleni (East Rand)	69	2,1%
Mogale City (Krugersdorp)	63	3,7%
Emfuleni (Vaal)	85	6,6%
Cape Town	36	1,8%
Nelson Mandela (Port Elizabeth)	84	8,6%

Source: Rand Water Survey.

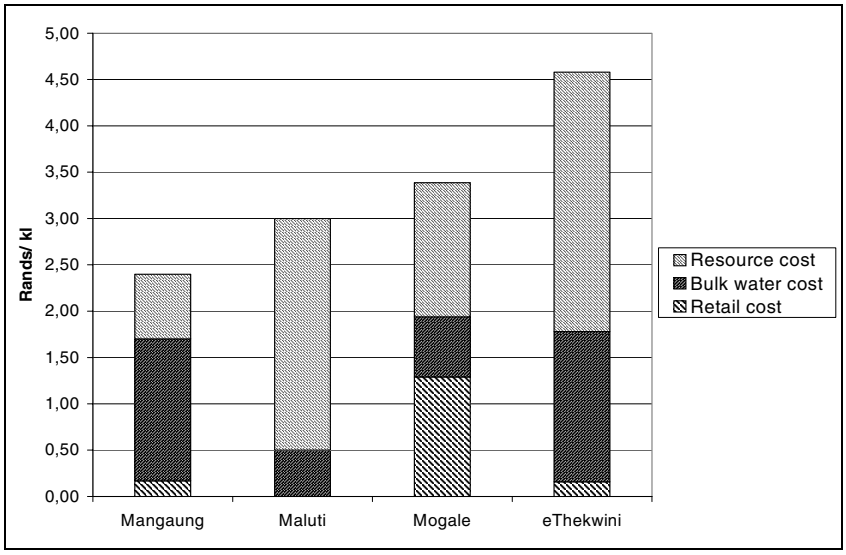
Mangaung experiences high bulk water costs while eThekwini has high retail costs

Figure 11.2 illustrates three situations where a Water Board is involved in the supply chain. The fourth scenario shows a situation in a rural area with a very good source of supply, where the resource and bulk costs are small.

The build-up of retail tariffs can be illustrated as follows:

- Mogale City in Gauteng is supplied with bulk water by Rand Water which gets its supply from the Vaal system which is augmented from the Lesotho Highlands water scheme. The pricing is made up of 41 per cent in resource costs, 15 per cent in bulk costs and 44 per cent in retail costs.
- eThekwini Metro gets its water from Umgeni Water, which draws from a number of sources, with a large portion from the Umgeni River. The pricing is made up of 6,5 per cent in resource costs, 30 per cent in bulk costs and 63,5 per cent in retail costs.
- Mangaung, which obtains bulk water from Bloem Water, which gets its water from the Caledon River, shows approximately 12,5 per cent in resource costs, 62,5 per cent in bulk water costs and retail costs of 25 per cent.
- Maluti Villages in Alfred Nzo district in the Eastern Cape, gets water from springs in the Maluti mountains, requiring no treatment and no pumping. The infrastructure is grant-funded and therefore no capital charges are included. The pricing is made up of bulk costs at 16 per cent and retail costs at 84 per cent.

Figure 11.2: Build up of water supply tariff



Source: PDG Study.

Rand Water and Umgeni had real increases over the past 5 years

The figure indicates that Rand Water and Umgeni Water have had annual increases of 8 per cent and 6 per cent respectively in real terms over the last five years[2]. On average the tariffs have increased by 2,9 per cent per annum over the last two years, in real terms, but by 12,7 per cent for the three years before that. This suggests an overall increase of 7,5 per cent for the last five years per annum in real terms (adjusted for inflation). As indicated above, the reason attributed by the Water Boards for the high increase in earlier years in the case of Umgeni relates to the additional costs of providing water in townships which were previously under separate administrations as well as previously unserved rural areas. In the case of Rand Water, it is primarily due to the rapidly increasing raw water charge paid for water from the Vaal system, augmented by water from the Lesotho Highlands scheme.

Annexure C provides further information on monthly household bills for a sample set of municipalities. The sample represents a small and large household, and charges for property taxes, electricity, water, sanitation and refuse removal.

Table 11.18 shows tariffs paid to water service providers from a sample set of municipalities. The table also reflects retail prices charged to different consumer categories, and the number of connections and cut-offs. Msunduzi pays R2,29 per kl while Mafikeng pays R1,64 per kl for bulk water. Mafikeng is therefore able to charge lower tariffs to its end users.

[2] It is unclear on the methodology used in arriving at these figures.

Table 11.18 Pricing and tariffs: Water and sanitation: 2002-03 budgeted

R per Kl	Mafikeng	Rustenburg	Msunduzi
Tariff paid to Water Service Provider	R 1,64	R 2,31	R 2,29
category			
Domestic/ Residential Consumers	R 4,20	R 4,70	R 5,62
Commercial Consumers	R 2,30	R 4,05	R 5,86
Industrial and Mining Consumers	R 4,20	R 4,05	R 5,86
Irrigation & Agricultural Consumers	R 4,20	N/A	N/A
Number of connections to consumers	12 000	43 885	400
Number of cut-offs/ Disconnections	N/A	6 000	N/A

Source: National Treasury Survey (March 2003).

Sanitation

Little information available on sanitation services

The provision of sanitation is expensive for water-borne systems. This is because waste water must be transported away from the users. Waste water reticulation is more expensive than water supply infrastructure and the waste water must be treated to a high standard before it is discharged back into the rivers for re-use by other consumers. These costs impact on the provision of free basic services. As an example, there appears to be considerable variety in municipalities on their sanitation tariff policy. Tshwane municipality charges a fee per toilet connection for residential users irrespective of water consumption or household numbers. Sewerage charges for a household in the City of Johannesburg are based on plot size, while in Cape Town charges are based on the metered amount of water consumed.

Conclusion

The financial structure of the water sector is complex, reflecting both the financing of trading services in a municipal context and the financing of natural resource management and development.

The Department of Water Affairs and Forestry has established a policy and regulatory framework which is being implemented and is now increasingly focusing on the monitoring of the performance of water management institutions.

In the area of water services, a system of regulatory oversight of Water Boards has been established, which is producing a regular flow of structured financial data. The situation in the municipal context is less clear since the new municipalities have not yet established effective financial systems which allow sectoral reporting and analysis.

However, given the need to protect scarce water resources, and yet at the same time make such services accessible to poor South Africans and ensure that pricing policies do not undermine inflation targets, Government faces a considerable challenge. This also relates to Government's role as both provider and regulator, in particular the regulation of monopolistic pricing tendencies, and the need to ensure that inefficiencies by water suppliers are reduced and not passed on to

consumers. Government is reviewing its whole approach to the price-setting process in the public sector.

The provider and regulator roles also raise other issues. For example, the water and electricity sectors are structured differently, and deal with the role of the regulator differently. While the electricity sector is moving towards establishing regional distributors, in the water sector this role is performed by municipalities and Water Boards. The question that arises is to what extent there should be consistency in the approach in the two sectors, without weakening the local sphere's role in the provision of these services.

In the area of water resources, the Department of Water Affairs and Forestry is building its resource economics capacity to be able to manage the challenges of inter-sectoral allocation and financing. These will become more acute as demand increases from a finite supply of available water.

The area of sanitation also requires further information to ensure that an appropriate policy for free basic sanitation is developed. It is also necessary to ensure that the impact of waste water generated by water-borne sanitation systems can be managed without damaging the water resource.