

DOES SOUTH AFRICA FACE A WATER CRISIS?

**A report to Business Leadership South Africa
by Nick Segal**

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Acronyms

AMD	Acid Mine Drainage
CMA	Catchment Management Agency
DWA	Department of Water Affairs (Department of Water Affairs and Forestry at the time of conducting the study)
NWA	National Water Act
NWRIA	National Water Resource Infrastructure Agency
NWRS	National Water Resource Strategy
WAR	Water Allocation Reform
WMA	Water Management Association
WSA	Water Services Act
WSAs	Water Services Authorities
WSPs	Water Services Providers

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Introduction

The purpose of this report is to give Business Leadership South Africa (BLSA) a “big picture” assessment of the state of the water sector in the country:

- is there a crisis in supply, now or prospectively?
- if so, what are its dimensions and its causes?
- what is being done about it, and what else could be done?
- how can business engage with government to help ensure that any problems identified are effectively and timeously addressed?

The study, comprising extensive consultations and review of published materials, was carried out in the period March – June 2009 and presented to the BLSA Council on 19 June. The present document is a slightly revised version of that presented to the Council.

The study was conducted in a period of flux in government. Not only was there a change of leadership, in personalities and in style, but there was also a change in ministerial portfolios and in concomitant departmental structures and roles. The water sector is one of those directly affected by the changes, and my consultations (despite, in a few critical instances, lack of them) revealed an inevitable uncertainty about the way forward on all fronts. The policy and institutional implications are as yet unclear.

Finally in this introduction, a comment of a rather different quality. *Prima facie*, water policy is a deceptively simple topic. The reality is different. The profound importance of water to human survival; the number and diversity of interests; the competition for access to water, locally and nationally as well as internationally; the technological choices for supply and treatment of waste water; ensuring reliable delivery of water of the appropriate quality to different classes of users and managing treatment of the resultant outflows; the use of price, licensing and other mechanisms for allocating water; the sheer size of the industry, with fixed assets of several hundred billion rands; ... these and other factors make water a sector of exceptional, and increasing, complexity.

Background

Before addressing the questions asked of this study, it is necessary to understand the policy and institutional framework of the water sector.

South Africa, on several indicators, is one of the driest countries in the world; it also has an unusually high intensity of water usage. The problem of water scarcity is compounded by the spatial pattern of economic activity and settlement, which is essentially out of line with the natural availability of water. To deal with this situation, over the course of the last century the country developed an internationally recognised competence in building and operating large dams, tunnels and pipelines for storing water and for transferring it from areas of surplus to areas of shortage. The problem of scarcity was masked too by extensive poverty and under-development, reinforced by the highly uneven racial distribution of access to water and to sanitation, with the bulk of the population being very poorly served.

Policy and institutional development

The political transition of the 1990s introduced fresh thinking and new energy into water management. Water was defined as an “indivisible natural resource”¹, managed by the national government² for the benefit of all South Africans. As a consequence, the system of riparian rights was abolished and citizens’ rights to water were changed to the status of temporary use rights from having been, where applicable, permanent property rights. The policy emphasis shifted from large-scale infrastructure development to issues of access, with a strong component of social equity, of ecological sustainability, of water conservation and demand management and of decentralisation in service delivery.

After a thorough and well managed consultation process, the Water Services Act of 1997 (WSA) and the National Water Act of 1998 (NWA), reinforced by the statutorily required National Water Resource Strategy of 2004 (NWRS)³, articulated these goals and placed overall responsibility for management of water and sanitation on what is now the Department of Water Affairs (DWA). It was (and still is) envisaged that DWA would step back from being directly involved in managing the water resources infrastructure, and would focus on its strategic, policy, regulatory and institutional support roles.

To implement the various Acts and the NWRS and to give effect to DWA’s new roles, over the past decade or so proposals for a new institutional architecture have been made, comprising principally:

- establishment of a statutory Catchment Management Agency (CMA) in each of 19 Water Management Areas (WMAs), with the mandate to formulate, within the framework of the NWRS, a catchment management strategy and generally to manage all aspects of water resources and to coordinate water-related activities in the respective WMA. It was agreed that, pending formation of a CMA, its functions would continue to be performed by DWAF
- establishment of statutory Water User Associations (WUAs), mostly based on the old irrigation boards

¹ The distinction is made between management of “water resources” (bulk water in rivers, dams and underground) and provision of “water services” (water being distributed for final consumption or being treated).

² According to the Constitution, management of water resources is a national competence and provision of water services a local competence. In addition, the national government, working with provincial government as necessary, has the responsibility for creating and managing the framework within which local government provides water (and other) services.

³ Numerous other policy and discussion documents have been issued by DWA over the years, such as the Strategic Framework for Water Services (2003), A Strategy for Water Allocation Reform (2006), A Pricing Strategy for Raw Water Use Charges (2007), the draft National Water Services Regulation Strategy (2008) and the Water Sector Institutional Realignment Project (2009). At present, considerable effort is going into a report entitled Water for Growth and Development Framework (WfGD) – version seven was published a few months ago, and the next version is currently under preparation – which is intended to form the basis of the statutorily required second edition of the NWRS due in 2009-10.

- designation of local government as Water Services Authorities (WSAs) with the responsibility for ensuring access to water and sanitation services
- designation of Water Services Providers (WSPs), responsible for supplying bulk and/or retail water on behalf of a WSA (which can act as a WSP itself). WSPs range from a multi-billion rand enterprise like Rand Water to a small provider in a rural community
- establishment of the National Water Resources Infrastructure Agency (NWRIA) as a state-owned institution responsible for operational and financial management as well as development of the physical infrastructure for water resources.

Further, within the policy framework set by the WSA, NWA and the NWRSA, DWA embarked on a number of strategic initiatives:

- formulation of so-called reconciliation strategies for water catchment areas, which explore the outlook for supply and demand in each area. This exercise, which commenced in July 2008 and is scheduled for completion in 2011, is intended to form the basis of the catchment management strategies noted above
- determination of the “ environmental reserve” for each catchment area. This is a concept aimed at ensuring that, before water is allocated for other uses, sufficient is “reserved” for the continuing ecological health of the catchment
- classification of water resources in accordance with the reserve, the rate and quality of inflow and of outflow, the presence of particular substances and other characteristics
- Water Allocation Reform (WAR). A strategy document was published in 2006 which, while emphasising access and equity, sought to establish a framework for allocation of water (dependent in part on the above two bullets) using an integrated licensing process
- development of an overall pricing policy that would incorporate the full costs of managing water, a so-called “waste discharge charge system” (based on the “polluter pays” principle) and, critically, a “conservation charge” as a measure of the real value of water
- more effective management of demand. This critically includes pricing policy, where it is openly acknowledged that prices in general are far too low. For instance, agriculture (which accounts for over 60% of water use) pays significantly less than the long-run marginal cost of supply, and the Treasury compensates DWA directly for this under-recovery of costs (the current annual sum is R1.5 billion)

- design and implementation of measures to conserve water. It is variously estimated that some 30-40% of water is lost due to faulty valves, leaking pipes and other failures in the supply system. In addition, the equivalent of the Mohale Dam on the Lesotho Highlands Scheme is thought to be stolen each year from the Vaal River system for illegal irrigation
- elimination of the backlogs in provision of potable water and of water-borne sanitation services (and associated elimination of the “bucket system”), so that all citizens would have satisfied their basic rights under the Constitution.

Positive achievements to date

What has been achieved with respect to reliable provision of local water supply and of sanitation services is impressive.

South Africa is ahead of target in delivering on the Millennium Development Goals. The number of households with access to improved water supply has increased from 60% in 1995 to 95% in 2008. Corresponding figures for sanitation are 48% and 73%. Further, the delivery backlogs are being addressed, through an array of centrally-financed programmes aimed at supporting local government. Despite the fragmented and uncoordinated nature of these initiatives and the fact that politicians have persisted in promising a faster pace of delivery than can be achieved, there can be few other developing countries that are doing so well.

Outstanding business

The record beyond this, however, is poor. The list of unfinished business is long.

Not one of the numerous institutional proposals has been taken through to fruition. For instance, although several Catchment Management Agencies have been established and one even has a board and an executive, none is yet fully functional – this 11 years after the legislation. No less tellingly, at the recent rate of issuing new licences, it will take at least five years to eliminate the current list of applications.

The same is true of all the policy initiatives noted above. Further, there are some areas, such as enforcement of regulations with regard to both water resources and water services, where little progress has been made.

Concluding comments

What emerges from the above is a sector in some disarray. While the objectives of policy reform in the 1990s, and the principles underlying them, are seldom if ever disputed and indeed are widely lauded, it is evident that the “system” has not had the capacity fully to achieve them. The next two sections will illustrate this point from

different but no less telling perspectives. The reasons for, and the implications of, the institutional malaise will be dealt with later.

Water quantity

It was observed at the outset that until now South Africa has done well in dealing with the fact that it is one of the driest countries in the world, chiefly through building and operating a large and complex system for storing water and for transferring it between different catchment areas in accordance with supply and demand. In 2000 five of the 19 WMAs experienced shortages and five surpluses (with the rest in balance), so that it was possible, though inter-basin transfers, for the overall requirements of the system to be met. With some 98% of currently developed water resources already allocated, it is clear that the overall demand-supply balance is very tight at present.

Based on the ongoing programme of developing reconciliation strategies mentioned previously (and perhaps influenced by the generally good rainfalls of the past 14 years), DWA nevertheless argues that in general sufficient water can at present be made available at all significant urban and industrial growth points for water not to be a constraint on social and economic development. The prospect, however, is problematic, for several reasons:

- growth in demand is unabated, as a consequence of *inter alia*
 - ✓ continuing progress in extending access to water and sanitation for the entire population
 - ✓ pressure to increase the volume of water supplied free to households
 - ✓ increased requirements for success of the emerging farmer sector
 - ✓ large-scale energy and industrial projects scheduled for implementation over the next decade and beyond
 - ✓ economic growth (even if now stalled) and, associated with it, higher *per capita* incomes
 - ✓ population growth and associated urbanisation
- DWA's supply/demand scenarios for 2025 show that shortages will become more prevalent if timely decisions are not taken for provision of more water. Large water resource schemes can take up to 20 years to implement, and plans are generally still at a very early stage for greater use of treated effluent and of groundwater and for desalinating sea water on a sizeable scale. The problem will be exacerbated if there is not a concentrated effort both to manage demand and to operate the supply system more efficiently – DWA's scenarios anticipate savings of 15% from each of these two measures, which will be a formidable achievement
- management of demand requires *inter alia* design and implementation of pricing policies that properly reflect full financial cost and economic value. As indicated earlier, despite the best intentions going back over a decade progress to these ends has been slow. Further, DWA does not have the

authority to prescribe pricing policies at local levels, and local government's capacity to design and execute the required policies is weak

- improved efficiency requires legal, technical, financial and other measures to reduce losses, to improve metering and billing and for installation of less water-intensive appliances. The elimination of theft is a vital element in reducing losses, which is principally for DWA to implement. Beyond that, responsibility is in the domain of water boards and of other water service providers; with significant exceptions (eg Rand Water, Umgeni Water, Johannesburg Water and eThekweni Municipality), the sector has limited capacity to deliver the required efficiencies. The infrastructure rehabilitation and maintenance backlog is huge. By way of example, one DWA estimate is that no more than 20% of the necessary expenditure on maintenance has been made over the past 10 -15 years. The maintenance expenditure backlog for water services is estimated to be in the order of R100 billion, essentially because of the primary thrust to increase access for new users
- improved efficiency also requires better management of the water catchment areas. While DWA's Working for Water programme continues to perform impressively at a local level in eliminating alien vegetation (and in generating jobs in rural areas), the hiatus over establishment of the Catchment Management Agencies has undoubtedly inhibited formulation and execution of so-called integrated water resource management strategies. DWA's ongoing work on the WMA reconciliation strategies is essential, but it will be of little value unless it is effectively translated into coherent action
- climate change is expected to impact adversely on water availability in certain regions
- there has been a continuing deterioration in the quality of water in rivers and dams and probably also of groundwater⁴, with the consequences that in a growing number of locations water is sometimes unfit for use, that (because of higher treatment costs) it becomes more expensive to provide and that there is serious and perhaps even lasting damage to the ecology of the catchment area concerned. There are three main causes of this deterioration:
 - ✓ continuing sub-standard discharge of urban, industrial and agricultural effluent to rivers, exacerbated by the sanitation problems associated with informal settlements
 - ✓ wash-off and leachate from mining operations (the problem of so-called acid mine drainage)
 - ✓ wash-off from areas with overloaded treatment plants and sewage systems.

Because the quality of water is so fundamental to the management of (the quantum of) water resources, it is essential to look more closely at the causes of the deterioration.

⁴ Currently 77% of the country's resources comes from rivers and dams, 14% from return flows of treated wastewater and 9% from groundwater.

Water quality

The first two causes listed above are long-standing and serious. To deal with them effectively requires *inter alia* implementation of the “waste discharge charge system” noted earlier (though there are reservations about the workability of the present proposals) and properly effective regulation and enforcement.⁵

The second cause, *viz* the problem of acid mine drainage (AMD), has additional dimensions. This arises from:

- the fact that a significant number of the offending mines, notably on the Witwatersrand, are no longer operational and hence cannot be called upon to pay
- the fact that, notably on the Mpumalanga and to some extent on the KwazuluNatal coalfields, there is a large number of small operators who do not have the resources to manage their effluent disposal to the required standard. By all accounts, this problem is worsening and, with large numbers of applications for new mines pending, will continue to do so
- the mines typically are situated within a water basin in which other mines are located – this means that their water supply and treatment problems are interconnected and hence that individual responsibility and accountability are not clear. This situation is exacerbated when some of the mines have been abandoned. While in both Gauteng and Mpumalanga water treatment schemes financed and operated jointly by a few major mining companies are successfully under way, the costs of treatment are very high relative to the price of water of comparable quality and ultimately a comprehensive and sustainable solution will require partnerships between the state and the industry
- the sheer scale of the problem. For instance, a rough estimate of the capital cost involved in dealing with AMD on the Witwatersrand is at least R1 billion
- the costs of not dealing with the problem are also very high. The degradation – due principally but not only to AMD – of such important rivers as the Olifants in Mpumalanga and the adverse consequences for wildlife is well documented. On the Witwatersrand, among the areas at risk is the site of the Cradle of Humankind.

⁵ DWA has up to now chosen not to take legal action against under-performing authorities and has only recently adopted a “name and shame” approach by making public its findings on the quality of management of drinking water and of wastewater treatment achieved by the country’s local authorities. It may be noted that in the first survey of water quality management, published earlier this year, only 22 local authorities were awarded so-called Blue Drop status, meaning they achieved a score of above 95% in complying with the required quality standards. The corresponding report on Green Drop status in respect of wastewater treatment is due out shortly.

The third cause of declining water quality is discharge of inadequately treated effluent from sewage treatment works. This is the result of the under-investment, as already noted, by many WSAs in physical infrastructure. It is critically also the result of the lack of managerial and technical capacity to manage waste water treatment works to the required standard, itself due to over-hasty affirmative action policies, the departure from local government of experienced white males and the politicisation of what should be a professional and technical services environment. The problems have been exacerbated by the very large number of players in the sector across the three tiers of government, with some confusion among them as to who is accountable for what and, as already noted, by the reluctance until very recently on the part of DWA to take action against under-performing local authorities.

The absence of adequate water treatment facilities and processes has been implicated in outbreaks of cholera in several provinces, in deaths from typhoid in Mpumalanga and in the deaths of infants in the Eastern Cape.

Why is the water sector in difficulty?

By way of prefatory comment, it may be noted too that South Africa is by no means unique in having a water sector in difficulty. In rich and poor countries alike, though not always for the same reasons, water management is becoming increasingly problematic, and there can be few countries which can claim to be doing well.

In a sector as complex as water, there is clearly not going to be a single or simple cause of difficulty. Nevertheless, four factors stand out as underlying South Africa's problems.

First, the objectives and instruments of water policy formulated in the 1990s were extremely ambitious in every sense, in terms of:

- rapidly increasing access for the large sections of the population who had previously been deprived
- operationalising apparently simple but, in practice, sophisticated concepts such as the ecological reserve and the polluter pays principle
- establishing new institutions on the supply and the demand sides of the industry
- requiring coordination horizontally across at least eight government departments and vertically between national, provincial and local government
- putting in place governance and management arrangements to ensure clear designation of responsibility, authority and accountability for each institution as well as effective interfaces between the different institutions, so as to achieve functionality of the system as whole
- devolving functions to local authorities that not all were equipped to perform.

Second, insufficient attention was, and continues to be, paid to implementation of policy; the intellectual energy was focused on clarifying the principles underpinning policy and the design of policy itself. (Even today one senses that DWA’s instinct, when things go wrong or new issues arise, is to write new policies or to commission new studies rather than to deal with problems managerially.) Consequently, insufficient thought was given to investing in the professional, technical and managerial skills necessary to ensure the effective functioning of the key institutions serving the sector.,

Nowhere is this more apparent than in DWA itself, where the difficulties were compounded by allowing if not encouraging the retirement or premature departure of highly experienced officials, including many with specialised skills. The resulting loss of institutional memory is significant and, given that the age profile of the Department spikes roughly in the age ranges 25-35 and 50-60 with a wide “valley” in between, is forecast to continue. While a Learning Academy has been set up within the AsgiSA and JIPSA frameworks, and a mentoring scheme is now in place, the prospect is of continuing high-level skills shortages.

Third, the expectations of local government were unrealistic. While starting in 1994 DWA itself stepped in to provide water services in those localities (mostly in the former Homelands) where local government capacity was weak, the transfer (as required by the Constitution) of these functions to local government after 2000 led, as we have seen, to massive problems in the operation of water and sewage systems. The dysfunctionality, where it arises, of local government is not confined to provision of water services alone, but the systemic nature of the problem and the generally weak governance that prevails make it harder to deal with. There are several nationally and donor-funded programmes under way to strengthen the capacity of local government, but the lead-times for discernible and sustainable impacts are long.

Finally, there has been a failure to recognise and to confront head-on the problems listed above. Instead of acknowledging, in the light of ongoing experience, the ambitiousness of the policy goals as well as the capacity constraints, the practice has been to proceed on all fronts as if the constraints did not exist. What was, and remains, essential is that priorities be established and committed to and that wherever possible policy design and execution be simplified.

In sum, the problems besetting the sector are problems fundamentally of governance and management and not of policy and the principles underlying policy.

Conclusions

The short answer to the question “does South Africa face a water crisis now?” is **no**. While clearly there are communities at risk, chiefly because of below-quality water, it is a sound generalisation – unless there is a run of drought years – that the country’s water supply is reasonably secure.

But the answer to the question, “does it face a water crisis in the future?”, is **yes** – UNLESS and UNTIL:

- there is awareness and explicit recognition in government, in business and in society generally of
 - ✓ the risks and challenges of our water-stressed circumstances
 - ✓ our institutional and management shortcomings
 - ✓ the need to accord far higher priority to water management in public and private sector planning, resource allocation and management

- swift and decisive actions are taken by government to
 - ✓ prioritise its numerous policy and institutional interventions and proposals, simplifying them wherever feasible
 - ✓ simplify procedures for administration of policy
 - ✓ implement a demand management programme, notably including a pricing policy that underpins an economically and financially sustainable system
 - ✓ implement measures to enhance efficiency in water supply and use
 - ✓ strengthen the capacity to monitor water supply performance and to enforce regulatory compliance

- a strategic commitment is made to investing in human capital at professional, technical and managerial levels in order materially to strengthen the short- and long-term capacity, notably in the public sector, to plan and manage water supply and demand.

As observed earlier, the country has had good rainfall over the past 14 years. This has allowed, with some local exceptions, demand to be satisfied. But there can be little doubt that a dry spell of only a few years would make the looming water crisis very real.

A **final** comment of a different quality. First, this study points unequivocally to the lack of management capacity of the government, at all levels, to deal with a sector of critical social and economic importance. Other sectors, most prominently health and education, are similarly or even worse affected. The “solution” thus lies beyond the water industry alone. The profound question for business is how it engages with the state at all tiers to address constructively the deep socio-economic challenges that we face. It will, concomitantly, require political leadership at the highest level of government to face up honestly to the weaknesses in implementation capacity and to commit to overcoming them.

Annex: Individual consulted

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