

Reality check on water resources management: Are we doing the right things in the best possible way?

Suggested citation

Schreiner, B., Pegram, G. & von der Heyden, C. 2009. *Reality check on water resources management: Are we doing the right things in the best possible way?* Development Planning Division. Working Paper Series No.11, DBSA: Midrand.

Note

This paper is one of a set of papers on the theme of water security that the Development Planning Division of the DBSA commissioned in 2009. There is a list of these papers at the back of this document.

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Contents

1. The purpose of the paper	5
2. Future vision	5
3. Drivers of change	5
3.1 Economic growth	6
3.2 Demographic change	7
3.3 Environmental degradation	7
3.4 Food security	8
3.5 Climate variability	9
3.6 Technological advances	9
3.7 Capacity to deliver	9
4. Key challenges in water resource governance	10
4.1 Water and poverty eradication	10
4.2 The beneficial use of water	11
4.3 Resource protection and weak vs strong sustainability	12
4.4 Water allocation and use	13
4.5 Institutional arrangements	15
4.6 Good water governance	16
5. Principles to guide the new approach	17
6. Prioritisation and simplification choices	18
6.1 Priority programmes	18
6.2 Priority programmes requiring simplification and streamlining	19
6.3 Programmes to be put on hold	20
7. Conclusion	21
References	22
List of tables and figures	22
List of acronyms and abbreviations	23
List of background papers	24

1. The purpose of the paper

The question addressed in this paper is whether the current implementation of the White Paper on a National Water Policy for South Africa (DWAF, 1997b) and the National Water Act (NWA) (DWAF, 1998) is achieving the desired objectives of water resources management (WRM), or whether a substantial rethink is needed in terms of managing water resources effectively.

2. Future vision

In order to do a reality check on current performance, it is necessary to have some idea of what it is that the water sector is striving for in the future. The goal set out in the White Paper remains valid: “[...] the national goal of making sure that there will always be some water, for all who need it, contributing towards growing prosperity and equity in our land” (DWAF, 1997b).

In essence, the water sector is aiming to contribute towards building a society in which ecologically sustainable development, management and use of water contribute optimally to economic growth and social development. The results aimed for are significantly reduced levels of poverty and a narrowing of the wealth gap.

3. Drivers of change

A decade of implementation of the NWA forms the backdrop to an assessment of current policy and implementation challenges in WRM. Before identifying and assessing key challenges in this regard, it is important to understand the changing context in which the water sector is operating, and which will place increasingly severe stress on water resources and their management. The most important changes that have taken place since 1994, as well as those likely to happen in the next decade, are discussed briefly below.

South Africa Scenarios 2025, a report developed by the Presidency in October 2008, lists seven main driving forces shaping the future of the country, namely, shifts in global economic power; shifts in global political power; resource constraints (including water); economic growth; governance; the social fabric; and technology. Of these, trends in economic growth, resource constraints, governance and technology are all critical drivers of change in the water sector, but there are other drivers as well.

These drivers, and their cumulative impact on the water sector, are highlighted in Figure 1.

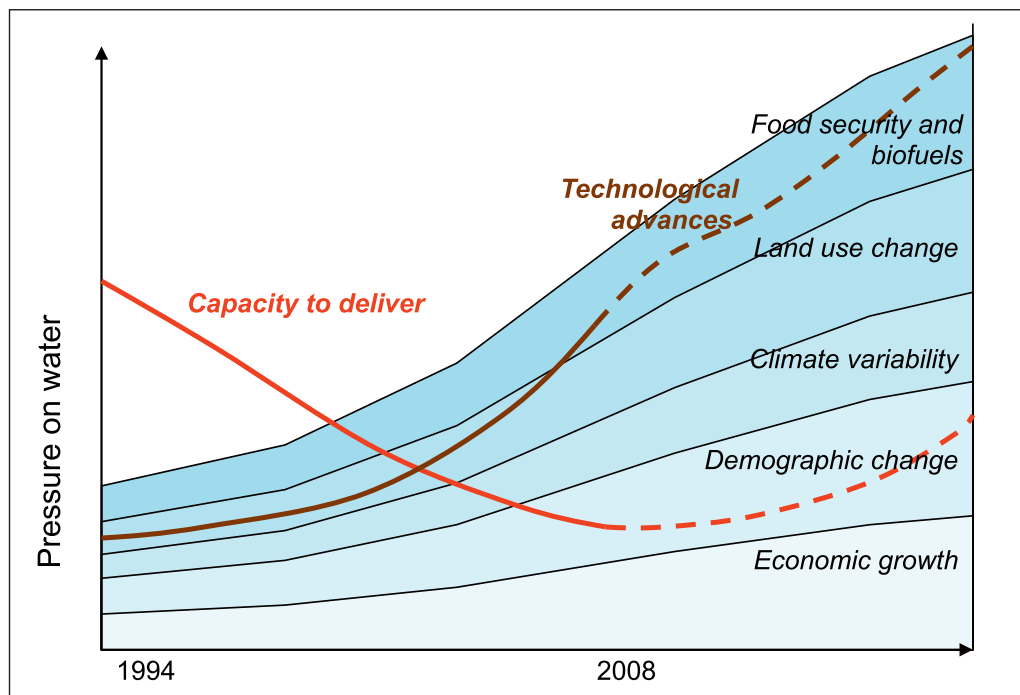


Figure 1: Cumulative pressures impacting on water resources management

3.1 Economic growth

Economic growth and improved livelihoods place increasing demands on limited water resources. If effluent discharge and water use are not managed properly, growth and improvements in people’s circumstances can be constrained by the reduced availability and decreasing quality of water.

In South Africa, economic growth averaged 3% per annum between 1994 and 2004. Since 2004, it exceeded 4% per annum, reaching 5% in 2005. The national target is a growth rate of 6% per annum after 2010, although this is likely to be reduced by the current slowing of the global economy.

The nature of this growth, and the major growth sectors (such as mining and manufacturing), may impact on water use in the country. This would occur through changes in water abstraction and use in direct production processes; increased levels of discharge and pollution; and higher water demands from households with increasing levels of income, if economic growth translates into more jobs and more equitably distributed income.

It is important not only to provide for the impacts of economic growth on water supplies, but also to ensure that knowledge about the availability of, and risks to, water is fed into the development policy process. This would ensure that any development is feasible in relation to the country’s water resources.

Internationally, and in South Africa, both corporate and finance institutions are viewing water as a risk area and are engaging more strongly on this issue. Government agencies driving economic and social development need to take the matter of water resources and use equally seriously and respond in a similar way.

While South Africa is aiming for high growth rates, so too are its neighbours in the face of high levels of poverty. While the Southern African Development Community (SADC) is aiming for increased regional economic integration, the vision of the Reconstruction and Development Programme (RDP) (ANC, 1994) of achieving growth through regional cooperation has not yet been achieved.

Slow development in neighbouring states, particularly Mozambique and Zimbabwe, may have concealed potential constraints on water resources from the South African perspective. This situation may change as economic growth rates rise in neighbouring states and the demands on shared water resources increase.

3.2 Demographic change

Since 1994, South Africa has undergone remarkable demographic shifts, and these are likely to continue into the future. Key elements are the impact of HIV and Aids, urban/rural migration, circular migration, population growth, and in-migration of refugees from neighbouring states.

Whereas population growth and improved standards of living increase the demand for water, demographic shifts (such as migration) change the intensity of the demand for water in particular areas. This is because improved living standards create a greater demand for domestic water supplies. While some sectors of the population have seen an improvement in their standards of living, levels of chronic poverty remain high, particularly in the ex-homelands (Seekings, 2007).

Improved standards of living not only result in an increased demand for water for domestic purposes, but also an increased demand for food and commodities. Some 32% of the population is under 15 years of age, which has implications for population growth and water demand as this cadre reaches maturity.

3.3 Environmental degradation

Ongoing changes in land use and environmental degradation are impacting negatively on water resources.

The Department of Environmental Affairs and Tourism (DEAT) has estimated that close to 18% of the natural land cover in South Africa has been transformed (DEAT, 2008). This has mainly been through cultivation (10%), degradation (4.5%), urban land use (1.5%) and forestry (1.4%). The trend

of intensification of agriculture and stocking capacity exceeds the carrying capacity in all provinces, with the Eastern Cape, KwaZulu-Natal, Limpopo, Mpumalanga and North West being the worst affected.

Degradation of land and desertification are highlighted as two of South Africa's most critical environmental issues, "intricately linked to food security, poverty, urbanisation, climate change, and biodiversity" (DEAT, 2008). Some 91% of the country consists of drylands that are particularly susceptible to desertification. South Africa also has widespread physical soil degradation through crusting and soil compaction. Land use degradation that impacts on water resources includes:

- Changes in runoff and infiltration that lead to flood events and reduced groundwater recharge
- Increased sediment in reservoirs, rivers and estuaries, linked to loss of topsoil
- Increased pollution, particularly through non-point source runoff
- Ecosystem changes that reduce the resilience of the system and its assimilative capacity

It is estimated that "soil degradation alone costs South Africa an average of nearly R2 billion annually in dam sedimentation and increased water treatment costs, for example" (DEAT, 2008).

3.4 Food security

Household food security in South Africa is compromised by rising food prices globally and high levels of poverty. Food security has two components: the ability to produce one's own food and the ability to access markets to buy food. It is threatened by a number of factors, including climatic, ecological, socio-economic and political issues, as well as access to markets and credit, technological developments, trade and pricing (Bonti-Ankomah, 2001).

While an estimated 14 million households in South Africa are vulnerable to food insecurity (Machethe, 2004), an estimated 2.2 million households are already food insecure. Women and children are the most vulnerable to the impacts of food insecurity. From July 2007 to July 2008, the year-on-year increase in the Consumer Price Index (CPI) for food was 17.8% (NAMC, 2008). South Africans earning less than the equivalent of US\$300 a month spend more than 30% of their income on food and non-alcoholic beverages (Stats SA, 2008). For such households, even a small increase in food prices has a significant impact.

The problem is exacerbated by the high levels of unemployment. According to the wider definition of unemployment that includes discouraged work seekers, some 38% of the South African population is unemployed.

The relationship between water and food security is reflected in the way in which limited water resources are best used to address food insecurity at the national and household levels. Pertinent questions are as follows:

- Is water being used to create jobs so as to enable people to buy food?
- Is water being provided to the rural poor for food gardening?
- What are the tradeoffs between the various options for water use?
- Which mix of options may be most appropriate?

3.5 Climate variability

Climate variability and climate change simultaneously pose threats and create opportunities in WRM. The Global Water Partnership (GWP) stresses that, while the mitigation of greenhouse gases is an energy issue, adaptation to climate change is, among other things, a water issue (GWP, 2007). Climate variability brings both opportunities and threats, with increased rainfall likely in some areas and reduced rainfall in others. This will require the water sector to improve its adaptive management capacity.

As climate variability is but one of several major challenges facing the water sector, it should not be given priority over more immediate management issues. Better water management dealing with major problems currently facing the sector will, at the same time, improve the country's ability to adapt to and manage climate change.

3.6 Technological advances

Changes in technology can be utilised to improve access to, and the management of, water resources. Advances both in high-technology and appropriate technology have the potential to increase the productivity of water resources, reduce pollution and improve access to water for the poor. The challenge is to harness such technologies effectively.

3.7 Capacity to deliver

The state currently does not have the capacity to manage the country's water resources effectively and sustainably. This is due partly to loss of expertise within the government, and partly to overly complex implementation strategies.

The lack of capacity within the government is a key issue in the need to review the current approaches being taken in the water sector. To date, the method has been one of designing highly sophisticated

water management strategies and then attempting to build the capacity to implement them. This approach has not been successful. The lack of capacity has impacted on the state's ability to issue licences and to control water abstraction and discharge, to mention only two aspects of WRM.

Despite capacity-building strategies, such as the Learning Academy, recruitment and retention remain a significant challenge to the DWAF. It is critical that the water sector should recognise such capacity constraints and begin to operate within them, rather than seeking, unsuccessfully, to build sufficient capacity for implementing overly ambitious programmes.

4. Key challenges in water resource governance

The previous section has sketched some of the main pressures on the water sector. In this context, the question is whether or not current implementation is achieving the desired objectives of sustainable, equitable and efficient WRM. Six key issues in this regard are examined below.

4.1 Water and poverty eradication

South Africa is frequently described as a water-scarce country. If the Falkenmark Water Stress Indicator (Falkenmark & Widstrand, 1992) for determining water scarcity and water stress is applied, the country is indeed experiencing water stress, at less than 1 100 cubic metres (m³) per capita. However, the degree of water stress experienced by different water users in South Africa varies enormously. A legacy of apartheid has been the extremely different levels and means of access to water for productive purposes for different racial groups.

Cullis & Van Koppen (2008) point out that a large proportion of the South African population is "water poor", particularly the rural poor. While the country has overcome primary scarcity challenges in providing water for urban and commercial or industrial purposes, it has failed to provide the rural poor adequately with either sufficient water or the benefits of water.

These authors also show that neither access to water for productive purposes nor access to the benefits of water use is distributed equitably. The Water Allocation Reform (WAR) programme aims to reallocate water in addressing racial and gender imbalances in this regard, which were derived from resource allocation under the apartheid state. It has not, however, achieved any significant allocation to the historically disadvantaged thus far.

This raises the issue of how limited water resources can best be used to contribute to eradicating poverty and supporting rural livelihoods and development. The government has identified a strong rural development strategy as an important part of the future growth and development envisaged for the country. The way in which the water sector can best support this drive needs to be investigated

further. Stronger integration between the water sector and the programmes of the Department of Agriculture (DoA) and the Department of Land Affairs (DLA) is critical to improving the livelihoods of the rural poor.

The challenge to this section of the population is, after all, much more than a water challenge. Poverty eradication requires access to markets, technology and credit, as well as water. A more nuanced approach may consider reallocation, not of water as such, but of water and/or the benefits derived from it.

4.2 The beneficial use of water

The issue of how water can best support poverty eradication is closely linked to the way in which the beneficial use of water in the public interest (as described in the White Paper and the NWA) is understood, not only within the water sector, but also more broadly throughout the government. To date, there has been insufficient structured dialogue between role-players in the water sector and the economic development sectors on what constitutes beneficial or optimal use of limited water resources as a key input into economic and social development.

The contention over allocations of water to the so-called golf estates is an example of the lack of a coherent view in the government on what constitutes beneficial use of water in the public interest. This is a particularly important debate, given the increasing number of catchments in which there is no further water to allocate for new developments.

Integrated water resources management (IWRM) calls for the integration of both economic and water planning. While the NWA has been cited as an excellent piece of legislation reflecting the principles of IWRM, one may question to what extent economic and water planning and management have engaged at all three levels of government. For instance, the DWAF is only now consciously planning for the development needs of municipalities, beginning with the metropolises.

The DWAF's plan is to deal with all municipalities facing significant water challenges over the next three years (Van Rooyen, 2008). For this process to be sustainable, it is critical that municipalities should plan for their progressive water needs through their Integrated Development Plans (IDPs) and Water Services Development Plans (WSDPs).

It is instructive that the South Africa Scenarios 2025 report of the Presidency refers rather generically to environmental collapse and water degradation, but not to the possibility of economic growth being hampered by water shortages. There appears to be a limited understanding of the constraints on water as an input into economic growth, rather than simply as an environmental concern. The challenge to ensure that all sectors understand water-related constraints and the opportunity costs associated with particular choices in water use, remains significant.

The same intergovernmental challenge pertains in ensuring that opportunities for development associated with water use are realised. Since 1994, several such development opportunities have been missed, largely due to the failure of cooperative government. Ten years ago, the then Minister of Water Affairs and Forestry made water available for black farmer development in the Northern Cape, Free State and Eastern Cape.¹ To date, little (if any) of this water has been utilised. This is in large part due to the failure of the provincial DoAs to support the uptake of water by new black farmers.

Similarly, water allocated to black farmers in the Blyde River area has not yet been utilised properly, even more than ten years since the allocation was made. This is once again due to the failure of cooperative government and the DoA and DLA, in particular.

4.3 Resource protection and weak vs strong sustainability

The concept of striving for the beneficial use of water in the public interest lacks a common developmental understanding within the government. So too, confusion exists around the nature of the sustainability path that South Africa has chosen:

- On the path of weak sustainability, the consumption of the natural capital is acceptable as long as it is replaced by manufactured capital of equal worth.
- On the path of strong sustainability, there is an assumption that environmental goods and services cannot be replaced and should, therefore, be protected.

It is unclear whether the government (rather than the DWAF alone) has taken a conscious position on which of these two approaches to follow. The White Paper requires, inter alia, that “even promoters of the needs of the environment will have to justify the degree of environmental protection they seek” (DWAF, 1997a). This possibly suggests a model of weak sustainability.

It is important, however, that this issue should be debated and a conscious and clear position be taken by the government, not just by the departments responsible for protecting the environment. The result of such a debate has significant implications for the way in which water is managed.

The issue of weak versus strong sustainability is reflected in the debate on resource protection. In order to protect the ecological functioning of water resources, the NWA requires that a reserve be determined for any significant water resource before its water can be allocated for use. It also requires the development of a classification system for water resources. The White Paper, however, is clear that such resources are to be protected for the purpose of using the water.

¹ Free State: 3000 hectares (ha) in the Upper Orange Water Management Area (WMA); Eastern Cape: 1000 ha in the Upper Orange and 4000 ha in the Fish/Tsitsikamma WMA; Northern Cape: 4000 ha in the Lower Orange WMA.

Resource protection, therefore, should strive for the sustainable use of water resources. It should protect a certain level of ecological functioning and ensure that the resource is fit for use. In fact, downstream users often require higher levels of water quality protection than the ecosystem requires. Degraded water resources thus impact on economic activities, both now and in the future.

Preliminary reserves have been determined for 42% of South Africa's water resources at different levels of confidence (Pienaar, 2008). However, due to the lack of structured monitoring and management, there is little coherent evidence as to whether the reserves are indeed being implemented. To remedy the situation, tools are being developed for implementing and assessing such reserves. The classification system which the NWA requires the Minister to establish has not yet been gazetted, but a draft has been compiled.

There are concerns that the system as developed will be highly resource intensive and difficult to implement, particularly in the context of decreasing capacity in the public sector. The methodologies for protecting water are already complicated and resource intensive, and thus require radical rethinking to introduce much simpler, yet effective systems.

At local government level, admirable successes have been achieved in the delivery of water to poor communities. However, these have been compromised by failures to achieve similar successes in sanitation delivery, and by poor operation and maintenance of both new and existing schemes. Failure by municipalities and the DWAF to control discharge from failing or poorly managed wastewater treatment works (WWTW) has had a significant effect on the state of water resources, with the resultant negative ecological, social and economic impacts. Notable exceptions exist, however, such as the turnaround in effluent discharge quality at Emfuleni Local Municipality after intervention by the DWAF and the National Treasury.

4.4 Water allocation and use

In the ten years since the NWA was promulgated in South Africa, no water has been reallocated through compulsory licensing and very few licences have been issued to black water users. In 2007/08, for example, 91 water use licences were issued, of which 16 were to historically disadvantaged water users (DWAF, 2008).

While the WAR programme is a flagship initiative of the DWAF, the development of policy and strategies has not yet given rise to any actual reallocation of water on the ground. In some instances, land reform is likely to lead to higher rates of reallocation than the WAR. General authorisations have been put in place in some areas to facilitate the uptake of water by small users, particularly those from historically disadvantaged communities. It is, however, unclear to what extent such facilitation has been communicated to potential users and to what extent they have actually made use of it.

The allocation of water and forward-looking planning serve commercial users (such as the mining sector) better than others, and the lack of a national strategy for rural development has been mirrored in the water sector. Some small success has been achieved with a rainwater harvesting programme, which is to be rolled out at a larger scale in order to extend the benefits.

The issuing and finalisation of water licences have been extremely slow. Despite improvements in this regard, there is still a backlog of licence applications. These amounted to 1300 in 2007/08, with only 91 licences having been issued during that period (DWA, 2008). Current authorisation processes, particularly those relating to compulsory licensing, are highly technical, resource intensive and inappropriate for the needs and capacity in South Africa.

The approach to licensing, both ad hoc and compulsory, needs to be reviewed. A radically new methodology should be developed, which will serve the need for equity and sustainability within the considerable human resource constraints of the DWA and the water sector. Alternative approaches to compulsory licensing might include the following:

- Purchasing water allocations for redistribution
- Making much wider use of general authorisations
- Working from the basis of current water use for curtailing reallocation
- Providing support to the land reform programme where this will also bring about reallocation of water

The programme should be able to respond more directly to calls from resource-poor farmers themselves for increased or new water allocations. At the same time, a strong and effective compliance monitoring and enforcement strategy should be developed and implemented to prevent the ongoing theft and pollution of water. Such a strategy should draw not only on the capacity of the state, but also on the capacity of water users to monitor water use on behalf of the DWA and catchment management agencies (CMAs).

Water resources infrastructure is critically important in ensuring reliable access to water. South Africa has a proud track record of such infrastructure development, which puts it well ahead of any other African country in terms of water storage per capita. It is this storage and transfer infrastructure, as well as the development of the mining, industry, manufacturing and services sectors, which has enabled the country's economic trends to disengage from rainfall trends. Many other countries in Africa are still predominantly dependent on rain-fed agriculture and hence are held hostage by the vagaries of the climate.

Even so, the infrastructure programme has failed to give sufficient attention to small infrastructure development with a view to contributing to poverty eradication and sustainable livelihoods in rural areas, in particular. Such infrastructure could include low-technology pumping systems for accessing

groundwater; appropriate irrigation systems; small dams; and rainwater harvesting, either in tanks or in-field. This is a matter requiring particular focus because of its links to poverty eradication and rural development.

4.5 Institutional arrangements

The water sector has been involved in restructuring institutional arrangements for water management since 1998. A range of these was proposed under the NWA and the Water Services Act (DWAF, 1997a), and included the establishment of CMAs. However, while a number of CMAs exist on paper, only one is functional in the sense of having a chief executive officer and some staff. Further CMAs have been put on hold, pending a review by the DWAF of the number of such agencies to be established. Current proposals are for 7–9 CMAs across the country.

The establishment of a national agency for building, operating and managing national water resources infrastructure reached the development of the South African National Water Resource Infrastructure Agency (SANWRIA) Bill. The Bill was withdrawn until after the elections held in 2009. There is a lack of clarity in the DWAF regarding the policy on the transformation and establishment of water user associations (WUAs) and the transfer of irrigation infrastructure to them.

While the Water Services Act provided for the separation of powers between water services authorities (WSAs) and water services providers (WSPs) this has, in fact, only happened where the WSA and WSP are separate institutions, either district or local municipalities, or where an external WSP has been contracted. The regulation of water services by WSAs at local government level has therefore not transpired in the way envisaged in the legislation.

At the municipal level, there is a lack of trained and experienced officials able to ensure the delivery, operation and maintenance of effective services. Failing WWTW is a particularly high-profile element of this failure. Shortage of staff in the DWAF and CMAs has resulted in long delays in the issuing of licences; poor control over water abstraction and discharge; poor oversight of institutions; and a lack of uptake of water by poor communities.

A key shift in the water resources sector is the recognition of the need for a greater degree of regulation. Considerable work needs to be done to unpack the regulatory functions. On the basis of the principle that form should follow function, appropriate institutional arrangements for regulation will have to be determined. Several questions still need to be resolved in this regard, for example:

- Whether to establish a regulator in the DWAF or an independent regulator
- How the regulator would deal with both water services and water resources issues
- How such a regulator might align with recommendations by the Presidency to establish a multi-sectoral economic regulator

In essence, therefore, despite over ten years having elapsed since the relevant legislation was promulgated, institutional arrangements within the water sector are still in flux. A settled set of institutions with clear mandates and the capacity to fulfil those mandates is some way off. Many of these challenges have been recognised by the DWAF, and by the government more generally. The DWAF has also put in place an institutional alignment project to investigate and make recommendations on how to streamline institutional arrangements for the water sector.

4.6 Good water governance

Good water governance is based on three elements, namely, clear policy direction, a professional bureaucracy, and an empowered civil society. In the South African water sector, unfortunately, none of these elements are currently in place to the required extent.

In terms of policy direction, confusion currently exists over a number of issues. These include institutional arrangements for the water sector in relation to CMAs, WUAs and the proposed National Water Resource Infrastructure Agency (NWRIA), as well as transformational approaches in water allocation and licensing, such as black economic empowerment (BEE) requirements for water use and timeframes and targets for compulsory licensing processes.

The professional bureaucracy the water sector needs to achieve good governance is sorely lacking. Vacancies in the DWAF are unacceptably high and for many years the Department has been unable to meet the challenges of recruiting and retaining skilled and professional staff effectively. While programmes and initiatives (such as the establishment of a Learning Academy) have been put in place in an attempt to rectify the situation, the DWAF is badly understaffed, particularly in the regional offices.

The confusion over employees' roles, responsibilities and delegated authority adds to the DWAF's inability to function as a professional bureaucracy. As alternative institutions such as the CMAs and the NWRIA have not yet been established, the DWAF continues to perform these functions.

The third element of good governance is that of an empowered civil society. Unfortunately, there are significant weaknesses in this regard, for example, in terms of organised civil society. Many water sector officials lack respect for civil society structures and their representatives.

It follows that the necessary building blocks for good governance in the water sector are not in place, and that considerable effort will be required to correct the situation. The challenges of achieving good governance have been exacerbated by a tendency to translate legislation into overcomplicated and resource-intensive implementation strategies, such as the reserve systems, classification systems and water allocation procedures, as mentioned below.

5. Principles to guide the new approach

Despite receiving international recognition, the translation of the NWA into actual implementation has not been entirely successful. Key reasons have been the overcomplication of implementation strategies, with high demands being made on human resources, finances and time. Moreover, attempts to do too much at a time have had limited results. An examination of the DWAF's Annual Report for 2007/08 (DWAF, 2008) indicates a strong focus on the development of policies, strategies and guidelines, with limited implementation targets and results being reported on. For instance, of the long list of WRM targets, only about half were achieved by 50% or more, and less than a quarter were fully achieved.²

The result has been slow, patchy and ineffectual implementation of some of the key aspects of the legislation, with the resultant negative social, economic and ecological impacts. The DWAF's report to the Portfolio Committee on Water Affairs and Forestry on 27 October 2008 revealed the following:

“Despite the notable achievements, the department alluded to a number of persistent concerns that required attention. Regulations to support the implementation of the Act had to be better integrated. The department also admitted that the Water Allocation Reform Programme was not being implemented at an adequate pace. As a result, equitable supply of water was not attaining the desired level. Water Management Institutions (WMIs) had also not been established as intended, due to staff transfer issues. Greater clarity was needed on the responsibilities of WMIs in terms of asset maintenance and operation. The capacity levels within the department also remained a cause for concern. The department pronounced that a more effective communication and marketing strategy would be needed to convey appropriate messages on water resource management to key partners. The department also faced a constant challenge from the discharge of urban and industrial effluent into rivers, the runoff from mining operations and dense informal settlements, climate change and poorly functioning municipal water treatment plants” (Sabinet Online Ltd, 2008).

To some extent, the best has become the enemy of the good in a complex context with limited human resources. It is clear that the current approach is not delivering effectively on the NWA and a new approach is therefore required for taking the water sector forward over the next ten years. It is suggested that implementation strategies should be:

- Simple and uncomplicated – more sophisticated systems and approaches could be built up over time, but at this point it is critical that implementation strategies start delivering sufficiently well to meet the needs of society.

² These figures are estimates by the authors, since many of the targets are not clearly measurable, are actually multiple targets, or are poorly or not reported on.

- Focused on key priorities, rather than attempting to do everything at once.
- Aimed at achieving the bulk of each priority as far as possible with the limited resources, whereas the final 20% requiring increased resource intensity could be achieved over time once resources are available.
- Aligned with capacity constraints – they should be based on existing capacity to deliver, not on international best practice, which may require considerably more resources than are available locally.
- Aimed at achieving optimal benefits to society from limited water resources.

6. Prioritisation and simplification choices

This paper deals with some of the considerable challenges and pressures faced in the management of water resources. It has suggested that the current capacity is insufficient to deliver effectively on all programmes currently being run by the DWAF. It is therefore proposed that the implementation of the NWA be triaged as follows:

- Priority programmes that are sufficiently well resourced to ensure effective delivery and are appropriately designed for delivery.
- Priority programmes that have been significantly simplified and streamlined.
- Programmes that are not a priority and are put on hold for the next 5–10 years.

This section highlights some of the key water resources programmes that could be prioritised, simplified and/or put on hold. The list is not comprehensive, but is put forward to invite debate on these matters.

6.1 Priority programmes

- *Planning for future needs:* Advance planning for meeting the water needs of the country is critical. Planning is currently highly professional, but the lack of mid-level DWAF professionals in this function could lead to its collapse in a few years time when senior planners retire. There is also a need for increased alignment with other sectors in support of a rural development programme, as well as local, provincial and national growth plans. While there has been great improvement in this regard in the past few years, much more work is required to ensure that all government departments and agencies, together with the private sector, factor water issues into their development plans.
- *Reconciling demand and supply:* Reconciliation of the demand for, and supply of, water remains critical for economic stability in the country. Water conservation and demand management (including recycling and reuse) should be national priorities, with adequate funding and support given to the ongoing programme of infrastructure development. Rehabilitation of infrastructure, both municipal and irrigation related, is also critical in balancing supply and demand. The third leg of reconciling supply and demand is having a strong programme for monitoring and enforcement compliance in order to control illegal water use.

- *Managing return flows and water quality in critical areas:* Decreasing water quality is having a significant impact on human wellbeing, the environment and economic growth. In the Vaal system, for example, good quality water is used to dilute poor quality water, resulting in less water available for use. Failing and poorly managed municipal WWTW are the source of unacceptably high levels of faecal contamination, while mines and industrial water use result in high levels of salinity and heavy metal pollution. Persistent organic compounds and endocrine disruptors are a cause of increasing concern. Managing water quality will require the implementation of a strong compliance and enforcement programme; some innovative solutions, such as the desalination of mine water; and high levels of investment to rehabilitate, replace and extend municipal WWTW.
- *Institutional realignment:* Over the past ten years, the water sector has been involved in restructuring and institutional realignment. This has entailed the demarcation of municipal boundaries, the establishment of CMAs, the proposed establishment of the NWRIA, and internal restructuring in the DWAF. Continual institutional flux has made it difficult for staff to deliver both on their core programmes and on the requirements of the restructuring. This has created a situation of uncertainty and confusion within the DWAF. The current institutional realignment programme needs to reach finality on the future shape of the sector within the next two months. Implementation of that vision should be driven hard and within strict timeframes, and no further institutional restructuring should take place for at least 10 years. This will enable the delivery of programmes within a stable and supportive environment.

6.2 Priority programmes requiring simplification and streamlining

- *The WAR, including validation, verification and compulsory licensing:* The WAR programme is currently held hostage by expensive, resource-intensive and highly technical procedures, particularly for the verification and validation of water use. Highly simplified, faster and less resource-intensive processes that respond to demands on the ground for the reallocation of water should be investigated and implemented.
- *Licensing procedures and use of general authorisations:* The DWAF is currently not coping with the issuing of licences. As mentioned, the DWAF (2008) reported on a backlog of 1300 licence applications, with only 91 licences having been issued during that year. The delay in processing licences places significant constraints on the development of new businesses. Simpler licensing procedures, greater use of general authorisations, and effective delegation of licensing to regional offices and CMAs would greatly enhance the processing of licence applications.
- *Reserve determinations:* The NWA requires that a reserve be determined before a water use licence can be considered. It does not, however, require such determination to take several years and cost millions of rands. The process should be simplified and shortened so that reserves could be determined for the whole country in a short space of time. These reserves could be revised

and improved on over time. What is critical at this point is that there should be a process of implementation and monitoring so as to ensure that reserve determination does not remain an exercise on paper, but actually translates into sustainable river health.

6.3 Programmes to be put on hold

- *A classification system:* The DWAF has developed a draft system for classifying all significant water resources, as required under the NWA. However, the approach as proposed is complex and resource intensive. The Act provides that preliminary reserves be determined and implemented prior to establishing a classification system. The implementation of the latter will impose new burdens on an already overstretched department and its consultants. As the preliminary process for reserve determination could be used quite effectively to protect water resources, it is recommended that the classification system be put on hold for at least the next 5–10 years. The fundamental elements of WRM should first be sound, and the capacity exist to implement the system without detracting from other, more important, functions.
- *Waste discharge charging system:* The waste discharge charging system is seen by many to be an important element in curbing the growing problem of pollution. There is, however, the potential that the imposition of such a system will do little more than increase local governments' bad debt to the national government. This is particularly true where municipalities do not have the resources to invest in the rehabilitation and refurbishment of WWTW, and where they are unable to attract and retain officials with the requisite skills and training to manage these works. Implementation of the waste discharge charging system will require considerable human resource commitment from the DWAF, which may detract from other key priorities at this stage.
- *Establishment of CMAs in certain areas:* The DWAF developed a draft paper on institutional realignment, which proposed the reduction in the number of CMAs to between 7 and 9. If these CMAs are to be established, it is recommended that the process be completed as fast as possible. However, it should also be considered whether CMAs are needed in all areas of the country at this stage, or whether there are some areas (such as the Northern and Eastern Cape) where it would be equally effective to allow the DWAF to continue to manage the water resources. In such cases, a stakeholder committee could be in place to ensure consultation with stakeholders in the decision-making process.
- *Adaptation to climate change:* Adaptation to climate change is a concern globally and also an important issue in the water sector. It is, however, only one of many pressures facing the sector. The South African water sector has always had to manage climate variability and is well placed to adapt to further changes. Currently, however, that ability is threatened by the challenges of delivering on fundamental management programmes, such as water resources planning, control of water use (abstraction and discharge), and establishing a stable institutional environment. Focusing on priority programmes will enable the establishment of a robust WRM sector that will

be able to respond to the challenges of climate change. However, too much of a focus on climate change may detract from the core priorities and so result in failure to create an effective WRM sector.

- *Further policy and guideline development:* Although the DWAF has a relatively strong policy branch, the capacity to implement the policies and guidelines developed by this branch is not always reflected in the regional offices. A suite of policies and guidelines have been developed to support implementation of the NWA, which is a major challenge at present. The focus on the DWAF, both at head office and in the regional offices, should be on effective implementation, with resources optimally deployed to this end. No further policies or guidelines in this regard should be developed unless they are critical to the success of a particular programme. The focus should be on the implementation of existing policies and guidelines, not the development of new ones that raise a bar that has not yet been reached.

7. Conclusion

The water resources sector is complex and challenging. Water quality and quantity, economic and social issues, and ecological protection should all be balanced in a context of varied availability from year to year. This is happening within a rapidly changing institutional environment and in the face of shrinking capacity. In this context, many of the current implementation strategies under the NWA are too complicated and resource intensive to be implemented successfully, particularly those relating to water allocation and resource protection. There is a need for a radical rethink and redesign of how these issues are handled.

This paper has proposed a triage of programmes under the NWA, namely, priority programmes that need to be driven and expanded; priority programmes that need to be rethought and streamlined substantially; and programmes that should be put on hold for the next 5–10 years. These proposals are intended to stimulate debate and promote a new vision of what the WRM sector should be focusing on.

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List of tables and figures

Figure 1: Cumulative pressures impacting on water resources management

List of acronyms and abbreviations

Aids	acquired immune deficiency syndrome
ANC	African National Congress
BEE	black economic empowerment
CMA	catchment management agency
CPI	Consumer Price Index
CSSR	Centre for Social Science Research
DBSA	Development Bank of Southern Africa
DEAT	Department of Environmental Affairs and Tourism
DLA	Department of Land Affairs
DoA	Department of Agriculture
DWAF	Department of Water Affairs and Forestry
DWEA	Department of Water and Environmental Affairs
GWP	Global Water Partnership
ha	hectare
m ³	cubic metre
HIV	human immunodeficiency virus
IDP	Integrated Development Plan
IWRM	integrated water resources management
NAMC	National Agricultural Marketing Council
NWA	National Water Act
NWRIA	National Water Resource Infrastructure Agency
PRB	Population Reference Bureau
RDP	Reconstruction and Development Programme
SADC	Southern African Development Community
SANWRIA	South African National Water Resource Infrastructure Agency
SARPN	Southern African Regional Poverty Network
Stats SA	Statistics South Africa
US\$	American dollar
WAR	Water Allocation Reform
WMA	water management area
WMI	water management institution
WRC	Water Research Commission
WRM	water resources management
WSA	water services authority
WSDP	Water Services Development Plan
WSP	water services provider
WUA	water user association
WWTW	wastewater treatment works

Papers on water security commissioned by the DBSA, 2009

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Challenges for human capital development and technological innovations in the South African water sector

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