Global Water Partnership Southern Africa

IWRM SURVEY AND STATUS REPORT:

South Africa

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Source Strategic Focus Pty (Ltd)

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EXECUTIVE SUMMARY

The average rainfall of South Africa is just over half of the world average. Water resources in South Africa consist of the following three sources: surface water (77%), return flows (14%) and groundwater (9%). The country has more than 500 government owned dams with a total capacity exceeding 37 millions m^3.

Over the past decade, in line with the new political dispensation, the country embarked on a review of the water law guided by the principles of equity, efficiency, sustainability and representivity that saw the adoption of the National Water Act (Act 36 of 1998) and the Water Services Act (Act 108 of 1997). The National Water Act is the principal legal instrument for water resources management in South Africa, while the Water Services Act provides a regulatory framework for the provision of water supply and sanitation services to which people are entitled. As required by the National Act, a National Water Resources Strategy was developed and promulgated in 2004, it sets out ways in which South Africa aims to achieve Integrated Water Resources Management (IWRM).

In South Africa, water institutions are either dealing with water resources management or the provision of water services and sanitation,. The role of the Department of Water Affairs and Forestry, the custodian of the country's water resources, is one of a regulator.

South Africa is an example of a country where the 'Enabling Environment' has been in place since more than 10 years, indicating a strong commitment to embrace IWRM as illustrated by the progressive National Water Act and all the other legislative documents. South Africa has also led the way in pioneering the development of a methodology for determining the ecological reserve, enforcing public participation processes, a water tribunal, etc.

In all these positive steps, the key challenge has been the effectiveness and the sustainability of the gains. Some emerging lessons are:

1. Reliable data is essential to support these processes. Monitoring of essential parameters such river flow, rainfall, groundwater levels, etc is a challenge. More importantly, monitoring of water use, in the face of a growing competition for water and enforcing the provision of the water act (such as the reserve and allocation) is critical.
2. Greater coordination between sectors at the planning and implementation phases requires improvement in order to optimise the allocation and use of water for competing needs.
3. A critical mass of qualified workforce in the water sector ranging from engineers, environmentalists, social scientists, water quality scientist, hydrologists and importantly technicians and artisans is required. At present, this seems to be the real bottleneck in ensuring the sustainability of the gains achieved.
4. Some areas will remain a challenge for the foreseeable future, these include:
    a. Effective enforcement of the ecological reserve, despite a progressive methodology
    b. Effective monitoring of water use
    c. Setting up functional institutions in water resources management
    d. Transparent tariff setting and effective cost recovery
5. Because the IWRM planning process (as adopted at the World Summit on Sustainable

Development) was aimed to fast track the achievement of the Millennium Development Goals (MDGs), it is important to look beyond the MDGs and focus on the needs of those who do not have yet access to essential services and who will not in the near future. These are the poor and marginalised, often living in remote access areas where providing the required infrastructure could prove prohibitively expensive.

6. Maximising the opportunities that the water sector offers to the overall economic development of South Africa seems to be the focus of W4DG. Yet, this new approach is likely to fail if all the above lessons are not taken into consideration.

The new 'Water for Growth and Development Framework' which has just been launched is an opportunity to strengthen and build on the gains that the adoption of IWRM has brought to South Africa. This is therefore an opportunity to focus on implementation, by engaging other sectors and focusing on delivery in order to achieve sustainable growth and development.

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CHAPTER 1: BACKGROUND AND CONTEXT

1.1 Project Background

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1.2 Geographic Context

Source: SANCID

Located on the southern tip of Africa, the Republic of South Africa stretches between the longitude from 17° to 33°E and latitude of 22° to 35°S. Namibia bounds the country on the Northwest, while Botswana and Zimbabwe are located in the North, Mozambique and Swaziland are on the Northeast. Lesotho, a landlocked country, forms an enclave within the Republic of South Africa. The South Atlantic and the Indian Oceans wash the relatively unindented coastline some 2,800 km long, west and east respectively of the longitude 20°E. The Republic has nine provinces: Northern Province, Mpumalanga, KwaZulu-Natal, Eastern Cape Province, Western Cape Province, North Cape Province, North West Province, Gauteng and Free State. The total land area of the Republic of South Africa is 1,223,410 km^2. Topographically South Africa may be divided into four zones, the Plateau, the Escarpment, the folded Mountains and the Coastal Plain.

Approximately 86% of the area of the Republic of South Africa lies in the summer rainfall area. A narrow belt along the southern coast, some 4 million ha in extent, receives rain during all seasons. 13 million ha in the southern western corner have a Mediterranean climate with winter rainfall and a dry summer. The rainfall decreases from east to west, from over 1,000 mm in the east to 50-100 mm in the Namib and Namaqualand areas in the west. Barely one third of the summer rainfall area receives more than 600 mm annual precipitation. Evaporation throughout most of South Africa is very high due to the semi-arid and arid conditions. The loss by evaporation from open water surfaces exceeds by far the average rainfall, ranging from 2,500 mm in the dry west to 1,500 mm in the more humid temperate regions.

Land use statistics are as follows:

- Land used for agronomic purposes: 107,796.15 km^2 (Rainfed) and 10,863.58 km^2 (Irrigated)
- Land used for pasture crops: 17,366.14 km^2 (Rainfed) and 2,093.51 km^2 (Irrigated)
- Natural extensive grazing areas: 839,280.62 km^2
- Forest and woodland: 11,790.00 km^2
- Other land: 234,220.00 km^2

Recent downscaling experiments indicate (Boko et al, 2007 and Bates et al, 2008):

- Increases in summer rainfall over the convective region of the central and eastern plateau and the Drakensberg Mountains;
- Decreases in early summer (October to December) rainfall and an increase in late summer (January to March) rainfall over the eastern parts of southern Africa.

1.3 Social and Economic Context

The total population of 48,687,000 (Stats SA, 2008a) grows at the rate of 0.8%. Out of the economically active population (aged 15 – 64 years) 3,873,000 are unemployed (Stats SA, 2008b). Amongst the employed, 764,000 are involved in agriculture (Stats SA, 2008b). Population migration within South Africa from rural areas to urban centre has been reasonably constant at around 12 percent of the population in each five-year period. The net international migration rate is estimated

at 4.98 migrants/1,000 population. There is currently an increasing flow of Zimbabweans into South Africa in search of better economic opportunities (CIA, 2008).

South Africa is a middle-income, emerging market with an abundant supply of natural resources; well-developed financial, legal, communications, energy, and transport sectors; a stock exchange that is 17th largest in the world; and modern infrastructure supporting an efficient distribution of goods to major urban centres throughout the region. Growth was robust from 2004 to 2008 as South Africa reaped the benefits of macroeconomic stability and a global commodities boom, but began to slow in the second half of 2008 due to the global financial crisis' impact on commodity prices and demand. Unemployment remains high and outdated infrastructure has constrained growth. At the end of 2007, South Africa began to experience an electricity crisis because state power supplier Eskom suffered supply problems with aged plants, necessitating "load-shedding" cuts to residents and businesses in the major cities. Daunting economic problems remain from the apartheid era - especially poverty, lack of economic empowerment among the disadvantaged groups, and a shortage of public transportation. The GDP composition per sector is as follow:

- Agriculture: 3.4%;
- Industry: 31.3%, and;
- Services: 65.3%

(Source CIA, 2008)

CHAPTER 2: WATER RESOURCES SITUATION

2.1 Water Availability and Infrastructure

Source: NWRS, W4GD Framework, and SANCID

The average rainfall of South Africa is just over half of the world average. The rainfall is strongly seasonal and highly irregular in occurrence. As a consequence of the uneven rainfall distribution and the topography, more than 60% of the river flow arises from only 20% of the area. It is estimated that 9% of the country's precipitation finds its way as runoff into rivers and streams. Water resources in South Africa are comprised of the following three sources: surface water (77%), return flows (14%) and groundwater (9%).

South Africa depends mainly on surface water resources for most of its urban, industrial and irrigation requirements. To meet the country's growing water requirements, water resources are highly developed and utilised in large parts of the country. About 320 major dams, each with a full supply capacity exceeding 1 million cubic metres, have a total capacity of more than 32.4 $10^9 m^3$, equivalent to 66 per cent of the total mean annual runoff. The total internal renewable surface water resources are approximately 49 x $10^9 m^3/a$ and the maximum yield is 33.3 x $10^9 m^3/a$.

Groundwater, while also extensively utilised, particularly in the rural and more arid areas, is limited due to the geology of the country, much of which is hard rock. Large porous aquifers occur only in a few areas. Hence, only about 20 per cent of groundwater occurs in major aquifer systems that could be utilised on a large scale.

Climate change has the potential to impact very significantly on both the availability of and requirements for water in South Africa. Some climate models suggest that this could increase the variability of climate and decrease rainfall in South Africa. According to these models stream flow could decrease, possibly by as much as 10 per cent by 2015 in the most affected parts of the Western Cape.

South Africa has more than 500 government owned dams with a total capacity exceeding 37 millions m^3; the biggest being Gariep Dam with a storage capacity of 5.5millions m^3. Many dams are part of an integrated system of which, often, the total yield is less than the actual demand. This leads to several measures such as (1) water conservation and water demand management; (2) optimising the operation and long term planning of these systems through complex water resources yield and planning models; (3) inter-basin transfers (IBT) including from other countries such as Lesotho. South Africa is continuously assessing the ability of the available water storage infrastructure to meet present and future needs. Though the options for building new dams are greatly reduced (compared to a few decades ago), some schemes are either upgraded through raising of the wall of existing dams (such as Flag Boshielo in Mpumalanga and Hazelmere Dam in KwaZulu-Natal) or the construction of new dams such as the Berg River Water Project in the Western Cape or De Hoop Dam in Mpumalanga. The planning section of the Department of Water Affairs and Forestry has a lead time in planning for new infrastructure to meet projected demand which is driven by the growing economy. The Gauteng region is the heart of South Africa's economy and its water needs are

planned for with the greatest care. Options to meet future demand for Gauteng include a Phase 2 of the Lesotho Highlands Water Project and the Thukela Water Project as part of the Vaal River system which is considered as the most important water source in South Africa, because it supplies water to 60% of the economy, 45% of the population, the whole of Gauteng and the Northern Cape.

Water stored in dams is often intended for multi purpose uses. Hydro electricity is generated from a few of dams, such as Gariep, Van der Kloof dams on the Orange River and from pumped storage schemes such as in the Drakensberg and at Steenbras near Cape Town in the Western Cape.

Although South Africa has good water resource infrastructure currently valued at about ZAR 93-billion, it often by-passes the poor and dispersed rural population. Hence, the challenge to build additional infrastructure to serve their needs through while knowing that such investment is unlikely to be recovered considering that the rural population is poor. The solution is often to couple an infrastructure project driven by economic needs with social considerations such as providing water for the surrounding communities or those communities on the path of the conveyance infrastructure.

2.2 Water Use, Demands and Requirements

Source: NWRS

Agricultural irrigation represents more than 60 per cent of the total water requirements in the country, urban requirements constitute about 23 per cent and the remaining 15 per cent is shared by the other four sectors (all standardised to 98 per cent assurance of supply). A summary of the estimated water requirements for the year 2000 for the different water use sectors and the estimated average annual requirements for the ecological component of the Reserve per water management area is given in Table 1.

Current population projections estimate that the population will grow to 53 million people by 2025. An implication from a water demand perspective is that domestic share of water use will shift from the current 27% to between 30% to 35% of the total national use. There are two primary concerns with respect to the water supplies: the first is keeping abreast of trends in population and economic growth, which have particular spatial dimensions, and the second is to address the historical basic water and sanitation service backlogs. Strategies for the future reconciliation of requirements and availability will be combinations of the following possible interventions: water demand management/Water conservation; re-allocation of water and the construction of new dams and related infrastructure, including inter-catchment transfers.

In 2004, the Department of Water Affairs and Forestry (DWAF) developed a National Water Conservation and Water Demand Management (WC/WDM) Strategy, and subsidiary strategies for three identified water use sectors, namely water services, agriculture, and industry, mining and power generation. The strategy articulates the roles and relationships of the various water sector institutions in respect to WC/WDM. Pilot projects established that WC/WDM can provide a significant reduction in water demand if measures are implemented and properly maintained on a sustainable basis. At present, the extent of the application of WC&DM in the WMA are not fully known and therefore the extent of the savings that can be achieved by applying WC&DM is not

established. DWAF is now developing a National Water Use Efficiency Information System to assist in monitoring the water use efficiency trends in the country at local, provincial and national scale.

Table 1. Water requirements for the year 2000 (million m³/a) and ecological Reserve (million m³/a) (DWAF, 2004)

	Water Management Area	Irrigation	Urban	Rural	Mining and bulk industrial	Power generation	Afforestation	Total local requirements	Ecological reserve
1	Limpopo	238	34	28	14	7	1	156	322
2	Luvuvhu/Letaba	248	10	31	1	0	43	224	333
3	Crocodile West and Marico	445	547	37	127	28	0	164	1,184
4	Olifants	557	88	44	94	181	3	460	967
5	Inkomati	593	63	26	24	0	138	1,008	844
6	Usutu to Mhlathuze	432	50	40	91	0	104	1,192	717
7	Thukela	204	52	31	46	1	0	859	334
8	Upper Vaal	114	635	43	173	80	0	299	1,045
9	Middle Vaal	159	93	32	85	0	0	109	369
10	Lower Vaal	525	68	44	6	0	0	49	643
11	Mvoti to Umzimkulu	207	408	44	74	0	65	1,160	798
12	Mzimvubu to Keiskamma	190	99	39	0	0	46	1,122	374
13	Upper Orange	780	126	60	2	0	0	1,349	968
14	Lower Orange	977	25	17	9	0	0	69	1,028
15	Fish to Tsitsikamma	763	112	16	0	0	7	243	898
16	Gouritz	254	52	11	6	0	14	325	337
17	Olifants/Doring	356	7	6	3	0	1	156	373
18	Breede	577	39	11	0	0	6	384	633
19	Berg	301	389	14	0	0	0	217	704
	Total for country	**7,920 62%**	**2,897 23%**	**574 4%**	**755 6%**	**297 2%**	**428 3%**	**9,545**	**12,871**

2.3 Key Water Resources Issues, Concerns and Priorities

Despite the government's vision for a comprehensive formalised system of water governance, water management in South Africa, and in particular in rural South Africa, tends towards plural legal systems (Malzbender et al, 2005). The complex set of institutional relationships that govern the water sector, involve a myriad of organisations fulfilling different roles and functions. Hence, problems and challenges experienced in the sector are in part a consequence of these multiple institutional layers and the associated risks of performance failure by any one party. Furthermore, the water related policies and legislation do not always agree with each other.

The National Water Act does not explicitly recognise customary water management structures and in fact, customary water management structures are not mentioned at all in the National Water Act. Nonetheless, the Traditional Leadership and Governance Framework Act (Act No. 41 of 2003) makes provision for traditional leadership to promote sustainable water resource management and requires national and provincial government to provide for their involvement (through legislation and other means). The recognition of customary/traditional law may result from the National Water Act and the water policies that offer practical guidelines for the implementation of the catchment management strategy within the legal framework of the National Water Act.

South Africa's per capita water availability is approximately 1,060 m^3 per year, of which the utilisable portion is only 300 m^3 per person per year. (UNESCO, 2003). In addition, as a result of the many control structures (dams and weirs), the abstraction of water and return flows to rivers, as well as the impacts of land use, the flow regime in many rivers has been significantly altered. In some instances this has resulted in a severe degradation of the quality of water and the integrity of aquatic life in rivers. Some of South Africa dams are among the world's worst examples of eutrophication, resulting from high levels of phosphates and nitrates washing into them. There is groundwater and surface water pollution as a result of:

- acid mine drainage from abandoned mines poses both a serious environmental threat and an obstacle to securing water for growth and development;
- Pollution from agriculture and the growth of settlements, and;
- Lack of adequate sanitation facilities in informal and rural settlements.
-

Many water and wastewater works have reached their design capacities. They are in a poor state and do not function properly, hence resulting in major wastewater spillages and related environmental and health impacts. Although all municipalities are legally required to monitor their drinking water quality, due to lack of capacity, not all municipalities monitor on a continuous basis. Consequently service quality is highly variable and data is sketchy.

Beck and Basson (2002) estimate that the average sedimentation rate is 0.34% of the storage capacity per annum for South African reservoirs, with the most famous example of reservoir sedimentation being that of Welbedacht dam which lost more than 70% of its storage capacity 15 years after it was constructed (de Villiers and Basson, 2007). In the planning of dams, as far as possible, the selection of a site is guided by the possibility of future raising of the dam wall to counter reservoir sedimentation. This is the case of Gariep and Van der Kloof Dams which were designed so as to be raised at a future stage for this specific purpose (WCD, 2000).

South Africa as a number of estuary: the Orange, Olifants and Berg Rivers on the Atlantic Ocean side and the Breede, Knysna, Keurbomms, Kromme, Umzimvubu,Tukhela, Umgeni rivers and St Lucia lake on the India Ocean side. In these systems, an occurrence of low flows and spring tide can result in salinity intrusion reaching as far as a few kilometres upstream in an estuary. The problem can be exacerbated by the construction of dams without making provision for releasing sufficient water to maintain the ecological balance. While mistakes of this kind might have been made in the past, especially in the Eastern Cape, recently, the construction of dams (such as the Berg Water Project in the Western Cape) have take great care of this problem through various model simulations and the adoption of an Estuarine Flow Requirement methodology.

Identified priorities for engagement are:

- Redressing past inequities and demands for higher levels of service;
- Bulk infrastructure development, asset management, and water quality management;
- Manage the increased demand for water due to increased standards of living by mainstreaming of WC/WDM
- Reducing pollution linked to economic growth and increase raw water quality;
- The promotion of sustainability in implementation and monitoring of water services and water resources management programmes;
- Water For Growth and Development;
- Eradication of Water services backlogs and meeting of delivery targets.

CHAPTER 3: ACTUAL STATE OF THE IWRM PROCESS

3.1 Policy and Legislation

The review of the water law was guided by a set of basic principles developed through an intensive process of consultation. These principles were translated, first into a statement of policy (White Paper on a National Water Policy, 1997) and thence consolidated into two major acts: the Water Services Act, 1997 and the National Water Act, 1998.

The National Water Act is the principal legal instrument relating to water resources management in South Africa. The overarching objective of the Act is to ensure the beneficial use of water in the public interest while the central guiding principles are equity, efficiency, sustainability and representivity. The Water Services Act provides a regulatory framework for the provision of water supply and sanitation services to which people are entitled. It deals with reticulated water supply and sanitation services. It specifically provides for the rights of access to basic water supply and basic sanitation and for the manner in which municipalities must fulfil their duty to provide water and sanitation services to their communities. The Water Services Act is aligned to the National Water Act since its interpretation is subject to the National Water Act.

Water resources management is also subject to the specific requirements of other national policies and legislations administered by a number of departments in the three spheres of government - which govern activities that are dependent on water or which affect water resources - such as:

- The National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA) and those parts of the Environment Conservation Act, 1989 (No. 73 of 1989) (ECA) that have not yet been repealed by NEMA.
- the Public Finance Management Act (No. 29 of 1999)
- the Promotion of Access to Information Act (No. 3 of 2000)
- etc

In South Africa, government is established in three spheres: national, provincial, and municipal. The governance of water was defined as the competence of government at a national level while the function of providing water services was the primary competence of local government, with national government's role being one of regulation and support.

The National Water Act provides for the establishment of bodies to implement international agreements for the management and development of water resources that are shared with neighbouring countries. It also recognises international obligations. Hence, South Africa has entered into a number of bi- and tri-lateral transboundary water agreements with neighbouring Southern African Development Community (SADC) states in relation to its shared watercourses. It should be noted that the SADC Revised Protocol on Shared Watercourses, signed in 2000 is the overarching agreement that provides a framework for future water resource development and management in the shared watercourses in SADC.

3.2 Institutional Arrangements

DWAF is the custodian of the water resource and overall leader of the water sector. It is not involved in operating any water services infrastructure and oversees the activities of all water sector

institutions and regulates water resources and water services. DWAF is responsible for water resource planning at the national and international levels and for decisions related to inter-catchment transfers and international allocations. Most water licensing functions will ultimately be delegated to catchment management agencies. Only licensing with significant strategic or inter-water management area implications are retained by DWAF. South Africa has been divided into 19 Water Management Areas (WMAs) as part of the progressive development of the National Water Resource Strategy (NWRS). Water institutions are either dealing with water resources management (yellow colour) or water services (Green colour) as indicated in Figure 1.

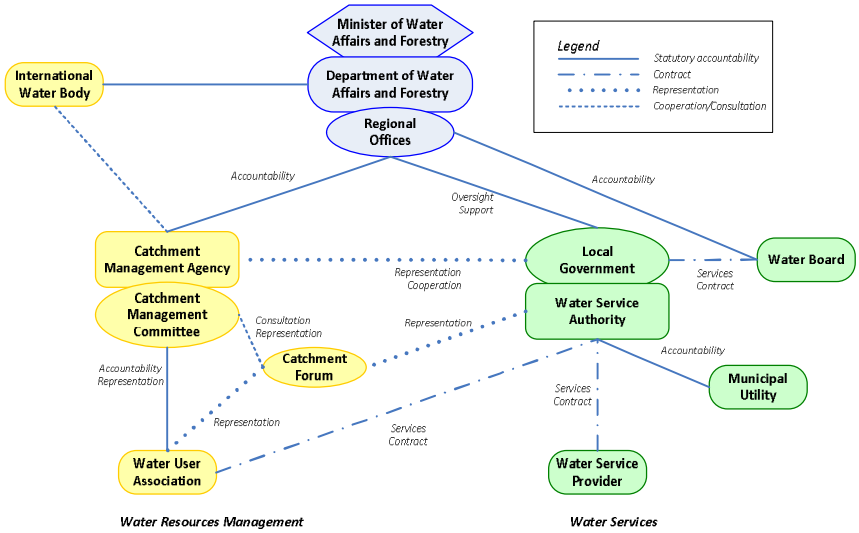

Figure 1. The hierarchy of Water Management Institutions (DWAF,2008)

Water resources management Institutions:

- **Catchment Management Agencies (CMA)** are responsible for water resource planning at WMA level and most water resources management activities in these areas, such as the licensing of water use and discharges where delegated by DWAF, monitoring abstractions and discharges, collecting abstraction and discharge fees, monitoring water quality, and overseeing land-use activities as this affects water management. DWAF fulfils the role of the CMA where these are not yet established.
- **Catchment Management Committees (CMC)** are established by a CMA to perform any of its functions within a particular area or generally or to advise it.
- **Water User Associations (WUA)** consist of an association of water users that operate within a given allocation of water at a localised level

Water Services institutions:

- **Water Services Authorities (WSA)** (metropolitan municipalities, some district municipalities and authorised local municipalities) have the constitutional responsibility for ensuring access, planning and regulating provision of water services within their area of jurisdiction.
- **Water Services Providers (WSP)** are the organisations that assume operational responsibility for providing water and/or sanitation services. All water services providers who provide water services to or on behalf of water services authorities must do so in terms of a service delivery agreement (contract) with the water services authority.
- **Municipal utilities** operate some local water resource infrastructure (such as dams and boreholes) and bulk water supply schemes, supply water and sanitation to consumers (households, businesses and industries) and operate wastewater collection and treatment systems.

- **Water Boards (WB)** operate some water resource infrastructure, bulk potable water supply schemes (selling to municipalities and industries), some retail water infrastructure and some wastewater systems. Through their role in the operation of dams they also play an important role in water resources management. The Water Boards which report to DWAF. The 15 Water Boards of South Africa indirectly serve about half the population. The three largest Water Boards are: Rand Water in Gauteng Province, Umgeni Water in KwaZulu-Natal Province and Overberg Water in the Western Cape.
- **International Water Bodies** implement international agreements in respect of the management and development of water resources shared with neighbouring countries and on regional co-operation over water resources.

Some municipalities have involved the private sector in water and sanitation service provision through short-term management contracts, long-term concessions and contracts for specific services such as wastewater treatment.

To date, eight of the nineteen planned Catchment Management Agencies have been established. South Africa is experiencing severe capacity challenges that hinder the successful implementation of the water policy and legislation. This translates into the slow establishment of CMAs, difficulties in several local authorities in discharging their water related duties, shortage of technical staff in DWAF national and regional offices. Furthermore, the water services sector is criticised for the inappropriate maintenance of its water services infrastructures. This situation poses a threat to the effective functioning of water institutions in South Africa.

The provision of water and infrastructure associated with it are largely financed from three main sources, i.e. (a) Municipal Infrastructure Grant (MIG) which is a capital grant intended for basic services, (b) Equitable Share which is meant to support the operation and maintenance costs for basic services and (c)cross-subsidies. South Africa has introduced a policy of free basic services that entitle every household to receive the first 6 cubic meters per month for free. The policy is financed through the equitable share grant.

The National Water Act and the Pricing Strategy for Raw Water Charges provides the financial framework within which CMAs operate. The two main sources of funding for CMAs are user charges (for water resources management) and parliamentary appropriations (through DWAF). The intention is that CMAs are largely financed through user charges on water resources management. Figure 2 summarises the financial flows between water users and institutions from the perspective of the CMA, particularly in terms of water resource management related water use charges and fiscal transfers.

The water sector also receives funds from a number of donors through bilateral cooperation agreement such as with the European Union (Masimbabane Programme), Danish International Development Agency (Danida) or the UK Department for International Development (DFID), etc. Phase III of Masibambane is funded to the tune of €107-Million (2009-2012) by the European Union and DWAF has committed ZAR 69-Billion of its own.

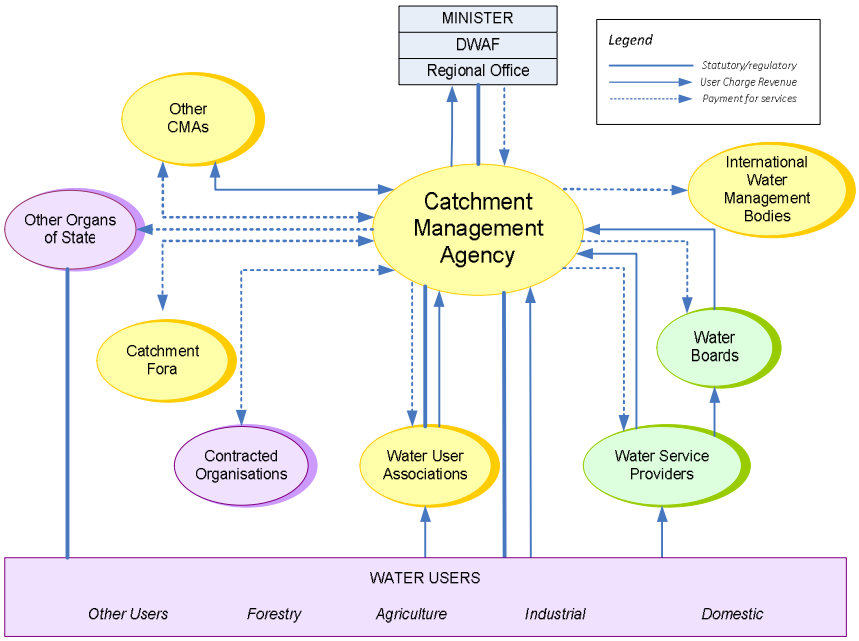

Figure 2. Financial flows between a CMA and other institutions within a WMA (Pegram and Palmer 2001)

Public participation in South Africa is mostly limited to public consultation (Buccus et al, 2007) despite the fact that it is outlined in key water and local government legislations. The guidelines for the implementation of catchment management emphasises local participation of all stakeholder interests, needs and values, particularly of marginalised communities such as women and the rural poor. These guidelines a further mainstreamed by the guidelines for Stakeholder Participation in Integrated Water Resources Management in Water Management areas. However, in spite of this strong emphasis on public participation, South Africa has yet to implement a comprehensive and functional approach to public engagement at the level of Water Management Areas. Part of the problem is that actual requirements are not explicitly articulated anywhere. This has led to the situation where public participatory processes are poorly conceptualised, misdirected and often perceived as confusing by stakeholders. . In some cases, a lack of coordination between projects targeting the same communities lead to confusion as each project comes with its own stakeholder participation process. 'Participation fatigue' or 'Stakeholder fatigue' is the consequence of this accompanied by a growing frustration with the implementation of the content of the Act. The intention for decentralised democratic water resources management is consequently seriously jeopardised if the public participation processes are not clearly presented in the public domain.

Although there are a number of projects where cross-sector coordination takes place, there are no established coordinating bodies or mechanisms. Cooperative governance is promoted and cross sector interaction takes part in the participatory processes. Nonetheless, not only thus the NWRS and the Catchment Management Strategy inform other sector about water availability but all water plans (NWRS, water services development plan, etc) must consider the imperatives and needs of other sectors.

3.3 Water Strategy and Instruments

The National Water Resources Strategy (NWRS) sets out ways in which South Africa aims to achieve IWRM. It describes how the water resources of South Africa will be protected, used, developed, conserved, managed and controlled in accordance with the requirements of the policy and law. Each CMA must develop and implement a catchment management strategy for the water resources within their Water Management Area. Catchment management strategies must be in harmony with the National Water Resource Strategy and must take into account any relevant national or regional plans that have been prepared in terms of a law. Internal strategic perspectives have been developed to provide a framework for DWAF's water management actions until such time as the CMAs become fully operational.

For local authorities (Provincial and local government), the IWRM plan is in its pilot phase. The IWRM plan for local authorities encompasses Water Management Plan that serves either as a stand alone report or as a supplement to the Water Services Development Plan and Integrated Waste Management Plan, which focuses on service delivery and not the full water management package: service delivery and resource protection.

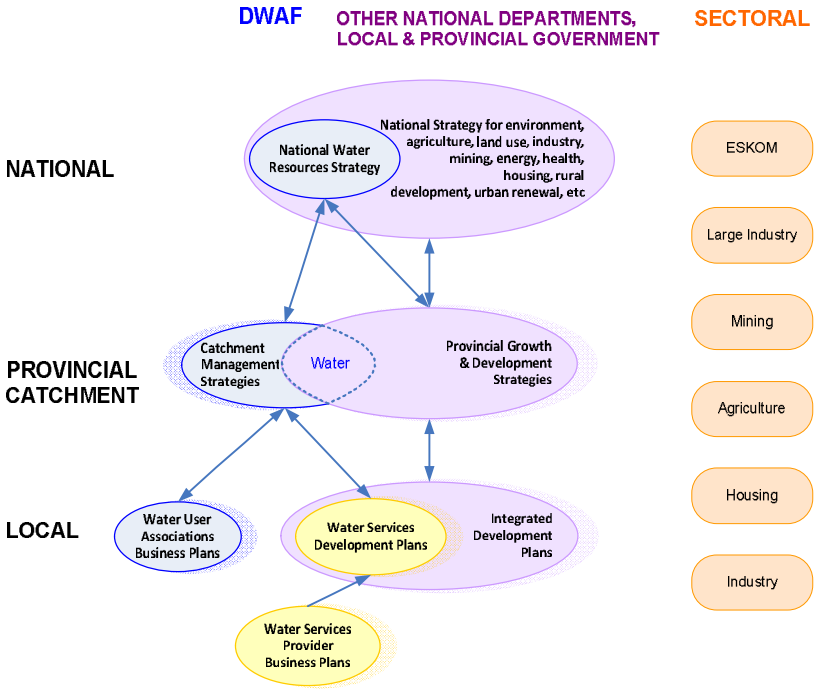

Figure 2. Water-related planning in the national planning framework (DWAF, 2004)

DWAF must ensure that its programmes are in accordance with government policy and are coordinated with relevant programmes of other national departments. Similarly, other departments have a responsibility to ensure that, where relevant, their programmes take account of the realities of South Africa's water situation. This is particularly important when it comes to planning developments that depend on water for their success. In these instances the availability of water must be factored into plans at the beginning of the development process. One of the purposes of the NWRS is therefore to provide sufficient information about water resources to facilitate coherent

and holistic planning, as well as establishing a platform for informed interactions between water resource managers and development planners in other sectors.

Figure 2 illustrates in broad terms the links between the strategies and plans for water resources management and water services provision, and the strategies and plans of other national, provincial, municipal and sectoral interests.

Though it does not set clear indicators, efforts to implement the NWRS are evident. The NWRS is due to be reviewed every five years, implying that this will be on the basis of some evaluation criteria. The review process which is lagging behind was recently initiated. A new focus on 'Water for Growth and Development' (W4GD) is receiving greater prominence, as a gradual evolution from the IWRM approach. A W4GD Framework has just been launched by DWAF in March 2009.

3.4 Practice (Implementation) of IWRM

The concept of IWRM is barely known or understood in the water sector and other sectors. Although quite well understood by DWAF national office and in some instances DWAF regional offices, IWRM is mostly unknown by water services professionals. It is expected that the IWRM plan guidelines for local authority will assist in promoting the understanding of IWRM among local governments. At present, with the drive away from IWRM to W4GD, it is to be expected that some managers and decision makers will not appreciate the value of the IWRM approach and concept as it is likely to be less and less advocated or resorted to. As an illustration, the W4GD framework is entirely silent on IWRM which is not even mentioned one single time.

Continued fragmentation in the national approach to water resource management represents a particular problem for the effective implementation of IWRM in South Africa. While water and land both fall under the broader concept of natural resources and are inextricably linked to one another in terms of the way in which use of the one impacts on the other, South African environmental, water and land-use legislation and administration are administered by separate line function government ministries. Despite the comprehensive reforms of South Africa's water, land and environmental law, this fragmentation is likely to persist into the foreseeable future.

The water related policies and legislation clearly define and support institutional mandates. Hence, institutions dealing with water services are established while the establishment of those dealing with water resources management (CMAs and WUAs) has proven difficult due to the lake of human resources. A number of international bodies (river basin commissions such as the Limpopo River Commission and the Orange-Senqu Commission) have been established in collaboration with the other co-basin states and are fully operational.

Despite the drive to register and license, the process of verification of such use is difficult. It is believed that many water users exceed their allocation, resulting in water systems being unduly stressed. The agriculture sector is by far the biggest water user and probably the biggest culprit in terms of individual water users exceeding their allocation. Equitable water allocation is a challenge especially in order to redress past imbalances and ensuring that those were previously disadvantaged

get access to the resource for economic activities. The Department of Water Affairs and Forestry has promulgated a regulation for the assistance of resource poor farmers for rainwater harvesting tanks.

DWAF which pledged to strengthen its regional gender units, and make sure that the centre and the regions pull together to achieve gender mainstreaming acknowledges that the sector still has a long way to go in achieving all the desired gender mainstreaming objectives. Despite DWAF's comprehensive Gender Policy, changing the gender balance of South African society is clearly a long term process, which will have varying degrees of success at the community level (Berold, 2003).

South Africa is leading the development of a methodology to determine ecological flow requirements (ecological reserve). The challenge is to convince other users to relinquish the water they need for economic activities for the ecological reserve. In order to achieve this, it will not be enough to determine the amount required for the reserve, it will be equally important to involve and obtain the buy in of other water users who depend on the same resource so that they cooperate in enforcing the reserve. It should be noted that implementation and monitoring of the ecological reserve is poor despite the excellent policy, legislation and methodologies.

Although a programme of implementation and a financing plan are provided for in the NWRS, no formal monitoring and evaluation systems are in place. Studies carried under the different directorates of the planning unit of DWAF do regularly undertake an assessment of the resource (updated hydrological studies) against projected socio economic needs in view of identifying the best option for reconciling demand and supply. This is done extensively and takes into account the development plans of key sectors within the study area. There is no sufficient awareness, critically capacity building provided for to meet the challenges of the strategy.

Elements of the supply and sanitation value chain are consistent and reliable for most part of the country. Water charges are collected and used as intended. The determination of tariffs is however a difficult exercise which is likely to improve with the adoption of a new water pricing strategy which seeks to objectively determine a methodology for tariff setting.

3.5 Monitoring and Evaluation

DWAF operates a number of monitoring systems that collect some of the required data and information. However, the systems were developed and are being operated largely in isolation from one another. Spatial coverage is incomplete and as a result little or no information is collected in some areas. Problems are also being experienced with the quality and reliability of information. Although efforts have been made, the dissemination of and access to information is not as effective or as comprehensive as it might be. Access to relevant data collected by other organisations, including other national government departments, provincial and local governments, water boards, private sector organisations and water users, is problematic in some cases. To address these shortcomings all existing and planned monitoring and assessment systems are amalgamated into a coherent and structured monitoring,

Case 1: Water Quality Management
The development in 2006 of the electronic water quality management systems enables DWAF to collect drinking water data on a monthly basis from 95% of the 166 water services authorities (The Water Wheel, 2008a)

assessment and information system.

The department also has a number of web-based spatial information systems that are continuously refined. Although the database is important, it is still insufficient for the all country and data need to be checked for consistency. Of concern are:

- The fact that the meteorological data is mostly controlled by the Department of Environmental Affairs and Tourism through the Weather Bureau. The continual decrease in the number of operational rainfall stations is of concern;
- In most regional DWAF offices, there is less and less technical staff in charge of hydrometric data collection. This poses a serious challenge;
- The same challenge applies to water quality, discharge, sedimentation, etc. The problem is compounded by reduced budgets allocated to these critical activities.
-

It is expected that the national framework for sustainable development (adopted in the second half of 2008) which is build on existing programmes and strategies that have emerged in the first 14 years of democracy will provide the mechanisms for monitoring other sectors' development plans/implementation.

CHAPTER 4: ACTUAL STATE OF WATER ACCOUNTING

4.1 Reliability of the Water Use Information

The NWRS contains coarse information about water availability and water requirements of all 19 WMAs and their sub-areas for the year 2000 for the different water use sectors (standardised to the equivalent quantities at a 98 per cent assurance of supply). More detailed information are available in the Internal Strategic Perspectives (ISPs) which provide framework for DWAF's management of the water resources in each WMA. The NWRS and the ISPs are available on the DWAF website (www.dwaf.gov.za). South Africa needs to update the current NWRS as well as the ISPs which are based on 2000 figures and makes projections to 2025.

The reconciliation strategies, which have been completed for some of the country's major water supply systems, and which will be followed by reconciliation studies for every town in South Africa will provide an accurate picture of water demand and supply and how to achieve the required balance at a micro level (W4GD). This information should be available by mid-2011.

> ***Case 2: Irrigation efficiency***
> It is estimated that a minimum of 20% to 30% of water supplied to the irrigation sector is lost due to leakages out of conveyance structures, evaporation, evapotranspiration, spillage and flooding among others. Some older schemes have and still are recording periodic losses of up to 70% (The Water Wheel, 2008b)

Though information of water use by sector in different WMAs are available from DWAF, they often do not include any efficiency figure. As stated previously, the National Water Use Efficiency Information System which is under development is expected to assist in monitoring the water use efficiency trends in the country at local, provincial and national scale. At present efficiency figures are only available in reports and journal papers produced by different organisations and institutions. Hence, their accessibility is complex and, more importantly, their reliability tricky to establish.

Reliable water use information is a challenge because of poor monitoring of water use. This is particularly true for water users of the agriculture sector (which is the biggest water user) who tend to exceed their allocation, as discussed earlier in section 3.4.

Bulk water from DWAF's dams is sold to water boards. These in turn treat it and sell it to local authorities in their capacity as Water services Authorities (WSA) who then sell it to consumers. WSA have the option to resort to Water Service Providers with whom they will enter into a contractual agreement to deliver water services. In some instances, such as for Cape Town, the city owns some dams or buys water directly from DWAF without the intermediary of a water board or a water service provider.

Local authorities are also responsible for sanitation. Treating waste water is a challenge for South Africa with the consequence that, in some cases, it is a growing source of pollution. Yet, some successful cases also exist, such as the East Rand Water Care Company (ERWAT) which provides wastewater treatment for a host of industries and more than 3,5 million people who have access to sanitation services. It is currently custodian of 20 wastewater care works, treating a combined

capacity of some 550 mega litres of wastewater per day. The majority of the operations are in the Ekurhuleni Metropolitan Council (formerly known as Eastern Gauteng region) while ERWAT also provides services to other metropolitan councils. The situation is different for smaller municipalities who often have less technical capacity.

4.2 Allocation of Water

The NWRS establishes priorities for water use and defines the proportions of total water available in each of the water management areas (WMAs) that fall under the direct control of DWAF. Priority uses are currently specified to include: the basic human and the ecological reserve; water required for compliance with international rights and obligations; water use for strategic importance, such as power generation; inter-catchment water transfers from surplus to deficit WMAs; and water for projected future needs. Once the priority uses are met, all other uses of water have to be authorised by the respective regional and local water management institutions (CMAs and WUAs) in the various WMAs. Existing water authorisations are:

- Schedule 1 of the National Water Act: permissible use of water where a licence is not required.
- General authorisations: they allow a user to use water without a licence provided that the water use is within the conditions of the general authorisation (in areas that are not under stress).
- Licence: for any new water use that is not listed in Schedule 1 or that is not covered by a general authorisation.
- Compulsory Licensing for water use in areas that are under stress.

The current allocation system is not effective since there are still unauthorised water uses taking place. Hence, DWAF is currently embarking into a water allocation reform which includes a number of actions such as: the provision of financial support to resource poor farmers; compulsory licensing to support the equitable (re)allocation of water in any catchment and the processing of licences and/or general authorisations to support the uptake of water by historically disadvantaged people.

Case 3: Unlawful water use in the Vaal River

240 million m3/a of irrigation water use in the Upper Vaal WMA is estimated to be unlawful. Some farmers withdraw more than their registered share of runoff river water (DWAF, 2006)

4.3 Water Pricing and Tariffs

Source Strategic Framework for water services

The National Water Act allows the Minister of Water Affairs and Forestry, with the approval of the Minister of Finance, to develop a strategy (The pricing strategy) for calculating water use charges. While the Water Services Act allows the Minister of Water Affairs and Forestry, with the approval of the Minister of Finance, to set national standards and norms and standards for tariffs in respect of water services. Consequently, the pricing strategy does not address treated water supplied in bulk and distributed to households. The responsibilities for setting water and sanitation tariffs are summarised in Table 2.

Table 2. Responsibilities for tariff setting (DWAF, 2003)

Tariff / charge	Responsibility for setting tariff and source of authority	Responsibility for regulating the tariff
Water resource management charge. (Recovers the costs of water resources management)	Catchment management agency in terms of National Water Act.	DWAF. Where there is no catchment management agency, DWAF also sets the tariff (self-regulation).
Raw water tariff (water resource development charge). (Recovers the infrastructure and operating costs of schemes.)	DWAF in terms of the national raw water pricing strategy and in consultation with water users including local government.	DWAF (subject to National Treasury oversight). (Note: raw water tariffs are also implicitly set by water services authorities and water boards where these organisations manage raw water systems.)
Bulk water and wastewater tariffs. (Recovers the cost of conveying and treating bulk water and wastewater.)	Negotiation between water board and water services authority (or its appointed provider) in the case of a water board. Water services authority where bulk function undertaken itself, or by an entity owned by the water services authority. Consultation between water services authority and external provider of service (for example, another municipality).	DWAF (direct regulation of water boards). Water services authority. DWAF (These are subject to National Treasury oversight.)
Retail water tariff and sanitation charges. (Includes the bulk water and wastewater tariff and recovers the retail costs.)	Water services authority in terms of the Water Services Act and Municipal Systems Act.	Water services authority (subject to DWAF oversight). DWAF sets national norms and standards for the setting of retail tariffs.
Waste discharge charge (A water resource charge based on the "polluter pays" principle.)	Catchment management agency in terms of National Water Act, in consultation with water users including local government. DWAF where there is no Catchment management agency.	DWAF (subject to National Treasury oversight).

Raw water charges for the 19 WMAs and are available from DWAF while water services tariffs should soon be available on the water services tariff monitoring system.

4.4 Economic Data

Source: DEAT

The gross geographic product (GGP) of South Africa is available at district level. It should be noted that GGP figures are only available values for 1994 (See Table 3).

Table 3. GGP per province (Stats, 1995)

Province	GGP (Rands)
Northern Cape	7,999,727,000
Limpopo	14,158,429,000
North West	21,251,571,000
Free State	23,688,305,000
Eastern Cape	29,049,145,000
Mpumalanga	31,174,669,000
KwaZulu-Natal	57,007,087,000
Gauteng	144,359,250,000

The manufacturing industry contributes the largest share of GGP in five of the nine provinces, namely in Gauteng, KwaZulu-Natal, the Western Cape, the Eastern Cape and Mpumalanga. Mining is the biggest contributor in the Northern Cape, North West Province and the Free State, and the government sector is the biggest contributor in the Northern Province.

4.5 Economic Water Accounts

Source: Stats SA, 2006

The United Nations framework for water resource accounting provided the basic structure for organising the South African water accounts. Key features of the physical and monetary components of water flow and asset accounts of the Integrated Environmental and Economic Accounting for Water Resources have been adapted for consistency with the principles of water management and policy mandate of the principal water management institutions in South Africa.

The following data sources were used to construct the South African physical water accounts:

- The Water Resources Situation Assessment conducted by DWAF for 1995;
- The NWRS, which provided water supply and demand data for every WMA for the year 2000;
- And, the Internal Strategic Perspective (ISP) reports for each of the 19 WMAs.

While data used for compiling monetary flow accounts for South Africa were mainly sourced from:

- Stats SA national accounts;
- And, Data on tariffs from DWAF as well as unpublished surveys.

Since geographical boundaries of the 19 WMAs do not correspond to geographical accounting units of Stats SA (provinces or municipalities), no economic datasets were available to construct monetary accounts per WMA.

The **physical accounts** provide information on the volumetric supply and use of water. South Africa receives approximately 500 mm of rainfall per year. Calculated over the total surface area of South Africa, this equates to 611 billion m^3 of rainfall falling annually in South Africa. The bulk of this water is evaporated or used by the natural environment (transpiration) leaving 49 billion m^3 available to mean annual runoff. The usable yield of mean annual runoff is 13.2 billion m^3, comprising approximately 10.2 billion m^3 of surface water yield, 1.1 billion m^3 of groundwater yield and approximately 1.9 billion m^3 of return flows. These water yields are supplied through a complex distribution network of dams and transfer schemes. The following institutions constitute the water distribution system in South Africa: DWAF, catchment management agencies, water boards, irrigation boards, water user associations, and municipalities. The water yield is used mainly by the agriculture sector (67%), most of which is used in irrigation (62%). Second to agriculture is domestic use (15%) followed by services (7%), manufacturing (5%) and mining (3%). Dryland agriculture and cultivated forests rely on soil water, and also impact on yield.

The **monetary accounts** provide a basket of measures that describe the economic and welfare impacts of water supply and use. The water valuation of water resources and their depletion was not attempted as they remain controversial because of the fundamental importance of the resource for basic human needs and the lack of a real market for water. In South Africa in 2000, water contributed the highest share of intermediate input costs in the mining sector (more than 3%) followed by other trade and services sectors with the construction and manufacturing sectors showing the lowest share (less than 0,5%). On average, the share of water in total intermediate costs was slightly more than 1% for the national economy. Trade and services sectors paid the highest cost

per unit water (ZAR 12/m^3) followed by the mining (ZAR 3.76/m^3), manufacturing (ZAR 1.58/m^3) and domestic use sectors (ZAR 1.19/m^3). On the other hand, agriculture paid the least (2.3 cents per m^3 of water used), while water used in power generation cost 50 cents per m^3 in 2000. While agriculture used the highest share of total water use it contributed only 3% of the national income. Conversely, trade and services used only 8% of the water to contribute about 70% of the total national income while manufacturing produced close to 20% of the total income and used only about 6% of the water. Consequently, trade and services had the highest GDP/m^3 indicator (ZAR 654) among all activities followed by manufacturing, mining and lastly agriculture (ZAR 3/m^3). The average national Gross Domestic Product indicator was R77/m^3 of water in 2000.

It must be noted that this economic accounting of water was a once off exercise largely developmental in nature.

CHAPTER 5: FUTURE PERSPECTIVES

5.1 Key Lessons from the Country Experience

South Africa is an example of a country where the 'Enabling Environment' has been in place since more than 10 years, indicating a strong commitment to embrace IWRM as illustrated by the progressive National Water Act and all the other legislative documents. South Africa has also led the way in pioneering the development of a methodology for determining the ecological reserve, enforcing public participation processes, a water tribunal, etc.

In all these positive steps, the key challenge has been the effectiveness and the sustainability of the gains. Some emerging lessons are:

1. Reliable data is essential to support these processes. Monitoring of essential parameters such river flow, rainfall, groundwater levels, etc is a challenge. More importantly, monitoring of water use, in the face of a growing competition for water and enforcing the provision of the water act (such as the reserve and allocation) is critical.
2. Greater coordination between sectors at the planning and implementation phases requires improvement in order to optimise the allocation and use of water for competing needs.
3. A critical mass of a qualified workforce in the water sector ranging from engineers to environmentalists, social scientists, water quality scientist, hydrologists and importantly technicians and artisans is required. At present, this seems to be the real bottleneck in ensuring the sustainability of the gains achieved.
4. Some areas will remain a challenge for the foreseeable future, these include:
    a. Effective enforcement of the ecological reserve, despite a progressive methodology
    b. Effective monitoring of water use
    c. Setting up functional institutions in water resources management
    d. Transparent tariff setting and effective cost recovery.
5. Because the IWRM planning process (as adopted at the WSSD) was aimed to fast track the achievement of the MDGs, it is important to look beyond the MDGs and focus on the needs of those who do not have yet access to essential services and who will not in the near future. These are the poor and marginalised, often living in remote access areas where providing the required infrastructure could prove prohibitively expensive.
6. Maximising the opportunities that the water sector offers to the overall economic development of South Africa seems to be the focus of W4DG. Yet, this new approach is likely to fail if all the above lessons are not taken into consideration.

The definite shift from IWRM to W4GD can be interpreted as a sign of impatience with IWRM's promises that seem to be slow to materialise.

5.2 Future Perspectives and the Need to Continue the Process

The new 'Water for Growth and Development Framework' which has just been launched is an

opportunity to strengthen and build on the gains that the adoption of IWRM has brought to South Africa. This is therefore an opportunity to focus on implementation, by engaging other sectors and focusing on delivery in order to achieve sustainable growth and development.

As a first step, all the lessons discussed in Section 5.1 above need to be integrated in the W4GD framework.

With regard to responding basic human needs, South Africa's gains need to be sustained beyond the MDGS. Possible obstacles that will have to be dealt decisively include:

(1) The institutional and human capacity to continue to provide essential services at desired level. In the recent past, there has been increasing reporting, some times controversial, on the falling water quality standards of South Africa's water resources and the inability of the country to deal with the problem.

(2) The difficulty of reaching scattered settlements in rural areas in order to provide them with clean water and adequate sanitation. The cost of reaching these settlements is prohibitive and will mostly rely on government intervention without any prospects of cost recovery. This is a challenge to providing 100% of essential services to all South Africa's households.

(3) A similar challenge exists for dense informal settlements around cities where it is impossible to provide essential services without first addressing the housing problem. Thus, providing adequate housing (to eradicate the infamous shacks) will have to go hand in hand with providing water and sanitation (at the same time with other essential services such as roads and electricity).

With regard to the economic needs, in implementing the Water for Growth and Development Framework, the water sector should contribute better to the socio economic development of South Africa which is the key to addressing most of the above challenges. A diversified economy that depends less on export commodities and more and more on manufacturing and services will reduce South Africa's vulnerability to market conditions. Job and wealth creation will result in improved living conditions with households being able to afford essential services without government subsidies.

With regard to ecological needs, the reserve methodology has to be objective, realistic and attainable. Once this has been achieved, there will be a strong need to obtain the buy-in from other water users who depend on the same resource and to improve the enforcement capacity of the responsible authority at all levels .

With regard to the possible role of the South Africa's Country Water Partnership (SA CWP), it is of worth to note that despite being somehow dysfunctional, a CWP was launched in South Africa in 2000. In comparison to other countries such as Malawi or Zambia, the SA CWP has to compete for space on the water scene to become relevant. South Africa has a myriad of role-players in the water sector, ranging from a complex organisational structure in government mostly at national level but also at the provincial and local levels, parasitical institutions such as water boards, the private sector

(consulting firms and others), academics and researchers, NGOs, etc. For the SA CWP to become relevant, it has to bring together a representative sample of all these role-players and provide a credible platform for engaging and supporting government efforts in implementing IWRM. This has hardly been the case in the recent past considering several other consultative platforms that have always been used for consultation in reshaping the face of the water sector since the advent of a new democratic South Africa in 1994.

The situation therefore calls for a rethink of the role and relevance of a CWP in the context of South Africa. DWAF and other institutions such as International Water Management Institute have in the past demonstrated their commitment to support a CWP in South Africa. However, this has not been matched with a decisive and convincing ownership by stakeholders, considering that the regional secretariat of Global Water Partnership-Southern Africa often intervenes to provide direction or stimulate activities.

It is therefore time, in the context of changing face of the water sector, that a new approach is taken to revive the SA CWP or to take the bold step of let it die silently and make use of alternative platforms. A thorough assessment is required before such a critical decision is made.

5.3 Constraints, Opportunities and Perspectives

DWAF – the national custodian of water resources – is experiencing severe capacity challenges that hinder its role of successfully managing the WMA as a unit. The water sector as a whole has the same capacity problem. The lack of a comprehensive and functional approach to public engagement coupled with the lack of capacity to participate in consultative processes makes difficult the involvement of the populace in decision-making processes. Concerted efforts have to be made by DWAF to strengthen collaboration with other sectors and stakeholders. The current insufficient collaboration between the different departments that impact on water generates a range of institutional challenges. Apart from the enabling environment which is well established, DWAF needs to strengthen its institutional roles and its management instruments. The current paucity of available information only delays the effective implementation of IWRM.

It is critical that the NWRS which is to be reviewed soon addresses the shortcomings identified over the past decade. Although the government is committed to high service standards and to high levels of investment subsidies to achieve those standards, there is uncertainty about the government's ability to sustain current funding levels in the sector. Nevertheless, the budget allocated to the water sector is an indication that there is a political will. In comparison to other SADC countries the water sector of South Africa is financially well endowed internally. The decentralisation of water resources services and water resources management gives DWAF the opportunity to enforce effective regulation of the water sector.

Though it appears to be a shift from IWRM, W4GD offers a new perspective in focusing on economic development. Indeed, all developed countries have resolved their water challenges through economic development. Whether water is scarce or not, all solutions become affordable if funds are made available through a prosperous economy i.e., countries in the Middle East resort to desalination. Thus, the role of water in achieving economic development should be the strategic

focus of South Africa in managing and developing its resources, while maintaining the current gains of IWRM especially the protection of the environment and taking into account lessons such as streamlining processes of public participation and simplifying the complex institutional set up.

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