Department : Water Affairs
and Forestry

Integrated Water Resources Management

Institutional Roles and Linkages: National Assessment

Summary

DEPARTMENT OF WATER AFFAIRS AND FORESTRY

INTEGRATED WATER RESOURCES MANAGEMENT

INSTITUTIONAL ROLES AND LINKAGES
NATIONAL ASSESMENT

SUMMARY

INTEGRATED WATER RESOURCE MANAGEMENT
STRATEGIES, GUIDELINES AND PILOT IMPLEMENTATION
IN THREE WATER MANAGEMENT AREAS, SOUTH AFRICA

DANIDA
FUNDING AGENCY

Edition 1

March 2004

TITLE:	INSTITUTIONAL ROLES AND LINKAGES: NATIONAL ASSESSMENT: SUMMARY
FUNDING AGENCY:	DANIDA
CATEGORY:	Strategy
PURPOSE:	To present a suite of strategies with a wide scope including: management; protection and use; institutional arrangements; human resources and capacity building, for inclusion in the National Water Resource Strategy.
TARGET GROUP:	DWAF, IWRM Project Consultants and implementers in three water management areas.
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INTRODUCTION

South Africa has made provision through the National Water Act [1], amongst others, for the implementation of a new and challenging framework for Integrated Water Resources Management (IWRM). A feature of this approach, is the establishment of Water Management Areas and Water Management Institutions that will allow water resources management to move from a central decision making level to a catchment and local level.

Nineteen Water Management Areas (WMAs) have been established in the country, each the home to a set of water management institutions that will be established through the combined initiatives of the Department of Water Affairs and Forestry (DWAF), Local Government, communities living in the catchment, businesses operating in the catchment and any other relevant organisation with a presence or interest in that catchment. The Constitution of South Africa, National legislation and policies, as well as district and local municipality by-laws, guide these institutions.

Defining the interface between water resources management and water services provision and the relevant roles and responsibilities is an evolutionary process. It requires the establishment of new institutions and a redefinition or greater clarity of roles and responsibilities of existing institutions, which is a challenge to conventional practices, attitudes and professional niches. The ultimate goal, however, is well supported by all, namely, the holistic and sustainable management of water resources for our collective growth and development.

The aim of this project was to produce a document that will assist future IWRM development based on the experiences gained and lessons learnt in three pilot Water Management Areas, namely, WMA11-Mvoti-Mzimkulu, WMA3-Crocodile-West & Marico and WMA17-Olifants-Doorn. The three WMAs were selected by DWAF based on, *inter alia*, the varying pathways and degree of advancement in the establishment of the water management institutions. This report considers the linkages and relationships of the institutions with respect to IWRM functions.

The project commenced with a review of current legislation and existing DWAF guideline documents, followed by visits to various stakeholders in the three pilot Water Management Areas to assess progress towards IWRM. Conceptual thinking and, where available, documented knowledge regarding institutional arrangements, roles and responsibilities of various stakeholders and the processes followed toward the establishment of the CMA were collated and analysed.

This project also saw the development of three unique situational assessment reports [2,3,4], which described for each of the pilot Water Management Areas: (i) The specific characteristics of each in terms of available institutions, their geographic locations, policies governing them, their functions and relationships with other institutions; (ii) The current duties and functions of DWAF and other water management institutions in each area with regards to the management of water resources, and (iii) The progress toward IWRM implementation in each. A fourth 'combined' report [5] that summarised the experiences in the three water management areas and provided a further resource in the form of guidelines toward institutional development for IWRM was developed.

These reports provide a basis to document the situation in the three selected pilot study areas with respect to the linkages and relationships of the institutions carrying out IWRM functions and to produce a report that will assist further IWRM development.

Three fundamental elements of IWRM have been identified internationally [6], namely: (i) *The enabling Environment, (ii) Institutional Roles,* and *(iii) Management Instruments.* This document summarises the combined report [5], which examines these elements in the context of existing legislation, policy and practises in the pilot WMAs.

STUDY AREA

Three of the nineteen WMAs in South Africa were selected by the DWAF for this project, namely, *WMA 11- Mvoti to Mzimkulu; WMA 3-Crocodile West & Marico* and *WMA 17-Olifants- Doorn*.

Their locations and general characteristics are described and shown in Figure 1.

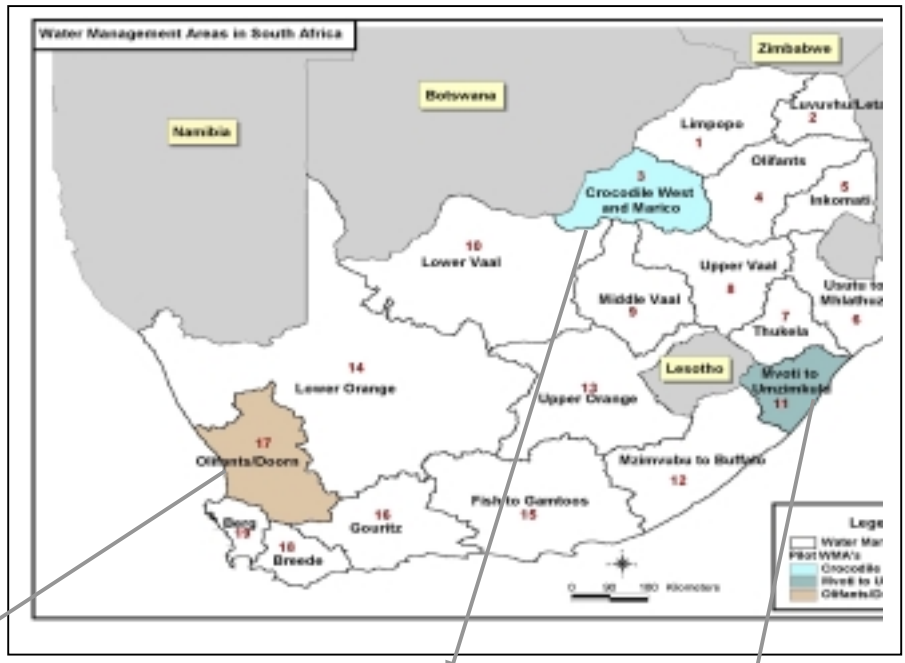


Figure 1: Water Management Areas in South Africa and the three pilot WMAs

WMA 17:Olifants Doorn

The Olifants Doorn Water Management area has eleven tertiary catchments and a population of approximately 260,000. Half of the population is urban-based living in small towns and villages, the largest of which is Vredendal.

The major river in the WMA is the Olifants of which the Doring is the main tributary. Both rivers are considered important from an ecological perspective as they contain certain endemic species some of which are endangered. Ground water is an important resource for many of the communities.

Water use is 373 Mm^3/a, with agriculture (irrigation) being the main user (90%). Increased water needs of the emerging and large commercial farmers and the need for economic upliftment in the area has been a catalyst for planning studies toward further dam development.

Water availability is a key issue to all constituencies and institutions, with curtailments a common practise. Sustainable water resources development is targeted as important for the development of this Water Management Area.

WMA 3: Crocodile West & Marico

This WMA has eight tertiary catchments and a population of ± 5 mil, about 70% of which are urbanised largely in the Johannesburg-Tshwane complex.

The WMA covers 40% of the Limpopo River basin with land use largely being, agriculture, industry, mining, forest and woodland and conservation areas, the latter including the Marakele and Pilansberg National Parks.

Water use is ± 1 245 Mm^3/a, with irrigation being the largest at 548 Mm^3/a followed by urban (461 Mm^3/a), mining (140 Mm^3/a) and rural at 69 Mm^3/a

Increasing urbanisation poses challenges on resource availability and allocation. Equally important is the need to redress historical imbalance especially in the rural settlements.

Resource quality in the catchments varies with salinity and eutrophication being moderate-high. Microbiologically related health risk is low-moderate with urban areas mostly impacted. Of concern is the existence of pesticides from irrigated lands.

WMA 11: Mvoti to Umzimkulu.

*The **Mvoti to Umzimkulu** WMA has ten tertiary catchments and population of ± 5.1 mil, of which 2.5 mil reside in urban areas of eThekwini and Msundusi Municipalities.*

Apart from the cities, land use is largely forestry, agriculture (large amount of sugarcane), grassland and some important game and nature parks, including the Drakensberg reserve.

Urban-industrial water use is the largest (290 Mm^3/a) followed by irrigation and afforestation users.

Several basins need poverty alleviation programmes and emphasis therefore needs to be placed on integrated rural development plans.

Resource quality in the catchments varies; Salinity is low, and microbiologically related health risk is low-moderate with urban areas the greatest impactors and the most impacted. Upper catchments are mesotrophic and lower catchment areas are eutrophic. The biotic-index is good, but pockets of severely degraded areas (notably urban) exist, while aliens frequently invade riparian vegetation.

WATER MANAGEMENT AND IWRM IN SOUTH AFRICA

Water management in South Africa comprises water resources management on the one hand and water services provision on the other. The primary objective is to ensure water security to meet the following obligations:

- *Water for people;*
- *Water for food;*
- *Water for the environment; and*
- *Water for industry and other users;*

These are guided by the principles of equity, environmental sustainability, economic efficiency, redress and participation.

Water Resources Management

The objectives of water resources management, as contained in the National Water Act, is to ensure that water resources are *protected, used, developed, conserved, managed and controlled* in such a way as to achieve optimum *environmental sustainability*, *social equity* and *economic efficiency*.

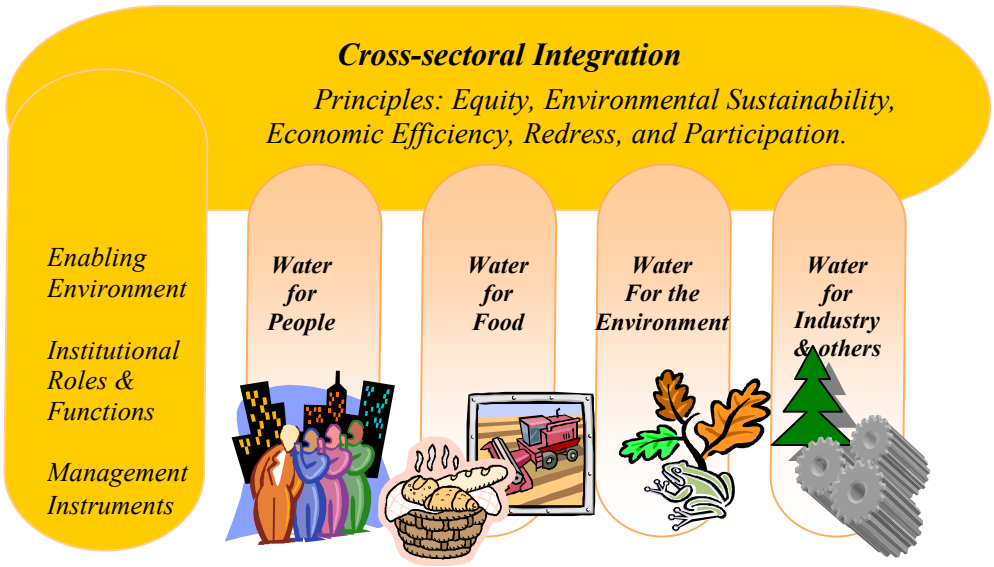
Water Services Provision

Water services provision on the other hand includes: *Activities of water abstraction, conveyance, treatment and distribution; and waste collection, removal, treatment and disposal generated by the use of water.*

Figure 2: IWRM Comb, modified after GWP, 2000 [2]. IWRM Requires integration of institutions and management instruments across all water user sectors. Effective water resources management will be achieved through sustainable water services provision.

To succeed in IWRM, three fundamental elements have to be in place as previously discussed, namely, an enabling environment, definition of institutional roles and functions and establishment of management instruments [6]. Maximum benefit and sustainability will be achieved through sectoral integration and availability of these support elements. **Figure 2** further depicts this integration, adapted from the GWP [6] and forms the essence of IWRM as enshrined in the National Water Act of South Africa.

Figure 2: Cross-Sectoral Integration



CREATING AN ENABLING ENVIRONMENT FOR IWRM

Successful implementation of IWRM requires policies and legislation to be harmonised in all spheres of government. What is also important is accountability, good governance, committed civil society and institutions that have the capacity to implement the relevant policies.

Table 1 presents the main components of South African legislation relevant to IWRM.

Table 1: *Legislation Relevant for IWRM Implementation*

Water Resources Management

The Constitution of the Republic of South Africa (1996)
The National Water Act (Act 36 of 1998)
The National Environmental Management Act (107 of 1998)
The Environment Conservation Act (Act 73 of 1989)
The Conservation of Agricultural Resources Act

Water Services

The Water Services Act (Act 108 of 1997)
The Municipal Structures Act (Act 117 of 1998) &
Municipal Structures Amendment Act (Act 33 of 2000)
The Municipal Systems Act (Act 32 of 2000)
Public Finance Management Act (Act 1 of 1999) &
The Public Finance Amendment Act (Act 29 of 1999)

INSTITUTIONAL ROLES AND RESPONSIBILITIES

The organisational framework for institutional roles and responsibilities that has been adopted is one defined by the institutional role in the water management cycle. In South Africa water institutions may be grouped into the following broad categories:

- ***Regulatory Bodies and Enforcement Agencies;***
- ***Water Services Institutions;***
- ***Facilitators and User Interest Groups;***
- ***Conflict Resolution Bodies.***

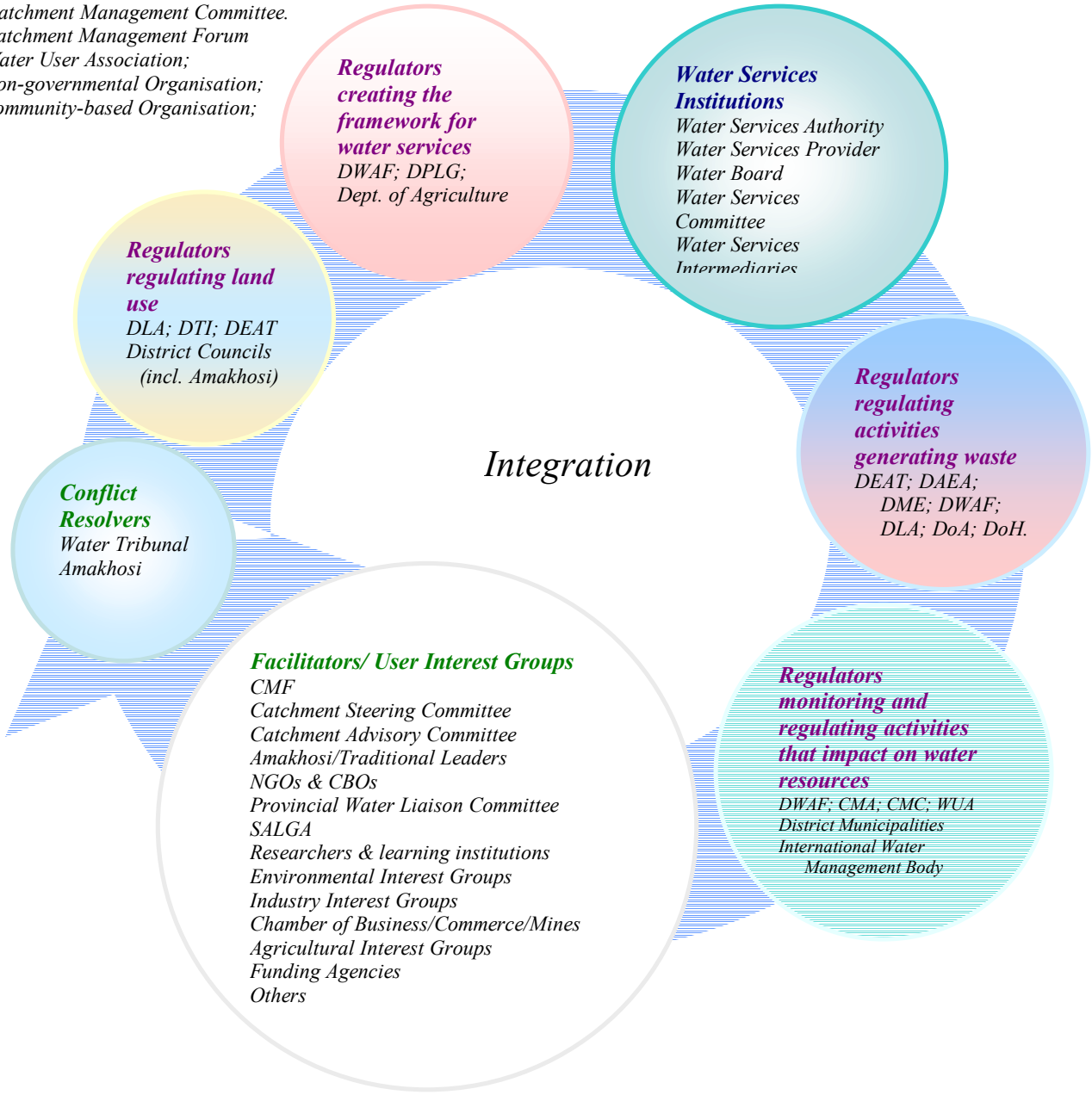
Regulators are institutions that make and enforce laws and monitor activities with respect to the management of water resources.

Water Services Institutions are institutions assuring potable water supplies to all communities in South Africa, and are also involved in the removal and treatment of wastewater before the effluent is returned to the environment.

DWAF: Department Water Affairs and Forestry
DPLG: Department of Provincial and Local Government.
DLA: Department of Land Affairs
DoA: Department of Agriculture
DoH: Department of Health
DTI: Department of Trade and Industry
DEAT: Department of Environmental Affairs and Tourism;
DAEA: Department of Agriculture & Environmental Affairs;
DME: Department of Minerals and Energy;
SALGA: South African Local Government Association;

CMA: Catchment Management Agency
CMC: Catchment Management Committee.
CMF: Catchment Management Forum
WUA: Water User Association;
NGO: Non-governmental Organisation;
CBO: Community-based Organisation;

Figure 3: Institutions Involved in IWRM and Their Broad Functional Categories



IWRM FUNCTIONS AND EXPERIENCES IN PILOT AREAS

The report identifies five broad functional areas where collaboration is required between the various institutions that play a role in water resources management, water services provision or activities that will impact on the water resource. These include:

(i) Institutional support and development;
(ii) Policy and strategy development;
(iii) Water Use Regulation;
(iv) Physical implementation (water management activities); and
(v) Information Management.

The analysis of each area includes a discussion on roles of each institution in the pilot study WMAs and the degree to which those institutions are fulfilling their roles as well as the problems that some of them are experiencing in undertaking the functions.

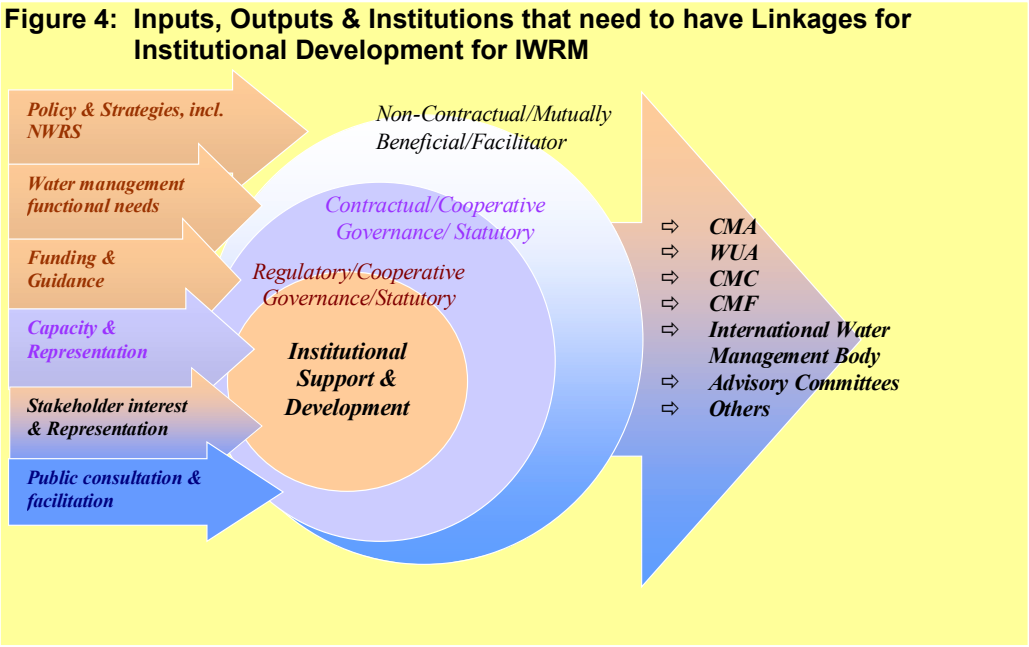
INSTITUTIONAL SUPPORT AND DEVELOPMENT

A summary for each pilot WMA with respect to institutional support and development is presented below (full details in Ref. 5), while Figure 4 shows inputs and outputs related to institutional support and development.

Mvoti Mzimkulu (WMA 11)

The Mvoti to Mzimkulu WMA, is situated on the east coast of South Africa, and overlaps the provinces of KwaZulu-Natal and Eastern Cape. Efforts in the Water Management Area to embrace the National Water Act principles for participatory water resources management have been through community involvement, supported by sixteen Catchment Management Fora. Several of these had not developed significantly over the last few years, and will therefore need future attention. However, the Catchment Management Agency (CMA) proposal development process, and the institutional development process through the DANIDA-DWAF Integrated Water Resources Management project, have been successful in bringing together a wide range of stakeholders. Other institutional capacity has also been boosted through several interventions associated with the Integrated Water Resources Management (IWRM) project. The Water Management Area is enriched with sixteen irrigation boards, a few of which have commenced conversion to Water User Associations. However, recent communication with the irrigation boards has indicated that there are delays in the transformation process.

Figure 4: Inputs, Outputs & Institutions that need to have Linkages for Institutional Development for IWRM



A CMA Proposal Development Working Group was established and had a reasonably balanced representation from DWAF, Water Board, District and Local Municipalities, organised business, farmers, Irrigation Boards and water users. The Proposal Development Working Group had systematically over a four-year period facilitated the development of the proposal towards the establishment of the Mvoti to Mzimkhulu Catchment Management Agency. The Catchment Management Agency Proposal Evaluation Committee has since reviewed the submission and identified that the proposal had met a lot of expectations in line with DWAF policies, but some areas required improvement.

The current status is that the Catchment Management Agency establishment proposal has not yet been approved. However, nominations to the Catchment Management Agency Board are anticipated to take place this year.

A number of organisations and institutions, including all three spheres of government, are already actively engaged in aspects of water management in the Mvoti-Mzimkhulu Water Management Area. The roles and functions of these organisations are discussed. It is acknowledged that IWRM is an evolutionary process and, as such, institutions will evolve over time to adapt their practises to fit into an IWRM framework.

Olifants - Doorn (WMA 17)

The Catchment Management Agency (CMA) proposal development process specifically, and the IWRM institutional development process in general, has been an highly inclusive and participative process in the Olifants-Doorn WMA over the last three years. Institutional capacity has been boosted through several interventions associated with the IWRM project. The WMA is now characterised by three fully operational Water User Associations (WUAs), three Irrigations Boards that are in the process of transformation to WUAs and eleven wall-to-wall Catchment Management Forums that represent all stakeholders. A Reference Group was established that was fully representative of the Catchment Management Forums, Water User Associations, Local Government and other government departments. The Reference Group over a two-year period systematically facilitated the development of the proposal toward the establishment of the Olifants-Doorn Catchment Management Agency. The proposal is currently under review by the Minister. Nominations for representation on the Advisory Body was carried out through the Reference Group and currently nominations to the CMA Board are being established through a broad consultation process.

A number of organisations and institutions (including all three spheres of government) are already actively engaged in aspects of water management in the Olifants-Doorn WMA. The roles and functions of these organisations are discussed, however, it is acknowledged that IWRM is a dynamic process as is institutional make-up. All stakeholders appreciate that IWRM is part-and-parcel of sustainable development and requires maintaining a balance between social, economic and environmental processes.

The Proposal for the establishment of the Olifants-Doorn CMA indicates that:

- ✧ The CMA is not intended to be a large organisation, and should adopt a flat management structure with as many of the operational functions as possible being outsourced during the initial phase of the CMA's development.
- ✧ The CMA will not be involved in the operation and maintenance of bulk water schemes or distribution systems. It is envisaged that this will be managed by the WUAs, as it is done at present.
- ✧ Hydrological services should remain a centralised function, preferably as part of the proposed national utility.
- ✧ An evolutionary approach should be adopted for the CMA to take on additional legislated functions.
- ✧ The transition to a fully functional CMA has to be supported by appropriate capacity and skills building programmes to include stakeholders from the area.

The Proposal further discusses the financial and social viability of the proposed CMA.

In the preparation of this document and echoed in the CMA establishment proposal it is acknowledged that the future success of IWRM in the Olifants-Doorn catchment hinged on the following risks being addressed:

- ✧ Financial support for the CMA: A Water User charge is to be levied on registered users. The viability of any CMA is therefore highly dependent upon the extent of registration within the WMA, as well as the ability to collect these charges.
- ✧ Continued communication between the CMA and the community: It is proposed that a concerted effort be made to execute an effective public participation process through the forum structure and that continued support be provided to the Forums.
- ✧ That the roles and responsibilities of all stakeholders be clearly identified and supported.

Crocodile West & Marico (WMA 3)

The Crocodile West & Marico Water Management Area is one of the many water stressed catchments in South Africa. Surface water resources are used extensively, particularly in the Crocodile River catchment, with the main water users being agriculture, industry, mining and urban use.

Initiatives on institutional development and alignment have been ongoing, taking place at different levels and contexts, depending on the agenda and legislative imperatives in force. The main developments that are relevant to implementation of Integrated Water Resources Management in this Water Management Area are the establishment of new forums and revival of existing ones in support of the Catchment Management Agency establishment process and transformation of water services institutions.

The South African Local Government Association (SALGA) has also taken a big stride in terms of involvement in water services in support of local government, including, presenting a position statement with regard to the relationship between local government and the CMA. Many important lessons have been drawn from developments over the past few years. These have included: information sharing and initiatives taken by different players such as the current DWAF-DANIDA Integrated Water Resources Management project through its different work packages and training of catchment mentors and champions; interdepartmental environmental forum activities; and alignment of the Department of Water Affairs & Forestry and Department of Provincial & Local Government around issues of support and transfer of assets to local government.

The Coordination and Liaison Committee (CLC), which is a body that coordinates all activities of the existing fora in this Water Management Area, has undertaken numerous tasks in relation to the Catchment Management Agency (CMA) establishment process, facilitation of stakeholder participation and in drafting of the proposal for establishment of the CMA. This committee has attracted stakeholders from various types of institutions providing it with a broad spectrum of expertise and knowledge base to address Integrated Water Resources Management issues. The skills and knowledge available is one of the unique characteristics of this Water Management Area, and is likely to continue to be utilised once the Catchment Management Agency is in place.

The Catchment Management Agency establishment process had been driven by the DWAF Regional Offices (Gauteng and North West) and the Coordination and Liaison Committee (CLC) with support from consultants. Nine catchment management forums were established as part of the process. Stakeholder participation, however, especially the previously disadvantaged individuals, was not adequate in many instances, which compromised the strength of the Catchment Management Agency establishment proposal.

Despite issues raised, the regional office made attempts to communicate the need for cooperation with most provincial departments and local government structures.

This communication was largely through written correspondence. An intensive marketing strategy and information dissemination mechanism needs to be put in place to take this further and popularise the Catchment Management Agency process.

It was also noted that consultants had a major role to play in the Catchment Management Agency establishment process. While this had advantages of efficient and timely delivery within tight schedules, the disadvantages appeared to be loss of control or ownership over the intellectual property by DWAF, which could weaken the support role that they need to play in future. Interventions made through the DANIDA training of trainers, deployment of catchment champions and related programmes have given the process more meaning and legitimacy and the process now needs to be taken forward into practical action plans.

POLICY AND STRATEGY DEVELOPMENT

The National Water Act (Act 36 of 1998) calls for the development of strategies to facilitate the proper management of water resources in South Africa. The ***National Water Resource Strategy*** (NWRS) provides the framework for the *protection, use, development, conservation, management, pricing, monitoring* and *control* of water resources for the country as a whole. The development of the NWRS between the period 2000 and 2002, involved extensive stakeholder consultation that enabled input into the various drafts. The NWRS serves as the umbrella for the country's catchment management strategies in each Water Management Area.

A ***Catchment Management Strategy*** (CMS) is required for managing water at regional level, in a defined Water Management Area. The Catchment Management Strategy must comply with all the criteria identified in the NWRS. Progress in the pilot study areas with respect to the development of the CMS are as follows.

WMA 11: Mvoti to Mzimkulu

The proposal for the establishment of the Mvoti-Mzimkhulu CMA has been completed, but requires amendment in line with comment from the CMA Proposal Evaluation Committee. The proposal recommended that the CEO of the CMA and the support staff should be appointed prior to the development of the CMS. The merit of this approach was that the CMS should get complete support and unconditional acceptance if the stakeholders implementing the strategy draft it. Much information that will be used to draft the CMS had been gathered for development of the proposal. This information included the situational assessment, financial viability, social viability and feasibility study. The CMA Proposal Evaluation Committee had also requested a review of the financial viability and further definition in terms of the timing and delegation of functions. The District and Local Municipalities have also completed development of their Integrated Development Plans (IDPs) and Water Services Development Plans and the Provincial Government has drawn up the Integrated Sustainable Rural Development Strategy (ISRDS), all of which will comprise integral inputs into the CMS.

WMA 3: Crocodile-West & Marico

In WMA 3 the forums undertook the development of local catchment management strategies based on issues identified by stakeholders. These will inform strategies that are put together by the CLC, which in turn will contribute towards the CMS for the WMA. The three water boards have in place business plans as a requirement of the Water Service Act. These have been harmonised to some degree with the local government WSDP and also incorporates water resources management aspects. All of the municipalities have prepared their WSDPs through guidance of the Water Services Directorate. Summaries of key areas in these plans have been included in the IDPs in most cases. Some of the important inputs to the CMS are details of the Limpopo Basin Study, the Sustainable Rural Development Strategy, Situational Assessment and CMA viability reports as prepared by the CLC.

WMA 17: Olifants Doorn

The activities and information documented by the various institutions, the Reference Committee and the Proposal Drafting team Reference Group will form a basis for the development of the Catchment Management Strategy. All of the municipalities have prepared their WSDPs under the guidance of the DWAF Water Services directorates in the Northern and Western Cape regional offices.

Many projects are being carried out in the WMA (WORDIS study, Olifants Doring Basin study, Raising Clanwilliam Dam Feasibility study etc.), which will provide input to the CMS. It has been proposed that the mandate of the Reference Committee, which comprises representatives from the entire catchment across all sectors, be extended to form the interim Catchment Management Committee, which will initiate the formulation process of the catchment management strategy.

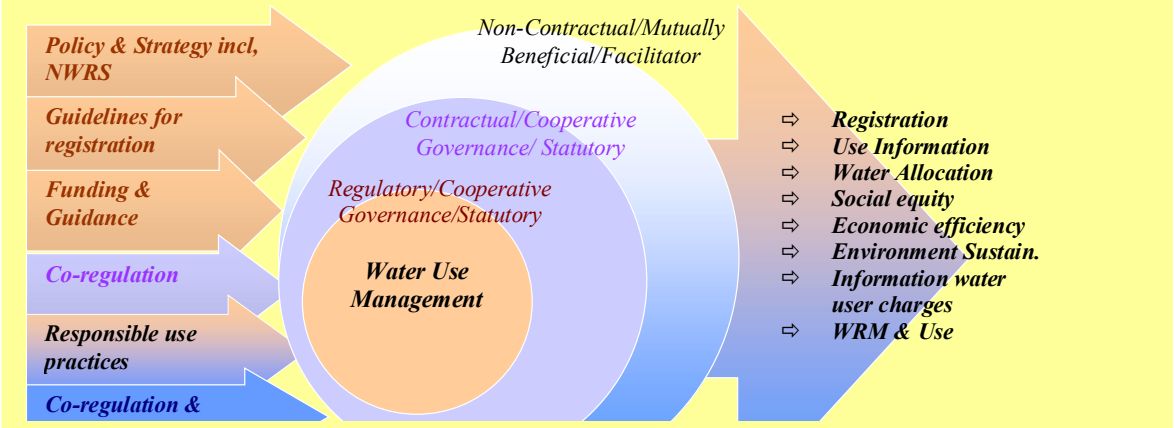
Collectively the lessons learnt from the WMAs were: (i) Stakeholder input on local plans is essential for development of a CMS; (ii) A comprehensive local CMS can only be drawn up if CMFs have a sound knowledge of the catchment, capacity and support; (iii) There must be co-ordination between all CMFs in order to harmonise their plans as a step towards development of the CMS, and (iv) Institutions such as water boards, WUAs, conservancies, environmental groups, all have valuable information that could be used to inform the CMS.

WATER-USE REGULATION

Water use is broadly defined as taking and storing water, activities which reduce streamflow, waste discharges, removing water found underground for certain purposes, and water used for recreation (see ref. 1 for a description of all eleven water uses defined in South Africa). It is acknowledged by all that DWAF has a key role to play in ensuring that water resources management and water services contribute to social and economic development and poverty eradication.

Figure 5, shows a schematic of the inputs and outputs relating to water use management.

Figure 5: Inputs And Outputs Relating To Water Use Management.



WMA 11: Mvoti to Umzimkulu

The current major water consumption in the Mvoti-Mzimkulu WMA is for urban, irrigation and forestry use, while rural use consumes very little. The total population of the area – and therefore potential user base – is approximately 5.12 million, which makes it one of the most populous Water Management Areas in South Africa. The Pietermaritzburg and Durban business and urban areas account for 2.5 million people alone.

A comprehensive registration process, as per requirement of the National Water Act, has been undertaken and is ongoing. Under this legislation, a much broader range of water users than in the past has been required to register, including forestry. In addition, all irrigators and those defined as undertaking "stream flow reduction activities," as well as other abstracters such as industry, water boards and local government institutions, are defined as water users and therefore liable for payment of water user charges to the future Catchment Management Agency. This process is still at an early stage of implementation and the focus for water user charges thus far has been on water boards, irrigators and forestry users.

WMA 17: Olifants -Doorn

WMA 17 is water stressed and, as such, requires strict regulatory measures for water use. Ninety percent of the water is used by the agricultural sector. The water registration process is being used for redress through empowering of emerging farmers. This WMA has formed an "Irrigation Action Committee" where DWAF provides a water allocation subsidy. The registered water use in WMA 17 is 21,1 mil. m^3 for municipal and 316 mil. m^3 for agricultural use per year. No streamflow reduction activities, such as afforestation, have been registered.

WMA 3: Crocodile West & Marico

WMA 3 is also a water stressed catchment, requiring strict regulatory measures for water use. Adding to the challenges of water management is the international obligation for equitable sharing of the resource in the Limpopo Basin. South Africa has verbal agreements with the governments of Botswana, Zimbabwe and Mozambique for equal sharing of the resource.

The regional office has managed water use registration within the WMA. The existing irrigation boards have played a pivotal role by aligning themselves with the process and facilitating registration within their sector. Mines and industries largely receive process water from the three water boards. The Water Quality Directorate at the National office regulates discharges into watercourses from wastewater works, mines and industries.

The National Government has the overall responsibility for and authority over water resources management including the equitable allocation and beneficial use of water in the public interest. The National Water Act could overrule, as may be required, any water use rights that an institution has under the Water Services Act. The Catchment Management Agency therefore governs how municipalities may obtain the use of water for their consumers and also how effluent and other wastewater may be returned to the resource.

PHYSICAL IMPLEMENTATION

The function of physical implementation revolves around: -

- ✧ *The protection of water resources and abstraction of raw water;*
- ✧ *The development of infrastructure to store and transport water and wastewater;*
- ✧ *The development, operation and maintenance of water and wastewater treatment works and reticulation systems.*

The ***Mvoti-Mzimkulu WMA*** is well equipped with water resource infrastructure, which includes 8 dams, 12 major potable water works and 18 wastewater works. There are also a number of proposals for water resources infrastructure augmentation, designed to increase the capacity of the Mgeni and systems to the North and South of the Mgeni.

Water conservation for urban use has been particularly successful in curtailing growth in water demand over the past number of years - notably in the eThekweni Municipality, with further reductions expected over the next few years, while the Msunduzi and Mngeni Municipalities and parts of the South Coast have embarked on similar campaigns.

Floods have been experienced in this WMA in the recent past notably 1987. The Disaster Management Plan (drought/flood scenarios) was executed successfully during the flood, and should be taken into consideration by the CMA when drafting its plan.

The Water Board historically played a lead role in conjunction with DWAF in protection of catchment water resources. In addition to monitoring and assessment, spill management, detection and tracing of problem discharges, and qualitative analysis work was provided. Such services could continue to be provided to the CMA, but on an agreed and financially sustainable basis.

The Working for Water (WfW) programme, doubling up as a social development programme, had been diversified to include a aquatic weed component and provided resources towards control work, including use of biocontrol agents. WfW is also providing a central coordinating role for all role players by planning and managing response through aquatic weed advisory committees. Resources available to WfW are limited, and the most effective use of those available will need to be identified by the CMA.

The ***Olifants-Doorn Water Management Area*** is generally arid with an average rainfall of less than 300 mm/a. There is one major river in the catchment, the Olifants River of which the Doring River is the main tributary. In excess of 90 percent of the water use is for irrigation in the summer months, making bulk water storage an essential component of water resources management. The regional economy is supported largely by agriculture and ecotourism emphasising the need to carefully manage the competing demands. The estimated population of the WMA is 267,187 people[1] and most live in either formal or traditional households and have access to a treated water supply (98.7 %). Only 9 percent of the population is without sanitation, which is well below the national average. However an area that needs to be championed by the newly formed Catchment Management Forums is attention to provision of waste management education and/or improvement in coverage of municipal solid waste services in order to reduce potential impacts on water quality. Currently 41% of households do not have municipal waste removal services.

There are two major impoundments in the Olifants Doorn WMA, the Clanwilliam Dam and the Bulshoek Barrage with a large number of farm dams commanding substantial portions of the catchment run-off, by storing run of river winter diversions from mountain streams. However, this catchment is unique in that its larger rivers are in a relatively pristine state and is the home to some rare endemic species of fauna and flora, serving as a tourist attraction. The development of future water infrastructure therefore necessitates close cooperation between all stakeholders in the catchment, the consideration of alternate water sources such as groundwater and the implementation of comprehensive water demand management programs before implementing infrastructure development. Members of Catchment Management Forums have been capacitated in water management and development options and have expressed a need for being involved in decision making with regards to water resources development.

The ***Crocodile West & Marico Water Management Area*** is one of several water stressed catchments in South Africa. Surface water resources are used extensively, particularly in the Crocodile River catchment, with the main water users being agriculture, industry, mining and urban. Agriculture accounts for about 33.5 % of total use and largely utilises privately owned dams and Government schemes. Rand Water, Magalies Water and the North West Water Authority supply most of the mining, industrial and domestic sectors from sources within the catchment and from the upper Vaal system, which receives a significant amount of return flow from Tshwane. There are approximately 3,99 million people who live within the Water Management Area of which about 70 % live in urban areas. The major economic activities are mining, agriculture and light industry.

[1] Municipal profiles: Census data: 2001. Not pro-rated for WMA area.

There are 21 dams of significant size and numerous farm dams that contribute significantly to the total storage volume in the WMA. Groundwater sources supplement water supplies in Pretoria and Thabazimbi, as well as other urban areas situated in the Groot-Marico and Molopo River catchments. Rand Water, Magalies Water and the North West Water Authority primarily provide bulk water services and reticulate through management contracts in certain rural villages, while there are other water works operated by local government structures. There are 25 municipal wastewater works with a combined capacity of 973 Ml/d and 8 industrial effluent treatment plants with a combined capacity of 70 Ml/d. Stormwater management and to some extent flood control is the responsibility of local municipalities. DWAF oversees flood control at catchment level including dam safety. Water conservation and demand management measures at municipal level are still lacking

Building and operating water resources infrastructure has in all WMAs, in the past, been largely driven by engineering requirements with a focus on getting water to people in as efficient and rapid a manner as possible. The result was a high standard of technical and engineering considerations and minimal focus on the regional, social, economic and environmental impacts of those actions. This situation has now changed and water infrastructure development is guided by several policies and strategies including water conservation, demand management, environmental impact, river rehabilitation and social development projects.

A great deal of change regarding institutional roles and responsibilities is taking place in the operation and management of water infrastructure. There are now wall-to-wall District Municipality demarcations ensuring that all areas fall under the responsibility of a district municipality, which is legislated to be the Water Services Authority for that area. While DWAF retains the powers to regulate the development and management of bulk water infrastructure, or appoint institutions such as water boards and water user associations to manage this function, the District Municipality must put in place structures to manage the reticulation of water to communities.

INFORMATION AND KNOWLEDGE MANAGEMENT

An Information and Knowledge Management System is a vital tool for water managers and practitioners to make important decisions on the use, development, conservation and protection of water resources at local, national and international level. The National Water Act calls for the minister to establish a national monitoring and information system in order to provide information for development and implementation of the National Water Resources Strategy (NWRS).

While there has been some development of information systems such as: (i) A National register of water-use authorisations, (ii) An information system on the quantity and class of water resources, (iii) An information system on the quality and health of water resources, (iv) A Groundwater information system, and (v) A Hydrological information system, the degree of completeness varies between the pilot WMAs concerned.

WMA 11: Mvoti- Mzimkulu

There are a number of key areas where information gathering has been deficient and in some cases non-existent, thereby obstructing informed decision-making. These areas include (i) The more detailed evaluation of the extent of alien infestation in the WMA; (ii) Detailed environmental reserve determinations for important rivers; (iii) More extensive water quality data for the rivers south of the Mkhomazi River; (iv) More detailed evaluation of the extent and impact of erosion problems; (v) More hydrological information for the rivers south of the Mkhomazi River; and (vi) More detailed outputs from the water situation assessment model.

There are a number of well-established institutions, which have been collecting data for the WMA for many years. These include Umgeni Water and eThekwini Municipality. The data collected has included: water quality, water quantity, biota & aquatic integrity, waterweed infestation and other pollution threats. These need to be capitalised on and built on by the future CMA.

WMA 3: Crokodil West&Marico

WMA 3 has been fortunate to be positioned strategically to access an abundance of support facilities and institutions and, as such, there is a broad information base available. Hydrological data, groundwater and water quality data for many sources have been collected over a long period of time, which helped in putting together the situation assessment and CMA viability reports.

Other valuable inputs are the departments of Environment, Agriculture and Conservation from Gauteng and the North West provinces through their involvement in river health monitoring and general water quality assessment. Johannesburg Metro has also established a catchment management unit in its environmental section to implement catchment management in its area of jurisdiction. The city has also received United Nations funding for establishment of a catchment management information system to be used as a pilot project in South Africa. Some of the input data comes from the health department, which monitors city rivers and wastewater discharges.

WMA 17: Olifants -Doorn

WMA 17 information management is poorly developed with no single source where all water related databases are developed and managed. Water quality data is of particular concern. The collection of data is not routine and grab samples are taken by various organisations such as DWAF, district and local municipalities, farmers, the Department of Health, the Department of Agriculture and the CSIR, each gathering information for their own needs with different criteria and locations for analysis. Hydrological information is well established around the Lower Olifants River Government Water Scheme and associated infrastructure, but to a lesser extent elsewhere in the catchment. The development of a Monitoring and Information Management System will thus be a priority for the newly developed water management institutions such as the CMA and the WUAs.

THE IMPORTANCE OF ENGAGING MARGINALIZED GROUPS

The Dublin Principles [6] provides guidance through four basic principles for water management (see section 3 of this document). One of these is that a *participatory* approach to water management is necessary for sustainable implementation. For IWRM to become a reality therefore, the involvement of all communities, especially previously disadvantaged individuals, has to be effected. Projects or activities initiated in the three pilot Water Management Areas to engage marginalized groups, included: -

- ✧ Improving communication through carrying out an initial *Communication needs analysis of the WMA* and then based on the analysis, providing resources for *Communication tools* such as newsletters, newspaper inserts, meeting advertisements and information talks on radio, amongst others.
- ✧ Building capacity to ensure informed participation through a *Capacity building needs analysis of the WMA,* followed by interventions to address these such as, *Development of the IWRM Champions program* and the *Project Cycle Management (PCM) for IWRM.*
- ✧ Ensuring adequate management and continuity of the process through *appointment of a dedicated IWRM Coordinator* and *providing resources for a WMA Forums Secretary*, for collation of minutes and provision of assistance to local forum secretaries. In addition, support for *evaluation tools* to assess stakeholder participation was enabled.

Previously disadvantaged groups within the forums were selected for the DANIDA-DWAF *Champions Programs*. The primary purpose of having *Champions* was to popularise DWAF's vision on IWRM and build capacity among other members of the forums and the greater community. An added benefit was development of people resources in the field of water resources management.

Courses included *Planning Aspects in Water Resources Management, IWRM and The Water Cycle, Communication and Conflict Resolution Skills, Leadership and Facilitation Skills, Institution-Related Knowledge* and *Administration*. Some of these champions were further exposed to *Participatory Developmental Project Cycle Management* techniques so that they could identify and develop programmes/projects that focused on water and poverty alleviation issues.

The outcome of the intervention was development of project proposals that addressed a broad spectrum of issues related to equitable socio-economic development in the WMA. *Micro-project funding (i.e.* small grants) was made available, and in some instances the champions tendered for externally advertised projects that met the goals of IWRM. *Case studies* in Ref. 5 describe some of these interventions. Projects included: *(i) Water Awareness, (ii) Water Conservation, (iii) Pollution response, (iii) Disaster Management, (iv) Institutional Development,* and *(v) Development of Environmental Networks*.

CONCLUDING REMARKS

This report provides lessons for IWRM in South Africa based on current thinking and the institutional development experiences from three pilot WMAs in South Africa. The project commenced with a review of legislation and relevant DWAF guideline documents, followed by visits to stakeholders in the three pilot WMAs to assess progress towards IWRM. Conceptual thinking, both global and national, and where available, documented knowledge regarding institutional roles and responsibilities of various stakeholders and the processes followed toward the establishment of the CMA were collated and analysed.

This report examined IWRM principles in the context of the legislation, policy and practise in the pilot WMAs and considered the linkages and relationships of the relevant institutions with respect to water management functions. Successful IWRM implementation requires collaboration between institutions involved in water resources management and those involved in water services provision, as well as the participation and support of all stakeholders. For the purposes of this document, IWRM relationships were successfully explored in terms of the DWAF management functions relating to: *Institutional Support and Development, Policy & Strategy Development, Water Use Regulation, Physical Implementation* and *Information Management.*
In addition, some of the recent communication and information initiatives undertaken to increase the engagement of marginalized groups in IWRM were briefly described in a final chapter in the form of *Case Studies*.

The successful implementation of IWRM requires an improved understanding of legislation and policy and IWRM principles embraced by all stakeholders who can then actively contribute to the sustainable development of the WMA and Country. Such initiatives would be in line with the National Water Act and global sustainable development thinking, and also serve as a useful model for other parts of the African continent. Together with successful demarcation of the country into 'wall-to-wall' District Municipality areas, each with their own Integrated Development Plan and Water Services Development Plans, South Africa is at a point where it has laid down several cornerstones for successful future implementation of IWRM toward sustainable development for all its people.

REFERENCES

[1] **Department of Water Affairs and Forestry, 1998.** *Republic of South Africa, National Water Act, Act 36 of 1998.*

[2] **Department of Water Affairs and Forestry, South Africa, 2004.** *Institutional Roles and Linkages - Situational Assessment – WMA3-Crocodile West & Marico*. Final Report. Prepared for DWAF-DANIDA Project by Carl Bro a/s and Umgeni Water IWRM Consultants.

[3] **Department of Water Affairs and Forestry, South Africa, 2004.** *Institutional Roles and Linkages - Situational Assessment – WMA11-Mvoti to Mzimkulu*. Final Report. Prepared for DWAF-DANIDA Project by Carl Bro a/s and Umgeni Water IWRM Consultants.

[4] **Department of Water Affairs and Forestry, South Africa, 2004.** *Institutional Roles and Linkages - Situational Assessment – WMA17-Olifants-Doring*. Final Report. Prepared for DWAF-DANIDA Project by Carl Bro a/s and Umgeni Water IWRM Consultants.

[5] **Department of Water Affairs and Forestry, South Africa, 2004.** *Institutional Roles and Linkages – Guideline Based on Experiences in Three WMAs*. Final Report. Prepared for DWAF-DANIDA Project by Carl Bro a/s and Umgeni Water IWRM Consultants.

[6] **Global Water Partnership, TAC, 2000.** *Technical Advisory Committee (TAC) Background Papers No. 4: Integrated Water Resources Management.* Published by the Global Water Partnership